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NATIONAL COASTAL ZONE MANAGEMENT EFFECTIVENESS STUDY



FINAL REPORT

Sea Grant
Washington

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2. "State Coastal Management Effectiveness in Protecting Beaches, Dunes, Bluffs, Rocky Shores: A National Overview. Final Report."National Ocean Service, NOAA, DOC Tina Bernd-Cohen and Melissa Gordon.

3. "Effectiveness of State Coastal Management Programs in Providing Public Access to the Shore: A National Overview." Rhode Island Sea Grant. Pamela Pogue and Virginia Lee.

4. "The Effectiveness of Coastal Zone Management Programs in Redeveloping Deteriorating Urban Ports and Waterfronts." Washington Sea Grant. Robert F. Goodwin and Sean P. Hastings.

5. "Effectiveness of State Coastal Management Programs in Addressing Seaport Development: A National Overview." Washington School of Marine Affairs. Marc J. Hershman.

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National Coastal Zone Management Effectiveness Study: Protecting Estuaries and Coastal Wetlands



FINAL REPORT

Oregon Sea Grant
and
Marine Resource Management Program
College of Oceanic and Atmospheric Sciences
Oregon State University

December 1998

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National Coastal Zone Management Effectiveness Study: Protecting Estuaries and Coastal Wetlands

FINAL REPORT

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The Oregon State University Team

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Executive Summary

Estuaries and coastal wetlands are among the most important ecosystems in the coastal zone, providing goods and services that are vital to human society. The need for protecting, preserving, and restoring these valuable ecosystems was a major factor in passage of the Coastal Zone Management Act (CZMA) in 1972. Congress affirmed this in 1980 CZMA amendments, including a specific objective encouraging state coastal management programs to protect natural resources, including estuaries and coastal wetlands.

The purpose of this study, which is one part of the larger National CZM Effectiveness Study, is to determine the effectiveness of state CMPs in meeting this objective—*protection of estuaries and coastal wetlands*. Previous national evaluations of CZM have focused mainly on assessments of CZM processes or perceptions of effectiveness. This study goes a step further to determine the extent to which effectiveness can be demonstrated by on-the-ground outcomes of CZM policy implementation. For this part of the study, the principal research question was "How effective are state CMPs, individually and collectively, in protecting estuaries and coastal wetlands?"

Our approach to this research question involved extensive collaboration with the states. Data collection and state profile development were based on published information, a series of structured interviews with state officials, and unpublished information from reports, permit tracking databases, and other sources. Once all available data for the twenty-nine states were collected and state CZM profiles developed, individual state programs were evaluated for effectiveness in a four-step, structured process to determine: (1) the relative importance of the issue in the state; (2) the potential effectiveness of the program, based on analysis of the policies, processes and tools used; (3) the on-the-ground outcome effectiveness based on analysis of outcome indicators; and (4) overall context-based performance, based on comparison of outcome effectiveness results (from step 3) with issue importance results (from step 1) and potential effectiveness results (from step 2). Tidal and nontidal management efforts were evaluated separately for both ecological and legal-institutional reasons.

Findings

The principal objective of this study was to determine the on-the-ground effectiveness of state CMPs in protecting estuaries and coastal wetlands. To the extent that outcome data were available (and it was meager in many cases), we found that state CMPs are relatively effective and make significant contributions to this national CZMA objective. Among the various management tools used by states, regulatory programs rated the highest for their contributions to estuary and coastal wetland protection. But a variety of other strategies and tools, many built around state-local planning partnerships, also contributed significantly to state accomplishments. State CMP weaknesses were also apparent, including a general lack of organized outcome monitoring; relatively limited use of restoration as a management strategy in many states; and relatively weak nontidal, freshwater wetland management in many states. The principal study findings follow.

1. The importance of estuary and coastal wetland protection is relatively high for most states and for the nation as a whole. Based on the seven indicators used in this study, the importance of estuary and coastal wetland protection as a CZM issue ranges from low to high among states, but is "moderately to highly important" overall. This suggests that most states would be expected to have relatively strong, comprehensive CZM policies, processes, and institutions in place and be operating effectively.

2. **The potential effectiveness of state coastal management programs in protecting estuaries and coastal wetlands looks good "on paper."** The *potential effectiveness* of state CMPs collectively, based on an assessment of process indicators, was judged to be "high" for estuaries and tidal wetlands—the saltwater coast—but just "moderate" for nontidal, freshwater wetlands. However, the limited use of available nontidal wetland management tools by some coastal states and too-narrowly drawn coastal zone boundaries in others means that states often lack sufficient jurisdiction to prevent the continued gradual loss of nontidal freshwater wetlands. Further, the fragmentation of wetland management responsibilities in many states and the incomplete networking of relevant authorities into state CMPs result in coordination problems, contribute to monitoring and record-keeping difficulties, and mask some state accomplishments

3. Outcome effectiveness of state coastal management programs in protecting estuaries and coastal wetlands gets moderate to high ratings for states with sufficient data. Eleven states could be assigned at least probable outcome ratings for tidal wetlands management. Of these, seven (64 percent) rated *high* in outcome effectiveness, with the remainder *moderate*. For nontidal wetlands, only seven states merited at least probable outcome ratings. Of these, effectiveness was *high* for two (29 percent), *moderate* for four (57 percent), and *low* for one. Combining tidal and nontidal, 50 percent rated high in *outcome effectiveness*, 44 percent moderate, and just 6 percent low. If it is assumed that these states are a representative sample of state programs, it is fair to conclude that nationally, outcome effectiveness is relatively high. Improved outcome data from more states are needed to prove or disprove this assertion.

4. The overall performance of state coastal management programs in protecting estuaries and coastal wetlands is relatively good for states with sufficient data. When on-the-ground outcome effectiveness in protecting estuaries and coastal wetlands is compared to issue importance-based expectations on one hand, or the "on-paper" potential as derived from process indicator evaluations on the other, 88 percent of state CMPs were judged to be performing at *expected* or *higher-than-expected* levels in the first case and 76 percent in the second case. As with outcome effectiveness, if we assume that the states for which we have sufficient data are representative, the overall performance of state CMPs nationally is fairly high.

5. Management of nontidal, freshwater wetlands needs CZM attention. The management of nontidal wetlands in state coastal zones is relatively weak compared to management of tidal areas. There are large areas of nontidal wetlands in many states that probably should be considered "coastal" for CZM purposes, but are located outside present state coastal zone

boundaries. These CZM weaknesses pose significant threats to coastal and estuarine water quality, coastal ecosystem sustainability, and flood hazard mitigation.

6. Nonregulatory wetland restoration is an underutilized tool in CZM. Historic loss of estuarine and nontidal freshwater wetlands in many states is high. Although historical losses do not necessarily equate to restoration opportunities, especially in densely populated states where much wetland loss can be considered permanent, only a few states have systematically evaluated wetland restoration opportunities or developed action programs. Other states should follow these examples, working toward a goal of achieving a net gain in wetlands in the coastal zone, so as to reclaim some of the valuable ecosystem services sacrificed in the past.

7. OCRM and the states need to act quickly to standardize CZM performance evaluation. Outcome data for evaluating state performance in this study were limited, but this situation is changing at the state level. These changes present a "window of opportunity" for establishing a national CZM outcome monitoring and performance evaluation system. Because many states are gearing up for or are in the process of developing improved information management systems, the opportunity exists for OCRM and the states to ensure that nationally important state CZM outcome indicators are part of these state systems. The advent of new information-handling and sharing technologies—high-speed desktop computers, easy-to-use off-the-shelf software, GIS, and the Internet and World Wide Web—is another trend that increasingly makes a national monitoring and reporting system feasible. *The key need is for a well-designed set of policy-relevant outcome indicators*—ones that clearly indicate the degree to which decisions are leading toward desired policy goals. These are included in recommendations below.

8. Although the question of attribution for CZM outcomes may be important in some cases, it should be subsidiary to questions of CZM performance overall. Too much focus on who gets what share of credit for outcomes discounts one of CZM's chief strengths, namely its role in fostering collaboration and integration across artificial boundaries. Where shares of credit for CZM outcomes *must* be determined, however, case studies are the preferred methodology, rather than the systematic cataloging of relative contributions. We conclude that the systematic evidence needed to make definitive attribution statements about CZM outcomes is not available today and may never be. The massive effort needed to systematically assign credit for coastal management outcomes is not justifiable in the first place. Such a quest contradicts other explicit national objectives of CZM, namely objectives to foster integration, partnerships, and resource leveraging to achieve common objectives. We found that the "shared credit" nature of CZM outcomes is actually the result of wise investments of limited resources, with CZM resources often used as a catalyst for subsequent non-CZM actions.

Recommendations

Recommendation 1: Establish a National Performance Evaluation System

A national outcome monitoring and performance evaluation system should be developed by OCRM in collaboration with state coastal managers. In designing the estuary and coastal wetland protection component of that system, we recommend using the indicators and the four-step evaluation process used here to determine (1) issue importance, (2) potential effectiveness, (3) outcome effectiveness, and (4) overall performance. In addition, a fifth step is recommended—the comparison of CZM effectiveness results to the "state of the coast" to determine and evaluate gaps between them.

For the evaluation of estuary and coastal wetland protection, the issue importance indicators used in this study are recommended as a starting point, but additional indicators should be sought to make the statistic more robust and address the limitations noted in the results and discussion. Similarly, the process indicators used in this study are also recommended, but the list should be narrowed to the most important processes and tools, plus several others that were highly ranked by one or more states or were otherwise judged important. Recommended outcome indicators for evaluating estuary and coastal wetland protection are listed below:

- *Regulatory Outcome Indicators*: the six outcome indicators used for this study are recommended: (1) area of absolute permitted loss, (2) absolute violation loss, (3) absolute mitigation gain, (4) permitted loss trends, (5) violation loss trends, and (6) mitigation gain trends. For nontidal freshwater wetlands especially, these results need to factor in two process indicators—the extent of state CZM jurisdiction over the resource; and the relative strength of the policy or tool, including exemptions.
- *Planning Outcome Indicators*: the first three outcome indicators used for this study are recommended for a national system: (1) area given high protection by local plans, (2) high protection provided by Special Area Management Plans, and (3) high protection provided by other plans and designations, such as Geographic Areas of Particular Concern, or Areas of Environmental Concern, and critical areas.
- *Acquisition and Nonregulatory Restoration Outcome Indicators*: several of the indicators used for this study are recommended: (1) area acquired in fee-simple (with CZM's contribution specified), (2) area acquired using less-than-fee methods (with CZM's contribution specified), (3) area of wetland or other aquatic habitat restored through nonregulatory mechanisms (including CZM's contribution), and (4) area of wetland or other aquatic habitat created through nonregulatory mechanisms (with CZM's contribution). In addition, for nonregulatory restoration, it may be desirable to differentiate between former wetlands and degraded wetlands restored.

Regularly assessing the "state of the coast" and comparing it to CZM performance is a fifth and very necessary step in the evaluation model. Using national guidelines, states should establish a baseline and monitor change in relevant indicators, such as the change in area of tidal and nontidal wetlands in a state. When CZM outcomes and performance are compared to overall

coastal change, gaps in program content or performance can be uncovered and management programs improved to address the gaps.

To begin the development of a national outcome-based evaluation system, OCRM should initiate a state-level audit of existing data collection methods, information management systems, and reporting methods. Improvements should be implemented that allow more effective identification, tracking, compilation, and reporting of the outcomes that can be attributed to CZM policy implementation. Again, the indicators recommended here serve as a starting point.

Recommendation 2: Improve Nontidal Freshwater Wetland Management

Improve nontidal freshwater wetland management in state coastal zones by expanding coastal zone boundaries as necessary to encompass all coastal wetlands, by strengthening wetland protection policies, and by applying a more robust set of wetland management tools.

OCRM and individual states should initiate a more intensive study of nontidal wetland protection needs, strategies, processes, and tools, ranging from more sophisticated statute-based programs to techniques that can administratively increase protection of these valuable resources.

Recommendation 3: Establish a Coastal Wetland Restoration Policy

OCRM should establish explicit national CZM policy goals for wetland restoration, including (1) no net loss of wetland area and function in the short term, implemented through regulatory programs; and (2) a net gain of wetland area and function over the long term, implemented through nonregulatory restoration programs.

State CMPs should implement a *no-net-loss* policy by requiring full mitigation of unavoidable losses permitted under state regulatory authorities. No net loss of wetland area is an inherent benchmark that can be assessed using regulatory outcome indicators and rating criteria recommended in this study. The *net-gain goal* of this recommended policy recognizes the substantial historic loss of coastal wetlands and the significant opportunities that exist to restore a portion of the lost or degraded functions, services, and values of these ecosystems. OCRM should encourage and support state nonregulatory initiatives for ecosystem restoration with a long-term goal to increase the quality and quantity of coastal wetlands as measured by acreage and function. CZMA Section 309 program enhancement guidance should also be amended to require more explicit assessment of restoration needs and opportunities. Implementing the *wetland "function"* part of the recommended coastal wetlands policy will be very challenging because standard methods for assessing wetland functions are just being developed and there is significant time and expense involved in adaptation of national methods to localities. Nevertheless, there are existing CZM examples that serve as models and other states' efforts should be supported by OCRM and explored by states using CZM technical and financial resources.

Introduction

This report is one part of the National Coastal Zone Management Effectiveness (CZME) Study, commissioned by the Office of Ocean and Coastal Resource Management (OCRM), National Oceanic and Atmospheric Administration (NOAA). The overall purpose of the study is to judge the effectiveness of the national coastal zone management (CZM) program, as implemented collectively by the states,[1] in addressing selected core objectives of the federal Coastal Zone Management Act (CZMA). In assessing effectiveness, particular emphasis is given to the systematic identification of the on-the-ground outcomes of policy implementation. The five core objectives studied include (1) protection of estuaries and coastal wetlands; (2) protection of beaches, dunes, bluffs, and rocky shores; (3) provision of public access to the shore; (4) revitalization of urban waterfronts; and (5) accommodation of seaport development (as an illustration of the policy to give priority to coastal-dependent uses). This report focuses on state coastal program effectiveness in protecting estuaries and coastal wetlands.

Estuaries and coastal wetlands are among the most ecologically important natural resources in our nation's coastal zones. This importance is reflected in the policy language of the federal Coastal Zone Management Act (CZMA), which states in Section 303(2)(A) that "Congress finds and declares that it is the national policy to...encourage and assist the states to exercise effectively their responsibilities in the coastal zone through the development and implementation of management programs to achieve wise use of the land and water resources of the coastal zone, giving full consideration to ecological, cultural, historic, and esthetic values as well as the needs for compatible economic development, which programs should provide at least for...*the protection of natural resources, including wetlands, floodplains, estuaries, fish and wildlife and their habitat within the coastal zone*" (emphasis added).

One reason for the high priority given to protection of estuaries and coastal wetlands by the CZMA is our increasing understanding of the critical role these environments play in the overall health of the coast. Another important factor is the intense pressure placed on these resources as coastal population grows and more people make demands on the goods and services estuaries and coastal wetlands provide. Because of these values, pressures, and resulting conflicts, a wide array of federal, state, and local governmental programs have been established to protect, preserve, enhance, and restore these resources. At state and local government levels, many of these programs were initiated in response to the federal CZMA, or, where pre-existing, were networked as part of state coastal management programs (CMPs). But as these programs have matured over the past two decades, countervailing social, economic, and political trends have emerged. Pressures for deregulation, the private property rights movement, and increasing distrust of government officials and bureaucracy are examples. This mix of environmental, social, economic, and political forces has helped shaped each state CMP and the role it plays in estuary and coastal wetland protection.

In addressing this CZMA objective, most state coastal programs, like the CZMA itself, call for a "balancing" of objectives, with resource protection policies working in concert with

[1]Throughout the text, the term "states" means the thirty-five U.S. states and territories eligible to participate in the U.S. coastal zone management program.

policies designed to accommodate or even promote development, including port and other water-dependent development, public access, and revitalization. Coastal zone management (CZM) is founded on this balancing principle—that development and protection can go hand in hand, but only if there are clear policies, advance planning to improve predictability, appropriate development controls and standards, and the programmatic flexibility to incorporate new knowledge and accommodate changing societal goals. Such development has occurred in the past and is continuing. The question this study asks is "Have estuaries and coastal wetlands been protected in the process of ongoing coastal development and to what extent can state CMPs claim credit?" This national overview report responds to this question and is organized as follows:

Background and Context for CZM Evaluation provides an overview of estuaries and coastal wetlands in the United States, including the extent and importance of these resources, how they have changed over time, and how government has been involved, including the roles of states and their CZM programs.

Evaluation Methodology outlines the research questions addressed, the evaluation framework, and the methods used to collect and analyze the data.

Results and Discussion includes a national overview of the importance of estuary and coastal wetland protection as a state CZM issue, the policy response of states in terms of processes and tools used, the on-the-ground outcomes of policy implementation, and particularly successful or innovative case examples of processes and tools used by states.

Conclusions present the principal findings of the study and *Recommendations* includes suggestions for improving CZM policy, programs, and national and state evaluation procedures.

Appendices include data collection forms used for the study, a sample state CZM profile (Delaware), a sample state effectiveness evaluation (Delaware), summary evaluations for each of the twenty-nine state programs, case examples of successful use of CZM processes and tools, and a detailed analysis of outcome data availability. The summary evaluations (Appendix D) are especially important because they are the only place in this report where recommendations for individual state coastal programs are specified (with the exception of our example state, Delaware).

Complete profiles and evaluations for the other twenty-eight state CZM programs and a bibliography of materials reviewed for this study are *not* included in this report. However, for readers who want to explore the basis of evaluation ratings of one or more states in depth, the profiles are useful because they include both the primary and secondary data collected during the study that served as a basis for evaluation. State profiles, evaluations, and data sources are available from the authors[2] or from OCRM.

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[2]State profiles, evaluations, and the bibliography may be ordered directly from Joy Burck, College of Oceanic and Atmospheric Sciences, 104 Ocean Admin Building, Oregon State University, Corvallis, OR 97331-5503. Ph: 541-737-0942; E-mail: jburck@oce.orst.edu There is a small charge for reproduction and mailing.

Background and Context for CZM Evaluation

Many environmental, economic, social, and political factors and conditions account for the relative importance given to estuary and coastal wetland protection as a state coastal management issue (Table 1). Examples include the types and extent of estuary and wetland resources in a state, the degree and causes of historic resource impacts, present-day threats and development pressures, existing state and local governmental institutions and traditions, public attitudes, and the approach and structure that states have used to organize and operate their CZM programs. The relative importance of these and other factors varies from state to state. These differences are in part responsible for differences in how states have responded to federal CZM requirements to protect estuaries and coastal wetlands.

This part of the report describes the characteristics of estuaries and wetland resources in the US, including their functions and values to society, and their geographic extent and distribution. Historical losses, other impacts, and present-day threats are discussed, along with other coastal zone characteristics that influence state efforts to protect estuaries and coastal wetlands, such as coastal growth and development. Estuary and wetland protection efforts at the federal level are also described, followed by a brief review of state management efforts. Much of the information in this section, particularly the data in Table 1, is used later in the study, either as baseline data for assessing outcome effectiveness of individual state CMPs or for evaluating the national program as a whole.

Estuaries and Coastal Wetlands: A National Resource[3]

Estuaries are among the most productive natural systems on earth. This productivity is driven by nutrient-laden freshwater from rivers that mixes with salty ocean water as the tide ebbs and flows. The estuarine ecosystems that result are highly dynamic with daily, monthly, and seasonal cycles and are surprisingly resilient to perturbations. Within estuaries and just inland, vast interconnected tidal and nontidal water and wetland ecosystems serve as part of "nature's infrastructure," providing valuable goods and services that benefit human society. Fish and wildlife support, flood water conveyance and storage, shoreline erosion control, and water purification are just a few examples. Estuaries and coastal wetlands are also among the most stressed natural ecosystems, due mainly to the wide variety of demands society places on them for waste disposal, transportation, commercial and recreational fisheries, and other recreational activities; and as sites for ports, industries, and urban centers. Because protection of estuaries and coastal wetlands and the needs of human society often conflict, estuary and coastal wetland management has been a central issue in U.S. coastal zone management.

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[3]The term *estuaries and coastal wetlands* is used throughout this article as "shorthand" for the combination of (1) tidal waters and wetlands up to the head of tide, including water surface area and submerged lands below mean low tide; vegetated and unvegetated tidal wetlands, such as mudflats, salt marshes, brackish marshes, and tidal freshwater marshes and swamps; and submerged aquatic vegetation; and (2) the nontidal freshwater wetlands, swamps, and waters within coastal regions (see footnote 4).

Table 1. Selected environmental-social indicators of estuary and coastal wetland issue importance for U.S. coastal programs.

States by Region	Shore Length	CZA and CZA as % of State		Tidal Wetland	Nontidal Wetland	All Coast Wetland	WET:CZA[1]	Wetland Loss %
New England	6,130	7,240	13	443	783	1226	0.17:1	31
Maine	3,478	3,700	12	250	346	596	0.16:1	20
New Hampshire	131	1,140	12	12	94	106	0.09:1	25
Massachusetts	1,519	1,000	13	143	50	193	0.19:1	28
Rhode Island	384	500	44	10	82	92	0.18:1	37
Connecticut	618	900	19	28	211	239	0.27:1	50
Mid-Atlantic	7,353	13,432	16	2,886	969	3,855	0.29:1	62
New York	1,850	3,600	8	1,880	127	2,007	0.56:1	60
New Jersey	1,792	1,200	16	452	156	608	0.51:1	27
Pennsylvania	140	175	1	1	19	20	0.11:1	96
Delaware	381	2,057	100	151	195	346	0.17:1	>40
Maryland	3,190	6,400	67	402	472	874	0.14:1	73
Southeast[2]	11,625[2]	43,300[2]	46[2]	6,956[2]	10,870[2]	17,826[2]	0.23:1[2]	47[2]
Virginia	3,315	8,700	22	1,015	781	1,796	0.21:1	42
North Carolina	2,625	9,400	19	457	1,982	2,439	0.26:1	51
South Carolina	2,876	7,800	26	858	2,687	3,545	0.45:1	27
Gulf Coast[2]	14,304[2]	44,400[2]	33[2]	6,223[2]	11,677[2]	17,900[2]	0.29:1[2]	48[2]
Florida	8,426	52,300	100	1,533	15,938	17,490	0.33:1	50
Alabama	607	500	1	62	130	192	0.38:1	50
Mississippi	359	1,800	4	97	1,027	1,124	0.62:1	12
Louisiana	7,721	7,300	17	5,037	0	5,037	0.69:1	46
West Coast	7,863	30,100	9	792	2,213	3,005	0.10:1	46
California	3,427	2,800	2	308	354	662	0.024:1	54–75
Oregon	1,410	8,400	9	102	100	202	0.02:1	38
Washington	3,026	18,900	28	382	1,759	2,141	0.11:1	33–70
Alaska	33,904	380,190	67	3,330	22,900	26,230	0.07:1	<1
Great Lakes	4,044	13,600	12	0	2,063	2,063	0.15:1	48
Michigan	3,224	2,900	5	0	165	165	0.06:1	59
Wisconsin	820	10,700	20	0	1,898	1,898	0.18:1	47
Islands	2,369	7,153	70	136	286	422	0.06:1	64
American Samoa	126	60	100	0.6	0.4	1	0.02:1	23
Guam	110	209	100	0.3	5.2	5.5	0.03:1	nd
Hawaii	1,052	6,366	100	15.2	158	173	0.03:1	12
Northern Marianas	206	190	100	0.1	0.8	0.9	0.01:1	64
Puerto Rico	700	193	6	117	122	239	1.24:1	75
Virgin Islands	175	135	100	3	0	3	0.02:1	>50
All States	87,592	539,515	38	20,766	51,761	68,943	0.13:1	38

[1]A ratio used here because consistent data were not available for all states to estimate the percent of entire coastal zone (land & water) that is combined tidal and nontidal wetland.

[2]In regional totals, Florida's indicator values are split among two regions to approximate actual distributions, with 1/3 to the Southeast and 2/3 to the Gulf Coast.

KEY: COLUMN HEADINGS AND DATA SOURCES

Shore Length	Tidal or Great Lakes shoreline length in miles (NOAA 1985)
CZA and % of State	Coastal zone land area in sq. mi. and as a percent of entire state area (NOAA 1992)
Tidal Wetlands	Area of tidal freshwater wetlands in coastal zone in square miles (NOAA 1991; state profiles)
Nontidal Wetlands	Area of nontidal freshwater wetlands in coastal zone in square miles (NOAA 1991; state profiles)
All Coast Wetlands	Combination of tidal and nontidal wetlands in coastal zone in square miles
WET:CZA	Ratio of all coastal wetlands to coastal zone land area (NOAA 1991, NOAA 1992; state profiles)
% Wetland Loss	Percent of historic wetland loss (Dahl 1990; state profile sources)

Table 1. Selected environmental-social indicators of estuary and coastal wetland issue importance for U.S. coastal programs (continued).

States by Region	ESA	ESA:CZA[1]	TYPE CMP	IMPLE LEVEL	Coastal County Population 1990	Population Density	% Population Change 1970–90
New England	2,539	0.35:1			8,763,660	435	9
Maine	1,130	0.31:1	FNL	ST&L	885,703	73	29
New Hampshire	25	0.02:1	FNL	ST	350,078	307	67
Massachusetts	589	0.59:1	FNL	ST	4,494,398	1,271	6
Rhode Island	165	0.33:1	CCL	ST&L	1,003,464	943	6
Connecticut	630	0.70:1	ML	ST&L	2,030,017	889	8
Mid-Atlantic	10,818	0.81:1			28,980,043	322	1
New York	1,829	0.51:1	ML	ST&L	15,046,336	859	-3
New Jersey	920	0.77:1	FNL	ST	6,978,509	1,227	6
Pennsylvania	25	0.14:1	FNL	ST&L	2,949,974	1,701	-9
Delaware	365	0.18:1	CCL	ST	666,168	345	22
Maryland	7,679	1.20:1	CCL	ST&L	3,339,056	518	12
Southeast[2]	7,266[2]	0.11:1[2]			9,524,339[2]	230[2]	72[2]
Virginia	2,700	0.31:1	FNL	ST	3,861,122	433	40
North Carolina	3,460	0.37:1	CCL	ST&L	710,903	76	39
South Carolina	277	0.04:1	CCL	ST	833,519	92	57
Gulf Coast[2]	9,381[2]	0.16:1[2]			11,071,790[2]	233[2]	71[2]
Florida	2,455	0.05:1	FNL	ST	12,356,384	247	90
Alabama	644	1.29:1	ML	ST&L	476,923	169	27
Mississippi	600	0.33:1	FNL	ST	312,368	175	30
Louisiana	6,511	0.89:1	CCL	ST&L	2,044,910	195	16
West Coast	2,196	0.07:1			26,334,384	356	40
California	586	0.21:1	CCL	ST&L	21,859,416	611	39
Oregon	210	0.03:1	FNL	ST&L	1,085,935	56	46
Washington	1,400	0.07:1	CCL	ST&L	3,389,033	180	46
Alaska	36,589	0.10:1	ML	ST&L	457,932	1	89
Great Lakes	0	0			6,548,762	156	-4
Michigan	0	0	FNL	ST	4,640,981	148	-5
Wisconsin	0	0	FNL	ST	1,907,781	181	0
Islands	154	0.02:1			4,955,345	466	35
American Samoa	1.0	0.02:1	CCL	ST&L	46,773	615	72
Guam	1.4	0.01:1	FNL	ST	133,152	396	57
Hawaii	25	0.01:1	FNL	ST	1,108,229	172	44
Northern Marianas	7	0.04:1	FNL	ST	43,345	236	255
Puerto Rico	117	0.61:1	FNL	ST	3,522,037	1,018	30
Virgin Islands	3	0.023:1	ML	ST	101,809	754	63
All States	68,943	0.13:1			108,992,639	123	22

[1]A ratio was used here because consistent data were not available for all states to estimate the percent of entire coastal zone (land and water) that is estuary.

[2]In regional totals, Florida's indicator values are split among two regions to approximate actual distributions, with 1/3 to the Southeast and 2/3 to the Gulf Coast

KEY: COLUMN HEADINGS AND DATA SOURCES

ESA	Estuary surface area in square miles (NOAA 1985; state profiles)
ESA:CZA	Ratio of estuarine surface area to coastal zone land area (NOAA 1985; NOAA 1992; state profiles)
TYPE CMP	Type coastal management program (FNL—fully networked legislative basis; CCL—comprehensive coastal legislation; ML—mixed legislative basis) (Knecht and others 1996)
IMPLE LEVEL	Primary level of implementation for state coastal programs (ST—state level; ST&L—state & local level)
Coastal County Population	Coastal county population in 1990 (NOAA 1991; NOAA data sheet)
Population Density	Coastal county population density (per square mile) in 1990 (NOAA 1992; NOAA data sheet)
% Population Change	Percent coastal county population change, 1970 to 1990: (Culliton and others 1990; NOAA data sheet)

Estuaries and Coastal Wetlands in the U.S. The most recent and comprehensive national inventory of estuaries in the contiguous United States is NOAA's National Estuarine Inventory (NOAA 1985; 1987). This inventory describes nearly 100 estuarine systems in the Northeast, Southeast, Gulf Coast, and West Coast of the United States, including their physical dimensions and characteristics, their hydrology, and the distribution of land use. Other more detailed characterizations of some of the major U.S. estuaries have been completed under the National Estuary Program, administered by the U.S. Environmental Protection Agency, but these are not easily synthesized to provide a national picture. One of the most distinguishing features of estuarine ecosystems is their physical extent and geographic distribution (Table 1), illustrated regionally as estuarine surface area in Figure 1. Alaska's estuaries comprise 53 percent of the U.S. estuarine surface area total (Hall, Frayer, and Wilen 1994). Removing Alaska from the total, estuarine acreage is greatest in the Mid-Atlantic states (33 percent of the remaining), mainly due to Chesapeake Bay, Delaware Bay, and Long Island Sound. Following this region are the Gulf Coast (29 percent), the Southeast (22 percent), New England (8 percent), West Coast (7 percent), and the Island state and territory (<1 percent) regions.

The distribution of tidal and nontidal wetlands has a somewhat different regional pattern than that for estuaries, particularly within the coterminous U.S. (Table 1 and Figure 2) (NOAA 1991). Nationally, Alaska still dominates in terms of overall wetland acreage, with 26,230 square miles or 36 percent of the total (Hall, Frayer, and Wilen 1994). However, removing Alaska from the total, the Gulf Coast (39 percent of the remaining acreage) and Southeast (39 percent) dominate, followed by much lesser amounts for the Mid-Atlantic (8 percent), the West Coast (6 percent), New England (3 percent), and the Island state and territory (1 percent) regions. Louisiana alone has nearly 25 percent of the tidal wetlands in the U.S. (NOAA 1991). The area of freshwater, nontidal coastal wetlands, however, far exceeds the area of tidal wetlands nationally—51,761 versus 20,781 square miles[4] (Table 1). These nontidal coastal wetlands are no less important to the overall health of the coast than the estuaries they are connected to, yet they receive much less protection at the state level than do tidal wetlands. In fact, in many states, much of this area is not even included within state coastal zone boundaries.

Historic Loss and Continuing Threats to Estuaries and Coastal Wetlands. One of the legacies of Euro-American settlement of North America has been the large-scale conversion of all types of aquatic ecosystems—lakes, rivers and streams, estuaries, and wetlands—to other land types and uses through draining, diking, filling, dredging, excavation, damming, channelization, diversion, and other alterations. Much of the early wetland conversion was for agriculture, but later land filling for port and urban expansion dominated, particularly in wetland areas fringing estuaries. For wetland ecosystems nationally, about 53 percent of the 221 million acres present in

[4]Nontidal freshwater wetlands were considered "coastal" in the NOAA wetland inventory (NOAA 1991) if they were within U.S. U.S. Geological Survey hydrologic units (HUCs) that included the head of tide on coastal rivers and streams (NOAA 1991). This protocol uses the NOAA "coastal assessment framework" that was also used for the NOAA coastal zone boundary review required under CZMA Section 6217 (NOAA 1992).

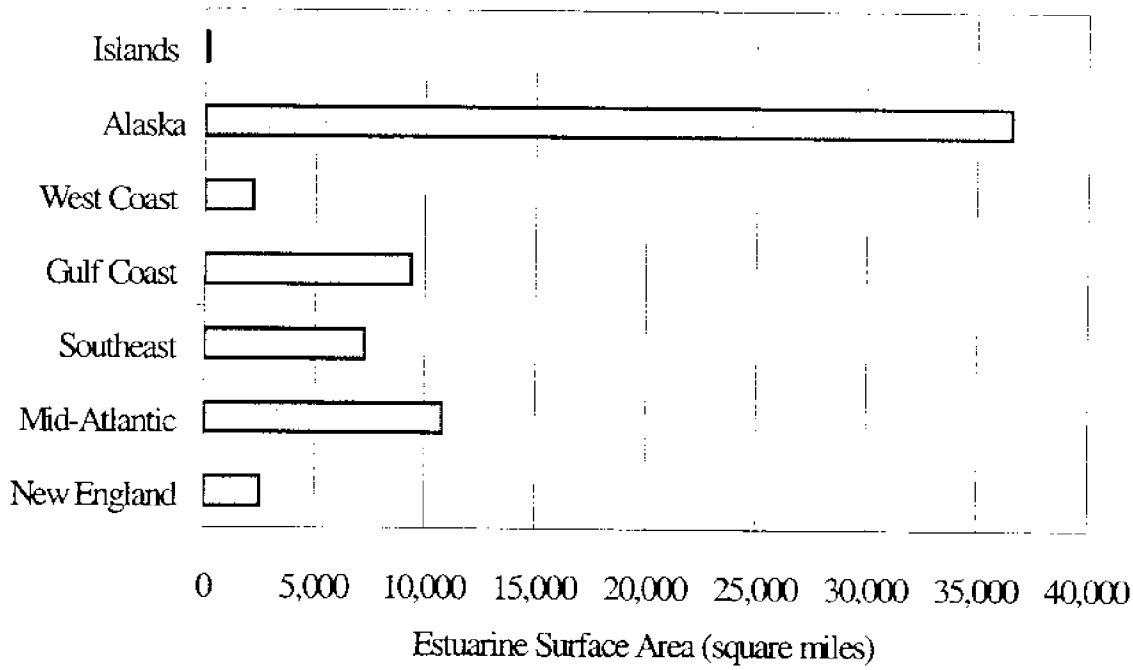


Figure 1. Estuarine surface area by US coastal region (sources: NOAA 1985; state profiles)

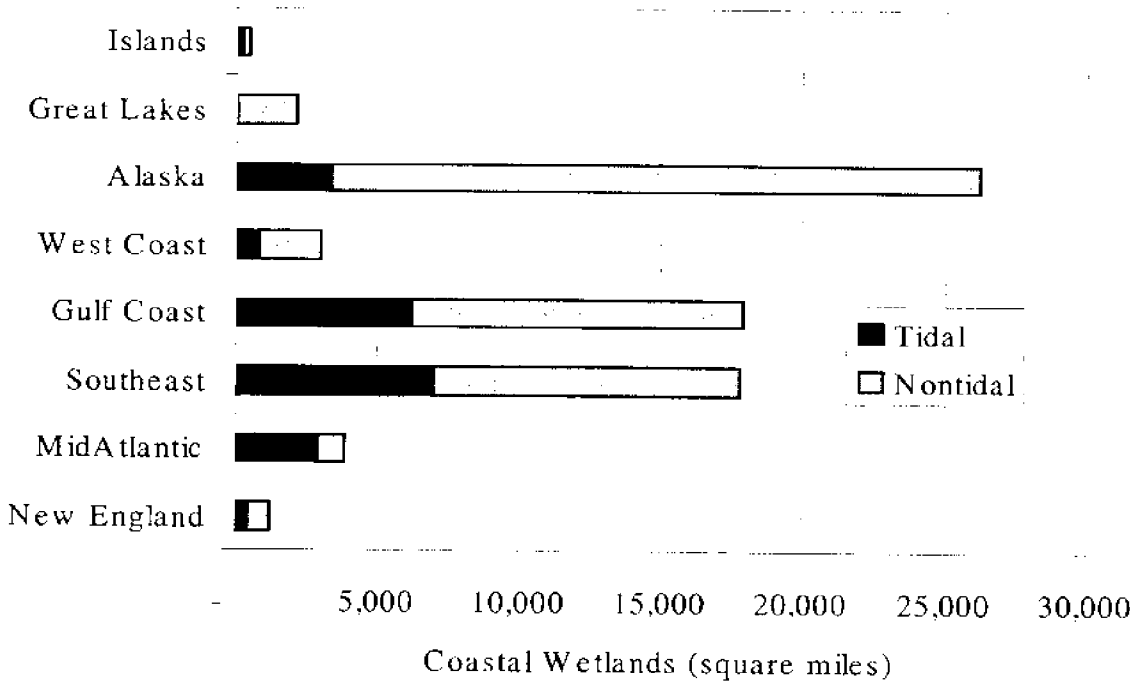


Figure 2. Coastal wetlands—tidal and nontidal combined—by US coastal region (sources: NOAA 1991; individual state profiles).

the 1780s in the coterminous United States have been lost (Dahl 1990). In coastal regions, based on a variety of state and national data collected for this study, estimated wetland loss is about 38 percent nationally (Table 1). Excluding Alaska, which has lost less than 1 percent of its wetlands, the loss is 49 percent. Combined loss of tidal and nontidal wetlands by U.S. coastal region is illustrated in Figure 3. Although all regions have significant loss, the Island states and territories and the Mid-Atlantic states have been particularly hard hit. At least ten coastal states have lost more than 50 percent of their wetlands statewide, led by Pennsylvania (94 percent), California (91 percent), Connecticut (74 percent), Maryland (73 percent), and New York (60 percent) (Dahl 1990). Besides these direct physical losses, estuaries and coastal wetlands historically have been subjected to other severe ecological stresses, including vast quantities of municipal and industrial waste, nonpoint source pollution from agriculture, urban construction and runoff, marine debris from land and ocean sources, intentional and inadvertent introduction of harmful exotic species, and more subtle impacts of habitat fragmentation and streamflow alteration. As a result, few pristine estuaries or coastal wetlands remain and many are seriously degraded. Although these wetland conversions and alterations have resulted in many benefits to society, the ecological and economic costs have also been great.

Since the late 1960s and 1970s, with the advent of wetland and waterway protection at the national level, estuaries and tidal wetlands have received relatively strong protection from direct physical alterations, particularly land filling and diking. Federal Clean Water Act Section 404 discharge limitations have played a major role in limiting tidal wetland loss, as have provisions in state CMPs, prompted by federal guidance described later. Public trust rights in these lands and waters, mostly public ownership, and public awareness of the value of estuaries has contributed to this turnaround.

One of the most significant threats to estuarine and coastal wetlands is loss associated with the gradual rise in global sea level (about one-half foot in the past century) combined with land subsidence in some coastal regions (IPCC 1992; Titus 1988). In the Mississippi delta region, for example, relative sea level has risen about 3 feet in the past century. This change, combined with the loss of marsh-nourishing sediments from Mississippi River overflow and other factors, has resulted in the loss of 25–35 square miles of wetlands per year in Louisiana alone (Titus 1988). Areas along the East Coast and in other parts of the United States, such as southern Puget Sound in Washington State, south San Francisco Bay, and the central Oregon Coast, are also experiencing a rise in relative sea level (Komar 1997). Scientists project gradually increasing rates of global sea level rise during the next century, if climate gradually warms as expected, resulting in significant loss of coastal wetlands (and upland) areas through land submergence (IPCC 1992). The ecological impacts of this scenario have received little attention.

Nontidal wetlands along our coasts are among the most threatened ecosystems today. These freshwater ecosystems are vital to coastal environmental health for a number of reasons. Connected to estuaries through surface and groundwater flow, they serve as the "kidneys" of the coastal landscape, storing and slowly releasing waters to help maintain stream flows and biodiversity, improve water quality, and recharge groundwater aquifers. During and after storms, nontidal wetlands store surface water, which helps moderate flooding and associated damage downstream. Their habitat functions for fish, birds, and other wildlife are also well documented (USGS 1996).

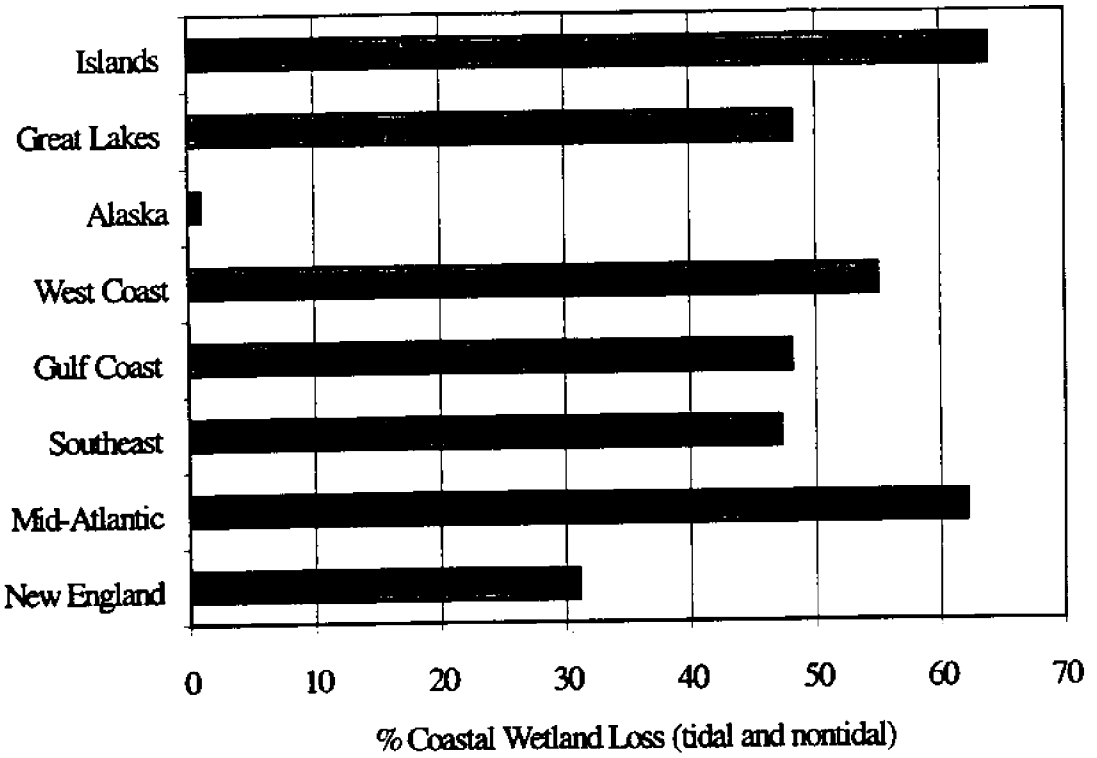


Figure 3. Coastal wetland loss—tidal and nontidal—by US coastal region (Dahl 1990; individual state profiles).

Threats to nontidal coastal wetlands are due mainly to development pressures brought on by a rapidly growing coastal population and the related demand for jobs, housing, improved transportation linkages, commercial services, and recreational facilities such as golf courses. These pressures and other factors present a variety of management challenges. Nontidal wetland inventories in many states are relatively poor, and there are gaps in our scientific understanding of how freshwater wetland ecosystems function, particularly at larger landscape scales. The amount and rate of loss of nontidal freshwater wetlands in U.S. coastal regions are also difficult to document, in part because of different interpretations as to what freshwater wetlands are actually "coastal." The physical and ecological criteria for defining what wetlands are "coastal" are much different from the criteria many states used to draw the inland boundary of their coastal zones, which often corresponded to a political unit boundary or a road or highway (NOAA 1992). Social and political factors contribute to the challenge of protecting nontidal freshwater wetlands. Most are in private ownership. Protection efforts sometimes raise the threat of private property "takings" lawsuits. There is also a general movement inside and outside government for less governmental regulation, which has led to efforts to limit resources devoted to maintaining existing programs, let alone implementing new measures. Finally, the sheer magnitude of coastal

nontidal freshwater wetland resources—estimated by NOAA (1991) at 52,000 square miles—makes their management a significant challenge.

Population and Growth Trends Affecting Estuaries and Wetlands. Many other stress factors affect states' responses to the CZMA's call for states protect estuaries and coastal wetlands. Some of the more important are demographic patterns and trends. Three of these discussed here are coastal population, population density, and population growth over the past two decades (Table 1).

Regional differences in coastal county population are strongly influenced by several individual states with very large populations, such as New York in the Mid-Atlantic region, California on the West Coast, and Florida in the Southeast and Gulf Coast regions (Table 1). But absolute population is not an adequate measure of development "intensity" in a state or region because the area within which that population lives is so variable. Population density is a better measure (Table 1). For example, despite having relatively small populations, the Island state and territory "region" generally make intensive use of coastal lands; population density is high. The same is true for most of the New England states and parts of the West Coast, where large population clusters in southern California and Puget Sound drive up overall population density regionally. One would expect that population density would be strongly correlated with historic wetland loss. This appears to be true in some cases (e.g., Pennsylvania—1,701 persons per square mile and 94 percent wetland loss, and Puerto Rico—1,018 and 75 percent loss), but it is not the case in other states (e.g., New Jersey—1,227 and 27 percent loss, and Massachusetts—1,271 and 28 percent loss) (Table 1).

Percent population change between 1970 and 1990 provides one good measure of recent coastal development pressure (Table 1). This time frame roughly corresponds to what might be considered the era of modern environmental policy, with 1970 being a good proxy for the beginnings of coastal management initiatives at state and federal levels. However, these growth rates as well as absolute population numbers do not account for the growth in seasonal populations associated with the coastal tourist trade, a mainstay of the local economy in many areas. Seasonal population in some coastal areas may be double or triple the number of permanent residents, resulting in greater development intensity and pressures than census data would suggest. One of the more interesting demographic trends is the "shift south" from the Great Lakes, Mid-Atlantic, and New England states to the Southeast and Gulf Coast. Much of this growth in the south has been in Florida, where population grew at a rate of about 4.5 percent per year between 1970 and 1990.

National Efforts to Protect Estuaries and Coastal Wetlands

Historically, numerous federal and state government programs have contributed to and even promoted the conversion of estuarine and coastal wetland areas in the U.S. In 1849, Congress passed the first of the Swamp Land Acts, which granted all swamp and overflow lands in Louisiana—nearly 10 million acres—to the state for reclamation (Dahl and Allord 1996). This authority was extended to twelve other states in 1850 and two more in 1860. Of these fifteen

states, twelve are coastal as defined by the federal CZMA and more than 43 million additional acres were ceded to them by the federal government for reclamation. Although most states did not immediately begin large-scale reclamation projects, these actions set the tone for federal policy for the next century (Dahl and Allord 1996).

There are still some federal programs that encourage or indirectly result in wetland conversion and estuarine alteration (Table 2). A number of these relate to highway and other transportation improvements, projects that represent a major continuing source of wetland loss, particularly nontidal, freshwater wetlands. Other programs related to agriculture, water development, and the navigation projects noted above continue to take their toll on wetlands and estuarine habitats. The U.S. Army Corps of Engineers (USACE), for example, has been the major player in the construction and maintenance of hundreds of Congressionally authorized and funded navigation projects in U.S. estuaries, with much of the dredged materials used to create new upland from estuarine wetland and shallow water areas. Over the past two decades, however, water projects have been drastically cut back. This trend continued with the 1990 Water Resource Development Act, which deactivated many navigation projects, established environmental protection as a primary Corps mission, and established an interim goal of "no net loss of the nation's remaining wetland base," and a long-term goal "to increase the quality and quantity of the nation's wetlands, as defined by acreage and function" (USDOI 1994).

Over the past quarter-century, probably the single most important piece of national legislation for estuary and wetland protection was the 1972 amendments to the Federal Water Pollution Control Act (now the Clean Water Act [CWA]). These amendments established the Section 404 permit program regulating discharges of dredge and fill material in the waters of the United States, including wetlands. Administered by the USACE with U.S. Environmental Protection Agency (USEPA) oversight, the 404 program works in concert with a number of other federal laws. These include the USACE-administered Section 10 permit program of the Rivers and Harbors Act or 1899; the National Environmental Policy Act of 1969, which requires environmental assessments; and the Fish and Wildlife Coordination Act of 1958, which requires fish and wildlife review of permits. The CWA Section 404 program, bolstered by these related laws, has been the cornerstone of federal estuary and coastal wetland protection in the U.S. for the past twenty-five years.

Numerous other federal programs provide additional kinds and levels of protection for estuaries and coastal wetlands. Some, such as the USEPA's National Estuary Program promote waterbody and watershed planning through a specified local-state-federal coordination process to address priority problems. These problems almost always include habitat loss and degradation. Other laws, such as the Coastal Barriers Resources Act, protect estuaries and wetlands by withdrawing federal development subsidies, while others provide funds for acquisition, preservation, and restoration, for example, the North American Wetlands Conservation Act of 1989.

Table 2. Selected federal programs that have significant effects on estuaries and coastal wetlands in the United States (USGS 1996; Kusler and Opheim 1996).

ENCOURAGE COASTAL WETLAND CONVERSION		
PROGRAM OR ACT	**Implementing Agency**	**EFFECT OF PROGRAM**
Executive Order 12630, Constitutional Takings	AFA	Provides a review process for agencies to protect against unintentional "takings" of private property.
Federal-Aid Highway Act of 1968	DOT	Highway construction can affect wetlands at every stage. Wetlands are often prime sites for highways.
National Flood Insurance Program	FEMA	Encourages development in flood plains, which contain wetlands, by providing low-cost federal insurance.
Surface Transportation Revenue Act of 1991 (P.L. 102-240)	DOT	Transportation projects directly and indirectly destroy wetlands.
U.S. Tax Code	IRS	Encourages farmer to drain and clear wetlands through tax deductions and credits for development activities.
Water Resources Development Act of 1976, 1986, 1988, 1990 (P.L.s 94-587, 99-662, 100-676, 101-640)	USACE	Water development projects directly and indirectly destroy wetlands.
DISCOURAGE COASTAL WETLAND CONVERSION THROUGH *REGULATION*		
Federal Water Pollution Control (P.L. 92-500) (Clean Water Act) Section 404 (1972)	USACE, EPA, FWS, NMFS	Regulates many activities that involve the disposal of dredged and fill materials in waters of the United States, including many wetlands.
Coastal Zone Management Act (P.L. 92-583) (1972)	NOAA	Provides federal funding for wetlands programs in most coastal states, including the preparation of coastal zone management plans.
Food Security Act of 1985 (*Swampbuster*) (P.L. 99-198)	FSA, , NRCS, FWS, FmHA	"Swampbuster" program suspends agricultural subsidies for farmers who convert wetlands to agriculture. Allows FmHA to eliminate some farm debts in exchange for long-term easements to protect wetlands.
Fish and Wildlife Coordination Act of 1956	DOI	Authorizes the development and distribution of fish and wildlife information and the development of policies and procedures relating to fish and wildlife.
Ramsar Convention (Treaty), adopted 1973, enforced from 1975.	FWS	Convention maintains a list of wetlands of international importance and encourages the wise use of wetlands.
DISCOURAGE COASTAL WETLAND CONVERSION THROUGH *ACQUISITION*		
Migratory Bird Conservation Act (45 Stat. 1222) (1929)	FWS	Established a commission to approve the acquisition of migratory bird habitat.
Emergency Wetlands Resources Act of 1986 (P.L. 99-645)	FWS	Pays debts incurred by FWS for wetlands acquisition, and provides additional revenue sources.
North American Waterfowl Management Plan (1986)	FWS, CWS	Establishes a plan for managing waterfowl resources by various methods such as acquiring wetlands.
North American Wetlands Conservation Act (1989) (P.L. 101-233)	FWS	Encourages public/private partnerships by providing matching grants to organizations for protecting, restoring, or enhancing wetlands.
Surface Transportation Revenue Act of 1991 (P.L. 102-240)	DOT	Authorizes funding for wetland mitigation banks for state departments of transportation.
Coastal Wetland Planning, Protection and Restoration Act (P.L. 101-646) (1990)	USACE, FWS, EPA, NMPS	Provides for interagency wetlands restoration/conservation planning and acquisition in Louisiana, other coastal States, and the Territories.
U.S. Tax Code Tax Reform Act of 1986 (P.L. 99-514)	IRS	Provides deductions for donors of wetlands and to some nonprofit organizations.
DISCOURAGE COASTAL WETLAND CONVERSION THROUGH *OTHER POLICIES*		
Endangered Species Act of 1973 (P.L. 93-205)	FWS	Provides for the designation and protection of wildlife, fish, and plant species that are in danger of extinction.
Executive Order 11990, Protection of Wetlands (1977)	AFA	Requires federal agencies to minimize impacts of federal activities on wetlands.
Fish and Wildlife Coordination Act (1965) (P.L. 89-72)	FWS	Requires federal agencies to consult with FWS before issuing permits for most water-resource projects.
Coastal Barriers Resources Act (P.L. 96-348) (1982)	NOAA	Designates various undeveloped coastal barrier islands for inclusion in the Coastal Barrier Resources System. Designated areas are ineligible for federal financial assistance that may aid development.
Food, Agriculture, Conservation, and Trade Act of 1990 (P.L. 101-624)	NRCS	Wetland Reserve Program purchases perpetual conservation easements on farmed wetlands. Subsidizes wetland restoration.
Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (P.L. 101-646)	FWS, USCG, EPA, USACE, NOAA	Created a federal program to prevent and control the spread of species that are aquatic nuisances.
Oil Pollution Act of 1990 (P.L. 101-380)	DOE, DOI, NOAA	Enhanced the response to oil spills and required natural resource damage assessments.

In addition to federal programs, there are a variety of private and public-private cooperative ventures that play major roles in protecting and restoring wetlands and associated habitats along our coasts. Land trusts, for example, are private, non-profit corporations dedicated to preservation of land for scenic, recreational, ecological, historical, or other non-commercial values. They protect land primarily through the donation of conservation easements, although older trusts are often more experienced at raising capital for outright purchase of lands. Land donated to a trust yields the same tax benefits as would a donation to a government agency, but land trusts are more aggressive and successful in soliciting donations. Some land trusts and similar nonprofit groups operate nationwide, such as The Nature Conservancy and Ducks Unlimited. Others operate at the regional, state, or local level. Many such groups forge alliances with federal and/or state agencies to accept funds, purchase lands, and use their special tax-exempt status to accomplish protection and restoration that might not otherwise occur. These private groups often play a relatively low profile role in protecting coastal wetlands and other habitat, but their importance can be immense, especially to state CMPs that have neither the mechanisms or resources to mount major acquisition programs.

Estuary and Coastal Wetland Protection in State Coastal Management Programs

The Coastal Zone Management Act (CZMA) of 1972—the subject of this study—established a unique state-federal partnership designed to encourage states develop programs to more effectively manage coastal resources, including the protection of estuaries and coastal wetlands. In response to the CZMA, many coastal states developed new or enhanced programs to protect coastal wetlands; others with already-strong laws simply networked their existing programs with added coordination features. Several recent reports or studies have documented state wetland protection efforts in general (Kusler and others 1992; Crane 1995; USGS 1996), and CZM and wetlands in particular (McGilvray 1990). McGilvray (1990) offered a variety of anecdotal evidence for the increasing importance of coastal wetland protection in state CZM programs. She cited the establishment of coastal regulatory programs in response to CZMA requirements, wetland acquisition and restoration efforts, public education programs, and priority given in funding allocations (25 percent of the state program allocations were for wetlands in fiscal year [FY] 1990). Brower and others (1991) reported that 28 percent of state CZM expenditures for the 1982–1987 period—almost $53 million—were allocated to natural resource protection.

Another recent sign of the importance of the issue in state coastal programs was that twenty-six of twenty-nine states selected wetlands protection and restoration as a priority area under the Coastal Zone Enhancement Grants Program (Section 309, 1990 amendments to the federal CZMA). Through FY 1993, nineteen states were working on Section 309-funded wetland program improvement projects (Bernd-Cohen and others 1995). Examples cited include revised permit threshold requirements, mitigation rules, new federal consistency guidelines for freshwater wetlands, and delineation guidelines. An equal number of states selected secondary

and cumulative impacts as areas for program improvement, sometimes integrating this issue with wetland concerns (e.g., California).

In the most recent comprehensive evaluation of state CMPs, Knecht, Cicin-Sain, and Fisk (1996) determined CZM effectiveness by surveying knowledgeable individuals from three groups—coastal program managers, interest groups, and academics. One of the four CZM goals they examined was natural resource protection (which includes estuaries and coastal wetlands). Perceptions of the three groups were that state programs are performing *well* or *very well* in protecting natural resources.

Another issue addressed by Knecht, Cicin-Sain, and Fisk (1996) was the relative strength of a program as compared to its structure—particularly a program's legislative basis and the primary governmental level at which it is implemented. They proposed a hypothesis that state programs based on a single comprehensive coastal law and involving program implementation at the state and local levels would tend to perform at a higher level than other programs. To examine this hypothesis, they determined whether a program was based on a single comprehensive coastal law, on the bundling together of various state laws, or on a combination of these approaches. They also determined whether a program was implemented primarily at the state level or if it primarily used a mixture of state and local implementation—their data on these two program characteristics are included in Table 1. A *fully networked* classification (FNL) indicates a program that is based on a bundling of legal authorities found in several state laws, through an executive order or coordinating legislation. *Comprehensive coastal legislation* (CCL) indicates a program based primarily on a single comprehensive coastal law. *Mixed legislative* (ML) basis indicates a program that contained elements of both specialized coastal legislation and other state legislation that is "networked" into the program. They found no apparent relationship between these indicators of program structure and perceived performance of the programs (Knecht, Cicin-Sain, and Fisk 1996, 155).

A question for our study is whether available outcome data support the findings of Knecht, Cicin-Sain, and Fisk (1996) as well as those of other recent process-oriented evaluations (e.g., Brower and others 1991; McGilvray 1990) that suggest CZM is making a difference. Another question is whether outcome-based effectiveness evaluation—deemed problematic by Knecht, Cicin-Sain, and Fisk (1996) because outcome data are scarce and attributions of outcomes are difficult—is feasible and appropriate for state CMPs.

Evaluation Methodology

This study is different from previous national evaluations of coastal zone management (CZM) in its attempt to determine on-the-ground outcomes of state CZM policy implementation and to use this information to estimate program effectiveness and performance. CZM as implemented in the U.S. is largely "process" oriented, beginning with the CZMA itself, which emphasizes the need to balance competing interests in the coastal zone—protection, preservation, development, and restoration. This focus on process extends to the requirements states must meet to gain federal approval and to subsequent program implementation.

As might be expected, CZM program evaluation has also been largely process-oriented, both at national and state levels. At the national level, evaluations have been driven by legislative oversight and the reauthorization process (USGAO 1976; OCZM 1979; USGAO 1980; USDOC 1981; Brower and others 1991), although there have been important academic contributions as well (Sabatier and Mazmanian 1983; Lowry 1985; Archer and Knecht 1987; Owens 1992). At the state level, the impetus for evaluations has been CZMA Section 312 requirements that OCRM to conduct a "continuing" review of state programs. In these Section 312 reviews, state programs are evaluated on the effectiveness of their organization and coordination mechanisms, the strength of their policies and the processes and tools used to implement and enforce them, and the perceptions of effectiveness of knowledgeable individuals (Allin, Menashes, and Wright 1996).

Several recent studies have sought to measure effectiveness, but are either relatively narrow in the examination of on-the-ground outcomes (Good 1994) or are based principally on perceptions of effectiveness, rather than outcomes (Knecht, Cicin-Sain, and Fisk 1996). The results of these various evaluations have led to meaningful process (and probably outcome) improvements in CZM at the national and state levels, but few address what has happened on the ground as a result of CZM.

Systematic, comparable outcome effectiveness evaluation applied to all the states and, by extension, to the national program, has been difficult for a number of reasons. One is that the states exhibit significant diversity, not only in their coastal management programs, but also in their environmental settings and resources; their social, economic, and political makeup; their institutional histories; and in many other ways. Data availability problems, uncertainty as to how to attribute responsibility for outcomes, and finding a basis for comparison of state programs have all made outcome evaluation problematic. Certain other trends, however, are causing coastal managers to examine the feasibility of outcome-based evaluation. One is an increasing interest and emphasis on accountability in terms of outcomes, not just process. Administration and congressional leaders are asking for clear explanations of program results and impacts on the ground (for example, see language in Public Law 103-62, the Government Performance and Results Act of 1993). The capacity to monitor, track, and report outcomes is also increasing, owing mainly to the rapid growth of high-speed personal computers, easy-to-use database software, geographic information systems (GIS), and the Internet and World Wide Web. Some or all of these information technologies are being used by virtually every state coastal program. This study is therefore timely and, while it has limitations, can be considered a prototype for combined process- and outcome-based evaluation of CZM program performance that takes issue importance into consideration. These three elements—issue importance, potential effectiveness based on process indicators, and outcome effectiveness—provide the framework for this CZM performance evaluation.

Study Objectives and Research Questions

The overall goal of the national CZM effectiveness study is to determine the on-the-ground effectiveness of state coastal management programs in addressing selected core objectives of the

U.S. Coastal Zone Management Act (CZMA). The three principal study objectives designed to achieve this goal for evaluating estuary and coastal wetland protection are:

- To assess and evaluate the individual and collective contributions of the twenty-nine state coastal zone management programs in achieving the federal CZMA core objective *to protect estuaries and coastal wetlands.*
- To identify and describe state and local CZM program case examples that address core objectives in a particularly innovative and effective manner.
- To identify ways that federal and state CMPs might improve their effectiveness in addressing the core objectives of the CZMA.

Given the focus on on-the-ground outcomes of policy implementation, another implicit goal of the study is to contribute to the design of a systematic, outcome-based, national CZM performance evaluation system. The methods, indicators, results, and conclusions presented here must therefore be viewed as experimental, not as absolute conclusions about state and national CZM performance.

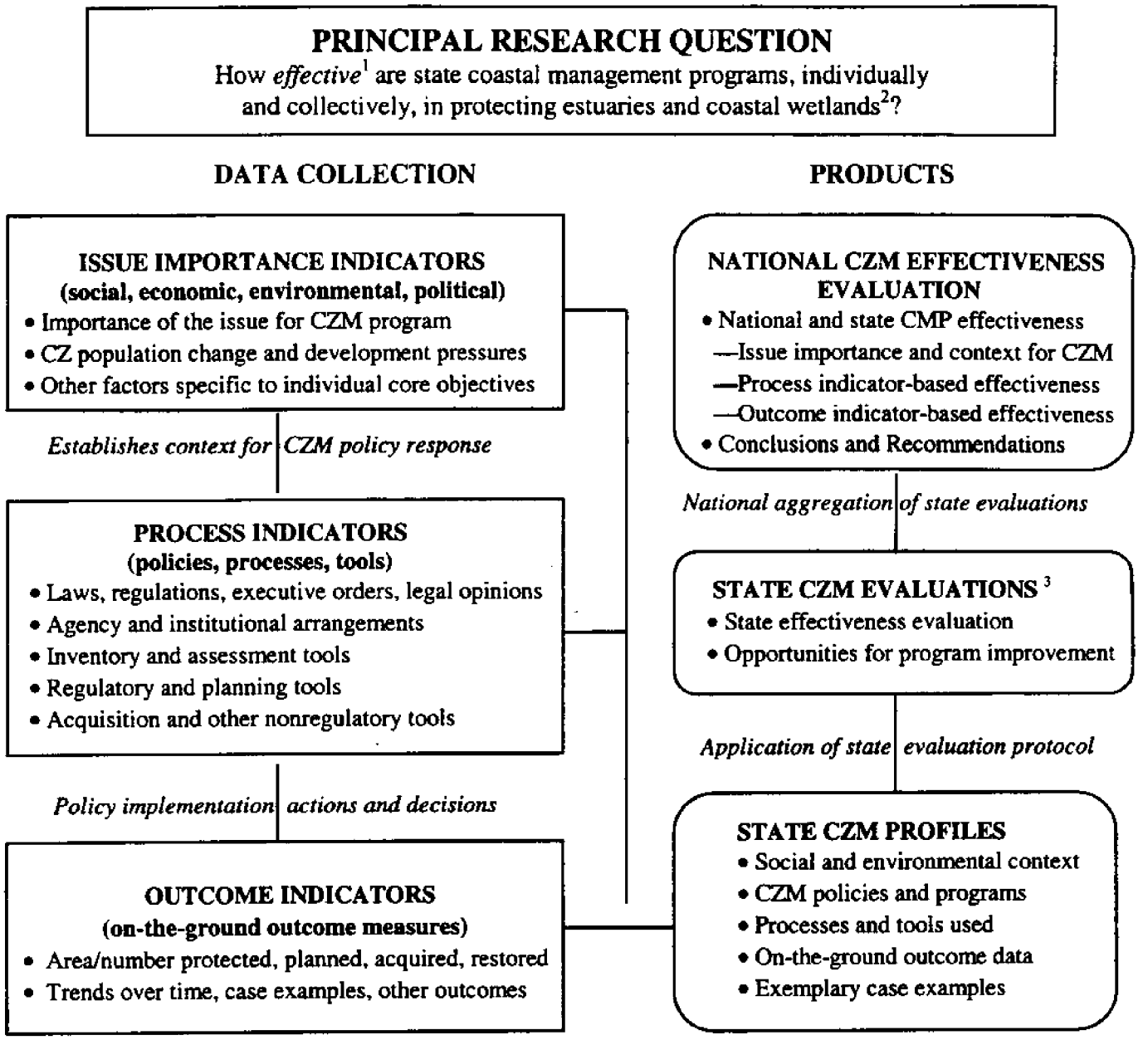
One of the first steps in the research process was to expand the objectives into a set of specific research questions to focus and organize the research. Most of the questions were equally important for both state and national program evaluation. Research questions identified include:

- How important is the issue of estuary and coastal wetland protection in each state or territory? How does it vary from state to state and region to region?
- What policies, processes, and tools does each state or territory use to protect estuaries and coastal wetlands, and what is their relative importance? Which are the most important policies, processes, and tools from a national perspective?
- Based on policies, processes, and tools states use to protect estuaries and coastal wetlands, what is the potential effectiveness of each state CMP "on paper"?
- What are the on-the-ground outcomes of estuary and coastal wetland protection policy implementation in each state and what level of CMP effectiveness do they demonstrate? How do these results add up nationally?
- Considering the answers to the above questions, how well is each state's CMP performing in protecting estuaries and coastal wetlands? How do these results add up nationally?
- How might each state's CMP be more effective in protecting estuaries and coastal wetlands?
- How might the national CZM program be more effective in promoting state efforts to protect estuaries and coastal wetlands?
- Is it feasible to develop a national CZM performance evaluation system that incorporates the monitoring and reporting of on-the-ground outcomes of program implementation? If so, what would it look like?

Overview of the Evaluation Process

The overall evaluation design for the CZME study is illustrated in Figure 4. The data collection process focused on three kinds of information: (1) environmental and social context data that provide a basis for estimating issue importance in a state; (2) policy, process, and tool data that provide a basis for estimating state CMP potential for achieving CZMA objectives; and (3) on-

CZM Effectiveness Study Evaluation Framework



[1]*Effectiveness* is defined as the impact of state CMPs relative to national core objectives. *Effectiveness* is measured by the on-the-ground outcomes of CZM program actions and decisions, the processes used to achieve the outcomes, and the relative importance given to the issue by the CZM program.
[2]Other core objectives addressed in the overall study include protecting beaches, dunes, bluffs, and rocky shores; providing for public access; revitalizing underutilized waterfronts; and promoting seaport development.
[3]See Appendix D for summaries of individual state CZM program evaluations; each one addresses issue importance, potential effectiveness, outcome effectiveness, and overall performance.

Figure 4. General framework model for evaluating the effectiveness of the U.S. national coastal management program, as adapted to the estuary and wetland protection issue.

the-ground outcome data that document the results of state CZM policy implementation actions. On the right in Figure 4, study products are illustrated, including (1) profiles for each of the twenty-nine federally approved state programs, (2) effectiveness evaluations for each of the state programs, and (3) a national performance evaluation that synthesizes state results. The state-level and national-level data analysis—shown with connecting arrows between the products—are the heart of the evaluation process and are described more fully later.

The study proceeded in stages. First, five test states were used to ground-truth our data needs and the collection process. This was followed by a long, intensive state data collection and profile development process that involved review of documents and structured interviews. Data analysis and synthesis was the final stage, focusing first on evaluation of individual state CMPs and then aggregation of results to the national level. Although the evaluation process is depicted as linear, it was actually an iterative learning process, with many feedback loops. The ex post facto nature of the study—essentially a reconstruction of the history of program operation and outcomes—made this a necessity. This was especially true for state data collection, which evolved throughout the project.

Definitions of Key Evaluation Terms. A number of terms are used throughout this report that are especially important in the research and evaluation process. One of these—*estuaries and coastal wetlands*—was defined in footnote 3. Other important definitions include:

Effectiveness—as defined for this study and for the CZME study as a whole, effectiveness is the impact of state CMPs relative to national core objectives; it is measured by the on-the-ground outcomes of CZM program actions and decisions, the processes used to achieve the outcomes, and the relative importance given to the issue by the CZM program.

Issue importance indicator—a single quantitative or qualitative measure that contributes to an overall assessment of the relative importance of estuary and coastal wetland protection as a CZM issue. Examples include the amount of wetland in a state's coastal zone versus the total area of the coastal zone, or the population growth rate as an indicator of development pressure. Issue importance indicators, taken together, represent the sum of environmental, social, economic, political, or other factors that influence a state's CMP development and implementation.

Process indicator—a qualitative, intermediate measure of effectiveness that contributes to the potential of a state CMP relative to CZMA goals. Examples include the scope and specificity of a policy, its geographic or jurisdictional reach (especially important for wetlands), its institutional strength (statute, administrative law, agency policy) and enforceability, and the perceptions of state experts as to its role and overall importance. For estuary and coastal wetland protection, an example of a process indicator is a regulatory permit program for wetland alterations or some of its specific components, such as exemptions, mitigation requirements, compliance monitoring and enforcement provisions, and so on. The process indicators used in this study are defined later.

Outcome indicator—a quantitative, on-the-ground measure of the results of CZM policy implementation decisions. The units of measure for on-the-ground outcome indicators may be area (square miles, acres, etc.), point (numbers), or line (miles, feet, or other lengths). Actual

measures are related to baseline data (e.g., total wetland area) to normalize results and make them comparable among states (e.g., percent wetland loss attributed to permitting). Specific outcome indicators used in this study are defined later.

Potential effectiveness—an estimate of the promise exhibited by a state CMP's policies, processes, and tools as they appear "on paper." A state CMP's potential effectiveness for protecting estuaries and coastal wetlands is characterized by an overall process indicator rating (*High, Moderate,* or *Low*). The estimate is made by comparing state process indicator data (the use, importance, and ranking of processes and tools) to an idealized "model" program, using specified rating criteria. The rating criteria are themselves based largely on what the states collectively consider the most important processes and tools for estuary and coastal wetland protection. Potential effectiveness ratings, when compared to outcome data, allow the evaluator to assess the "gap" between policy potential and on-the-ground implementation.

Outcome effectiveness—an estimate of the on-the-ground impact of state CMP decisions on the protection of estuaries and coastal wetlands; it is characterized in this study by an overall outcome indicator rating (*High, Moderate,* or *Low*). The outcome effectiveness estimate is made by aggregating the rating results of individual outcome indicators, first to the outcome indicator category level (regulatory, planning, acquisition, and restoration) and then to the overall state CMP level, using aggregation criteria developed by the researchers. Where good data were available for all rating categories, a conclusive overall rating is assigned. Where little or no data were available, inconclusive outcome ratings are assigned. Recognizing the ex post facto nature of this evaluation design and the stringent criteria for assigning conclusive ratings, a "probable" rating category was also invented for this study. This accommodated situations where available data strongly suggested a particular rating, but were still insufficient to be conclusive.

Program performance level—a context-based measure that rates programs as performing at either *higher-than-expected, expected, or less-than-expected levels* of effectiveness, considering issue importance ratings on one hand and potential effectiveness on the other. These ratings are "effectiveness in context" measures and are explained in detail later in the report.

The Data Collection Process

Five test states—Louisiana, Oregon, Pennsylvania, Rhode Island, and South Carolina— were selected for initial data collection and interviews. Test states were used to "ground truth" our data collection process, to test and refine our preliminary list of process and outcome indicators, and to identify additional information needed to develop state profiles and evaluate CZM effectiveness. OCRM provided a list of interview contacts for the states and an initial set of materials (original CZM program documents, Section 309 assessments and strategies, etc.). These were supplemented throughout the process by information from the states. A preliminary data collection form and proposed state "profile" outline were developed, sent to test states, and then used as the basis for initial phone interviews. The full study team met near the end of this stage to share results and work on continued development of the general framework for the study.

Preliminary state data analysis and evaluation methods were also developed at this stage, based in part on the types and amounts of outcome data available from test states. However, a decision was made early on not to limit the data search to just those indicators for which data

were readily available, but instead to create an "ideal" set of outcome indicators—what data we would like to be able to collect. This had several purposes: it allowed for differences to emerge in record keeping among the states, including case examples of good record keeping; it provided an initial model of what a comprehensive outcome monitoring and record-keeping effort might look like; and it provided for a national assessment of how much effort might be involved in developing and implementing an national outcome indicator monitoring and reporting system. Identifying data gaps was therefore as important as identifying data availability.

Based on test state results, a final data collection form (DCF) was developed for estuary and coastal wetland protection (Appendix A). Published information, such as the initial CZM program approval document, CZMA Section 309 assessments and strategies, and other reports and articles were initial data sources for completing the DCF, but the primary data were collected through a series of DCF-structured interviews. Interviews usually expanded beyond principal study contacts to specialists in different aspects of estuary and coastal wetland protection: research, mapping, record keeping, regulatory programs, planning elements, acquisition programs, wetland restoration efforts, education, and coordination. For example, see the state agency contacts list for Delaware in Appendix B. Agency contacts often provided additional unpublished information from reports, permit-tracking databases, and other sources. The data compiled in the DCF were converted to a standardized state CZM profile for estuary and coastal wetland protection for each of the twenty-nine states, following the template in Figure 5. A sample state profile for Delaware is provided in Appendix B. Detailed steps in the state data collection process included:

- OCRM provided information available from national files on the state CMP to the research team, which was then reviewed by the designated research team member.
- A research team member initiated the project by sending the state-designated contact person a blank copy of the DCF, followed by an introductory phone conversation to review the questions, identify and request additional information that might be available to answer the questions, and get a general idea of the state's program.
- The research team then filled out the data collection form using all the information now available, conducting one or more additional phone interviews as needed.
- A draft DCF completed by the research team was sent to the state-designated contact(s) for review, corrections, and additions, returning the modified DCF and supplemental information to the research team.
- The research team finalized the DCF form and developed a draft state profile following the template in Figure 5.
- The draft state profile is sent to the state for review, corrections, and additions; the state then returns the modified profile to the research team, which finalizes the profile. The final profile is then sent back to the state.

A. BACKGROUND AND CONTEXT (boundary, areas, shoreline, landforms, population, human use, etc.)

1. STATE'S ESTUARIES AND COASTAL WETLANDS

Estuaries and Tidal Wetlands
- Overview (number and areas of estuaries, tidal wetlands, etc.)
- Functions and Values
- Historic Losses
- Recent Losses and Development Pressures

Non-tidal Freshwater Coastal Wetlands
- Overview (data on area, distribution, and types of nontidal wetlands in the CZ, etc.)
- Functions and Values
- Historic Losses
- Recent Losses and Development Pressures

2. ISSUE IN THE STATE—IMPORTANCE OF ESTUARY AND COASTAL WETLAND PROTECTION

Issue Importance at CZM Approval (based on program content, etc.)

Evolution of Issue Importance (how issue importance changed from CZM approval to present)

B. KEY MANAGEMENT AUTHORITIES AND POLICIES

1. POLICIES *PRIOR* TO CZM PROGRAM

2. POLICIES *AT CZM PROGRAM APPROVAL*

3. POLICY *ADDITIONS & CHANGES* SINCE PROGRAM APPROVAL

C. MANAGEMENT PROCESSES AND TOOLS (Table: CZM Management Processes and Tools)

D. "ON-THE-GROUND" OUTCOMES OF POLICY IMPLEMENTATION

1. OUTCOME MONITORING AND RECORD KEEPING (extent/quality of data and record keeping)

2. REGULATORY PROGRAM OUTCOMES (tables and narrative)

3. PLANNING PROGRAM OUTCOMES (tables and narrative)

4. ACQUISITION PROGRAM OUTCOMES (tables and narrative)

5. NONREGULATORY PROGRAM OUTCOMES (tables and narrative)

E. CASE EXAMPLES OF SUCCESSFUL PROCESSES AND TOOLS

F. STATE DATA COLLECTION CONTACTS

G. REFERENCES

Figure 5. State CZM profile *template* for estuary and coastal wetland protection.

Steps in the State CMP Evaluation Process

Once all available process and outcome data for states were collected and state CZM profiles developed, individual state programs were evaluated for effectiveness in a four-step process to estimate issue importance, potential effectiveness based on process indicator evaluation, outcome effectiveness based on available outcome data, and overall performance. Each of the four steps in the state CMP effectiveness evaluation has a separate worksheet, including rating criteria and a summary table. For potential effectiveness, outcome effectiveness, and overall performance, tidal and nontidal management efforts were evaluated separately. This separation has an obvious ecological basis, but it also has a legal-institutional rationale, given differences in public trust responsibilities, ownership predominance, and jurisdictional boundaries. Appendix C is an example of the evaluation worksheets for the state of Delaware. Data for the worksheets were drawn from the state profiles and from baseline data in Table 1. The steps in the state evaluation process are outlined below and discussed further in the Evaluation Results and Discussion section.

Step 1: Assess Issue Importance. The importance of estuary and coastal wetland protection as an issue in each state was estimated based on the seven social and environmental indicators:

- ESA:CZA—Estuarine surface area compared to coastal zone land area (percent)
- WET:CZA—Area of wetlands in coastal zone compared to coastal zone land area (percent)
- %Loss—Percent historic (pre-CZM) wetland loss
- PopD—Population density of coastal counties in 1990
- %PopC—Percent population change from 1970 to 1990
- Impt1—Issue importance at the time of CZM program approval
- Impt2—How the importance of the issue evolved from the time of CZM approval to present

High, moderate, and low rating classes were defined for the first five of these indicators based on spreadsheet analysis of the data in Table 1, followed by categorization of states based on how they clustered. The last two indicators were rated during the state interview process. These results and the significance of each of the indicators are presented later in the Evaluation Results and Discussion. The value of a state's issue importance rating is that it establishes expectations for estuary and coastal wetland policy emphasis, scope, and detail. For example, if there are large estuary and wetland areas in a state's coastal zone compared to overall coastal zone land area, and coastal development pressure is high, the issue would likely be of high importance. In this case, one would expect the state to have robust estuary and wetland protection policies, use a range of tools, and implement them effectively as evidenced by on-the-ground outcomes. On the other hand, if a state has few wetlands with minimal historic loss, and there is low population and little growth, estuary and wetland protection, while still important because of the national prominence of the issue, may not be given as much attention as some other CZM issues.

Step 2: Evaluate process indicators to determine potential effectiveness. The processes and tools that states use to implement CZM policies and programs for estuary and wetland protection were defined as "process indicators." The use and importance of thirty-three different processes

and tools in six categories—Resource Assessment, Regulatory, Planning, Acquisition, Nonregulatory, and Coordination—were examined (the complete list of processes and tools is presented later in the context of results). During the state data collection process, the use of each process or tool was determined (*yes* or *no*), its importance for protection rated (*high, moderate,* or *low*), and the top five tools arranged in rank order. Process indicator ratings were used in several ways. First, once all states were evaluated, the final ranking results were aggregated to determine the *most important processes and tools* for estuary and coastal wetland protection from a national perspective. Next, these same processes and tools were used to characterize a *model state CMP,* and then to develop criteria and scaling factors for rating individual state CMPs. These criteria-based process indicator evaluations, in turn, serve as a rough measure of the *potential effectiveness* of state CMP for protecting estuaries and coastal wetlands. The process indicator evaluations also establish expectations for state CMP implementation and the kinds of outcome indicator data that might be available. For example, if a state rates its tidal wetland regulatory program as highly important for estuary and wetland protection, it would be expected that on-the-ground outcome data are available to support that, such as area lost through permitting, and area regained through compensatory mitigation (assuming they had a no-net-loss policy).

Step 3: Evaluate outcome effectiveness based on available data. Of the six categories of processes and tools examined in this study, only four result in on-the-ground outcomes as defined here: Regulatory, Planning, Acquisition, and Nonregulatory. Even within these four categories, only selected processes and tools were deemed to have outcome indicators that can be measured on the ground. For each of the indicators in each category—Regulatory, Planning, Acquisition, and Nonregulatory Restoration, available data were used to assign a rating based on outcome indicator criteria that are described as part of the Evaluation Results and Discussion section. In general, if a process or tool is used in a state, and good data were available that address a particular outcome indicator, a *high, moderate,* or *low* rating is assigned, based on how the data match up with the criteria. If a tool was used by a state and data were not available, it is assigned an *inconclusive* rating. In some cases where sufficient data were not available to make a conclusive determination but were highly suggestive of performance levels, a probable outcome rating—for example, *inconclusive (moderate)*—was assigned for that indicator. Data for rating outcome indicators were from the state profiles we compiled. It is important to note that we did not ask the states to do extensive work to develop new data sets just for this study; instead, we relied on available or easily compiled data. A sample state evaluation for Delaware is included as Appendix C.

Step 4: Synthesize and evaluate state CMP effectiveness and overall performance. For each state, summary ratings of issue importance, process indicators, and outcome indicators were compiled and a narrative evaluation prepared. In addition, an overall effectiveness rating was assigned, program strengths identified, and areas for program improvement suggested. Individual state effectiveness evaluations, summaries of which are included in Appendix D, are useful as a stand-alone product, especially for the state involved, but their principal use is in the overall national assessment of CZM effectiveness.

For the national synthesis of state CZM effectiveness prepared for estuary and coastal wetland protection (this report), evaluation results for all states were compiled into summary tables, analyzed, and compared. Issue importance was examined from regional and other perspectives to examine relationships and trends. Some national-level analysis fed into parts of the evaluation process discussed earlier. For example, process indicators were used to define *most important processes and tools* from a national perspective, and these in turn were used to help define both a *model state CMP* for estuary and coastal wetland protection and process indicator evaluation criteria. Outcome effectiveness was examined nationally to determine patterns in data availability and regional trends. Case examples from states that use different processes and tools in particularly successful and innovative ways were summarized. All of the results were then compared—issue importance, potential effectiveness, and outcome effectiveness. Issue importance establishes expectations for state CZM policy; the process indicator evaluation suggests whether expectations were exceeded, met, or not met. When outcome effectiveness is added, there is a basis for assessing overall state CZM program performance. From the outset of the study, it was expected that outcome data would be sparse; consequently, an assessment of data availability from a national perspective is an important part of this analysis.

Limitations of the Study and Evaluation Methodology

This CZM effectiveness study presented a number of conceptual challenges and practical limitations. Some of these relate to the ex post facto nature of this evaluation study. Others have to do with the broad, yet often loose structure of state CMPs, especially the networked programs. Still others have to do with niche role that state CMPs play in some aspects of estuary and wetland management. Others simply relate to the limited funding and time available to conduct the study. Some of the challenges and limitations are discussed below.

Attribution of Policy Outcomes to CZM Versus Other Programs. A research design challenge that merits particular attention in a study focusing on outcome effectiveness is the "attribution question"—Was this outcome a result of CZM or was it more associated with some other program? How are relative contributions sorted out? Because the emphasis in this study was on examining outcomes of state CZM policy implementation, and not on comparing CZM policy outcomes to those of the many other public and private programs working toward similar goals, we could not fully address the attribution issue. However, our criteria for linking outcomes with CZM activities were fairly clear-cut. For CZM to get credit for an outcome, it needed to have a clear basis in state CZM policy, an associated investment of either federal or state CZM resources, and a direct or indirect outcome that could be linked back through a CZM process or tool. Nevertheless, it was clear that many of the outcomes we identified as "CZM" were based on partnerships with other governmental agencies and private organizations—the credit is shared. In many cases, this "shared credit" was the result of wise investments of limited resources. Often, CZM resources were used as a catalyst for subsequent non-CZM actions—for example, providing CZM funds to prepare a plan for acquisition of critical wetland habitat, but depending

on other public and private sources to actually implement the plan. However, sorting out the relative contributions of different programs was not possible in our study, which focused exclusively on CZM.

Data Availability. Probably the most significant limitation of this study was the scarcity of data for some of the outcome indicators we identified as important. This situation was expected because no standardized, on-the-ground outcome monitoring protocol exists for assessing state CMP performance relative to national CZMA objectives. Indeed, one of the underlying purposes of this study was to identify a meaningful set of outcome indicators for each objective that might serve as a basis for establishing a national performance monitoring system in the future. Even the initial request for proposals suggested that outcome data would likely be limited and that process indicators might serve as a fall-back for estimating effectiveness. Outcome data were indeed relatively scarce and when data were available, they often lacked comparability. Baseline data needed to evaluate some indicators were also of relatively poor quality in some cases. Despite these built-in limitations, there were sufficient data to draw some tentative conclusions about state and national CZM performance. These findings are presented later in this report.

Limited Scope and Depth of Study. State CMP effectiveness is examined principally in terms of how well estuaries and coastal wetlands are protected from direct physical alterations such as dredging, filling, and other conversions. Area measurements are thus the principal currency for outcome indicators. We did not attempt to address questions of estuarine or coastal wetland function or quality. Wetland managers will appreciate the reasons for this. Standard methods for assessing wetland function and quality are just being developed. States do not systematically address these issues in their decision making, relying more on case-by-case application of professional judgment. Records of these considerations are not kept. Similarly, we did not explicitly address the water quality aspects of protection, even though they are very important. This was in part because state CMPs are recent entrants to the water quality management arena; historically, other federal and state agencies and programs have dominated. It was also beyond the scope of this study, given available funding and time. Such evaluation should be considered for a future study.

State and Federal CZM Funding and Staffing Measures. We did not tabulate overall state and federal CZM funding and staffing inputs to estuary and coastal wetland protection. These might have enabled us to sort out those programs that were long on policy but short on implementation and enforcement. However, given the highly networked nature of CZM for this issue area, such tabulation would have added further complexity to an already major data collection effort. Furthermore, one relatively recent study (Brower and others 1991) has already summarized these data, albeit at a more general level (i.e., for natural resource protection in aggregate).

CZM Policy Outcomes versus State of the Coastal Environment. This study focused on the on-the-ground outcomes of CZM decisions and actions—for example, the area of wetlands lost due to development that required a CZM permit, or the area of wetland regained through compensatory mitigation. We did not systematically relate CZM policy outcomes to *overall*

health of estuaries and coastal wetlands. Data for such comparisons, such as change detection analysis for wetlands, simply do not exist in most states. Nevertheless, linking CZM policy decision outcomes to overall changes on the ground should be the ultimate goal of program evaluation. Eventually, NOAA's "state-of-the-coast" project and similar programs in several states may be able to track key indicators of coastal environmental health and relate them to state CZM and other programs. Florida is one promising example of a state coastal health indicator framework that may have the potential to be linked to CZM program outcome indicators (www.fsu.edu~cpm/FACT/).

Would the Same Outcomes Have Occurred Without CZM? A final limitation of the research is that it is not possible to say whether or not the same outcome would have occurred without CZM. One problem is that there are no states to serve as controls. States without federally-approved CZM programs might be considered candidates, but all are "contaminated" by their previous participation in the federal program. All have thus been influenced by national criteria or by examples from states with approved programs.

Evaluation Results and Discussion

Results of the effectiveness evaluation process are presented and discussed here using the same four steps followed in the evaluation process. Issue importance is discussed first, providing context for how significant estuary and coastal wetland protection as a policy issue for each states. Process indicator results are then presented, including the derivation of the model program that serves as the standard of comparison for estimating the potential effectiveness of each state CMP. Outcome effectiveness results follow, along with a discussion of data availability issues. Examples of states with relatively good record keeping for at least some outcome indicators are given. Next, overall performance results are presented—this is the final step in the evaluation process where outcome effectiveness is compared with issue importance on one hand and potential effectiveness on the other. This final step is designed to place outcome effectiveness results within the unique social, environmental, and institutional setting of each state. Finally, the role and importance of case examples in CZM evaluation is discussed.

Step 1: The Relative Importance of Estuary and Coastal Wetland Protection

Many factors contribute to the relative importance of *estuary and coastal wetland protection* in a state and, in turn, to the attention it gets in a state's coastal program. Some of these factors are environmental, while others are economic, social, or political in nature. Seven such factors, some of which were discussed earlier, were selected as *indicators of issue importance* for this study issue (Table 3). There are several reasons why this particular set of indicators was selected from the range of possible candidates. First, comparable national data were available; for many other variables, this is not the case. Second, the indicators appear to be relatively independent of one

Table 3. Issue importance indicators for *estuary and coastal wetland* protection in coastal states, indicator significance, number of states in each rating class, and data sources for indicators.

ISSUE IMPORTANCE INDICATOR	DEFINITION	SIGNIFICANCE AS AN INDICATOR	RATING CLASSES, CRITERIA AND NO. STATES IN CLASS[1]	PRINCIPAL DATA SOURCES
ESA:CZA[2]	Estuarine surface area compared to coastal land area (ratio)	Rough measure of the relative physical dominance and importance of services provided by estuaries in the coastal zone	HIGH: >0.35:1 (9) MOD: 0.06-0.35:1 (9) LOW: <0.06:1 (9)	NOAA (1985) NOAA (1992)
WET:CZA	Wetland area in coastal zone compared to coastal land area (ratio)	Rough measure of the relative physical dominance and importance of services provided by wetlands in the coastal zone	HIGH: >0.30:1 (8) MOD: 0.10-0.30:1 (12) LOW: <0.10:1 (9)	NOAA (1991) NOAA (1992)
%Loss	Historic wetland loss (%)	Rough measure of long-term direct impacts of human development of coastal zone	HIGH: >40%(17) MOD: 20-40% (8) LOW: <20% (4)	Dahl (1990) State profiles
PopD	Population density of coastal counties (1990)	Rough measure of historic and present urban development pressures in coastal zone	HIGH: >500/mi^2(11) MOD: 150-500/mi^2 (12) LOW: <150/mi^2 (6)	NOAA (1990)
%PopC	Population change 1970–1990 (%)	Rough measure of development pressures in coastal zone since CZM instituted	HIGH: >50% (8) MOD: 20-50% (11) LOW: <20%(10)	NOAA (1990)
Impt1	Issue importance at time state CZM program approved	Estimate of political attention given and perceived importance of issue at CZM approval	HIGH: (17) MOD: (10) LOW: (2)	State profiles
Impt2	Issue importance evolution to present	Estimate of political attention given to issue from CZM approval to present	HIGH: (25) MOD: (4) LOW: (0)	State profiles

[1]Rating classes were based on how states clustered in spread sheet analysis of data for each indicator (see Table 1 for data); the numbers of states in each rating class are in parentheses (for ESA:CZA, there are only twenty-seven states because Michigan and Wisconsin, both Great Lakes states, have no estuaries).
[2]Ratios were used because consistent data were not available to estimate the percent of entire coastal zone (land and water) that was either estuarine surface area or coastal wetland.

another—they do not measure the same things. Finally, the indicators represent a good balance of environmental factors (the first three), social-demographic factors (the next two), and policy leaders' perceptions (the final two). No doubt there are other factors that are just as important to those selected. For example, the unique institutional legacy of each state or territory—how it approaches environmental management generally and what approaches are socially and politically acceptable—is very important. So are funding and staffing levels for program implementation. Other social and political forces and trends and state CZM program response to them may also be significant factors. And there are more—Sabatier and Mazmanian (1983), in their evaluation of California's coastal program, identified as many as seventeen variables affecting implementation.

To simplify the results and allow easy comparisons among states, a simple data classification system was established, with high-moderate-low ratings for each indicator based on how states clustered into groups of approximately equal size (Table 3). The exceptions to this equal-size grouping criterion were the indicator for wetland loss and the two perception-based indicators. In the first case, because loss was relatively high in most states, rating class boundaries were such that a majority of states received a "high importance" rating for this indicator.

Aggregation of the seven indicator ratings for each state showed that estuary and coastal wetland protection as a state CZM issue was of *high importance* for thirteen of twenty-nine states or 45 percent (Table 4). Examples include Alabama and Puerto Rico (2.71 ratings) and Connecticut, New York, New Jersey, Florida, and California (all with 2.57 ratings). Issue importance was of *low importance* for just two states (Guam and Hawaii), with the remainder being rated of *moderate importance* (fourteen states or 52 percent). The mean rating for all twenty-nine state CMPs was 2.27 with a standard deviation of ±0.32. Mean scores for individual issue importance indicators show that three of the seven were of high importance. Perceived issue importance today (2.86) and perceived importance at CZM approval (2.52) were the highest rated indicators overall, followed by historic loss of coastal wetlands (2.45). The remaining indicators were of moderate importance overall.

As might be expected, there are some differences in *overall* issue importance for the indicators when aggregated to the regional level (Table 4). For none of the coastal regions was issue importance low overall; this is not surprising given the fact that estuary and coastal wetland protection has been a front-burner issue generally in the U.S. over the past twenty-five years. For three of the regions—Gulf Coast (2.50), Mid-Atlantic (2.46), and Southeast (2.43)—issue importance was high, and another was just below high (New England (2.29). The remaining three were clearly in the mid-range of moderate—West Coast (2.14), Great Lakes (2.08), and Islands (2.05). Among the individual states, just two in the moderate range fell below the mid-point—Alaska (1.71) and Oregon (1.86).

There are also many regional differences and patterns among the different indicators (Table 4). For example, a comparison of percent historic wetland loss with population density in the Mid-Atlantic region shows an apparent correlation between the two variables, probably because extensive urban development contributed significantly to wetland loss. But the same correlation does not show up in the Great Lakes states, perhaps because wetland loss there is

Table 4. Issue importance ratings for estuary and coastal wetland protection by region.

STATE or REGION	ESA: CZA[1]	WET: CZA	% Loss	PopD	%PopC	Impt1	Impt2	OVERALL IMPORTANCE	
								Mean	Rating
Maine	M[2]	M	M	L	M	M	H	2.00	*Moderate*
New Hampshire	L	L	M	M	H	H	H	2.14	*Moderate*
Massachusetts	H	M	M	H	L	H	H	2.43	*High*
Rhode Island	M	M	M	H	L	H	H	2.29	*Moderate*
Connecticut	H	M	H	H	L	H	H	2.57	*High*
New England	2.2 *Mod.*	1.8 *Mod.*	2.2 *Mod.*	2.4 *High*	1.6 *Low*	2.8 *High*	3.0 *High*	2.29	*Moderate*
New York	H	H	H	H	L	M	H	2.57	*High*
New Jersey	H	H	M	H	L	H	H	2.57	*High*
Pennsylvania	M	M	H	H	L	M	H	2.29	*Moderate*
Delaware	M	M	H	M	M	M	H	2.29	*Moderate*
Maryland	H	M	H	H	L	H	H	2.57	*High*
Mid-Atlantic	2.6 *High*	2.4 *High*	2.8 *High*	2.8 *High*	1.2 *Low*	2.4 *High*	3.0 *High*	2.46	*High*
Virginia	M	M	H	M	M	H	H	2.43	*High*
North Carolina	H	M	H	L	M	H	H	2.43	*High*
South Carolina	L	H	M	L	H	H	H	2.29	*Moderate*
Florida	L	H	H	M	H	H	H	2.57	*High*
Southeast	1.75 *Mod*	2.5 *High*	2.75 *High*	1.5 *Low*	2.5 *High*	3.0 *High*	3.0 *High*	2.43	*High*
Florida	L	H	H	M	H	H	H	2.57	*High*
Alabama	H	H	H	M	M	H	H	2.71	*High*
Mississippi	M	H	L	M	M	M	H	2.14	*Moderate*
Louisiana	H	H	H	M	L	H	H	2.57	*High*
Gulf Coast	2.25 *Mod*	3.0 *High*	2.5 *High*	2.0 *Mod*	2.0 *Mod*	2.75 *High*	3.0 *High*	2.50	*High*
California	M	M	H	H	M	H	H	2.57	*High*
Oregon	L	L	M	L	M	H	H	1.86	*Moderate*
Washington	M	M	H	M	M	H	H	2.43	*High*
Alaska	M	L	L	L	H	M	M	1.71	*Moderate*
West Coast	1.75 *Mod*	1.5 *Low*	2.25 *Mod*	1.75 *Mod*	2.25 *Mod*	2.75 *High*	2.75 *High*	2.14	*Moderate*
Michigan	n/a[4]	L	H	L	L	H	H	2.00	*Moderate*
Wisconsin	n/a[4]	M	H	M	L	M	H	2.17	*Moderate*
Great Lakes	n/a[4]	1.5 *Low*	3.0 *High*	1.5 *Low*	1.0 *Low*	2.5 *High*	3.0 *High*	2.08	*Moderate*
American Samoa	L	L	M	H	H	L	H	2.00	*Moderate*
Guam	L	L	L	M	H	L	M	1.57	*Low*
Hawaii	L	L	L	M	M	M	M	1.57	*Low*
Northern Marianas	L	L	H	M	H	H	M	2.14	*Moderate*
Puerto Rico	H	H	H	H	M	M	H	2.71	*High*
Virgin Islands	L	L	H	H	H	M	H	2.29	*Moderate*
Islands	1.33 *Low*	1.33 *Low*	2.17 *Mod*	2.5 *High*	2.67 *High*	1.83 *Mod*	2.5 *High*	2.05	*Moderate*
All State Mean[3]	2.00 *MOD*	1.97 *MOD*	2.45 *HIGH*	2.17 *MOD*	1.93 *MOD*	2.52 *HIGH*	2.86 *HIGH*	2.27	*MODERATE*

[1] See Table 3 for definitions of issue importance indicators.

[2] H—Data indicate issue should be of *High Importance* in state/region (for mean scores H = 3).
M—Data indicate issue should be of *Moderate Importance* in state/region (for mean scores M = 2).
L—Data indicate issue should be of *Low Importance* in State or region (for mean scores L = 1).

[3] 1.0 to 1.67 = Issue is of *Overall Low Importance* in the state (row) or for indicator (column).
1.68 to 2.33 = Issue is of *Overall Moderate Importance* in the state (row) or for indicator (column).
2.34 to 3 = Issue is of *Overall High Importance* in the state (row) or for indicator (column).

[4] Neither Michigan or Wisconsin have estuaries (on the Great Lakes)

more associated with agriculture than urbanization. Another example is that for all regions except the Southeast, perceptions of issue importance by coastal managers increased between the time of initial state CMP approval to present. In 1996, twenty-five of the twenty-nine state CZM programs (86 percent) perceived estuary and coastal wetland protection of high importance, whereas at the time of initial state CMP approval, fewer did—eighteen of twenty-nine, or 63 percent. For only one CZM program—the Northern Mariana Islands—did perceived issue importance decrease over this time.

Another issue importance trend from initial program approvals (late 1970s and early 1980s) to present that is not apparent from the rating data, but clear in state profiles, is a shift in program development emphasis from estuaries and tidal wetlands to freshwater, nontidal coastal wetlands. Generally, by the early 1980s, estuarine and tidal wetland areas were relatively well protected from direct physical alterations through state and federal regulatory programs and other authorities. However, freshwater wetlands, mostly on private lands, do not enjoy the same strong protection. These wetlands are being converted to other uses at a relatively high rate as the numbers of new residents, visitors, and associated development mushroomed. Some states responded with new regulatory programs (e.g., New Jersey and Maryland) or, where such programs could not be enacted, with creative use of federal consistency (e.g., South Carolina), with improved Clean Water Act Section 401 certification procedures (e.g., Wisconsin) to provide increased state oversight within the coastal zone, or with special area planning designations and programs that increased protection (e.g., Rhode Island).

The significance of the issue importance ratings is that it establishes expectations for how much attention each state gives to estuary and coastal wetland protection in terms of policy emphasis, the processes and tools used to implement policy, and record keeping to track on-the-ground outcomes of policy implementation. Essentially, issue importance sets up a baseline for evaluating the effectiveness of a program in relative terms. For example, if issue importance is moderate, outcome effectiveness should be at least moderate in order for a state's program to be considered performing well or "as expected" for this core CZM objective. However, an overall issue importance rating is not a substitute for more detailed consideration of individual indicators and other factors that comprise the context for a state's coastal policies and their implementation.

Step 2: Potential Effectiveness of CZM Programs Based on Process Indicators

The next step in the CZM evaluation process was to estimate the potential effectiveness of each state's "on-paper" management program, based on the policies, processes, and tools they used to achieve estuary and coastal wetland protection objectives. We defined these policies, processes, and tools as "process indicators" (Table 5). But before potential effectiveness could be estimated, a consistent CMP evaluation method needed to be developed that could be applied to each state across the board. The approach we took was to compare each state's program to an empirically derived *model state CMP* developed using aggregated state process indicator results. The model CMP and its basis are described below, followed by a national overview of potential effectiveness results.

Table 5. Process indicators—the processes and tools used by states to protect estuaries and coastal wetlands—and the ten *most importance processes and tools* (**bold**) based on aggregated state rankings of importance.

CZM POLICY, PROCESS, OR TOOL DEFINITIONS	RANKINGS	
	Raw Score	Ranking
1. INFORMATION AND RESEARCH		
1a. Inventory and mapping	**25**	**5**
1b. Wetland functions assessment	6	
1c. Wetland change detection monitoring	0	
1d. GIS, database, automated records to track program actions	4	
2. REGULATORY		
2a. State tidal wetlands permit required	**100**	**1**
2b. State nontidal wetlands permit required	**62**	**2**
2c. Local government tidal or nontidal wetland permit required	21	
2d. General permits or exemptions for low-impact activities used	2	
2e. Federal consistency standards used *in lieu of* state-level permit	**23**	**8 (tie)**
2f. State consistency standards used *in lieu of* state-level permit	0	
2g. State CWA 401 certification used *in lieu of* state-level permit	10	
2h. State tideland leasing requirements used *in lieu of* state-level permit	0	
2i. Environmental impact assessment required	13	
2j. Non-water-dependent exclusion or limitations	6	
2k. Single-purpose dock exclusion or limitations	0	
2l. Other use exclusion or limitations	10	
2m. Compensatory mitigation required (no-net-loss policy)	**23**	**8 (tie)**
2n. Compliance monitoring and enforcement program	**24**	**6 (tie)**
2o. Mitigation banking permitted as compensatory mitigation	0	
2p. Development setback or buffer from wetlands required	10	
3. PLANNING		
3a. Land use planning and zoning protects wetlands	**37**	**3**
3b. Special area management plan (SAMP) protects wetlands	**23**	**8 (tie)**
3c. Critical Areas, other protected area designations	16	
3d. Advanced Identification Plans (EPA) protect wetlands	0	
4. ACQUISITION		
4a Fee simple acquisition with state or federal CZM funds	18	
4b. Less-than-fee acquisition with state or federal CZM funds	5	
4c. *Fee simple* acquisition with other than CZM funds	**29**	**4**
4d. *Less-than-fee ac*quisition with other than CZM funds	5	
5. NONREGULATORY		
5a. Nonregulatory restoration or enhancement	12	
5b. Education and technical assistance	**24**	**6 (tie)**
6. COORDINATION		
6a. Joint state-federal permit application	2	
6b. Interagency pre-application consultation process	9	
6c. Memoranda of agreement to promote cooperation	0	

The Model State CMP and Evaluation Criteria. The first task in developing the model state CMP and process indicator evaluation criteria was to identify the policies, processes, and tools most important for estuary and coastal wetland protection from a national perspective. These were identified in a three-step assessment of process indicator use that relied heavily on state CMP documents and interviews with state coastal staff. In the first step, it was determined whether a process or tool was used in the state—simply a *yes* or *no.* Because most processes and tools were being used by most state CMPs (Table 6), these results did not contribute much to development of an idealized or model CMP. The next step, therefore, was to ask, for each tool that was used, how important it was for protecting estuaries and coastal wetlands in the state—*high, moderate,* or *low.* Aggregating these importance ratings across all states provided a measure of relative importance of different tools, but with a bias toward tools with broad use. To help remove this bias, each state was asked to identify, in rank order, its top five tools for estuary and coastal wetland protection. These ranking data were then aggregated to identify the *most important processes and tools* from a national perspective. The final rankings for each state were arrived at through interviews with one or more state-level personnel, with final signoff by principal study contacts during state profile review.

The top ten processes and tools in rank order are identified in Table 5 (far right column). Five of the top ten are regulatory programs or elements of regulatory programs. This suggests that these tools are the underpinnings for estuary and coastal wetland protection at the state level, much the same as the Clean Water Act's Section 404 program is perceived as the lynchpin to federal wetland protection. Other processes and tools, however, were also deemed essential for a well-rounded estuary and coastal wetland management program. These included inventory and mapping efforts that accurately characterize wetland location and type; planning at the local or regional level to resolve land use conflicts and provide advance protection for critical resources; careful use of CZM resources to acquire or promote acquisition of critical areas that cannot otherwise be protected; and education and technical assistance for a variety of audiences.

Comparison of the results from the steps used to arrive at the list of *most important processes and* tools demonstrates the utility of the three-step approach. For example, just six of the most-used tools (Table 6) were among the ten most important (Table 5), and there are significant differences in their relative importance. The top-ranked tools—state tidal and nontidal permits—were not even among the ten most-used tools. Compliance monitoring and enforcement, and education and technical assistance were used by all states, but were ranked sixth among the most important processes and tools. Interagency pre-permit application meetings were used by all states, but did not rank among the ten most important. The point is that simple use of a tool does not determine its relative importance in achieving management objectives. The *most important processes and tools* also are useful for other purposes, serving as the foundation for a *model state CMP* for estuary and coastal wetland protection, as well as the basis for developing *process indicator evaluation criteria.* These are discussed next.

The ten *most important processes and tools* were the principal basis for defining elements of a *model state CMP* for estuary and coastal wetland protection (Figure 6). Other less important tools are included as well, such as nonregulatory restoration and various coordination features, but the most important processes and tools are at the core of the model program. An implicit

Table 6. The use of estuary and coastal wetland protection processes and tools in state coastal management programs.

PROCESS OR TOOL	AL	AK	AS	CA	CT	DE	FL	GU	HI	LA	ME	MD	MA	MI	MS	NH	NJ	NY	NC	NM	OR	PA	PR	RI	SC	VI	VA	WA	WI	Total Using
INFO/RESEARCH TOOL																														
1a. Inventory and mapping	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	28
1b. Wetland functional assessment	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓			✓	✓	✓	26
1c. Wetland change monitoring	✓	✓		✓	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓			✓	✓				✓		✓	19
1d. GIS, database, computer-based records	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	28
REGULATORY TOOLS																														
2a. State tidal wetlands permit	✓		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	na	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		na	24/27
2b. State nontidal wetlands permit	✓		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓		✓		✓			✓	21
2c. Local tidal/nontidal wetland permit		✓		✓	✓		✓		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓			✓		✓	✓		✓	✓	✓	20
2d. General permits/exemptions	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	26
2e. Federal consistency stds. *in lieu of* permit	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓			✓			✓	✓				✓		✓		✓			16
2f. State consistency stds. *in lieu of* permit	✓	✓				✓			✓	✓	✓				✓			✓	✓	✓							✓			11
2g. State CWA 401 certif. *in lieu of* permit	✓	✓			✓	✓		✓		✓			✓		✓		✓	✓	✓				✓		✓		✓	✓	✓	16
2h. State tideland leasing regs. *in lieu of* permit	✓	✓					✓	✓	✓	✓	✓			✓	✓		✓	✓		✓			✓	✓			✓			15
2i. Environmental impact assessment	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	24
2j. Non-water-dependent exclusion/limit	✓	✓	✓	✓	✓	✓				✓		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		✓	✓	✓	22
2k. Single-purpose dock exclusion/limit	✓					✓	✓					✓	✓			✓	✓		✓		✓			✓	✓		✓	✓	✓	14
2l. Other use exclusions/limits	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓	25
2m. Compensatory mitigation required	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		27
2n. Compliance monitoring/enforcement	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	29
2o. Mitigation banking				✓			✓			✓	✓	✓	✓	✓	✓		✓		✓		✓		✓				✓			13
2p. Development setback or buffer		✓	✓	✓	✓	✓	✓				✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	22

Table 6. The use of estuary and coastal wetland protection processes and tools in state coastal management programs (continued).

PROCESS OR TOOL	AL	AK	AS	CA	CT	DE	FL	GU	HI	LA	ME	MD	MA	MI	MS	NH	NJ	NY	NC	NM	OR	PA	PR	RI	SC	VI	VA	WA	WI	Total Using
PLANNING TOOLS																														
3a. Land use planning or zoning	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓	27
3b. Special area management plan (SAMP)		✓	✓	✓	✓		✓	✓	✓	✓		✓			✓		✓	✓	✓	✓			✓	✓	✓		✓	✓		19
3c. GAPC, AECs, Critical Areas, MPAs	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	28
3d. Advanced Identification Plans (EPA)	✓	✓	✓	✓			✓							✓	✓		✓		✓						✓				✓	11
ACQUISITION TOOLS																														
4a. *Fee simple*[2] acquisition with CZM$	✓			✓					✓		✓	✓				✓			✓		✓		✓		✓		✓	✓	✓	13
4b. *Less-than-fee*[2] acquisition with CZM$	✓			✓															✓								✓	✓	✓	6
4c. *Fee simple* acquisition with other $	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓			✓	✓			✓	✓	✓	22
4d. *Less-than-fee* acquisition with other $				✓	✓	✓	✓					✓		✓		✓	✓	✓	✓				✓	✓			✓	✓		14
NONREGULATORY TOOLS									✓																					
5a. Restoration, creation, enhancement (non-regul.)		✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓		✓			✓				✓	✓	✓		✓	✓	✓	20
5b. Education and technical assistance	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	29
COORDINATION TOOLS																														
6a. Joint state-federal permit application	✓	✓	✓	✓	✓		✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓					✓	✓	✓	21
6b. Interagency pre-application meetings	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	29
6c. Memoranda of agreement	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	24

✓—The state or territory CMP uses this process or tool to implement estuary and/or coastal wetland protection policies; na means not applicable.

Information and Research Element
A **recent, accurate wetland inventory** and **GIS-based mapping** support regulatory, planning, and other program elements. The inventory integrates **wetland function assessment**, and the state periodically **monitors wetland change** on the ground.

Regulatory Element
The state has regulatory **permit programs** for tidal and nontidal waters and wetlands in the coastal zone, either through a coastal use permit or a resource-specific program. The programs are administered at the state level, or, if at the local level, there is strong state oversight. State permit decisions are the basis for **federal consistency** and **401 water quality certifications**. The program has streamlined its process using **general permits**, but there are no exemptions that lead to significant cumulative impacts. The state has a **no-net-loss** of wetlands policy implemented through a sequenced "avoid-minimize-compensate" wetland **mitigation** requirement. Mitigation priorities emphasize restoration over creation. There is also a strong compliance monitoring and enforcement program. **Reliable *outcome data*** is available through agency **databases and GIS** and demonstrate that permitted loss of habitat is low with favorable trends, that violations and related losses are low or decreasing. This is supported by independent on-the-ground wetland change analysis. Mitigation has replaced both area and functions lost through permitted projects at greater than a 1:1 ratio. Only water-dependent projects receive permits for wetlands adjacent to navigable waters, and single-purpose dock permitting has declined in favor of community moorage.

Planning Element
Local land use plans based in part on state standards to protect estuarine and wetland resources are in place. In areas with particularly important resources, many competing uses, and/or significant development versus conservation conflicts, other more intensive planning exercises have succeeded using **special area management planning** (SAMP) or similar processes. Alternatively, the state has designated **GAPCs, AECs, or critical areas** and, using similar processes, developed plans that protect coastal waters and wetlands. **Reliable *outcome data*** show that the most valuable estuarine and wetland areas are protected through zoning or special area designations that severely limit alterations; less important but still sensitive areas have moderate protection, while areas especially suited for port and other water-dependent development are set aside for these uses.

Acquisition Element
Acquisition of estuarine and wetland areas has been an **important but limited program** focused on areas most at risk of loss. These include significant resource areas needed to preserve endangered species, critical habitat for other important fish and wildlife species, and other highly functional areas otherwise threatened with loss or degradation. **Fee-simple purchase**, mostly using **other-than-CZM funds** is the most important tool, with **CZM assisting** by identifying wetland areas for acquisition or facilitating transfers. Less-than-fee acquisition through **conservation easements** has been an important tool. **Reliable *outcome data*** show acreage and habitat types acquired using different tools and other information on subsequent management.

Nonregulatory Element
The state has **strong public, landowner, and continuing professional education programs** to support and promote wetland protection and nonregulatory restoration. Based on a **goal of net-gain-of-wetland area and function** over the long term, the state has mounted a **significant nonregulatory wetland restoration** program for degraded and former wetlands. **Reliable *outcome data*** show that a significant percentage of these wetlands have been restored and that there are plans for more as funding and willing landowners become available.

Coordination Element
Using **memoranda of agreement, joint permit applications and notices** with the federal Section 404 program, and **pre-application conferences**, the state CMP has built an effective intergovernmental coordination program and a communication link with the development community that **expedites the permit process and promotes compliance**.

Figure 6. Model State Coastal Management Program for Estuary and Coastal Wetland Protection

assumption in the model program is that issue importance is high across the entire suite of indicators, which of course is not the case for any of the actual state CMPs. Note also that the model program is forward-linked to outcome effectiveness evaluation (see Step 3 in the overall process), in that it assumes a strong program of outcome monitoring, record keeping, and reporting for ongoing effectiveness and performance evaluation. Again, this is an ideal that no actual state CMP approaches at this time.

The final step in developing the procedure for estimating potential effectiveness of individual state CMPs was to develop and weight process indicator evaluation criteria (Table 7). The *model state CMP* and the *most important processes and tools* upon which it is based are central to these criteria. For each category of tools, the criteria were weighted toward the most important processes and tools in that category (Table 7, top). For example, the regulatory category had five of the top ten processes and tools (Table 5). Criteria were weighted such that to receive a high process indicator rating for this category, a state would have to use all five tools and have high ratings for most of them. Overall process indicator ratings for each state were based on aggregating results from each of the six process and tool categories—Information and Research, Regulatory, and so on—using a set of combining rules (Table 7, bottom). To receive a *high* overall process indicator rating, the regulatory category also had to be *high*, again because of the importance of this category. For *moderate* or *low* ratings, criteria were more flexible. The overall evaluation criteria also took into account the issue importance indicator "percent wetland loss" to determine how the nonregulatory category would be considered in the evaluation process.

The principal purpose of the model program and associated evaluation criteria are to provide a common, consistent basis for evaluating the potential effectiveness of individual state CMPs. They could also serve as a simple self-evaluation framework for states wanting to improve their programs. Whatever the use, the strength of the model program rests on its basis in empirical data (process indicator results) provided by the states. In effect, collectively, states are saying "These are the processes and tools that really work." Clearly, however, the model is an ideal—no actual state CMP is likely to have all these features. In some cases, certain elements of the model program may not even be relevant. Alaska, for example, with very low historic wetland loss, would not be expected to have an extensive wetland restoration program. Each state has its special circumstances that may make one or another strategy or tool inappropriate. The point is that a state can have a strong, effective program without fully emulating the model program.

National Overview of the Potential Effectiveness of State CMPs. Process indicator ratings for all states, organized by region in Table 8, hint at the diversity of policies, processes, and tools used by state CMPs, much the same as issue importance indicator results illustrated social and environmental diversity. Generally, most states look good "on paper." Compared to the model program, six state CMPs rated *high* in potential effectiveness for both tidal (estuarine) and nontidal wetland management—New Hampshire, Massachusetts, New Jersey, Maryland, Florida, and Guam. Fourteen state CMPs have *moderate* ratings for both areas. The remaining nine state CMPs have mixed ratings. Just three CMPs have *low* ratings, and those are for nontidal wetlands management only. Collectively, as a national program, there is high potential effectiveness for

Table 7. Process indicator category and overall rating criteria for state CMPs (process and tool numbers are cross-referenced to Table 6; data for ratings come from each state's profile).

PROCESS INDICATOR CATEGORY RATING CRITERIA (if tools in a category are not used by a state, a "not applicable" is assigned)

INFO/RESEARCH TOOLS RATING:

HIGH

❒ If H for 1a, and H or M for one other tool or L for two tools

MODERATE

❒ If 1a is at least M and at least one other tool is M or L

❒ If 1b, 1c, 1d have at least one H and one M among them

❒ Other combinations not H or L

LOW

❒ If 1a is L, and M for one other tool or L for two or more tools

❒ If 1a is L, and only one other tool >L

REGULATORY TOOLS RATING (apply separately to tidal and nontidal)

HIGH

❒ 2a (and/or 2b) is H; 2m or 2n at least H and other M

❒ 2c is H; 2m or 2n at least H and other M

❒ 2e is H; 2m or 2n at least H and other M

❒ 2a (and/or 2b) or 2c or 2e are H, either 2m or 2n are H, and at least one other tool is H

MODERATE

❒ 2a (and/or 2b) is M; 2m and 2n at least M

❒ 2c is M; 2m and 2n at least M

❒ 2e is M; 2m and 2n at least M

❒ 2a (and/or 2b) or 2c or 2e is M, either 2m or 2n are H, and at least one other tool is M

❒ Other combinations not H or L

LOW

❒ 2a (and/or 2b) is M or less and no other M or higher

❒ 2c is M or L, and no other M or higher

❒ 2e is H, M or L, and no other M or higher

PLANNING TOOLS RATING:

HIGH

❒ If H for either 3a, 3b, or 3c

MODERATE

❒ If no H, and M for either 3a, 3b, 3c

❒ Other combinations not H or L

LOW

❒ If no H or M, and L for either 3a, 3b, 3c

ACQUISITION TOOLS RATING

HIGH

❒ If H for 4c

❒ If H for either 4 a, 4b, or 4d, and M for 4c.

MODERATE

❒ If M for 4c

❒ If at least M for either 4 a, 4b, or 4d; and L for 4c

❒ Other combinations not H or L

LOW

❒ If no H or M; and L for 4a, 4b, 4c, or 4d.

NONREGULATORY TOOLS RATING:

HIGH

❒ If H for either 5a or 5b and M or L for other

MODERATE

❒ If no H, and M for either 5a or 5b

❒ Other combinations not H or L

LOW

❒ If no H or M, and L for either 5a or 5b

COORDINATION TOOLS RATING

HIGH

❒ If H for either 6a, 6b, or 6c

MODERATE

❒ If no H; and M for either 6a, 6b, or 6c

❒ Other combinations not H or L

LOW

❒ If no H or M; and L for either 6a, 6b, or 6c

OVERALL PROCESS RATING CRITERIA

(apply separately for tidal and nontidal areas)

HIGH

❒ If Regulatory H and three of Info/Research, Planning, Acquisition, and Restoration are H; and Coordination M or L

❒ If Regulatory H and two of Info/Research, Planning, and Acquisition are H; Coordination M or L; and Issue Importance indicator "%LOSS" is L

MODERATE

❒ If Regulatory M and three of Info/Research, Planning, Acquisition, and Restoration are at least M; and Coordination M or L

❒ If three of Info/Research, Regulatory, Planning, and Acquisition are all M; Coordination M or L; and Issue Importance indicator "%LOSS" is L

❒ Other combinations not HIGH or LOW

LOW

❒ If Regulatory L and at least two of Info/Research, Planning, Acquisition, Restoration, and Coordination are L or not used

❒ If at least two of Info/Research, Regulatory, Planning, Acquisition, and Coordination are L; and Issue Importance indicator "%LOSS" is L

Table 8. Regional summary of *process indicator* ratings, which serve as a measure of state and regional CZM *program potential* for effective estuary and coastal wetland protection.[1]

STATE or REGION	INFO RSCH	REGULATORY		PLAN	ACQU	NON-REGUL	COOR	OVERALL RATING[1]	
		Tidal	*Nontidal*					*Tidal*	*Nontidal*
Maine	H	M	M	H	M	M	M	*Moderate*	*Moderate*
New Hampshire	H	H	H	H	M	H	H	*High*	*High*
Massachusetts	H	H	H	H	H	H	H	*High*	*High*
Rhode Island	H	H	H	H	M	M	M	*Moderate*	*Moderate*
Connecticut	H	M	M	H	L	H	M	*Moderate*	*Moderate*
New England	3.0 *High*	2.6 *High*	2.6 *High*	3.0 *High*	2.0 *Mod.*	2.6 *High*	2.4 *High*	2.4 *HIGH*	2.4 *HIGH*
New York	H	H	H	H	L	L	M	*Moderate*	*Moderate*
New Jersey	H	H	H	H	H	L	H	*High*	*High*
Pennsylvania	H	H	H	L	L	M	H	*Moderate*	*Moderate*
Delaware	H	H	M	L	H	H	H	*High*	*Moderate*
Maryland	H	H	H	H	H	H	H	*High*	*High*
Mid-Atlantic	3.0 *High*	3.0 *High*	2.8 *High*	3.0 *High*	3.0 *High*	2.0 *Mod.*	2.8 *High*	2.6 *HIGH*	2.4 *HIGH*
Virginia	H	M	M	H	M	M	M	*Moderate*	*Moderate*
North Carolina	H	H	M	H	H	M	H	*High*	*Moderate*
South Carolina	L	H	H	M	M	M	H	*Moderate*	*Moderate*
Florida	L	H	H	H	H	M	H	*High*	*High*
Southeast	2.0 *Mod.*	2.75 *High*	2.5 *High*	2.75 *High*	2.5 *High*	2.0 *Mod.*	2.75 *High*	2.5 *HIGH*	2.25 *MOD.*
Florida	L	H	H	H	H	M	H	*High*	*High*
Alabama	H	H	H	M	M	L	H	*Moderate*	*Moderate*
Mississippi	H	H	M	H	H	M	H	*High*	*Moderate*
Louisiana	H	H	M	M	M	H	H	*Moderate*	*Moderate*
Gulf Coast	2.5 *High*	3.0 *High*	2.5 *High*	2.5 *High*	2.5 *High*	2.0 *Mod.*	3.0 *High*	2.5 *HIGH*	2.25 *MOD.*
California	H	H	M	H	H	H	H	*High*	*Moderate*
Oregon	H	H	H	H	M	M	H	*Moderate*	*Moderate*
Washington	L	M	L	H	M	H	M	*Moderate*	*Low*
Alaska	H	M	M	H	np	M	M	*Moderate*	*Moderate*
West Coast	2.5 *High*	2.5 *High*	2.0 *Mod.*	3.0 *High*	1.75 *Mod.*	2.5 *High*	2.5 *High*	2.25 *MOD.*	1.75 *MOD.*
Michigan	H	na	H	H	M	H	H	na	*High*
Wisconsin	H	na	M	H	H	H	M	na	*Moderate*
Great Lakes	3.0 *High*	*na*	2.5 *High*	3.0 *High*	2.5 *High*	3.0 *High*	2.5 *High*	*na*	2.5 *HIGH*
American Samoa	M	M	M	M	0	H	M	*Moderate*	*Moderate*
Guam	H	H	H	H	L	H	H	*High*	*High*
Hawaii	H	M	M	H	H	M	L	*Moderate*	*Moderate*
Northern Marianas	H	M	L	H	M	H	H	*Moderate*	*Low*
Puerto Rico	H	M	M	H	H	M	L	*Moderate*	*Moderate*
Virgin Islands	L	H	L	M	0	L	M	*Moderate*	*Low*
Islands	2.5 *High*	2.33 *High*	1.83 *Mod.*	2.67 *High*	1.5 *Low*	2.33 *High*	2.0 *Mod.*	2.17 *MOD*	1.83 *MOD*
All-state mean	2.69 *HIGH*	2.67 *HIGH*	2.39 *HIGH*	2.69 *HIGH*	2.27 *MOD*	2,31 *MOD*	2.52 *HIGH*	2.37 *HIGH*	2.24 *MOD*

[1]Process indicator ratings: H—*high potential* for effectiveness, M—*moderate potential* for effectiveness, L—*low potential* for effectiveness; 0—no program in this category; "na" means not applicable because no tidal areas. The ratings are based on criteria developed from an assessment of the *most important processes and tools* for estuary and coastal wetland programs nationally and a *model state CMP* for this issue area (Figure 4). For determining mean scores for states or for indicator categories, H = 3, M = 2, L = 1, with rating categories the same as those used in note 3 of Table 3.

tidal waters and wetlands protection (2.37) and moderate potential effectiveness for nontidal areas (2.24). Differences between the two are due mainly to the lesser emphasis and more limited role some state CMPs play in freshwater wetland management.

Process indicator results for each of the six categories of processes and tools—information and research, regulatory, planning, acquisition, nonregulatory, and coordination—are discussed below. Exemplary case examples of the use of CZM processes and tools to protect estuaries or coastal wetlands are presented in Appendix E.

Information and Research Tools. This process and tool category includes many of the behind-the-scenes activities of state CMPs that are critical to the successful operation of the more visible parts of the program, such as planning and permitting. Important information and research tools include inventory and mapping; rapid assessment methods for assessing coastal wetland functions; on-the-ground analysis of wetland change; and the use of computers, databases, and integrated information technologies such as GIS to better understand and track agency actions and decisions and their impact on the ground. Among these tools, inventory and mapping was clearly the most important. Twenty-eight CMPs used this tool (Table 6), twenty-two rated it as highly important (76 percent), and compared to all other processes and tools for estuary and wetland protection, it ranked fifth of thirty-three in importance (Table 5). One interviewee summed the importance of a good inventory very simply by saying "You can't protect wetlands unless you know where they are."

Regulatory Processes and Tools. A regulatory program provides varying degrees of on-the-ground protection for estuaries and coastal wetlands. The amount of protection relates directly to the specific prohibitions, limitations, and exemptions written into regulatory policy; the geographic area of jurisdiction and the resources and activities controlled; the strength of enforcement provisions and the staff and effort devoted to the activity; the penalties for violations; and the support provided by agency leaders, the governor, the legislature, the courts, and the public.

Five of the top ten processes and tools for estuary and coastal wetland protection are in the regulatory category. *State-administered tidal wetland permits* (or more general coastal use permits that included tidal wetland protection standards) were far and away the top-ranked tool overall, scoring 61 percent higher than the second-ranked tool, *state-administered nontidal wetland permits*. Three other regulatory tools were also ranked among the top ten tools (Table 5)—*compliance monitoring and enforcement* programs (ranked sixth), *federal consistency standards* used in lieu of a separate tidal or nontidal permit (tied for eighth), and *compensatory mitigation* (tied for eighth). Although not in the top ten tools, *locally administered wetland permits* were also important (ranked eleventh overall) and picked up some of the slack in state programs (e.g., in Washington State and in Hawaii). For overall protection, it is clear that regulatory permit programs provide the foundation for state estuary and coastal wetland management.

Another finding is that tidal wetlands are much better protected through CZM regulatory (and other) mechanisms than are nontidal areas. For tidal wetlands—salt, brackish, and tidal fresh wetlands—virtually 100 percent of the resource is protected through CZM-related permit programs, often with very restrictive conditions for alterations and no-net-loss compensatory mitigation requirements. Regulatory jurisdiction and the degree of control over activities in

nontidal wetlands is highly variable, however. Some states (New Hampshire, Oregon, and Pennsylvania) have integrated tidal-nontidal wetland regulatory programs that apply statewide. Others have state or locally administered land use permits with wetland standards (Massachusetts). Still others have separate tidal and nontidal wetland laws (New Jersey and New York). Many, however, have little or no state-derived authority to regulate nontidal freshwater wetlands, and so must rely on Clean Water Act Section 401 certification procedures or CZMA Section 307 consistency to exert some control within the coastal zone. Examples of such states include Alaska, Delaware, Hawaii, Louisiana, Mississippi, North Carolina, Puerto Rico, South Carolina, and the Virgin Islands. Further, some states have jurisdiction over nontidal wetland alterations only within relatively narrow strips above mean high water. Examples include Washington State (200 feet), California (1,000 yards or 0.57 miles), Rhode Island (200 feet), and Wisconsin (areas adjacent to navigable waters). The use and regulatory effectiveness of 401 certification and 307 consistency varies. Wisconsin's 401 certification serves as a national model; so does South Carolina's use of federal consistency to shape federal Section 404 permit decisions (see case examples in Appendix E).

The relatively weak and fragmented management of nontidal, freshwater wetlands in the U.S. coastal zone suggests that this is an area warranting additional study. One of the key issues is the need to consider expanded jurisdiction over coastal areas to more fully encompass nontidal wetland resources with clear, unambiguous links to estuaries and coastal waters. On this question of expanded jurisdiction, the coastal assessment framework (CAF) developed by NOAA is a logical starting point for discussion (NOAA 1992). The CAF is a watershed-based spatial framework that is serving as the cornerstone of NOAA's efforts to develop a national estuarine assessment capability. This framework was used by NOAA to inventory the area of tidal and nontidal "coastal" wetlands on the National Wetland Inventory (NOAA 1991); many of the nontidal freshwater wetlands so defined are outside present state coastal zone boundaries. The CAF was also used by NOAA as the basis for its Section 6217 "coastal boundary review" process required under by the 1990 amendments to the CZMA that focused on nonpoint source pollution (NOAA 1992). Nine states were deemed to have adequate coastal zone boundaries to control nonpoint source pollution, sixteen states adopted expanded boundaries for improved nonpoint source control, and four were in negotiation with OCRM (Bill Millhouser, OCRM, personal communication, October 17, 1997). Expansion of jurisdiction over nontidal wetlands within the CAF would seem to be the next logical step, especially since freshwater, nontidal wetlands are a key element of "nature's infrastructure" for controlling nonpoint sources of pollution.

Another weakness in most state CMP wetland policies is the broad-based exemptions from regulations for normal farming and silviculture activities. This weakness is similar to exemptions in federal laws that many consider necessary to control workload and focus on large projects. Nevertheless, agriculture is still the principal cause of wetland loss in the U.S. (USFWS 1997). Agricultural exemptions likely play a significant role in these loss trends. In another example, the Chesapeake Bay Program reported in *Recent Wetland Status and Trends in the Chesapeake Watershed (1982–89)* that 37,000 acres of wetlands were lost in the watershed in that time frame, largely due to agricultural practices. Exemptions for these and other activities, such as the filling of wetlands for purposes of construction single-family dwellings, need to be

evaluated for their cumulative impacts. Although the rate is declining, nontidal wetland loss in coastal zones remains one of the greatest threats to coastal and estuarine water quality, ecosystem sustainability, and flood hazard mitigation. This issue is much larger than state CMPs, but nevertheless needs CZM attention.

Planning Processes and Tools. Land use planning, critical areas, Areas of Environmental Concern (AECs), Geographic Areas of Particular Concern (GAPCs), and similar special management designations provide on-the-ground protection *if* they are clearly linked to on-the-ground governmental decision-making, such as state or local regulatory permitting. If there is such a link, special planning designations often provide significant additional levels of protection for especially valuable estuarine or wetland resources, as compared to just having case-by-case regulatory controls.

Local land use planning and zoning for estuary and coastal wetland protection was the third-ranked tool nationally (Table 5). For state programs where this tool was important, units of local government were generally required to meet minimum state standards and be subject to oversight in subsequent permitting processes. The relatively high importance of local planning and zoning for wetland protection underscores the value of the federal-state-local partnership that CZM is in most states. It also suggests the value of increased attention to the local role and an emphasis on education and training for local coastal planners. *Special Area Management Plans* also ranked among the top ten tools nationally (tied for eighth), mainly for their role in serving as a multi-jurisdictional forum for regional problem solving that often includes wetland protection.

Nonregulatory Processes and Tools (including Acquisition). Nonregulatory processes and tools—education, technical assistance, acquisition, preservation, and restoration and enhancement—are increasingly the focus of many state CMPs, both to maintain support for protection efforts and to promote estuaries and wetlands for their own sake and value to human society. *Education and technical assistance* is a sometimes under-valued strategy, although for CZM-related wetland protection, it was ranked sixth nationally (Table 5). CZM programs focus a good deal of attention on education because it is perceived as a positive approach to protection. Examples include classroom and outdoor programs for K–12, "how-to" guides, videos and other multi-media programs, workshops for elected officials and professionals, and a wide variety of programs for the general public. Nevertheless, because education and technical assistance impacts accrue over the long term and because outcomes are difficult to measure, they are often the first to go when budgets are cut.

Acquisition programs, when combined with good land management, generally provide the best possible protection for estuary or coastal wetlands. The larger and more coherent the area and the more it is buffered from impacts outside the area, the more the natural resources are protected. National Estuarine Research Reserves (NERRs) serve as one model for this relatively comprehensive protection. *Outright, fee-simple purchase* provides the highest potential for protection and even restoration and enhancement, except it is very expensive and used as a last resort in most situations. *Fee-simple purchase of coastal wetlands where CZM provides assistance*, but other funds are used, was the fourth-ranked tool nationally (Table 5). *Less-than-fee techniques*, such as *conservation easements*, have sometimes been used for relatively large areas because they cost less. Although they may provide virtually the same degree of protection

as fee-simple purchase, they are often limited in time frame or scope, giving private landowners significant latitude; this limits protection.

Often, acquisition programs are linked to *restoration and enhancement programs*. Many states have had significant historic loss or degradation of coastal wetland or estuarine resources (Table 1). Potential for restoring former or degraded wetlands is viewed by some states as the best strategy for increasing the resource base and quality. However, although twenty of twenty-nine state CMPs use nonregulatory restoration at a wetland management strategy, most programs' efforts are minimal. Some of the states with among the highest historic wetland losses are among the least active. Notable exceptions include Louisiana, Connecticut, Maryland, Delaware, and California, all of whom have made major commitments to restoration as an estuary and coastal wetland management strategy.

Coordination Processes and Tools. Coordination processes and tools are some of the most important features of U.S. coastal zone management. Federal consistency under Section 307 of the CZMA, a principal impetus for state participation in the program, is the driving force behind much of the state-federal coordination that takes place. It requires that federal actions be consistent to the maximum extent practicable with the enforceable policies of federally approved state CMPs. In its regulatory context for estuary and coastal wetland protection, it ranked eighth overall (Table 5). Local-state coordination is also a key element in most state programs because local governments traditionally make many of the decisions that affect coastal resources. Many states have developed and implemented *memoranda of agreement* with other state agencies and with federal agencies, such as the USACE, to protect estuaries and coastal wetlands. *Joint permit applications and notices* are features many states use to streamline federal-state processes and reduce paperwork for applicants. *Pre-application conferences* are another central feature of coordinated permit processes, as are integrated review protocols. Monitoring and enforcement are another active area of coordination, as discussed earlier for Pennsylvania. Many of these processes and tools are standards for state CZM, but a variety of other innovative mechanisms are also being developed, such as American Samoa's village liaison/facilitator program, described in a case example in Appendix E.

Potential Effectiveness versus Issue-Importance-Based Expectations. Another way to look at process indicator data nationally is to compare the potential effectiveness of state CMPs "on paper" to what might be expected, given issue importance ratings. Comparison of the two sets of indicator results—issue importance from Table 4 and potential effectiveness from Table 8—identifies states whose potential effectiveness is exceeded, equaled, or not met, given issue importance (Table 9). As discussed earlier, the importance of estuary and coastal wetland protection as a CZM issue in a state creates expectations for program content, policy emphasis and strength, and the kinds of processes and tools used to implement policy. For example, if estuary and coastal wetland protection issue importance is *high*, as it is in Florida, then it would be expected that Florida's process indicator rating for tidal and nontidal areas would be *high*, which is indeed the case (Table 9).

Table 9. Potential effectiveness of state CMPs[1] (based on process indicators), *versus* the importance of estuary and wetland protection as a state CZM issue.

POTENTIAL EFFECTIVENESS OF STATE CMP

ISSUE IMPORTANCE	High		Moderate		Low	
	Tidal	Nontidal	Tidal	Nontidal	Tidal	Nontidal
High	CA, FL, MA, MD, NJ, NC Mid-Atlantic Southeast Gulf Coast	FL, MA, MD, NJ Mid-Atlantic	AL, CT, LA, NY, PR, VA, WA	AL, CA, CT, LA, NY, NC, VA Gulf Coast Southeast		PR, WA
Moderate	DE, MS, NH New England	NH, MI New England Great Lakes	AK, AS, ME, NM, OR, PA, RI SC, VI West Coast Islands	AK, AS, DE, ME, MS, NM, OR, PA, RI, SC, WI USA West Coast Islands		VI
Low	GU	GU	HI	HI		

States where potential effectiveness of CZM programs compared to the model program is greater than issue importance (PE>IS)

States where potential effectiveness of CZM programs compared to the model program is equal to issue importance (PE=IS)

States where potential effectiveness of CZM programs compared to the model program is less than issue importance (PE<IS)

[1]State CMP abbreviations for Tables 9, 12, 13, 14, and 15 are listed below:

AL Alabama	FL Florida	MA Massachusetts	NM Northern Marianas	SC South Carolina
AK Alaska	GU Guam	MI Michigan	NY New York	VA Virginia
AS American Samoa	HI Hawaii	MS Mississippi	OR Oregon	VI Virgin Islands
CA California	LA Louisiana	NC North Carolina	PA Pennsylvania	WA Washington
CT Connecticut	ME Maine	NH New Hampshire	PR Puerto Rico	WI Wisconsin
DE Delaware	MD Maryland	NJ New Jersey	RI Rhode Island	

Examining Table 9, we see that for five states (19 percent) and one region, and for the U.S. as a whole, potential effectiveness for protection of tidal waters and wetlands exceeds expectations, given issue importance. For nontidal areas, four states (14 percent) and two regions exceed expectations. However, seven states (26 percent) for tidal and ten (34 percent) for nontidal exhibit potential effectiveness lower than expected. For the rest of the states—fifteen for tidal (56 percent) and fifteen for nontidal (52 percent)—potential effectiveness is about what as expected, given issue importance.[5]

Why might states' potential effectiveness be greater than or less than issue importance-based expectations? In the case of New Hampshire, for instance, issue importance was just moderate but potential effectiveness was high. The moderate issue importance rating can be attributed mainly to the limited amount of estuarine and wetland area in the state's coastal zone (Table 3, issue importance indicators 1 and 2), resulting in a low rating for those indicators. Nevertheless, New Hampshire values its limited estuarine and wetland acreage sufficiently to have enacted relatively strong, comprehensive protection measures that compare well, at least on paper, to the model program. Hence, New Hampshire achieved a high potential effectiveness rating (Table 8). In Washington State, however, moderate (tidal) and low (nontidal) ratings for potential effectiveness contrast with a high rating for issue importance. Issue importance rated high because of the significant estuarine and wetland acreage in the coastal zone, high historic loss, and perceived importance of the issue (Table 4). Nevertheless, Washington has a relatively weak wetland protection program as compared to the model, relying mostly on nonregulatory education efforts to achieve its goals. Other reasons for differences between issue importance and potential effectiveness can be gleaned from individual state profiles and evaluations.

Step 3: On-the-ground Effectiveness Based on Outcome Indicators

Outcome effectiveness is defined here as an estimate of the on-the-ground impacts of CZM policy implementation over time. This step in the process—systematically evaluating these on-the-ground CZM impacts using outcome indicators—is what differentiates the CZME study from previous evaluation efforts. In designing this part of the evaluation process, we first recognized that just four of our six categories of policies, processes, and tools had the potential to generate on-the-ground outcomes that related to estuary and coastal wetland protection. These were the Regulatory, Planning, Acquisition, and Nonregulatory tools. Nineteen outcome indicators within these four categories were identified, defined, and linked back to the specific processes and tools that had the potential to provide data to address each indicator (Table 10). Using these indicators as a guide, we collected available outcome and baseline data from each of the state coastal programs. As expected, outcome data were limited in most states—the reasons for this are

[5]Percentages are different for tidal and nontidal because only twenty-seven of the twenty-nine CMPs have tidal wetlands, whereas all twenty-nine, including Michigan and Wisconsin, have nontidal wetlands.

Table 10. On-the-ground outcome indicators, rating criteria, and processes and tools that serve as outcome indicator data sources.

OUTCOME INDICATOR[1]		OUTCOME INDICATOR RATING CRITERIA			PROCESSES/TOOLS USED AS OUTCOME DATA SOURCES[2]
		High	Mod.	Low	
RG1	Area of annual permitted loss/yr as percent of all regulated waters & wetlands *(separately for Tidal and Nontidal)*	<0.1%	0.1-1.0%	>1.0	2a, 2b, 2c, 2d, 2e, 2f, 2g, 2h
RG2	Area of violations loss/yr as % of all regulated waters & wetlands *or* number/yr as % of all permits *(separately for Tidal and Nontidal)*	<0.1% area or <5% number	0.1-1.0% area or 5-10% number	>1.0 area or >10% nr.	2n
RG3	Area of wetland compensatory mitigation (WCM) as a % of RG1 losses *(separately for Tidal and Nontidal)*	>90%	75-90%	<75%	2m, 2o
RG4	Trend in permitted losses (change in acres lost/yr over at least 5 years) *(separately for Tidal and Nontidal)*	>60% decrease	30-60% decrease	<30% decrease	2a, 2b, 2c, 2d, 2e, 2f, 2g, 2h
RG5	Trend in violations losses (change in area lost/yr *or* number violations/yr) *(separately for Tidal and Nontidal)*	>60% decrease	30-60% decrease	<30% decrease	2n
RG6	Trend in WCM replacements (change in % mitigated/yr) *(separately for Tidal and Nontidal)*	>60% increase	30-60% increase	<30% increase	2m, 2o
PL1	Area afforded *high* protection by local planning & zoning as % of all water/wetland area under control	>75%	50-75%	<50%	3a
PL2	Area afforded *high* protection by SAMPs as % of all water/wetland area under SAMPs	>75%	50-75%	<50%	3b
PL3	Area afforded *high* protection by GAPC, AEC, Critical Area Plan as % of all water/wetland area under control	>75%	50-75%	<50%	3c, 3d
PL4	Area afforded *moderate* protection by local plans & zoning as % of all water/wetland area under control	>75% not high prot.	50-75% not high prot.	<50% not high prot.	3a
PL5	Area afforded *moderate* protection by SAMPs as % of all water/wetland area under SAMPs	>75% not high prot.	50-75% not high prot.	<50% not high prot.	3b
PL6	Area afforded *moderate* protection by GAPC, AEC, Critical Area Plan as % of all water/wetland area under control	>75% not high prot.	50-75% not high prot.	<50% not high prot.	3c, 3d
AQ1	Area fee simple acquisition with federal or state CZM $ as % of tidal/nontidal wetlands not in public ownership	>5%	1-5%	<1%	4a
AQ2	Area less-than-fee acquisition with federal or state CZM $ as % of tidal/nontidal wetlands not in public ownership	>5%	1-5%	<1%	4b
AQ3	Area fee simple acquisition with other $ but with CZM assist as % of tidal/nontidal wetlands not in public ownership	>10%	5-10%	<5%	4c
AQ4	Area less-than-fee acquisition with other $ but with CZM assist as % of tidal/nontidal wetlands not in public ownership	>10%	5-10%	<5%	4d
NR1	Area of former or degraded *coastal* wetlands restored by nonregulatory means as a % of acres historic coastal wetland loss	>10%	5-10%	<5%	5a
NR2	Area of former or degraded *tidal* wetlands restored by nonregulatory means as % of historic tidal wetland loss	>10%	5-10%	<5%	5a
NR3	Area of former or degraded *nontidal* wetlands restored by nonregulatory means as % of historic nontidal wetland loss	>10%	5-10%	<5%	5a

[1]RG1-RG6 are Regulatory outcome indicators—they are applied to both tidal and nontidal areas (resulting in twelve Regulatory indicators overall); PL1-PL6 are Planning-related outcome indicators; AQ1-AQ4 are Acquisition-related outcome indicators; and NR1-NR3 are Nonregulatory Restoration-related indicators.

[2]Numbers identifying processes and tools in far right column may be cross-referenced to Table 4 for detailed definitions.

addressed later. Nevertheless, collectively there were sufficient numbers of states with outcome data to define a set of rating criteria for each indicator (Table 10) and rules for combining indicator ratings to arrive at overall outcome effectiveness ratings (Table 11).[6]

Three of the most important outcome indicators in Table 10 from the standpoint of national policy are RG1 (area of permitted wetland loss), RG3 (area of compensatory wetland mitigation), and NR1 (area of nonregulatory wetland restoration). A state achieving a high outcome rating for the first two of these indicators would be approaching a "no-net-loss" goal for wetlands. Further, a high rating for NR1 (or NR2 or NR3) from Table 10 would most likely correspond to an overall net gain of coastal wetlands for a state. These particular sets of indicators are thus among the most important from a national perspective and will be further discussed later.

Once rating criteria and combining rules were in place, each state was evaluated for each relevant indicator (Table 12). Two overall outcome effectiveness ratings assigned to each state—one for tidal waters and wetlands protection (excluding Wisconsin and Michigan), and the other for nontidal waters and wetlands (Table 12). Where sufficient data were available, conclusive outcome ratings of *High, Moderate,* or *Low* effectiveness were assigned. Where there were significant state outcome data available, but insufficient to warrant a conclusive rating, *Probable High, Probable Moderate,* or *Probable Low* ratings were assigned based on the judgment of the investigators. Where data were insufficient for conclusive or probable outcome determinations, an *Inconclusive* effectiveness rating was assigned. Because we did not explicitly address water quality issues in our study, most of the emphasis was on wetland habitats, not subtidal or deep-water areas. Outcome effectiveness ratings (and issue importance and process indicator ratings) for each state are summarized in Appendix C, with accompanying narratives that make recommendations for program improvements.

National Overview of Outcome Effectiveness. For those states with sufficient data to determine either conclusive or probable outcome ratings, seven (64 percent) rated *high* in outcome effectiveness for tidal management, and the remainder rated *moderate* (Table 13). For nontidal management, effectiveness was rated *high* for two (29 percent), *moderate* for four (57 percent), and *low* for one. This left seventeen states (61 percent) with *inconclusive* outcome effectiveness ratings for tidal wetland management and twenty-three states (77 percent) *inconclusive* for nontidal wetland management (Table 13). The predominance of *inconclusive* ratings reflects the lack of sufficient outcome indicator data. Another obvious pattern is that data availability was somewhat better for evaluating outcomes of tidal area management than for nontidal area management—eleven states for tidal (39 percent of state programs evaluated) versus seven (23 percent) for nontidal could at least be assigned a *probable* overall outcome effectiveness rating

[6]Outcome rating criteria were developed using the model state coastal program as a guide (Figure 6). Outcome indicator "reference standards" were established based on examination of individual or sets of states that, in the judgment of the investigators, were highly effective. For example, as of 1996, Delaware, a state where more than 40 percent of its historic coastal wetlands have been lost or severely degraded, had restored about 19 percent of lost or degraded wetlands. Using Delaware and several other similar states as a guide, the reference standard for a High rating for nonregulatory restoration was fixed at >10 percent restoration of historically lost or degraded wetlands.

Table 11. Outcome indicator category and overall outcome indicator rating criteria for state CMPs (indicator codes—e.g., RG1—are defined in Table 10).

CRITERIA FOR OUTCOME INDICATOR CATEGORY RATINGS

REGULATORY
(apply separately to tidal and nontidal)

HIGH
❒ If H for either RG1 or RG4; and at least M for RG2 and RG3, or RG5 and RG6
❒ If H for either RG2 or RG5, and H for RG3 or RG6
MODERATE
❒ If M for either RG1 or RG4, and H or M for one other indicator
❒ If one H for other than RG1 or RG4, and one other M
❒ Other combinations not resulting in H or L
LOW
❒ If no H, and M for either RG1 or RG4, and no other M
❒ If no H and M and L other indicators
INCONCLUSIVE
❒ Tool used, but insufficient data to make determination

PLANNING
❒ If H for either PL1, PL2, or PL3
❒ If M for PL1, PL2, and PL3, or H for at least two of PL4, PLO, or PLO
MODERATE
❒ If M for either PL1, PL2, or PL3 or H for either PL4, PLO, or PLO
❒ Other combinations not resulting in H or L
LOW
❒ If L for either PL1, PL2, or PL3 or M for PL4, PLO, or PLO
INCONCLUSIVE
❒ Tool used, but insufficient data to make determination

ACQUISITION
HIGH
❒ If H for either AQ1 or AQ3
❒ If M for three of AQ1, AQ2, AQ3, and AQ4
MODERATE
❒ If M for either AQ1 or AQ3
❒If M for AQ2 or AQ4, and L for one of AQ1 or AQ3
❒ Other combinations not resulting in H or L
LOW
❒ If L for either AQ1, AQ2, AQ3, or AQ4
INCONCLUSIVE
❒ Tool used, but insufficient data to make determination

NONREGULATORY RESTORATION
HIGH
❒ If H for either NR1, NR2, or NR3
MODERATE
❒ If M for either NR1, NR2, or NR3
Other combinations not resulting in H or L
LOW
❒ If L for either NR1, NR2, or NR3
INCONCLUSIVE
❒ Tool used, but insufficient data to make determination

OVERALL RATING CRITERIA
(apply separately to tidal and nontidal)

HIGH
❒ If Regulatory, Planning, Acquisition, and Restoration are all H
❒ If Regulatory, Planning, Acquisition are H, and Issue Importance indicator "%LOSS" is L (Table 1b)
MODERATE
❒ If Regulatory, Planning, Acquisition, and Restoration are all M
❒ If Regulatory, Planning, Acquisition are M, and Issue Importance indicator "%LOSS" is L (Table 1b)
❒ Other combinations not HIGH or LOW
LOW
❒ If Regulatory, Planning, Acquisition, and Restoration are all L
❒ If Regulatory, Planning, Acquisition are L, and Issue Importance indicator "%LOSS" is L (Table 1b)
INCONCLUSIVE
❒ Tools used, but insufficient data available to make above determination

Table 12. State outcome indicator ratings for estuary and coastal wetland protection.

State	Regulatory Outcome Indicators[1]														Acquisition Outcome Indicators[1]				
	RG1		RG2		RG3		RG4		RG5		RG6		REG SUMMARY		AQ1	AQ2	AQ3	AQ4	ACQUISITION SUMMARY
	T	N	T	N	T	N	T	N	T	N	T	N	Tidal	Nontidal					
AL	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	NA	I
AK	I(M)	I(M)	I	I	I	I	I(H)	I(H)	I	I	I	I	I(M)	I(M)	NA	NA	NA	NA	NA
AS	I	I	I	I	I	I	I	I	I	I	I	I	I	I	NA	NA	NA	NA	NA
CA-B[2]	H	H	I	I	H	H	H	H	I	I	H	H	H	H	H	M	I	I	H
CA-C[2]	I	I	I	I	I	I	I	I	I	I	I	I	I	I	H	M	I	I	H
CT	I	I	I	I	I	I	I	I	I	I	I	I	I	I	NA	NA	I	I	I
DE	I	I	I	I	NA	NA	I	I	I	I	NA	NA	I	I	NA	NA	M	I	M
FL	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
GU	I	I	I	I	I	I	I	I	I	I	I	I	I	I	NA	NA	I	NA	I
HI	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	NA	I	NA	I
LA	H	H	I	I	I	I	H	H	I	I	I	I	I(H)	I	NA	NA	L	NA	L
ME	H	H	I	I	I	I	H	H	I	I	I	I	I(H)	I(H)	I	NA	I	NA	I
MD	H	H	I	I	H	H	H	L	I	M	H	H	M	H	I	NA	I	I	I
MA	I	I	I	I	I	I	I	I	I	I	I	I	I	I	NA	NA	I	M	M
MI	NA	I	NA	I	NA	I	NA	I	NA	I	NA	I	NA	I	NA	NA	L	I	L
MS	I	I	I	I	I	I	I	I	I	I	I	I	I	I	NA	NA	I	NA	I
NH	H	H	I	I	H	I	I	I	I	I	I	I	I(H)	I(H)	L	NA	L	I	L
NJ	I(H)	H	I	I	I	L	I(H)	I(H)	I	I	I	I(H)	I(H)	I(H)	NA	NA	I	I	I
NY	I	I	I	I	I	I	I	I	I	I	I	I	I	I	NA	NA	NA	I	I
NC	H	I	I	I	I	I	I	I	I	I	I	I	I(H)	I	H	I	H	I	H
NM	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
OR	H	I	I	I	L	I	H	I	I	I	H	I	M	I	L	NA	NA	NA	L
PA	I	I	H	H	I	I	I	I	H	H	I	I	M	M	NA	NA	NA	NA	NA
PR	I(H)	I	I	I	I	I	I(H)	I	I	I	I	I	I(H)	I	H	NA	I	I	H
RI	I	I	I	I	I	I	I	I	I	I	I	I	I	I	NA	NA	I	I	I
SC	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I(M)	NA	NA	NA	I(M)
VI	I	I	I	I	I	I	I	I	I	I	I	I	I	I	NA	NA	NA	NA	NA
VA	I(H)	I	I	I	I	I	I	I	I	I	I	I	I(H)	I	I	I	I	I	I
WA	I	I	I	I	I	I	I	I	I	I	I	I	I	I	M	M	I	I	M
WI	NA	H	NA	I	NA	NA	NA	H	NA	I	NA	NA	NA	M	I	NA	I	NA	I

[1]See Table 10 for definitions of outcome indicators; Outcome Ratings: H—high effectiveness for this indicator; M—moderate effectiveness; L—low effectiveness; I—inconclusive due to insufficient data; I (H)—inconclusive, but the limited data available suggest probable high (or M or L) rating; NA—not applicable because the process or tool is not used by the state. In column headings, T = Tidal and N = Nontidal.

[2]California outcomes are reported separately for CA-B: San Francisco Bay (BCDC and CSCC); and CA-C: the outer coast (CCC and CSCC).

Table 12. State outcome indicator ratings for estuary and coastal wetland protection (continued).

State	Planning Outcome Indicators[1]							Nonregulatory Restoration Indicators[1]				OVERALL OUTCOMES	
	PL1	PL2	PL3	PL4	PL5	PL6	PLANNING SUMMARY	NR1	NR2	NR3	NONREG SUMMARY	TIDAL	NONTIDAL
AL	I	I	I	I	I	I	I	NA	NA	NA	NA	I	I
AK	I	L	NA	I	L	NA	L	I	I	I	I	I	I
AS	I	NA	I(M)	I	NA	I	I(M)	NA	I	I	I	I	I
CA-B[2]	NA	H	NA	NA	I	NA	H	H	NA	NA	H	H	H
CA-C[2]	I	NA	I	I	NA	I	I	H	NA	NA	H	I(M)	I
CT	I	I (L)	I	I	I	I	I(L)	NA	M	NA	M	I	I
DE	I	NA	I	I	NA	I	I	NA	H	I	H	I(M)	I
FL	I	I	I	I	I	I	I	I	NA	NA	I	I	I
GU	I	I	I	I	H	I	M	I	NA	NA	I	I	I
HI	I	I	I	I	I	I	I	I	I	I	I	I	I
LA	I	I	NA	I	I	NA	I	H	NA	NA	H	I(H)	I
ME	I	NA	I	I	NA	I	I	NA	NA	NA	NA	I	I
MD	NA	NA	H	NA	NA	H	H	I	L	I	L	I(H)	I(H)
MA	I	NA	M	I	NA	I	M	I	NA	NA	I	I	I
MI	I	NA	L	I	NA	I	L	NA	NA	I	I	NA	I
MS	I	NA	M	I	NA	I	M	NA	NA	NA	NA	I	I
NH	I	NA	I	I	NA	I	I	NA	L	I	L	I(H)	I(M)
NJ	I	L	I	I	I	I	L	NA	NA	NA	NA	I(H)	I(M)
NY	I	I	I	I	I	I	I	NA	NA	NA	NA	I	I
NC	I	I	I(H)	I	I	I	I(H)	I	NA	NA	I	I(H)	I
NM	NA	I	M	NA	I	I	M	NA	NA	NA	NA	I	I
OR	M	NA	I	H	NA	I	M	NA	NA	NA	NA	M	I
PA	NA	NA	I	NA	NA	I	I	NA	NA	NA	NA	I(M)	I(M)
PR	I	I	H	I	I	I	H	I	I	I	I	I(H)	I(L)
RI	I	H	I	I	I	I	H	I	NA	NA	I	I	I
SC	I	I	I	I	I	I	I	I	NA	NA	I	I	I
VI	I	NA	I	I	NA	I	I	NA	NA	NA	NA	I	I
VA	I	I	I	I	I	I	I	NA	L	I	L	I	I
WA	I	I	I	I	I	I	I	I	L	I	L	I	I
WI	L	NA	L	I	NA	I	L	I	NA	I	I	NA	I(M)

Table 13. State program *outcome effectiveness* ratings[1] for each outcome category and for overall tidal and nontidal water and wetland management.

OUTCOME EFFECTIVENESS RATING	OUTCOME INDICATOR CATEGORIES						
	Regulatory Tidal	Regulatory Nontidal	Planning	Acquisition	Nonregulatory Restoration	TIDAL OVERALL	NONTIDAL OVERALL
HIGH	CA-B[2], MD	CA-B, MD	CA-B, MD, PR, RI	CA-B, CA-C, NC, PR	CA-B, CA-C, DE, LA	CA-B	CA-B
MODERATE	OR, PA	PA, WI	GU, MA, MS, OR, NM	DE, MA, WA	CT	OR	none
LOW	none	none	AK, MI, NJ, WI	LA, MI, NH, OR	NH, MD, VA, WA	none	none
PROBABLE HIGH	LA, ME, NC, NH, NJ, PR, VA	ME, NH, NJ	NC	none	none	LA, MD, NH, NC, NJ, PR	MD
PROBABLE MODERATE	AK	AK	AS	SC	none	CA-C, DE, PA	NH, NJ, PA, WI
PROBABLE LOW	none	none	CT	none	none	none	PR
INCONCLUSIVE	AL, AS, CA-C, CT, DE, FL, GU, HI, MA, MS, NM, NY, RI, SC, VI, WA	AL, AS, CA-C, CT, DE, FL, GU, HI, LA, MA, MI, MS, NC, NM, NY, OR, PR, RI, SC, VA, VI, WA	AL, CA-C, DE, FL, HI, LA, ME, NH, NY, PA, SC, VA, VI, WA	AL, CT, FL, GU, HI, MD, ME, MS, NJ, NM, NY, RI, VA, WI	AK, AS, FL, GU, HI, MA, MI, NC, PR, RI, SC, WI	AL, AK, AS, CT, FL, GU, HI, MA, ME, MS, NM, NY, RI, SC, VA, VI, WA	AL, AK, AS, CA-C, CT, DE, FL, GU, HI, LA, MA, ME, MI, MS, NC, NM, NY, OR, RI, SC, VA, VI, WA
NOT APPLICABLE	MI, WI	none	none	AK, AS, PA, VI	AL, ME, MS, NJ, NM, NY, OR, PA, VI	MI, WI	none

[1]Outcome effectiveness ratings for process and tool categories and for overall ratings are based on aggregating the ratings of individual indicators (see Table 7), first to the category level, and then to the overall level.
[2]California outcomes are reported separately for the San Francisco Bay program (CA-B) and the outer coast program managed by the California Coastal Commission (CA-C).

KEY OUTCOME INDICATOR RATINGS:
HIGH—high outcome effectiveness for this indicator
MODERATE—moderate outcome effectiveness
LOW—low outcome effectiveness
INCONCLUSIVE—inconclusive due to insufficient data
PROBABLE HIGH—inconclusive, but limited data suggest probable high (or probable moderate or low) rating
NOT APPLICABLE—not applicable because the associated process or tool category is not used by the state

(Table 13). Examples of states with conclusive and probable outcome ratings below, along with the data that serve as the basis for the ratings, paint a more colorful picture of CZM accomplishments and impacts than do the simple ratings.

States With Conclusive Outcome Effectiveness Ratings. Two state CMPs had sufficient data to be assigned conclusive outcome indicator ratings—the San Francisco Bay portion of California's programs, and Oregon. San Francisco Bay was assigned high effectiveness ratings for both tidal and nontidal wetlands management, although relatively small areas of nontidal wetlands are under their jurisdiction. Good data on the strong BCDC regulatory program, additional data on protection provided through planning initiatives, and acquisition and restoration efforts of the California State Coastal Conservancy figured in the evaluation. Oregon received a moderate effectiveness rating for its tidal wetlands management and inconclusive for nontidal. Examples of outcome data leading to these ratings are outlined below.

San Francisco Bay—high outcome effectiveness for tidal and nontidal management. One of the best examples of CMPs that have relatively good, long-term records of outcomes for estuary and coastal wetland protection was the San Francisco Bay Conservation and Development Commission (BCDC). BCDC has maintained detailed records of its permit actions since well before its 1978 federal CZM approval. Key data they track include numbers of permit actions, approvals and denials, acreage filled, and acreage gained though compensatory mitigation. Detailed wetland mapping serves as baseline data for estimating relative losses and gains. Permit records were computerized by BCDC in the mid-1980s and are now being moved into a GIS-based system. Wetland loss due to filling has dramatically reversed, from 2,300 acres/year from 1940 to 1965 (before BCDC), to 20 acres/year from 1965 to 1986 (post-BCDC and early CZM), to 4 acres/year from 1987 to 1991 (recent CZM). Mitigation has more than compensated for these losses, with more than 30 acres/year net gain since 1987. The entire Bay is in a high protection zone, and four special area management plans provide for more detailed protection and restoration.

Oregon—moderate outcome effectiveness for tidal management. Oregon's estuary GIS database represents one of the best examples of documentation of resource protection through local-state-federal collaborative planning. The GIS data and maps, published in *The Oregon Estuary Plan Book* (ODLCD 1987), documents estuarine zoning (Natural, Conservation, and Development management units) and estuary and tidal wetland habitats. Although the book serves as a valuable resource for local and state regulators, recording of permit actions since plan development are *not* part of the system, limiting its utility. Nevertheless, based on these and other data, Oregon gained a conclusive *moderate* outcome effectiveness rating for tidal wetland management. Based on its estuary plans, 64 percent of Oregon's tidal wetlands are in a high protection zone (Natural) and 34 percent additional in a moderate protection zone (Conservation) (ODLCD 1987). These plans are implemented through local zoning ordinances and through the state's strong regulatory permit program. From 1983 to 1987 period (subsequent data were not available), tidal wetland loss associated with state permits amounted to about 0.02 percent/year, of which 84 percent was mitigated through restoration or creation program (Fishman Environmental Services 1987). Loss reduction from pre-CZM to the same post-CZM evaluation period (1983-87) was 70 percent.

States with "Probable" Outcome Effectiveness Ratings. States with *probable high* ratings for tidal areas included Louisiana, Maryland, North Carolina, New Hampshire, New Jersey, and Puerto Rico, whereas only Maryland rated *probable high* effectiveness for nontidal area management (Table 13). California's outer coast program, Delaware, and Pennsylvania merited *probable moderate* ratings for tidal wetlands; New Hampshire, New Jersey, Pennsylvania, and Wisconsin were judged *probable moderate* for nontidal wetlands. One state, Puerto Rico, merited a *probable low* rating for nontidal. Many of these state programs had excellent data for one or more categories of outcome indicators, but data were incomplete for other categories. A sample of these states serves to illustrate the bases for probable ratings.

Louisiana—probable high effectiveness for tidal management. Louisiana established a geologic review process for oil- and gas-related permit applications, resulting in an 87 percent decrease in annual rate of loss of tidal wetlands between 1982 (1,500 acres/year) and 1990 (200 acres/year); annual losses today amount to less than 0.01 percent of the resource (Harder, Rives, and Wellman 1991). Insufficient data for wetland mitigation and planning outcomes prevented assignment of a conclusive rating.

Maryland—probable high outcome effectiveness for tidal and nontidal management. Maryland's tidal wetlands program, total permitted losses amounted to less than one acre for the 1990–1995 period. Nontidal wetland losses are higher (138 acres for the 1991–1995 period), but wetland mitigation has replaced these losses at a greater than 1:1 ratio. Maryland's Critical Area planning program included nearly 95,000 acres of land and associated wetlands adjacent to tidal waters in a limited development zone—77 percent of the entire critical area. Of states with probable ratings, Maryland is as close as any to moving over to the conclusive category.

New Jersey—probable high effectiveness for tidal and moderate for nontidal management. Tidal wetland loss is estimated to be near zero for New Jersey, but good computer-based records were not available to confirm this. However, New Jersey has published high-quality data illustrating how its freshwater wetlands protection program has dramatically reduced losses since its inception in 1987. Permit-related losses of freshwater wetlands for the entire state were just 109 acres/year from 1988 to 1993, or 0.03 percent of the resource base (Torok, Lockwood, and Fanz 1996). Most of this loss was mitigated, with 1.3:1 mitigation ratios for individual permits issued. Lack of outcome data for planning and acquisition programs prevented a conclusive rating, and state CZM is not involved in restoration programs.

New Hampshire—probable high effectiveness for tidal management; probable moderate for nontidal management. New Hampshire's regulatory program has reduced tidal wetland loss to near zero over the past ten years, and the small amount of loss associated with high-profile public port and transportation projects has been mitigated at greater than 1:1 ratios. Nontidal wetland loss has amounted to just 0.06 percent of the resource base. Incomplete data on contributions of planning efforts to protection prevented a conclusive determination.

Puerto Rico—probable high effectiveness for tidal management. Although data are not conclusive, the protection provided by Puerto Rico's Special Management Area designation for 22,000 remaining acres of mangroves in the Commonwealth apparently have reduced mangrove loss to near zero. Change detection analysis suggests mangrove acreage might actually be

expanding. Data for Puerto Rico's regulatory program is needed to ascertain whether protection provided by plans is actually working as well as change detection analysis suggests.

Wisconsin—probable moderate effectiveness for nontidal management. Compared to total wetland area, Wisconsin's regulatory losses are the lowest of any state CMP we evaluated—0.005 percent/year (62 acres/year) between 1991 and 1995. This represents a 77 percent reduction since early CZM (1982–1991) and is attributable to the Wisconsin Water Quality Wetland Standards, implemented mainly through the state's Clean Water Act Section 401 certification process. Lack of a mitigation requirement bumped the state down to a moderate rating, and the lack of planning and acquisition data prevented a conclusive determination.

States with Inconclusive Outcome Effectiveness Ratings. Many of the state programs with *inconclusive* ratings—seventeen for tidal and twenty-three for nontidal (Table 13)—had either *high* or *moderate potential effectiveness* (Table 8), but there were simply insufficient outcome data to warrant even probable outcome ratings. Some of the reasons for this data gap and prospects for improved monitoring of outcome indicators are discussed next.

The Outcome Data Availability Gap. The limited availability of outcome data, illustrated by the predominance of inconclusive ratings in Tables 12 and 13, made it impossible to develop a definitive national picture of CZM outcome effectiveness in protecting estuaries and coastal wetlands. Data availability to address outcome indicators is further detailed in Appendix E. The lack of sufficient outcome data for most states is attributable in part to the fact that there are no national requirements for outcome monitoring and reporting. Without such requirements, and in the face of many competing demands for time and resources, few states have independently set up the necessary record-keeping systems to track on-the-ground outcomes. Generally, state priorities are more forward-looking than retrospective. Although most acknowledge the value of outcome monitoring, they simply lack the time, resources, or expertise to carry out a systematic program.

Highlighting this gap in outcome data availability is not meant as an indictment of state coastal programs. Remember that the CZME is an ex post facto study—a retrospective search for data for outcome indicators we identified at the outset of the study. OCRM pointed this out from the start in their 1995 request for proposals, stating that outcome data was likely to be limited for some areas and that process indicators might need to be substituted as measures of effectiveness. Understanding these limitations and the competing demands on coastal managers, data availability was probably about as good as could be expected. The implication here is that the CZME was as much a prototype design effort for a national outcome-monitoring and performance-evaluation system as it was an evaluation study. In this regard, it is worth noting that several states have relatively good, long-term records of outcomes for estuary and coastal wetland protection, although none were comprehensive with respect to the range of indicators in this study. A number of these "role model" states were highlighted earlier—BCDC, Louisiana, and Wisconsin with their regulatory program databases; New Jersey with its mitigation database; and Oregon with its estuary and wetland planning GIS. Another state with good records was Maryland, which has kept records of permit-related acreage loss and gain since 1981 for its estuary and tidal wetland program, and since 1991 for its nontidal wetland programs. Maryland

also has an excellent GIS-based statewide wetland inventory that serves as a baseline for measuring progress.

Many other states have some kind of permit tracking system, but they are mostly for administrative purposes—permit status, processing time performance, and so on. Few have kept records of on-the-ground outcomes of their actions. This is changing rapidly, in part due to increased emphasis on accountability, but also because of dramatic advances in information systems technology, particularly powerful desktop computers, database software, and GIS. Record keeping is simply becoming easier, and many states are now in the process of upgrading their capacity for monitoring CZM outcomes. Requiring consistency among states in outcome indicators monitored would provide a basis for an improved understanding of national CZM outcome effectiveness.

Caveats Regarding Outcome Effectiveness Determinations. Several caveats apply to the effectiveness evaluations based on the outcome-indicator rating criteria and combining rules we developed and applied in this study. Most important is that the criteria and rules are preliminary—whether for individual indicators (Table 10), aggregation of indicator results by category (Table 11, top), or aggregation of results to overall effectiveness estimates (Table 11, bottom). The rating criteria are based on outcome data from a few "reference states" and the investigators' best professional judgment. They are therefore open to criticism and modification, especially if the indicators are included in some future national outcome-indicator monitoring system. Such modification may result in changes in the outcome effectiveness ratings for individual states. *Consequently, state outcome effectiveness estimates using this evaluation model must be considered preliminary.* This said, the authors do believe that the criteria and rules, and the resulting evaluations, are good and reasonable first estimations.

A second caveat is that a good number of state CMPs were assigned *probable* outcome effectiveness ratings, as opposed to *conclusive*. Although available data strongly suggested particular ratings, data were incomplete and the effectiveness ratings should be considered preliminary in this sense as well. More outcome data are needed to determine whether these probable outcome effectiveness ratings hold up.

Finally, because the outcome indicators used here focus mainly on area measurements, little can be said about the relative quality of resources protected, preserved, or restored through CZM, or about the ecosystem services they provide, even though these kinds of considerations may figure into state management decisions. Similarly, none of the indicators dealt with water quality, a particularly important aspect of estuary and coastal wetland protection. These questions were simply beyond the scope of this study. These points were made earlier, but are restated for emphasis.

Step 4: Estimating State CMP Performance in Context

Outcome effectiveness ratings (Table 13) are one possible end point of the CZM effectiveness evaluation process. Implicit in this approach is the establishment of uniform performance standards for all states (as in Table 10), whatever the local situation or the nature of the state's

program. We believe that such a "one-size-fits-all" outcome-effectiveness standard does not make sense, given the diversity among U.S. coastal states and CMPs.

The approach used here takes the evaluation process a step further to put outcome effectiveness "in context." First, outcome effectiveness is compared to issue importance, which earlier we suggested establishes expectations for a state CMP. Second, outcome effectiveness is compared to potential effectiveness—the "on-paper" promise exhibited by a state's CMP. These comparisons place a state's outcome effectiveness ratings within its unique context—the social and environmental setting in the first case, and institutional and policy setting in the other. The result is two complementary, context-based performance measures.

Outcome Effectiveness Compared to Issue Importance Ratings. Comparison of outcome effectiveness with issue importance provides one measure of context-based performance for state CMPs in protecting estuaries and coastal wetlands. It suggests that if a state CMP is performing at a higher level (based on outcome effectiveness) than might be expected (given how important the issue is in the state), the program can be judged to have a *Higher-than-expected Performance* level. If outcome effectiveness and issue importance are the same, the program is achieving the *Expected Performance* level, be it high, moderate, or low. If outcome effectiveness is rated lower than issue importance, then the program is achieving *Lower-than-expected Performance*—improvement is needed.

When outcome effectiveness is compared to issue importance (Table 14) for tidal area management, just one program—New Hampshire—performs at a higher-than-expected level, and nine (33 percent) states perform at about the same level as expected (New Jersey, Pennsylvania, Delaware, Maryland, North Carolina, Louisiana, the San Francisco Bay program, Oregon, and Puerto Rico). One program—the California outer coast—performed at a less-than-expected level. The remainder (60 percent) had inconclusive outcome results and could not be compared. For nontidal area management, fewer states did well compared to issue importance. None performed at a higher-than-expected level, and only five programs (17 percent) performed about the same as issue importance might suggest (New Hampshire, Pennsylvania, Maryland, the San Francisco Bay program, and Wisconsin). Two performed at levels less than were expected (New Jersey and Puerto Rico). The remainder (77 percent) had inconclusive outcome results for nontidal areas and could not be compared. Despite the fact that most states have inconclusive ratings, it is a positive sign for U.S. CZM as a whole that of those states that did receive at least a probable outcome rating, most were performing at expected performance levels with respect to issue importance-based expectations.

Outcome Effectiveness Compared to Potential Effectiveness. Comparison of outcome effectiveness with potential effectiveness provides a second measure of overall state CMP performance. This comparison asks whether or not a CMP's outcome effectiveness measures up to its potential "on paper." The rating structure is the same as for the first comparison: if outcome effectiveness is greater than potential effectiveness, a program can be judged as having *Higher-than-expected Performance*. If potential effectiveness and outcome effectiveness are the same, the program is achieving the *Expected Performance* level. Finally, if outcome effectiveness is

Table 14. Performance levels of state CMPs based on a comparison of the importance of estuary and wetland protection in a state *versus* outcome effectiveness ratings.

OUTCOME EFFECTIVENESS OF STATE CMPS

	High		Moderate		Low		Inconclusive	
	Tidal	Nontidal	Tidal	Nontidal	Tidal	Nontidal	Tidal	Nontidal
High	**CA-B,** LA, MD, NC, NJ, PR	**CA-B,** MD	CA-C	NJ		PR	AL, CT, FL, MA, NY, VA, WA	AL, CA-C, CT, FL, LA, MA, NY, NC, VA, WA
Moderate	NH		DE, **OR,** PA	NH, PA, WI			AK, AS, ME, MS, NM, RI, SC, VI	AK, AS, DE, ME, MI, MS, NM, OR, RI, SC, VI
Low							GU, HI	GU, HI

Notes: For states highlighted in **BOLD**, outcome ratings were based on conclusive data; the remaining states had only limited data and outcome ratings are only probable; a key to abbreviations for state CMPs used in this table is found in Table 7. California's two programs were evaluated separately for outcome effectiveness (CA-B is the San Francisco Bay Program, CA-C is the outer coast program).

States where outcome effectiveness of CZM programs is greater than issue importance (OE>IS); *overall*, these state CMPs are judged to have ***Higher-Than-Expected*** performance, considering the importance of the issue in the state.

States where outcome effectiveness of CZM programs is equal to issue importance (OE=IS); *overall*, these state CMPs are judged to have ***Expected*** performance, considering the importance of the issue in the state.

States where outcome effectiveness of CZM programs is less than issue importance (OE<IS); *overall*, these state CMPs are judged to have ***Lower-Than-Expected*** performance, considering the importance of the issue in the state.

States where outcome effectiveness of CZM programs is inconclusive due to insufficient data (OE=I); *overall*, these state CMPs are judged to have ***Inconclusive*** performance levels, compared to issue importance in the state.

rated lower than the program's potential suggests, then the program is achieving *Lower-than-expected Performance* and improvement is needed.

When outcome effectiveness is compared to the potential of a program as predicted by process indicators (Table 15), the results are very similar to those for the outcome effectiveness versus issue importance comparison (Table 14). For tidal areas, Louisiana and Puerto Rico were the only states whose outcome-based performance for tidal areas exceeded the expected performance level; no states exceeded expected performance levels for nontidal areas. Seven states performed about as expected for tidal areas (New Hampshire, New Jersey, Pennsylvania, Maryland, North Carolina, the San Francisco Bay program, and Oregon), and six for nontidal (Maryland, New Jersey, Pennsylvania, the San Francisco Bay program, Wisconsin, and Puerto Rico). California and Delaware programs for tidal areas performed at a lower-than-expected effectiveness level. For nontidal wetlands, two state programs—New Hampshire and New Jersey—performed at lower-than-expected effectiveness levels. The same 60 percent of states for tidal and 77 percent for nontidal had inconclusive outcome results and could not be compared (Table 15).

Which of these two context-based performance measures has the most utility? The first—issue importance compared to outcome effectiveness—is useful because it is based more on on-the-ground expectations, such as the development pressures on wetlands and relative predominance of estuaries and wetlands in a state's coastal zone. But many other factors than those considered in our issue-importance determination go into the design and implementation of a state CMP. The "on-paper" potential of a state CMP may more accurately reflect these other factors; for example, what management institutions already existed when the state began to develop its CZM program. From this perspective, the second measure of program performance—potential effectiveness compared to outcome effectiveness—is the more useful one. Probably the most informative approach is to examine both relative performance measures, considering their results as complementary. The first is what might be expected, while the second is what the state is working toward. However, outcome effectiveness on its own (Table 13), independent of issue importance or process ratings, is also useful when comparing state performance. This is especially true when national policy is taken into account, such as the no-net-loss and net-gain of wetland policies being promoted by the current administration (WHOEP 1993).

The Role of Case Examples in Understanding State CMP Effectiveness

Case examples provide the richness and detail not apparent in the dry numbers and ratings of the evaluation process. One or more case examples are included in each of the state profiles for estuary and coastal wetland protection. Particularly noteworthy examples of these are included in Appendix D to this report. Case examples were particularly valuable in this study because most states did not have sufficient outcome data to be rated for outcome effectiveness.
Notwithstanding this and other shortcomings of state CMPs noted above, state coastal managers have invented, adapted, or creatively applied a variety of policies, processes, and tools to protect estuaries and coastal wetlands that are worthy of emulation.

Table 15. Performance levels of state CMPs based on a comparison of the potential effectiveness (based on process indicators) *versus* outcome effectiveness ratings.

POTENTIAL EFFECTIVENESS	OUTCOME EFFECTIVENESS OF THE STATE CMP							
	High		Moderate		Low		Inconclusive	
	Tidal	Nontidal	Tidal	Nontidal	Tidal	Nontidal	Tidal	Nontidal
High	**CA-B,** MD, NC, NH, NJ	**CA-B,** MD, NJ	CA-C, DE	NH, NJ			FL, GU, MA, MS	FL, GU, MA, MI
Moderate	**LA, PR**		**PA, OR**	PA, WI			AL, AK, AS, CT, HI, ME, NM, NY, RI, SC, VA, VI, WA	AL, AK, AS, CA-C, CT, DE, HI, LA, ME, NC, NY, MS, OR, RI, SC, VA
Low						PR		NM, VI, WA

Notes: For states highlighted in **BOLD**, outcome ratings were based on good data; the remaining states had only limited data, and outcome ratings are only probable; California's two programs were evaluated separately for outcome effectiveness (CA-B is the San Francisco Bay Program, CA-C is the outer coast program).

States where outcome effectiveness of CZM programs is greater than potential effectiveness (OE>PE); *overall*, these state CMPs are judged to have ***Higher-Than-Expected*** performance levels, given their potential effectiveness.

States where outcome effectiveness of CZM programs is equal to potential effectiveness (OE=PE); *overall*, these state CMPs are judged to have ***Expected*** performance levels, given their potential effectiveness.

States where outcome effectiveness of CZM programs is less than potential effectiveness (OE<PE); *overall*, these state CMPs are judged to have ***Lower-Than-Expected*** performance, given their potential effectiveness.

States where outcome effectiveness of CZM programs is inconclusive due to insufficient data (OE=I); *overall*, these state CMPs are judged to have ***Inconclusive*** performance levels with respect to potential effectiveness.

One of the best examples of CZM innovations is special area management planning (SAMP), an elaborate adaptation of regional planning and dispute resolution methods to address intense conflicts and complex problems in specific geographic areas. SAMP as a CZM process was first elaborated and described in the mid-1970s in the Grays Harbor, Washington estuary plan (Evans and others 1980) and was incorporated into the CZMA as part of the 1980 amendments. Other states have developed and refined the SAMP process as a principal management tool and have shared this experience nationally and internationally (e.g., Rhode Island). Compensatory mitigation for wetland loss is another CZM innovation, first incorporated as explicit state CZM policy in Oregon in 1976 (OLCDC 1976); subsequently, Oregon developed the mitigation banking concept as a tool for collectively addressing the mitigation needs for many small projects (CREST 1979).

Other noteworthy examples of CZM leadership in the design and implementation of management tools to protect estuaries and coastal wetlands include integrated land and water use planning (Oregon, New Hampshire, and others); innovative public-private partnerships and environment-development dispute resolution techniques (California); protection of wetlands from unnecessary loss or degradation through water-dependency tests for locating on the shoreline (San Francisco Bay and many others); exclusion zones for major facilities (Delaware); shoreland buffers to protect tidal and freshwater wetlands (New Hampshire, Maryland, and New Jersey); coastal habitat restoration (Louisiana, Delaware, and Connecticut); GIS-based methods for wetland evaluation and restoration planning (North Carolina and Washington); innovative use of federal consistency standards in lieu of a separate state permit (South Carolina); and many others described in individual state profiles developed as part of this research. Sixteen of these case examples have been expanded to full case studies by Weber (1998).

These and other innovations that took root in state CMPs have seen wide application in coastal zones (and inland areas) throughout the U.S. and the world. Although it is impossible to say what would have occurred in the absence of CZM, coastal states, with impetus provided by the national CZMA and OCRM, can justifiably take a large measure of credit for inventing and advancing the concept and practice of integrated coastal management. Because limited data availability constrains our ability to assess outcome effectiveness across all state programs, case examples of successful, innovative management of estuaries and wetlands are particularly important for understanding the impact of state and national CZM. If used by other states with similar problems or opportunities, significant improvement of individual state programs could result, with national benefits. Specific case examples for each category of processes and tools examined are included in Appendix D.

Conclusions

The principal objective of this study was to determine the on-the-ground effectiveness of state CMPs in protecting estuaries and coastal wetlands. To the extent that outcome data were available (and it was meager in many cases), we found that state CMPs are relatively effective

and make significant contributions to this national CZMA objective. Among the various management tools used by states, regulatory programs rated the highest for their contributions to estuary and coastal wetland protection. But a variety of other strategies and tools, many built around state-local planning partnerships, also contributed significantly to state accomplishments. State CMP weaknesses were also apparent, including a general lack of organized outcome monitoring; relatively limited use of restoration as a management strategy in many states; and relatively weak nontidal, freshwater wetland management in many states. Most of these weaknesses can be traced back to shortcomings in national policy, such as the lack of outcome monitoring requirements and performance standards. The principal study conclusions follow.

1. The importance of estuary and coastal wetland protection is relatively high for most states and for the nation as a whole. Based on the seven indicators used in this study, the importance of estuary and coastal wetland protection as a CZM issue ranges from low to high among states, but is "moderately to highly important" overall. Although there are differences among the states with respect to the importance of estuary and coastal wetland protection, they are mostly subtle gradations within the high and moderate rating categories. This finding and the high importance of the issue nationally means that most states would be expected to have relatively strong, comprehensive CZM policies, processes, and institutions in place and be operating effectively. One caveat to these findings is that the issue importance indicators used here must be considered preliminary. Additional indicators should be evaluated for their relevance in helping define the importance of this and other CZM issues in the states. *See Recommendation 1.*

2. The potential effectiveness of state coastal management programs in protecting estuaries and coastal wetlands looks good "on paper." The *potential effectiveness* of state CMPs collectively, based on an assessment of process indicators, was judged to be "high" for estuaries and tidal wetlands—the saltwater coast—but just "moderate" for nontidal, freshwater wetlands. Despite these generally positive findings, the limited use of available nontidal wetland management tools by some coastal states and too-narrowly drawn coastal zone boundaries in others means that states often lack sufficient jurisdiction to prevent the continued gradual loss of nontidal freshwater wetlands. Further, the fragmentation of wetland management responsibilities in many states and the incomplete networking of relevant authorities into state CMPs result in coordination problems, contribute to monitoring and record-keeping difficulties, and mask some state accomplishments.

Another conclusion based on process indicator data is that a wide variety of processes and tools—inventory and assessment, regulatory, planning, and nonregulatory—are needed for a well-rounded estuary and coastal wetland protection program. However, because five of the ten most important processes and tools were in the regulatory category, it is clear that regulatory programs are considered essential to strong estuary and coastal wetland protection at the state level. States without such regulatory components should consider ways to add or otherwise strengthen their protection efforts to compensate.

The model program and associated evaluation criteria are useful CZM evaluation tools, providing a common, consistent basis for evaluating the potential effectiveness of individual

state CMPs—what we have termed the "paper program." The model program also serves as a simple self-evaluation framework for states wanting to improve their programs. The strength of the model program rests on its basis in empirical data (process indicator results) provided by the states. Clearly, however, the model is an ideal—no actual state CMP is likely to have all its features, nor should it necessarily, because each state's unique context for estuary and wetland management may make one or another strategy or tool inappropriate. *See Recommendation 1.*

3. Outcome effectiveness of state coastal management programs in protecting estuaries and coastal wetlands gets moderate to high ratings for states with sufficient data. Eleven states could be assigned at least probable outcome ratings for tidal wetlands management. Of these, seven (64 percent) rated *high* in outcome effectiveness, with the remainder *moderate*. For nontidal wetlands, only seven states merited at least probable outcome ratings. Of these, effectiveness was *high* for two (29 percent), *moderate* for four (57 percent), and *low* for one. Combining tidal and nontidal, 50 percent rated high in *outcome effectiveness*, 44 percent moderate, and just 6 percent low. If it is assumed that these states are a representative sample of state programs, it is fair to conclude that nationally, outcome effectiveness is relatively high. Improved outcome data from more states are needed to prove or disprove this assertion. *See Recommendation 1.*

4. The overall performance of state coastal management programs in protecting estuaries and coastal wetlands is relatively good for states with sufficient data. When on-the-ground outcome effectiveness in protecting estuaries and coastal wetlands is compared to issue importance-based expectations on one hand, or the "on-paper" potential as derived from process indicator evaluations on the other, 88 percent of state CMPs were judged to be performing at *expected* or *higher-than-expected* levels in the first case and 76 percent in the second case. As with outcome effectiveness, if we assume that the states for which we have sufficient data are representative, the overall performance of state CMPs nationally is fairly high. These findings comport well with the expert opinion-based results of Knecht, Cicin-Sain, and Fisk (1996), who found that state programs are performing "well" or "very well" with respect to the CZM goal of natural resource protection. *See Recommendation 1.*

5. Management of nontidal, freshwater wetlands needs CZM attention. The management of nontidal wetlands in state coastal zones is relatively weak compared to management of tidal areas. Further, there are large areas of nontidal wetlands in many states that probably should be considered "coastal" for CZM purposes, but are located outside present state coastal zone boundaries. Weak management of nontidal, freshwater wetlands in coastal regions in the U.S. poses one of the most significant threats to coastal and estuarine water quality, coastal ecosystem sustainability, and flood hazard mitigation. One of the key issues is the extent to which coastal zone boundaries might need to be expanded to fully encompass nontidal wetlands with clear, unambiguous relationships to coastal waters. A logical starting point for examination of this issue is the coastal assessment framework (CAF) developed by NOAA (1992). This same framework was used to define the boundaries within which wetlands on National Wetlands Inventory maps were defined as "coastal" (NOAA 1991). *See Recommendation 2.*

6. Nonregulatory wetland restoration is an underutilized tool in CZM. Historic loss of estuarine and nontidal freshwater wetlands in many states is high. Although historical losses do not necessarily equate to restoration opportunities, especially in densely populated states where much wetland loss can be considered permanent, only a few states—Louisiana, California, Connecticut, Delaware, North Carolina, and Washington—have systematically evaluated wetland restoration opportunities or developed action programs (see Appendix D for specific case examples). Other states should follow these examples, working toward a goal of achieving a net gain in wetlands in the coastal zone, so as to reclaim some of the ecosystem services sacrificed in the past. *See Recommendation 3.*

7. OCRM and the states need to act quickly to standardize CZM performance evaluation. Outcome data for evaluating state performance in this study were limited, but this situation is changing at the state level. These changes present a "window of opportunity" for establishing a national CZM outcome monitoring and performance evaluation system. Because many states are gearing up for or are in the process of developing improved information management systems, a window of opportunity is open for OCRM and the states to ensure that nationally important state CZM outcome indicators are part of these state systems. The advent of new information-handling and sharing technologies—high-speed desktop computers, easy-to-use off-the-shelf software, GIS, and the Internet and World Wide Web—is another trend that increasingly makes a national monitoring and reporting system feasible. *The key need is for a well-designed set of policy-relevant outcome indicators*—ones that clearly indicate the degree to which decisions are leading toward desired policy goals. *See Recommendation 1.*

8. Although the question of attribution for CZM outcomes may be important in some cases, it should be subsidiary to questions of CZM performance overall. Too much focus on who gets what share of credit for outcomes discounts one of CZM's chief strengths, namely its role in fostering collaboration and integration within and among governmental levels, economic sectors, disciplines, and across the coastal land-water interface. Often, the most effective state CMPs are those able to engage other governmental and nongovernmental partners to achieve collective goals. Where shares of credit for CZM outcomes must be determined, however, case studies are the preferred methodology, rather than the systematic cataloging of relative contributions. In the earlier discussion of methods, we raised the attribution question—*Was the outcome we identified based on CZM or was the credit due more to some other local, state, federal, or private agency or group?* We acknowledged that we could not fully address this question because we were examining only CZM programs and outcomes linked to CZM policy, not the larger array of programs working toward similar goals. We could not make definitive statements about relative credit due each program for each outcome. However, we conclude that the systematic evidence needed to make such definitive statements is not available today and may never be. The massive effort needed to systematically assign credit for coastal management outcomes is not justifiable in the first place. Can you imagine the ensuing arguments? Finally, such a quest contradicts other explicit national objectives of CZM, namely objectives to foster integration, partnerships, and resource leveraging

to achieve common objectives. We assert that the "shared credit" nature of CZM outcomes is actually the result of wise investments of limited resources, with CZM resources often used as a catalyst for subsequent non-CZM actions. For example, in this study, we found that several states used CZM funds to collaboratively prepare a plan for acquisition of critical wetland habitat, but depended on other public and private sources to fund acquisition efforts. Clearly, CZM was a catalyst and legitimately gets a share of the credit for the outcome, because without their initiative, the outcome may not have happened at all. This suggests that case studies are a more effective and useful way to learn about relative contributions of coastal management outcomes. *See Recommendation 1.*

Recommendations

Recommendation 1: Establish a National Performance Evaluation System

A national outcome monitoring and performance evaluation system should be developed by OCRM in collaboration with state coastal managers. In designing the estuary and coastal wetland protection component of that system, we recommend using the indicators and the four-step evaluation process used here to determine (1) issue importance, (2) potential effectiveness, (3) outcome effectiveness, and (4) overall performance. In addition, a fifth step is recommended—the comparison of CZM effectiveness results to the "state of the coast" to determine and evaluate gaps between them.

Performance Evaluation Model. The semi-quantitative CZM program performance evaluation model recommended here is built around five questions—the four addressed in this report and the fifth suggested above. In theory, the same five questions could be applied to any of the outcome-oriented objectives of the CZMA, but this needs more exploration. Our CZME study colleagues examining state CMPs relative to other CZMA objectives followed the same general evaluation model, but modified it to suit their aims. The five questions in the evaluation model are listed below, followed by more detailed discussion of elements of the proposed evaluation framework:

1. How important is the objective or the issue in the state?
2. What is the potential effectiveness of the coastal management program "on paper" for this issue, based on assessment of the policies, processes, and tools employed?
3. How effective are management efforts "on the ground" as determined by outcome indicator data associated with state policies, processes, and tools used?
4. What is the overall performance of the state coastal program, considering issue importance in the state and the potential effectiveness of the program?
5. How does state coastal program effectiveness and performance compare with "state of the coast" data and trends? Do gaps exist between program performance and the state of the coast? If so, what are the causes, and can they be addressed through CMP improvements?

Recommended Issue Importance Indicators. For the evaluation of estuary and coastal wetland protection, the issue importance indicators used in this study are recommended as a starting point, but additional indicators should be sought to make the statistic more robust and address the limitations noted in the results and discussion. Greiner (1998) is examining additional issue importance indicators that may account for makeup of state wetland management programs.

Recommended Process Indicators. The process indicators used in this study are also recommended, but the list of thirty-three processes and tools should be narrowed to the most important processes and tools, plus several others that were highly ranked by one or more states (e.g., local regulation, environmental assessments, state 401 certification, wetland setbacks) or otherwise judged important (e.g., less-than fee acquisition, nonregulatory restoration) (Table 5).

Recommended Outcome Indicators. Recommended outcome indicators for evaluating estuary and coastal wetland protection are listed below and are a subset of those in Table 10. All indicator data need to be normalized (for example, percent wetland loss versus absolute loss) so that state-to-state comparisons are more valid. Outcome indicators that can be addressed using a variety of tools should be emphasized (e.g., loss and/or gain of wetland area can be based on data from state permit decisions, local permit decisions, 401 certifications, and federal consistency reviews). These outcome indicators should be applied separately to (1) estuaries and tidal wetlands, and (2) nontidal, freshwater wetlands in coastal zones. Such separation has an ecological basis, but equally important for CZM, it has an institutional basis. Institutional considerations that argue for this separation include differences in the predominance of public versus private ownership, public trust responsibilities, applicable legal precedents, and management policies and laws. Recommended outcome indicators include:

- *Regulatory Outcome Indicators*: the six outcome indicators used for this study are recommended: (1) area of absolute permitted loss, (2) absolute violation loss, (3) absolute mitigation gain, (4) permitted loss trends, (5) violation loss trends, and (6) mitigation gain trends. For nontidal freshwater wetlands especially, these results need to factor in two process indicators—the extent of state CZM jurisdiction over the resource; and the relative strength of the policy or tool, including exemptions.
- *Planning Outcome Indicators*: the first three outcome indicators used for this study are recommended for a national system: (1) area given high protection by local plans, (2) high protection provided by Special Area Management Plans, and (3) high protection provided by other plans and designations, such as Geographic Areas of Particular Concern, or Areas of Environmental Concern, and critical areas.
- *Acquisition and Nonregulatory Restoration Outcome Indicators*: several of the indicators used for this study are recommended: (1) area acquired in fee-simple (with CZM's contribution specified), (2) area acquired using less-than-fee methods (with CZM's contribution specified), (3) area of wetland or other aquatic habitat restored through nonregulatory mechanisms (including CZM's contribution), and (4) area of wetland or other aquatic habitat created through nonregulatory mechanisms (with CZM's contribution). In addition, for nonregulatory restoration, it may be desirable to differentiate between former wetlands and degraded wetlands restored.

"State of the Coast" Baseline and Monitoring. Regularly assessing the "state of the coast" and comparing it to CZM performance is a fifth and very necessary step in the evaluation model. Using national guidelines, states should establish a baseline and monitor change in relevant indicators, such as the change in area of tidal and nontidal wetlands in a state. When CZM outcomes and performance are compared to overall coastal change, gaps in program content or performance can be uncovered and management programs improved to address the gaps. In addition, natural processes (e.g., global change and relative sea level rise) and human activities (e.g., water withdrawal for inland irrigated agriculture) that affect estuaries and coastal wetlands and over which CZM has little influence can be sorted out. With this improved knowledge about the state of the coast and diagnostic methods to identify causal mechanisms, changes in CZM or other programs or activities can be pursued as appropriate.

Use of Case Studies. Case studies are an often-used evaluation method, and although they do not provide a comprehensive picture of effectiveness that an indicator-based program does, they do lend detail and richness to impact evaluation that could otherwise be missed (see, for example, Appendix D). It is recommended that a national CZM performance evaluation system incorporate case studies as a means to gain more understanding of state accomplishments and effectiveness. Case studies are also valuable when relative contributions to important CZM outcomes need to be attributed.

State Record Keeping on CZM Outcomes. OCRM should initiate a state-level audit of existing data collection methods (e.g., permit and grant application forms), information management systems (e.g., databases and GIS), and reporting methods. Improvements should be implemented that allow more effective identification, tracking, compilation, and reporting of the outcomes that can be attributed to CZM policy implementation.

One of the major difficulties anticipated with state record keeping, especially for mostly networked programs, is that many of the activities that come under the aegis of "CZM" are carried out by other than the lead CZM agency. Persuading other state agencies—or more difficult yet, many local government units—to monitor outcomes of CZM decision making and projects would be a monumental task. This is complicated by coastal zone boundaries that do not necessarily correspond to existing record-keeping units, such as whole states, counties, watersheds, and so on. It is recommended that centralized monitoring and record keeping at the lead CZM agency be considered as the most efficient and simple mechanism. For estuary and coastal wetland protection, expanding or strengthening record keeping for federal consistency decisions might be a partial solution.

At a minimum, states should develop and maintain databases to track CZM outcome indicator results, providing standardized performance reports to state officials and OCRM. Eventually, monitoring systems should be upgraded to include relevant data in a GIS to provide for more meaningful display, analysis, and reporting. A final step should be incorporation of such data into state CMP World Wide Web sites, so that historical and near-real-time current performance could be available on demand to OCRM, researchers, or the public.

Recommendation 2: Improve Nontidal Freshwater Wetland Management

Improve nontidal freshwater wetland management in state coastal zones by expanding coastal zone boundaries as necessary to encompass all coastal wetlands, by strengthening wetland policies, and by applying a more robust set of wetland management tools.
OCRM and individual states should initiate a more intensive study of nontidal wetland protection needs, strategies, processes, and tools, ranging from the more sophisticated statute-based programs of Maryland or New Jersey to techniques that can administratively increase protection of these valuable resources. Section 401 certification, federal consistency standards, executive orders, and similar mechanisms should be examined. In addition, states should reexamine the 6217 coastal boundary review (NOAA 1992) with respect to the need to protect wetlands within estuarine and coastal drainage areas, particularly where land use and other activities, including wetland alterations, may have direct and significant impacts on estuarine and coastal waters (NOAA 1985; NOAA 1991). One way for OCRM to initiate this nontidal wetland management review would be through the next round or a supplemental round of Section 309 assessment and strategy development. Individual states could also undertake independent reviews.

Recommendation 3: Establish a Coastal Wetland Restoration Policy

OCRM should establish explicit national CZM policy goals for wetland restoration, including (1) no net loss of wetland area and function in the short term, implemented through regulatory programs; and (2) a net gain of wetland area and function over the long term, implemented through nonregulatory restoration programs.
This national CZM policy should strongly encourage states to explicitly establish their own policies as part of their federally approved CMPs. Both wetland policy goals recommended here—no net loss in the short term and net gain in the long term—are fully consistent with CZMA objectives, the findings and recommendations of the National Research Council (NRC 1992), present White House policy (WHOEP 1993), and Congressional policy (Water Resources Development Act of 1990, P. L. 101-640).

Implementing No Net Loss. State CMPs should implement a no-net-loss policy by requiring full mitigation of unavoidable losses permitted under state regulatory authorities. No net loss of wetland area is an inherent benchmark that can be assessed using regulatory outcome indicators and rating criteria recommended in this study, particularly RG1 and RG3 in Table 10.

Implementing Net Gain. The net-gain goal of this recommended policy recognizes the substantial historic loss of coastal wetlands and the significant opportunities that exist to restore a portion of the lost or degraded functions, services, and values of these ecosystems. OCRM should encourage and support state nonregulatory initiatives for ecosystem restoration with a long-term goal to increase the quality and quantity of coastal wetlands as measured by acreage and function. Net-gain benchmarks should be established by states based on an assessment of historic loss and actual restoration opportunities. Assessment can be based on the nonregulatory outcome indicators and rating criteria recommended in this study (NR1 to NR3 in Table 10). CZMA Section 309 program enhancement guidance should also be amended to require more explicit assessment of restoration needs and opportunities.

Implementing Function and Quality Assessments. Implementing the wetland "function" part of the recommended coastal wetlands policy will be very challenging for reasons outlined earlier (e.g., standard methods for assessing wetland functions are just being developed, and there is significant time and expense involved in adaptation of national methods to a locale and subsequently validating results). Nevertheless, there are existing CZM examples that serve as models. North Carolina's Coastal Region Evaluation of Wetland Significance (NC-CREWS) is one (Sutter and Wuenscher 1997); Washington State's function-based wetland restoration planning is another (Gersib 1997). Both examples utilize hydrogeomorphic (HGM) classification approaches that focus explicitly on the habitat, water quality, and hydrologic functions of wetlands (Brinson 1993; 1995; 1996; Brinson and others 1996). These and other means of addressing wetland function and quality should be supported by OCRM and explored by states using CZM technical and financial resources.

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APPENDIX A

Sample State CZM Profile—DELAWARE

DELAWARE CZM PROFILE
PROTECTION OF ESTUARIES AND COASTAL WETLANDS

A. BACKGROUND AND CONTEXT

The Delaware coastal zone is the entire 2,057 square-mile state, although principal management efforts are concentrated in a "coastal strip" that averages about 4 miles in width. The coastal strip can be further divided into two main management areas—the Atlantic coast and Delaware Bay.

The Atlantic coast is a 24.5 mile long strip extending from the Maryland border on the south to Cape Henlopen on the north. Along this part of the coast, barrier beaches enclose several large bays that have extensive tidal wetlands. Barrier beach communities along this stretch of coast include Rehoboth Beach, Bethany Beach, and Fenwick Island. The extreme north part of the Atlantic shore is state-owned, while the south is mostly private beach and resort development (DCMP 1992).

The Delaware Bay and River shore extends from Cape Henlopen north to the Pennsylvania border north of Wilmington approximately 60 miles. From Lewes on the south to Delaware City, there are narrow beaches and scattered summer colonies, backed by large marsh areas. North of here, there is a dramatic shift to industrial land uses and development, with extensive urbanization in the New Castle-Wilmington area. The Port of Wilmington is a major center for such activities (DCMP 1992).

Delaware's 1990 population of 666,000 resides mostly in the northern one-third of the state and is expected to increase 9% to 728,000 by 2010 (SEA-NOAA 1992). Significant development pressure exists throughout the state's coastal strip, mostly through intensification of present land uses.

1. DELAWARE'S ESTUARIES AND COASTAL WETLANDS

Delaware's 1981 National Wetland Inventory (NWI) identified roughly 223,000 acres of wetlands and 234,000 acres of open water (excluding the marine waters of Delaware Bay) (Tiner 1985). This was about 18% of the state's land surface area. Of the open water areas, 98% were estuarine or brackish tidal waters of inland bays or rivers. Of the wetlands, about 40% were estuarine salt and brackish marshes, and 56% were palustrine, mostly nontidal, wetlands. Various data for tidal water and wetland areas are provided in table A-1, with all wetlands and coastal waters illustrated in figure A-1.

Estuaries and Tidal Wetlands

Overview. The largest estuary in the state, Delaware Bay, is shared with New Jersey and Pennsylvania. About 66,600 acres (104 square miles) of Delaware Bay waters are within state boundaries. To the south of Delaware Bay are the smaller Atlantic coast inland bays (Rehoboth Bay, Indian River Bay, Little Assawoman Bay). These estuaries have major areas of open water, intertidal flats, and estuarine and tidal fresh vegetated wetlands. Tidal ranges in Delaware's estuaries vary from about 4 to 5 feet (SEA-NOAA 1985). Extensive estuarine marshes fronted by narrow sandy beaches or flats line the shore north of Cape Henlopen. Based on the National Wetland Inventory for Delaware (Tiner 1985, 18-19), there were approximately 167,037 acres of estuarine waters (excluding Delaware Bay), 89,758 acres of estuarine wetlands (vegetated and flats), and 7,121 acres of tidal palustrine (forested, emergent, and scrub-shrub) wetlands in 1981. This is about 7% of the state's surface area.

Functions and Values. Delaware's estuaries and coastal wetlands are important for the state's fisheries, providing spawning and rearing habitat for 40 species, including 98% of those with commercial importance (e.g., menhaden, bluefish, striped bass, shad, flounder, sea trout). Estuarine aquatic beds provide important cover for juvenile fishes and other estuarine organisms. Wetlands are also important for bay scallops, blue crab, oysters, clams, and other

Table A-1. Estuary and tidal wetland data summary (national data from *National Estuarine Inventory Data Atlas: Physical and Hydrologic Characteristics*, NOAA, Strategic Environmental Assessment Division 1985).

Data Source	No. of Estuar.	ESA (mi^2)	WSA (mi^2)	Tidal Wetlands (acres) SM	TFM	TFSS	TF	SAV	TOTAL
(SEA-NOAA -SEA 1985)	1	768	13,450						
(USDOI 1953)				93,300	22,000				
(Tiner 1985, 19)	4			78,083	1,585	5,536	8,872	2,803	96,879

KEY:

ESA - Estuary surface area from mouth to head of tide
EDA - Estuary drainage area determined by NOAA as area of primary coastal influence
WSA - Watershed area, a combination of what NOAA defines as the fluvial drainage area and EDA
SM - salt marsh
TFM - tidal fresh marsh
TFSS - tidal forested scrub-shrub
TF - tidal flat
SAV - submerged aquatic vegetation

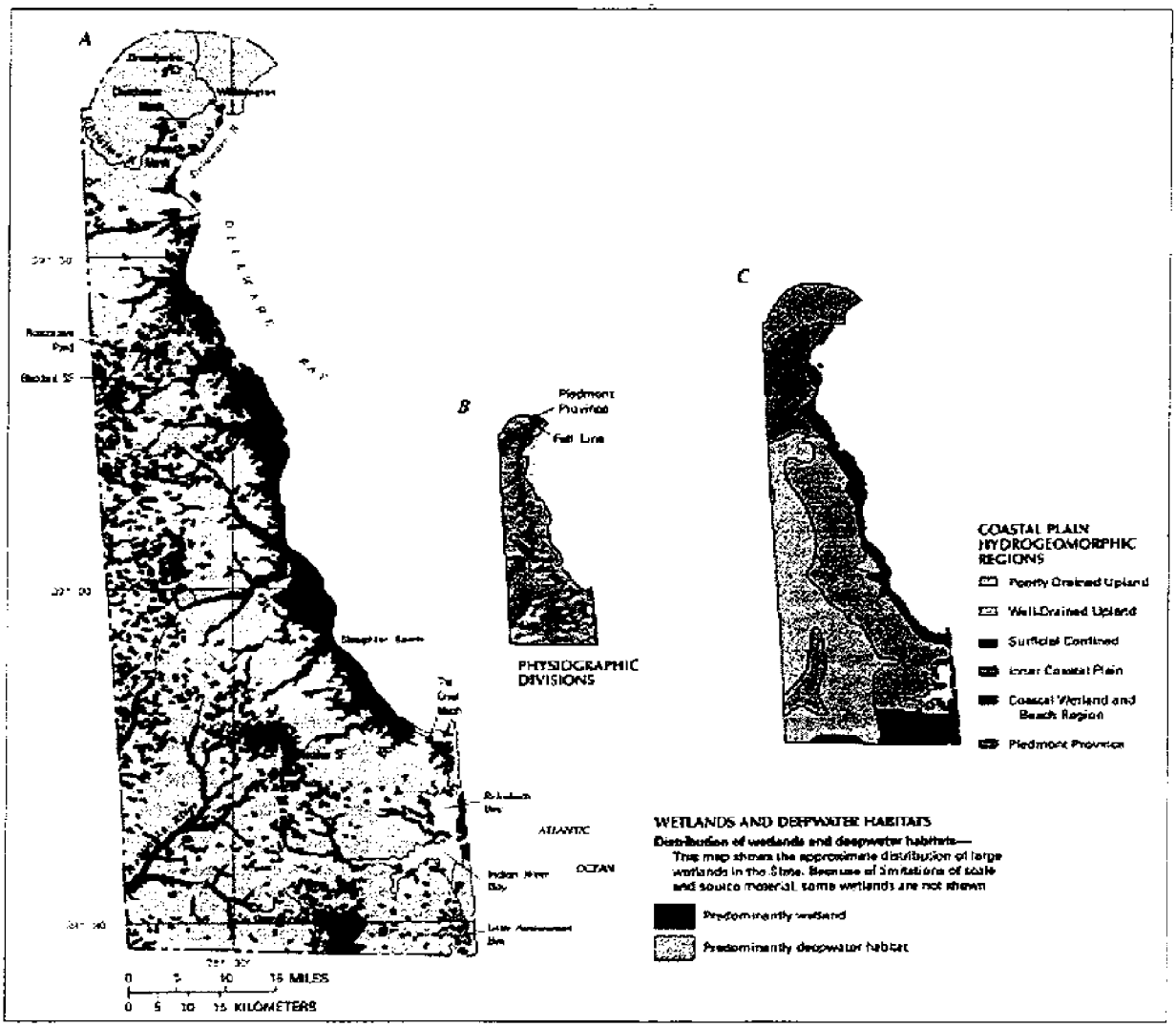


Figure A-1. Wetland distribution in Delaware and physical features that control wetland distribution in the state (Source: USGS 1996, *National Water Summary on Wetland Resources*, WSP 2425).

shellfish. Freshwater and anadromous fishes also usethe estuary and freshwater tidal and nontidal marshes in the coastal zone and inland. Delaware's estuaries and coastal wetlands are also critical nesting, resting, and feeding habitat for many species of waterfowl, waders, other birds, and other wildlife, including furbearers, deer, amphibians, and reptiles. Pea Patch Island is home to the largest nesting colony of colonial wading birds north of Florida with up to 12,000 nesting pairs from nine species. Delaware's coastal wetlands also play a critical role in helping maintain water quality in Delaware Bay and the smaller estuaries to the south, taking up nutrients, removing sediments, and transforming or fixing other pollutants. These and other estuary and wetland functions translate into significant economic and social values for flood and erosion control, water purification, hunting and fishing, research and education, and nonconsumptive recreation and tourism (Tiner 1985).

Historic Losses. Natural historic and continuing impacts to tidal wetlands include subsidence, erosion, barrier beach overwash, hurricanes, and invasion of salt marshes common reed (DCMP 1992). Historic human impacts to estuaries and coastal wetlands include low-level diked impoundments for agriculture and urban flood control 200-300 years ago; high-level diked impoundments in the present century for waterfowl management (10,000-12,000 acres); ditching for mosquito control in the 1930s (45,000-60,000 acres); filling for residential and commercial development (4,300 acres lost between 1939-69 in Atlantic Inland Bays); dredging of coastal waters and wetlands for navigation and disposal of dredged and other fill material in coastal waters and wetlands; timber harvest; inlet stabilization; and liquid waste disposal. Tidal wetlands decreased about 8,252 acres or 9% between 1938 and 1973, from an estimated 91,672 acres to 83,420 acres (Daiber et al. 1976). More than half of this loss was attributed to large construction projects for housing, industry, highways, with the remainder due mostly to waterfowl impoundments. About 7,400 acres of this tidal wetland loss occurred between 1954 and 1971, at a rate of 444 acres per year (Lesser 1971). This rate decreased to only 20 acres per year between 1973-79 (Hardisky and Klemas 1983). The invasion of *Spartina* marshes by the common reed (*Phragmites australis*) has been a growing problem over the last 40 years, degrading wildlife and fisheries habitat. Phragmites is now monodominant over 11% of tidal wetlands and codominant on an additional 22%. Significant habitat and food web impacts resulted from this invasion (DCMP 1992).

Recent Losses and Development Pressures. The threat of major alterations to remaining tidal wetlands is not great, given the strong regulatory program which has permitted only a few acres of wetland loss in recent years. Although the state has developed a number of programs to restore or enhance tidal wetlands, many tidal wetlands remain in a degraded status. In New Castle County, where one-quarter of the land in the coastal strip is already developed for industry and urban use, population continues to grow, creating some additional pressure on remaining tidal wetlands. In Kent County, where mosquito grid ditching and wetland impoundments have degraded tidal wetlands, development pressure is low. In Sussex County, recreational suburban sprawl along the edges of the inland bays continues to impact tidal wetlands. In all three counties, wetland migration landward in the face of rising sea level is being inhibited by bulkheading. Other problems include the inability to address cumulative impacts from many small developments, problems with poor regulatory program maps, illegal shoreline stabilization projects, and proliferation of phragmites.

Ownership and Management. Tidelands (MHW to MLW) in Delaware are privately owned, unless the state or some other entity has purchased them, but they are still subject to federal and state regulation and public trust, as detailed later. At present, about 53,800 acres of coastal wetlands are owned and managed by public and private entities. The Division of Fish and Wildlife and Division of Parks and Recreation combined manage about 20,000 acres; the USFWS owns and manages another 22,000 acres of wetlands in two refuges; Delaware Wild Lands, Inc. owns about 10,000 acres; and The Nature Conservancy about 1,800 acres. Private individuals and corporations also own significant wetland areas; these private areas are the emphasis for regulatory management efforts because the threats to wetland values are greater.

Non-tidal Freshwater Coastal Wetlands

Overview. Delaware has 124,781 acres of nontidal freshwater wetlands, 90% of which are seasonally or temporarily flooded forested wetlands (mostly red maple swamps). Emergent wetlands (5,994 acres), scrub-shrub wetlands (4,019 acres), and shallow ponds (3,118 acres) comprise nearly all of the remaining freshwater wetlands (Tiner 1985,

17). Most of the forested wetlands are not within the coastal strip, although there a few large areas of forested wetlands just inland from Delaware Bay.

Functions and Values. Delaware's nontidal freshwater wetlands perform a variety of hydrologic functions (flood storage and desynchronization, groundwater supply and recharge), biogeochemical functions (sediment removal, water purification, pollutant transformation), and habitat and food chain support functions (waterfowl and other bird nesting, resting, and feeding; habitat for furbearers and other wildlife).

Historic Losses. Loss of nontidal palustrine wetlands from the mid-1950s through the late 1970s suggest a 20% loss (freshwater marshes and swamps) and roughly a 30% gain in ponds. The net loss rate in palustrine vegetated wetlands may be as high as 1,500 acres per year during this period, mostly due to agricultural ditching, drainage and conversion; stream channelization; construction of deep ponds or reservoirs; forestry practices; and beaver trapping and removal (Tiner 1985, 62; Tiner and Finn 1986; Meredith 1996). According to analysis of hydric soil data, as much as two-thirds of Delaware's original pre-colonial freshwater wetlands may be gone, but it is more like in the 40-50% range (Tiner 1985, 62).

Recent Losses and Development Pressures. Currently, there is significant development pressure on nontidal freshwater wetlands throughout the state, but nowhere as intense as in eastern Sussex County, where population is growing rapidly and great pressures exist to convert wetlands for real estate development (Tiner 1985). Future losses of inland wetlands can expect to continue, given the relative lack of legal protection provided to freshwater wetlands in the state.

Ownership and Management. The vast majority (~80-90%) of nontidal freshwater wetlands are in private ownership (Meredith 1996). Three state agencies (DFW, DPR and State Forestry) do own some freshwater wetlands and the two USFWS refuges in the state contain about 4,000 acres of nontidal wetland.

2. ISSUE IN THE STATE—IMPORTANCE OF THE ESTUARY AND COASTAL WETLAND PROTECTION

Issue Importance at CZM Approval (1979)

Estuary and coastal wetland protection were ***moderately important*** issues in the process of CZM program development, but were not a major new policy focus because tidal wetlands were well covered by existing statutes. Nontidal freshwater wetlands were not covered, however, and no new initiatives were developed to cover these resources as an enforceable program element. This suggests that other issues, for example, industrial development within the coastal strip, were higher on the agenda.

Evolution of Issue Importance

Increased concern over the continued degradation of estuaries, tidal wetlands, and the significant unregulated loss of nontidal freshwater wetlands within Delaware's watersheds raised this issue to the ***highly important*** category by the late 1980s. This concern over freshwater wetlands in the state was reflected in 1988 Executive Order 56 (described below), which established a task force that in 1989 recommended comprehensive freshwater wetland legislation. A change in administrations at the state level has precluded passage of the legislation, but administrative changes have improved freshwater wetland protection to some degree and hope continues for eventual state legislation. Delaware is also working on an improved Clean Water Act 401 certification process (for 404 permits) as a basis for improved nontidal wetland protection. Delaware also selected coastal wetlands as a priority for coastal management program improvement under Section 309 of the federal CZMA (DCMP 1992b)

B. KEY MANAGEMENT AUTHORITIES AND POLICIES

Policies are broadly defined as the relevant constitutional provisions, statutes, administrative laws, court-made law and other agency programs and operating procedures that protect estuaries and coastal wetlands.

1. POLICIES *PRIOR* TO CZM PROGRAM.

Three laws that were important for estuary and wetland protection were in place prior to Delaware developing its coastal management program:

1969 - Subaqueous Lands Act (Title 7, Chapter 72): regulatory permit program for estuarine and coastal waters that requires that impacts to water quality and adjacent resources (wetlands) be minimized. Subaqueous lands are tidelands (MLW to MHW), submerged lands (below MHW in tidal areas or OLW in nontidal, but navigable rivers, lakes, and streams). The permit program is administered by DNREC's Division of Water Resources.

1973 - Wetlands Act (Title 7, Chapter 66): regulates alterations to all tidal wetlands, salt and fresh, as well as nontidal wetlands over 400 acres in size. Tidal wetlands include "lands above the mean low water (MLW) elevation" and thus overlap with subaqueous lands between MHW and MLW. The wetlands permit program is administered by DNREC's Division of Water Resources, Wetlands and Subaqueous Lands Section (WSLS).

1973 - Environmental Protection Act (Title 7, Chapter 60): comprehensive air, water, solid waste pollution control law, implements NPDES permit program; indirect effects on wetlands. Water Quality Standards, a regulation promulgated under Chapter 60, define wetlands as waters of the state. This affords wetlands the protection of designated uses and the criteria to support those uses.

2. POLICIES *AT CZM PROGRAM APPROVAL*

The Delaware Coastal Management Program (DCMP) is a fully networked program established by Executive Order 61 in 1978. Federal CZM requirements for estuary and coastal wetland protection were addressed by networking existing laws (above) with several new laws, and by establishing special policies: 10 for wetlands, 15 for subaqueous lands and the coastal strip, and 33 for coastal waters. The latter deal mostly with water quality and are beyond the scope of this profile. Key additional statutes and executive orders establishing the DCMP included:

1978 - Executive Order 61: requires state agencies to "enforce the goals, policies, and objectives of the DCMP;" this is the order that "networked" the program for federal approval; this EO is currently being updated.

1978 - Sediment and Erosion Control Act: regulates construction site activities and other land disturbance; focused on keeping nonpoint sources of sediment out of coastal waters and wetlands. Requires a state standard-based, locally-approved "erosion and sediment control plan" before land alteration (excludes most agricultural and forest activities, and single dwelling construction).

1978 - Land Use Planning Act (Title 29, Chapter 92): provides principal authority to manage uses adjacent to wetlands and estuaries. Local governments regulate land uses; focus was on improving coordination between land use and other activities, including wetland regulation.

1978 - Coastal Zone Act (Title 7, Chapter 70): prohibits heavy industry and bulk transfer facilities from locating in the coastal strip and requires permits for manufacturing uses.

1978 - Natural Areas Preservation System Act (Title 7, Chapter 73): provides for natural areas inventory and registry and program for acquisition using outright purchase or dedication, easements and other voluntary non-regulatory controls. Serves as basis for open space acquisition.

3. POLICY *ADDITIONS & CHANGES* SINCE PROGRAM APPROVAL

1988 - Executive Order 56: aimed at reducing impacts of public agency actions on freshwater wetlands; requires state agencies and local governments to minimize impacts; avoid undertaking or funding projects with direct impacts; requires DNREC to develop special consultation agreements with Departments of Agriculture, Transportation, and Development designed to avoid or minimize impacts; not dispose of state-owned wetlands; inventory state-owned freshwater wetlands; establish a freshwater wetlands roundtable to develop measures for improved freshwater wetland conservation. This effort led to the development of proposed freshwater wetlands legislation that has not yet passed.

1990 - Land Protection Act (Title 7, Chapter 75): Designated State Resource Areas (SRAs), which include protected state, federal, local, and private conservation organization lands, and potential additions to these areas. This includes tidal and nontidal wetland. There are now 20 SRAs and most tidal wetlands now in public ownership.

1996 - National Wetlands Inventory Update: NWI is being updated with 1988 photography to more accurately define the extent of state jurisdiction in tidal wetlands. It will also allow control of nontidal wetlands through a new CWA Section 401 certification process being developed or through a new nontidal wetland law, should that pass. The inventory will be completed by April 1996 and be in GIS by 1997.

C. MANAGEMENT PROCESSES AND TOOLS

Delaware's estuary and coastal wetland protection policies, described in the previous section, are implemented through an array of decision-making processes and management tools. For estuary and coastal wetland management, these processes and tools are categorized as follows: Information and Research Tools, Planning Tools, Regulatory Tools, Acquisition Tools, Nonregulatory Tools, and Coordination Tools. Tables C-1 and C-2, respectively, display summary and detailed information on a range of estuary and wetland protection processes and tools that might be used by a state. For each process or tool, information is recorded on (1) whether or not it is used in the state; (2) if it is used, its importance for estuary and wetland protection, and (3) its overall ranking (top 5). Table C-2 provides additional information, including the legal authorities for the tool or process and other amplifying information.

The management processes and tools used to implement coastal policies for estuary and coastal wetland protection are used to judge the potential effectiveness of the program relative to an "ideal" model program. The processes and tools used also determine what on-the-ground outcome indicator data should be available to help judge overall program effectiveness, again, in comparison to an "ideal" model program.

SUMMARY

Virtually all of Delaware's estuary and wetland management functions are housed within Divisions of the Department of Natural Resources and Environmental Control (DNREC). Principal agencies and responsibilities include (1) Division of Soil and Water Conservation (DSWC), the lead CZM and federal consistency agency; (2) Division of Water Resources (DWR), administrator of regulatory permit programs; (3) Division of Parks and Recreation (DPR), acquisition and environmental education agency; and (4) Division of Fish and Wildlife (DFW) for wetland restoration.

Several regulatory processes and tools are considered ***highly important*** provisions of the DCMP for estuary-wetland protection. Ranked processes and tools included the Wetlands Act (WA) and the Subaqueous Lands Act (SLA) permit programs (ranked 1), and federal consistency determinations (ranked 4), which have received much greater attention since 1993. Other *very important*, but unranked regulatory process and tools included a number of requirements under the WA/SLA: environmental assessments, limitations on non-water-dependent uses, prohibitions on certain industrial uses, and the state's aggressive compliance monitoring and enforcement program. Among acquisition tools, Delaware's state-funded open space program are also deemed *very important* for estuary and wetland protection (ranked 2). Nonregulatory tools deemed *very important* are the DFW's wetland restoration projects (ranked 3), all of which received CZM funding assistance to get underway. Finally, inventory and mapping

programs (ranked 5), part of information and research tools, was deemed *very important* for estuary and wetland protection.

Among other regulatory processes and tools used by the state, exemptions for low impact activities and state policies protecting freshwater wetlands were considered ***moderately important***. Education and technical assistance, a nonregulatory tool, and state agency memoranda of agreement for freshwater wetland protection, a coordination tool, were also considered ***moderately important***.

Processes and tools that are only of ***low importance*** for overall estuary and wetland protection in the state include: (1) the WA and SLA's freshwater wetland regulatory controls, (2) the state 401 certification process (although it is being strengthened), (3) the difficult to administer single-purpose dock limitations within marina regulations, (4) development setback regulations from MHW in county land use regulations, (5) functional assessments and GIS applications (these are growing in importance), (6) local land use planning, (7) critical area planning, (8) fee-simple acquisition using CZM funds (principally for the Delaware NERR), and (9) less-than-fee acquisition techniques.

Table C-1. Summary of CZM Management Processes and Tools Used and Importance in Delaware.

CZM PROCESS OR TOOL	Tool Used?	Importance of Process or Tool for Protection			Relative Importance (Rank)
		High	Moderate	Low	
1. INFORMATION/RESEARCH TOOLS					
1a. Inventory and mapping	yes	X			5
1b. Wetland functions assessment	yes			X	
1c. Wetland change monitoring	no				
1d. GIS, database, records	yes			X	
2. REGULATORY TOOLS					
2a. State tidal wetlands permit	yes	X			1
2b. State nontidal wetlands permit	yes			X	
2c. Local tidal or nontidal wetland permit	no				
2d. General permits/exemptions	yes		X		
2e. Federal consistency standards *in lieu of* tidal or nontidal wetland permit	yes	X			4
2f. State consistency standards *in lieu of* permit for tidal or nontidal wetlands	yes		X		
2g. State CWA 401 certification *in lieu of* tidal or nontidal wetland permit	yes			X	
2h. State tideland leasing regulations *in lieu of* tidal wetland permit	no[1]				
2i. Environmental impact assessment	yes	X			
2j. Non-water-dependent exclusion/limit	yes	X			
2k. Single-purpose dock exclusion/limit	yes			X	
2l. Other use exclusions/limits	yes	X			
2m. Compensatory mitigation required	no				
2n. Compliance monitoring/enforcement	yes	X			
2o. Mitigation banking	no				
2p. Development setback or buffer	yes			X	
3. PLANNING TOOLS					
3a. Land use planning /zoning	yes			X	
3b. Special area mangt. plan (SAMP)	no				
3c. GAPC, AECs, Critical Areas, MPAs	yes			X	
3d. Advanced Identification Plans (EPA)	no				
4. ACQUISITION TOOLS					
4a *Fee simple*[2] acquisition with CZM$	no				
4b.*Less-than-fee*[2] acquisition with CZM$	no				
4c. *Fee simple* acquisition with other $	yes	X			2
4d. *Less-than-fee* acquisition with other $	yes			X	
5. NONREGULATORY TOOLS					
5a. Restoration/enhancement (non-reg.)	yes	X			3
5b. Education and technical assistance	yes		X		
6. COORDINATION TOOLS					
6a. Joint state-federal permit application	no				
6b. Interagency pre-application meetings	yes	X			
6c. Memoranda of agreement	yes		X		

[1]tool or process is used, but does not serve an "in-lieu-of" permit role in management

[2]fee simple acquisition is outright property purchase; less-than-fee acquisition includes purchase or donation of conservation easements, purchase of development rights, tax deferrals, etc.

Table C-2. Delaware CZM Program Management Processes and Tools Used and Importance.

CZM PROCESS OR TOOL	Tool Used?	Importance of Process or Tool for Protection			Relative Import. (Rank)	Legal Authority or Basis for Process/Tool	COMMENTS
		High	Mod.	Low			
1. INFORMATION & RESEARCH TOOLS							(Note how information used for management)
1a. Inventory and mapping *(note NWI status in CZ; when last updated, scale)*	yes	X			5	Wetlands Act & regulations	The current NWI is based on 1981 photos (Tiner 1985) and is being updated in 1996 with 1988 photos; separate, less detailed Tidal Wetland Maps were developed earlier (1973) to implement the Wetlands Act and are still part of the regulations
1b. Wetland and/or riparian functional assessment	yes			X			Use the "Evaluation for Planning and Assessment" method developed by Environmental Concern, Inc. in 1993.
1c. Wetland change monitoring	no						
1d. GIS, databases, record keeping for any wetland management purpose	yes			X		Wetlands Act & regulations	Permit-tracking database (no area info); periodically update the tidal wetlands maps; physically draw projects on the maps; being put into GIS in 1997; DSWC developing COMPAS Delaware with NOAA-SEA pilot for DNERR watersheds
2. REGULATORY TOOLS							Comments
2a. State permit—tidal wetlands (and underwater estuarine lands)	Yes	X			1	Wetlands Act; Sub-aqueous Lands Act; Coastal Zone Act (and related policies)	WA (MLW to upper wetland boundary) and SLA (MHW seaward) require permits. Where authority overlaps, WA controls. CZA prohibits new heavy industrial use altogether and new/expanded manufacturing facilities in coastal strip wetlands (also defers to WA where overlapping).
2b. State permit—nontidal wetlands	yes			X		Wetlands Act & Subaqueous Lands Act	Very weak program: Wetlands Act applies to nontidal wetlands over 400 acres, but policy not useful; SLA applies to nontidal wetlands adjacent to rivers/has habitat protection component. Comprehensive freshwater wetland legislation was proposed in 1989 but has not passed to date.

Table C-2. CZM Program Management Processes and Tools Used and Importance (continued).

CZM PROCESS OR TOOL	Tool Used?	Importance of Process or Tool for Protection			Relative Import. (Rank)	Legal Authority or Basis for Process/Tool	COMMENTS
		High	Mod.	Low			
2. REGULATORY TOOLS (continued)							Comments
2c. Local permit—tidal or nontidal wetlands (specify)	no						
2d. General permits or other categorical exemptions for tidal or nontidal wetlands	yes		X			Wetlands Act, regulations, and policy 10 (DCMP 1993)	Wetland permit exemptions: foot bridges, duck blinds, nesting structures, boundary markers, navigation aids, DNREC-authorized mosquito control, hunting, fishing, trapping, haying, and domestic animal grazing. Latter two are problems re impacts (Moyer 1996). No general permits under WA, but 3 under SLA.
2e. Federal consistency standards *in lieu* of tidal or nontidal wetland permit	yes	X			3	Wetlands & Sub-aqueous Lands Act (& related regs and policies) for tidal; EO 56 for fresh-water wetlands	DCMP staff review federal agency consistency determinations for federal projects and USACOE Section 10/404 permits against DCMP enforceable policies (DCMP 1993). [Prior to 1993, issuance of a state wetland or SLA permit was de facto consistency determination]. DCMP has denied USACOE Nationwide Permit 29 (single family dwellings), requiring individual consistency determination; no real enforceable policies for freshwater wetland review
2f. State consistency standards *in lieu* of separate state permit for tidal or nontidal wetlands	yes		X			EO 56 for freshwater wetlands	State actions affecting freshwater wetlands must be follow EO 56 policies (DCMP 1993). Has not had great impact because most wetlands are privately owned.
2g. State CWA 401 certification *in lieu* of tidal or nontidal wetland permit	yes			X		Environmental Protection Act	State 401 certification required on all projects required; are in process of developing stronger freshwater wetland standards as an alternative to new state legislation; will strengthen review of USACOE permits
2h. State tideland leasing regs/standards *in lieu* of tidal wetland permit	no*						*Tidelands (MHW-MLW) are privately owned (but are regulated as noted earlier). Below MLW, lands are leased for 10 years and environmental protections can be built in.

Table C-2. CZM Program Management Processes and Tools Used and Importance (continued).

CZM PROCESS OR TOOL	Tool Used?	Importance of Process or Tool for Protection			Relative Import. (Rank)	Legal Authority or Basis for Process/Tool	COMMENTS
		High	Mod.	Low			
2. REGULATORY TOOLS (continued)							Comments
2i. Environmental impact assessment	yes	X				Wetland Act regulations; Sub-aqueous Lands Act; Coastal Zone Act	WA-requires environmental impact evaluation and consideration of alternative measures before permit approval; WA-cumulative impacts must be considered; SLA/CZA-requires environmental assessment
2j. Non-water-dependent use exclusion/limitation policy	yes	X				Wetlands Act and regulations	Requires that wetlands not be altered unless required for water access/use and no reasonable alternative exists. Not applicable to SLA
2k. Single-purpose dock exclusion/limitation policy	yes			X		Delaware Environ-mental Protection Act (DEPA); SLA	DEPA marina regulations require community facilities; SLA also (>4 slips considered a marina); has been difficult to administer (not effective)
2l. Other key land-water use exclusion/limitation policies (specify)	yes	X				Coastal Zone Act and regulations	New heavy industry, bulk transfer facilities, offshore pipelines are prohibited in coastal strip; other new or expanded manufacturing uses require permit, environmental assessment and wetland avoidance.
2m. Compensatory mitigation/no-net-loss policy	no*						*Follow the lead of the USACOE on mitigation; no separate authority at state level.
2n. Compliance monitoring & enforcement	yes	X				Wetlands Act and regulations; Submerged Lands Act	DNRC aggressive surveillance and rapid enforcement for tidal wetlands through Environmental Protection Officers; have civil and criminal authority; only 6 violations in 1990 (DCMP 1992a)
2o. Mitigation banking	no*						*Process getting underway with the DDOT for a transportation-related projects mitigation bank
2p. Development setback or buffer	yes			X		County ordinances	All counties--have 50-foot setback from MHW for development; for tidal wetlands, maps have a "built-in buffer" using 50% transition wetland vegetation as boundary

Table C-2. CZM Program Management Processes and Tools Used and Importance (continued).

CZM Process or Management Tool	Tool Used?	Importance of Process or Tool for Protection			Relative Import. (Rank)	Legal Authority or Basis for Process/Tool	COMMENTS
		High	Mod.	Low			
3. PLANNING TOOLS							Comments (note how plans implemented)
3a. Land use planning & protective zoning	yes			X		Land Use Planning Act	Local governments notify state if wetland impact possible (tidal or nontidal); state has very little impact on nontidal areas—state says what they'd like them to do but is not enforceable.
3b. Special area manage-ment planning (SAMP)	no*						*Will be beginning a SAMP in 1996 in Pea Patch Island/1000 acre Marsh area (heron rookery)—pesticides are an issue
3c. Planning for GAPC, AECs, Critical Areas, Marine Protected Areas	yes			X			Comprehensive Conservation and Management Plan for tidal wetlands (CZM-funded and serves as statewide guidance for management); EPA has funded similar initiative for FW wetland areas
3d. Advanced Identification planning (CZM with EPA)	no*						*Several false starts in the early 1980s
4. ACQUISITION TOOLS							Comments
4a. *Direct (fee-simple)* wetland acq. with CZM $	no*					CZMA	*State or other funds used to acquire lands for the new Delaware Bays NERR (St Jones River & Blackbird Creek)
4b. *Indirect* (less-than-fee) wetland acq. with CZM $	no*						*CZM funds used to develop guide for voluntary land (and wetland) protection
4c. *Direct* wetland acq. with others' $ and CZM assist	yes	X			2	1978 Natural Areas Preservation System Act (NAPSA);1990 Land Protection Act (LPA)	Acquisition programs administered by DPR and DFW. Natural areas are voluntarily protected by acquisition, less-than-fee-simple purchase and other nonreg. controls. State funding used for open space program ($47 million in bonds and direct approp. since 1990; new 21st Century funding will provide will provide $40 million over 7 years). The LPA designated 20 State Resource Areas (SRAs) to consolidate existing protected areas with inholdings and adjacent properties--CZM funded survey crews for boundary determ. Most tidal wetlands now in public ownership.

Table C-2. CZM Program Management Processes and Tools Used and Importance (continued).

Table C-2. CZM Program Management Processes and Tools Used and Importance (continued).

CZM Process or Management Tool	Tool Used?	Importance of Process or Tool for Protection			Relative Import. (Rank)	Legal Authority or Basis for Process/Tool	COMMENTS
		High	Mod.	Low			
4. ACQUISITION TOOLS							Comments
4d. *Indirect* wetland acquisition with others' $ & CZM help	yes			X		NAPSA and LPA	Some critical areas and SRAs acquired as noted above using conservation easements and other less-than-fee methods.
5. NONREGULATORY TOOLS							Comments
5a. Wetland restoration and enhancement (non-regulatory)	yes	X			3		DFW has five major programs, all funded in full or part by DCMP: (1) Open Marsh Water Management (OMWM); (2) Phragmites control; (3) Restoration and management of high-level, high-salinity coastal impoundments; (4) Beaver management plan; (5) restoration and management of low-salinity coastal impoundments in urban areas; and (6) wetland improvement projects on state lands (see case example for details). Division of Water Resources, Wetlands and Aquatic Protection Branch also promotes a wetland program for nonstructural erosion control.
5b. Education and awareness	yes		X				DSWC/DCMP: Secondary school programs on wetlands; "adopt-a-wetland" program; public access guide for waters; interpretive exhibits; DPR plays major role in wetland and environmental education, including the DNERR public program.
6. COORDINATION TOOLS							Comments
6a. Joint state-federal permit applications/notices	no						
6b. Interagency coordination forums/preapplication meeting	yes	X					Monthly meeting since 1984 (Joint Permit Processing Group); process needs improvements (Moyer 1996)
6c. Memoranda of agreement (MOAs and MOUs)	yes		X			EO 56 (1988)	At state level, EO requires agreements between DDOT, DDAgriculture, and Office Of Development

D. "ON-THE-GROUND" OUTCOMES OF POLICY IMPLEMENTATION

INTRODUCTION

CZM policy implementation using the estuary and wetland protection processes and tools described in table C-2 can, in some cases, be tracked "on the ground" by monitoring selected "outcome indicators." *Outcome indicators are defined here as the on-the-ground results of implementation decisions that express themselves geographically and are subject to some degree of measurement as either areas (square miles, acres, etc.), points (numbers) or lines (miles, feet, or other lengths).* An example of an outcome indicator might be the area of wetlands lost due to filling or dredging compared to the area of wetland replaced through compensatory mitigation. Other examples might be the area of coastal wetland protected through zoning in local plans or SAMPs, the area of wetland acquired through fee-simple purchase or through conservation easements, or the area of former wetland restored to a functioning system. Outcomes are described below for four categories of processes and tools described in Part C (Regulatory, Planning, Acquisition, and Nonregulatory). These are preceded by a discussion of data availability in the state.

1. OUTCOME MONITORING AND RECORD-KEEPING

Much of the information for outcomes is derived from databases, GIS output, published data reports, and similar quantitative state-level record-keeping. State record-keeping related to selected outcome indicators are listed in table D-1, including available databases and GIS layers and analysis capabilities. Below is a brief assessment of the adequacy of state-level data and record keeping relative to the needs of this project and possible future outcome monitoring.

Delaware maintains a permit tracking database for Wetlands and Subaqueous Lands permits, but currently does not have "area impacted" data, violations, or compensatory mitigation data, so trends analysis is not possible. Permit administrators in WSLS are in the process of revising their database, with EPA assistance, to include all this information and more so as to be able to assess cumulative impacts. Since 1993, the DSWC has maintained a federal consistency database using dBASE IV and is now converting it to GIS using ArcView. Permitted projects will be geographical referenced. Delaware is also one of the test states for the NOAA-SEA COMPAS GIS/database program. Currently, a pilot project in three watersheds, including the St. Jones and Lower Blackbird Creek watersheds in the new Delaware National Estuarine Research Reserve, is underway to begin to track wetland alterations and nonpoint source pollution problems.

Table D-1. Databases, GIS layers, and other data records for Delaware.

Cover/File	Description	Source	Base Scale	File size	Comments
Wetlands-Subaqueous Lands database	Permit tracking	DNREC, Wetlands and Subaqueous Lands Section	na		# of permits; no area data; with USEPA, in process of updating & improving database
Federal consistency database	Consistency decision tracking	DNREC, Division of Soil and Water Conservation (DCMP)	na		began in 1993; currently dBASE IV but migrating to ArcView; no area data in database
COMPAS	numerous data layers to be developed	DNREC, DSWC (DCMP)			Not fully operational; new pilot project underway for three watersheds

2. REGULATORY PROGRAM OUTCOMES

The principal state regulatory tools for estuary and wetland protection are the Wetlands Act (tidal wetlands) and the Subaqueous Lands Act (lands under tidally-flowed or navigable waters). Both laws are administered by the Wetlands and Subaqueous Lands Section of DNREC's Water Resources Division. Some protection for freshwater wetlands is provided through E.O. 56 and through federal consistency and CWA Section 401 water quality certification of USACOE 404 permits. All federal nationwide permits (NWP) through NWP 26 have been waived by Delaware, in effect leaving the permit decision up to the USACOE. For recently-issued NWP 29 (single family dwellings on wetlands), however, Delaware has denied certification, leaving 401 certification decisions to be made on a case-by-case basis.

Tidal wetlands were lost at a rate of 444/acres per year between 1954-71 (Lessor 1971). Tidal wetland loss associated with human activities decreased to about 20 acres per year between 1973-79, the reduction being attributed in part to implementation of the 1973 Wetlands Act (Hardisky and Klemas 1983). Section 404 of the Clean Water Act was also being implemented at this time. The DCMP was approved in 1979. Combined Wetlands Act-Subaqueous Lands Act "permits-approved" data are listed in table D-2, but no data are available on tidal wetland area lost due to permitting, mitigation required, or violations. WSLS estimates that 90% of the permits numbers are SLA permits (as opposed to wetlands), that most of the wetland permits are for boardwalk crossings over wetlands, and that actual filled or dredged wetland area is minimal in recent years. Nevertheless, with no actual outcome data, it is difficult to assess the impacts of Delaware's estuary and wetland protection laws and the impact that the DCMP creation in 1979 had on further reducing human impacts on tidal wetlands. WSLS is in the process of developing a more sophisticated permit and violations monitoring program that tracks subaqueous land or wetland type, area impacted, and functions impacted and similar data on mitigation that is required under federal permits. This data, combined with periodic wetland change analysis from photointerpretation, will allow a better assessment of the effectiveness of regulatory (and restoration) programs in protecting Delaware's tidal wetlands.

What is more certain is that the DCMP and associated policies, lacking significant controls on human activities in freshwater wetlands, has had little impact on protection of these resources. There was roughly a 20% loss of nontidal freshwater wetlands from the mid-1950s through the late 1970s (about 1,500 acres net loss per year), mostly due to agricultural conversion, drainage and channelization, and forestry practices (Tiner 1985, 62; Tiner and Finn 1986). At the same time, there was a 30% gain in ponds. No freshwater wetland loss data are available for the period the DCMP has been in effect, but digitization of the 1988-based NWI update, due in 1997 (Moyer 1996), should allow such calculations. Losses may be increasing in some areas due to extensive development pressures, particularly in eastern Sussex County.

3. PLANNING PROGRAM OUTCOMES

Delaware has not made significant use of planning tools in their efforts to protect estuaries and coastal wetlands. Local governments regulate land use and, under the Land Use Planning Act, must notify the state if development may impact a tidal or nontidal wetland. For tidal wetlands, this may lead to the state assuming jurisdiction over the project, but for nontidal wetlands, the state's lack of authority or enforceable policies results in little impact on local land use decisions. Delaware is in the process of developing its first special area management plan (SAMP) for Pea Patch Island. This area, the largest colonial nesting bird rookery north of Florida, is home to nine species with up to 12,000 nesting pairs. One priority issue for the planning is pesticide use that threatens the birds. Two other planning efforts for wetlands now underway are also important. The first is the development of Comprehensive Conservation and Management Plan for tidal wetlands with Division of Fish and Wildlife as lead agency. This CZM-funded plan will serve as statewide policy guidance and does not have any specific on-the-ground zoning or other protections. The second effort is a similar EPA-funded policy plan for nontidal freshwater wetlands, with Division of Water Resources the lead agency. There are no area-based CZM plans in place in Delaware, so there are no on-the-ground protection data available.

Table D-2. Indicators of on-the-ground protection provided by Delaware's Wetlands Act **regulatory** actions for tidal wetlands 1976-95 (DNREC 1996).

PROCESS OR TOOL OUTCOME	YEAR																				
	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	Total
1. Permits (#)																					
2. Approved (#)	62	166	105	111	113	182	209	249	305	296	258	287	351	245	365	285	333	282	317	303	4,824
3. Denied (#)																					
4. Violations (#)																					
5. Buffers req'ed (# or length)																					
6. Wetlands Lost (acres)																					
7. Wetlands Replaced (acres)																					
8. Violation Losses (acres)																					
9. Net loss/gain (-6+7-8)																					

Notes: Permits approved data includes both Wetland Act (~10% of total) and Subaqueous Lands Act permits (~90%); no area or other data available (Moyer 1996).

4. ACQUISITION PROGRAM OUTCOMES

By law, Delaware's tidelands (MHW to MLW) are privately owned. This has made acquisition of these areas (mostly tidal wetlands) a high priority protection strategy (Vickers 1996). As of 1985, there were approximately 42,630 acres of tidal wetlands were in federal, state, and private conservation group ownership: Division of Fish and Wildlife and Division of Parks and Recreation (combined 14,000 acres), USFWS (20,930 acres in two refugees), Delaware Wildlands, Inc. (about 7,700 acres) (Tiner 1985). At present, about 53,800 acres of coastal wetlands are owned and managed by public and private entities. The Division of Fish and Wildlife and Division of Parks and Recreation combined manage about 20,000 acres; the USFWS owns and manages another 22,000 acres of wetlands in two refuges; Delaware Wild Lands, Inc. owns about 10,000 acres; and The Nature Conservancy about 1,800 acres (Vickers 1996).

Since 1978, under the Natural Areas Preservation System Act, Delaware has been protecting critical areas (including an unspecified area of tidal and freshwater wetlands) by means of purchase, conservation easements, and other nonregulatory techniques. In 1990, under the Land Protection Act, 20 State Resource Areas (SRAs) were established by consolidating state natural area holdings. $47 million in bonds and direct legislative appropriations have been provided for purchasing land or easements to set up these areas. It is not known how much of this area is wetlands. The 21st Century funding makes an additional $40 million available over seven years beginning in 1996 for open space purchases. CZM funded a state survey crew ($45,000 for 3 years) who have been vital for surveying state wetland purchased and planned for purchase by DPR.

Table D-3. On-the-ground protection of estuaries and coastal wetlands through DCMP-related ***acquisition*** programs.

TOOLS & OUTCOMES	Tidal and Nontidal Wetland Acquired (acres)
Fee simple acquisition with CZM$	none
Less-than-fee acquisition with CZM$	none
Fee simple acquisition with other $	5,575 acres since 1990
Less-than-fee acquisition with other $	100 acres, including 25 acres salt marsh, 45 acres nontidal fresh marsh, and 30 acres nontidal forested scrub-shrub.
Total Area	5,675 acres

5. NONREGULATORY PROGRAM OUTCOMES

Division of Fish and Wildlife has six major restoration programs, all funded in full or part by DCMP: (1) Open Marsh Water Management (OMWM); (2) Phragmites control; (3) Restoration and management of high-level, high-salinity coastal impoundments; (4) Beaver management plan; (5) restoration and management of low-salinity coastal impoundments in urban areas; and (6) the Wetland Improvement Project on State Wildlife Lands (WIPSWA). These are listed in table D-5 and are detailed in the case example in Section E.

Division of Water Resources, Wetlands and Subaqueous Lands Section also promotes a wetland creation program for nonstructural erosion control. No data are available on shoreline miles or area created through this program.

Table D-5. On-the-ground restoration or enhancement of estuaries or wetlands through ***nonregulatory restoration projects***.

OUTCOME DATA	# sites	Area (acres)	Participating partners & projects	Total $ expended	Type of Wetlands (Key)	Comments (time frame, location, etc.)
Northern Delaware Wetland Restoration Program	4	1,610	• DFW • DSWC • New Castle Conservation District	$100K CZM over 2 years	tidal low-level impound-ments	27 additional sites identified; 6 on high priority list; involved watershed-based planning
Open Marsh Water Management	many	5,000	DFW	$400K CZM over 4 years	tidal	restore grid-ditched areas to multiple functions; eventual goal is 15,000 acres restored of 45-60,00 acres impacted
Phragmites control	~20-30	6,000-8,000	DFW & private and public owners; Public Service Electric and Gas (PSE&G)	$280K CZM over 4 years (have $1.9 million for 4,600 a. more)	tidal	one-third of all tidal wetlands ditched; herbicide/burn method developed; led to state program
PSE&G	1	1,000	DFW	No CZM $		restored impoundments
Wetland Improvement Project on State Wildlife Lands (WIPSWA)	2	40-50	DFW, DDOT, Solid Waste Authority	$ one-year CZM grant to identify restoration areas on state land	tidal and nontidal	identified 20 potential WIPSWA restoration projects (400-500 acres total); will help DDOT and DSWA mitigate impacts
TOTAL NUMBERS & AREAS	27-37+	13,650+	na	CZM: $830,000	na	na

KEY: SM - salt marsh; TFM - tidal fresh marsh; TFSS - tidal swamp; TF - tidal flat; SAV - submerged aquatic vegetation; TOW - tidal open water; NFM - nontidal fresh marsh; NFSS - nontidal swamp; NOW - nontidal open water

E. CASE EXAMPLES OF SUCCESSFUL PROCESSES AND TOOLS

DE-1: WETLAND RESTORATION AND REHABILITATION PROGRAM

Description

The Division of Fish and Wildlife has successfully used CZM funds for six research and demonstration projects: (1) Open Marsh Water Management (OMWM); (2) Phragmites control; (3) Restoration and management of high-level, high-salinity coastal impoundments; (4) Beaver management plan; (5) Restoration and management of low-salinity coastal impoundments in urban areas; and (6) Identification and implementation of wetland improvement projects on State Wildlife Lands. Each of these are briefly described below with the problem, the program, its results, and CZM funding.

Open Marsh Water Management (OMWM)
Problem: grid ditching and heavy insecticide use for mosquito control had degraded 45,000-60,000 acres of Delaware's 90,000 acres of tidal marsh.
Program: OMWM involved the development and implementation of environmentally-compatible ponding and ditching techniques to control saltmarsh mosquito breeding, reduce the amount of insecticide use (80% reduction target), and at the same time provide habitat restoration benefits for waterfowl, wading birds, and fishes. Ultimate goal is to restore 15,000 acres.
Results: 5,000 acres of high-level impoundments had been restored to multiple functions by 1996.
CZM Funding: $100,000 per year for four years.

Phragmites Control
Problem: Over the past 40 years, *Phragmites australis* (common reed) has invaded and degraded spartina marshes (cordgrass) such that it is now monodominant over 11% of tidal wetlands and codominant on an additional 22% (DCMP 1992a)
Program: This project developed and refined a herbicide-and-burn technique to control the spread of phragmites and allow impacted areas to revert to spartina.
Results: This project led to a 50:50 state-funded cost-share program with private landowners, with about 6,000-8,000 acres treated thus far on 20-30 sites. DFW seeks to expand this program in a more area-wide comprehensive program, beginning in the Lower Blackbird Creek marsh (DNREC 1994). Based on a settlement with a New Jersey nuclear power plant (Public Service Electric and Gas), $1.9 million will be used to treat an additional 4,600 acres in Delaware.
CZM Funding: $70,000 per year for four years

Restoration and management of high-level, high-salinity coastal impoundments
Problem: About 10,000-12,000 acres of Delaware's tidal marshes are in high-level impoundments, established in the 1950s and 1960s to enhance waterfowl habitat, provide for hunting, and control saltmarsh mosquitoes. However, the impoundments also impacted other birds and wildlife, marine fishes (menhaden, mullet, many others). Eventually, salinity buildup killed marsh plants, leaving open mudflats.
Program: This project involved the development, evaluation, and implementation of water management, mainly the restoration of some tidal exchange, to provide for multiple marsh functions at different times of the year (Meredith 1996).
Results: This project led to development of techniques and other funding provided for a manual for high-level marsh impoundment management. No data on wetland area restored to multiple functions are available.
CZM Funding: $40-50,000 per year for three years; funding no longer available.

Beaver Management Plan
Problem: Beaver have made a dramatic comeback over the past several decades. Their resurgence has created a variety of land use and other conflicts related to transportation, agriculture, and rural residence.
Program: Develop a collaborative plan with agencies and affected interests.
Results: The goal of the plan is to achieve and maintain a maximum sustainable population of beavers and their associated wetland habitats located and managed to minimize human-beaver conflicts. A variety of active and passive measures are to be used (DFW 1991). No data are available yet on wetland habitat preserved or new beaver wetlands created, based on plan implementation.
CZM Funding: $35,000 to develop the plan.

Restoration and management of low-salinity coastal impoundments in urban areas
Problem: 10,000 acres of tidal freshwater and brackish marshes along the Christina and Delaware Rivers in northern Delaware have been degraded by low-level impoundments constructed as early as the 17th century and subsequent filling of areas for urban development.
Program: The Northern Delaware Wetlands Rehabilitation Program (NDWRP) has identified 31 sites totaling about 10,000 acres for nonregulatory restoration, has developed a watershed-based plan with agency and public involvement.
Results: In its first success story, the 210-acre Broad Dyke Marsh has had a sophisticated water control structure installed to control flooding of upland property while regaining marsh functions. More than 1,400 other acres of

marsh have been restored at three other sites, six other sites are targeted in a "top ten" list, and 21 additional sites are slated for eventual restoration.
CZM Funding: $50,000 per year for two years.

Wetland Improvement Project on State Wildlife Lands (WIPSWA)
Problem: State-managed wildlife lands have many degraded wetland areas with potential for restoration.
Program: DFW initiated a planning effort using CZM funds to identify potential restoration actions for wetlands on state wildlife lands and make them available for restoration as funds became available.
Results: DFW identified 20 sites on state wildlife lands totaling more than 400 acres that have potential for wetland restoration. Subsequently, they have worked with DDOT and the Delaware Solid Waste Authority to identify sites they can use as mitigation for highway and landfill project impacts. Two projects (~40 acres) have been constructed by mid-1996.
CZM Funding: $50,000 to develop WIPSWA.

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Appendix A: Delaware State Profile

APPENDIX B

Sample State CZM Evaluation—DELAWARE

NATIONAL CZM EFFECTIVENESS STUDY
STATE DATA ANALYSIS AND EVALUATION PROCEDURE
Estuary and Coastal Wetland Protection

DELAWARE

Once all available process and outcome data for states are collected and state CZM profiles developed, each state can be evaluated for *effectiveness* relative to the CZMA objective of protecting estuaries and coastal wetlands. Each state is evaluated in comparison to an "ideal" state program relative to the estuary and coastal wetland protection issue. This hypothetical ideal program was derived in part from a determination of the "most important processes and tools" for estuary and coastal wetland protection, as described in the Methodology part of the main report. The ideal program is described in narrative form in figure 1 and in terms of criteria for program evaluation in the Methodology section. The state effectiveness evaluation consists of four steps. The basic steps are listed below, followed by a more detailed worksheets for each. Data for the worksheet tables is drawn from state profiles. The ratings are used to standardize the evaluation process, with *HIGH, MODERATE, and LOW* ratings defined and used, where data are available; an *INCONCLUSIVE* rating is assigned when data are not available or insufficient. The steps in the state evaluation process are:

Step 1: Evaluate issue importance in the state

Step 2: Evaluate process effectiveness of the state program

Step 3: Evaluate outcome effectiveness based on available data

Step 4: Synthesize and evaluate state CZM program effectiveness overall

State CZM Effectiveness Evaluation
STEP 1: ISSUE IMPORTANCE WORKSHEET

Introduction
The importance of estuary and coastal wetland protection as an issue in each state is estimated based on a number of social and environmental factors for the coastal zone. These include estuary area, wetland area and historic wetland loss, population density, and 1970-1990 population change. Perceptions of issue importance by state officials interviewed during data collection are also included as indicators.

Use of the Issue Importance Estimate
Estimates of issue importance in each state are used as a guide for what to expect for CZM program emphasis, scope, and sophistication. For example, if there are large estuary and wetland areas in a state's coastal zone and coastal development pressure is high, the issue would likely be of high importance. In this case, one would expect the state to have robust estuary and wetland protection policies, use a range of tools, and implement them effectively as evidenced by on-the-ground outcomes. On the other hand, if a state has few wetlands with minimal historic loss, and there is low population and little growth, estuary and wetland protection is not likely to be a high CZM program priority. Expectations for the CZM program for such a state would be significantly lower.

Step 1.1 (a) Using the table of state data for issue importance indicators and the rating class criteria below, record issue importance class for each of the indicators on table 1.

Issue importance indicator rating classes and criteria used to assess the relative importance of the *estuary and coastal wetland protection* in coastal states.

ISSUE IMPORTANCE INDICATORS	ISSUE IMPORTANCE RATING CLASSES[1]		
	High Importance (3)	Moderate Importance (2)	LowImportance (1)
	Range of Values	Range of Values	Range of Values
ESA:CZA[2]	>0.35:1	0.06-0.35:1	<0.06:1
WET:CZA[2]	>0.30:1	0.10-0.30:1	<0.10:1
%Loss	>40%	20-40%	<20%
PopD	>500 persons/mi^2	150-500 persons/mi^2	<150 persons/mi^2
%PopC	>50%	20-50%	<20%
Impt1	Data collection process rated	Data collection process rated	Data collection process rated
Impt2	Data collection process rated	Data collection process rated	Data collection process rated

[1] Class ranges are based on spread sheet analysis of data for selected social and environmental context factors in each state, followed by grouping of states into three categories based on cluster analysis and other factors. Indicator definitions and data sources are below.
[2] Ratio used because consistent data were not available to estimate the % of entire coastal zone (land and water) that was either estuarine surface area or coastal wetland

INDICATOR	DEFINITION AND DATA SOURCE
ESA:CZA	Ratio of estuarine surface area to coatal zone land area (NOAA 1985; NOAA 1992; state profiles
WET:CZA	Ratio of all coastal wetlands to coastal zone land area (NOAA 1991; NOAA 1992); state profiles
%Loss	Percent historic (pre-CZM) wetland loss (Dahl 1990; state profile sources)
PopD	Coastal county population density in 1990 (per sq. mi.) (NOAA 1992; NOAA data sheet)
%PopC	Percent coastal county population change from 1970 to 1990:(NOAA 1990; NOAA data sheet)
IMPT1	Issue importance at CZM program approval (source is this study survey)
IMPT2	Issue importance evolution up to the present (source is this study survey)

Table 1. Issue importance factors for the State of DELAWARE

Importance Indicators	Value for state	Rating class and number	Comments
ESA:CZA	365/2057 mi^2 = 0.19:1	M (2)	Atlantic coastal inland bays; Delaware Bay is additional 100 sq mi
WET:CZA	346/2057 mi^2 = 0.17:1	M (2)	NWI data (Tiner 1985)
%Loss	> 40%	H (3)	tidal (20% loss & 40-60% degraded) and nontidal fresh (40-50% loss)
PopD	333 persons/sq mi	M (2)	population concentrated mostly near coast from north to south
%PopC	22% from 1970-90	M (2)	significant residential pressure in SE
Impt1	Moderate	M (2)	from state profile
Impt2	High	H (3)	from state profile
Mean Score		M (2.29)	MODERATE, with significant estuarine areas, high historic loss of wetlands, development pressure along southern beaches and inland

INDICATOR	DEFINITION AND DATA SOURCE
ESA:CZA	Ratio of estuarine surface area to coatal zone land area (NOAA 1985; NOAA 1992; state profiles
WET:CZA	Ratio of all coastal wetlands to coastal zone land area (NOAA 1991; NOAA 1992); state profiles
%Loss	Percent historic (pre-CZM) wetland loss (Dahl 1990; state profile sources)
PopD	Coastal county population density in 1990 (per sq. mi.) (NOAA 1992; NOAA data sheet)
%PopC	Percent coastal county population change from 1970 to 1990:(NOAA 1990; NOAA data sheet)
IMPT1	Issue importance at CZM program approval (source is this study survey)
IMPT2	Issue importance evolution up to the present (source is this study survey)

RATING KEY

H (3) - Data indicate issue should be of *High Importance* in this state
M (2) - Data indicate issue should be of *Moderate Importance* in this state
L (1) - Data indicate issue should be of *Low Importance* in this state

MEAN SCORE INTERPRETATION

1 to 1.66 = Overall *Low Importance* in this state (row)
1.67 to 2.33 = Overall *Moderate Importance* in this state(row)
2.33 to 3 = Overall *High Importance* in this state(row)

State CZM Effectiveness Evaluation
STEP 2: PROCESS INDICATOR EVALUATION WORKSHEET

During state data collection, the processes and tools states use to implement CZM policies and programs for estuary and wetland protection were identified, rated as to importance for estuary and wetland protection (high, moderate, low importance in state profile Tables C-1 and C-2). Estuary and wetland protection processes and tools were divided into six categories: Information/Research, Regulatory, Planning, Acquisition, Nonregulatory, and Coordination. After all tools used by a state were identified and rated as to importance, the top tools were ranked 1 to 5. For each state, these were considered to be the most important processes or tools for estuary and coastal wetland protection.

These ratings and rankings were then aggregated for all states (see table 4-7 in the full report) and the results of this aggregation defined the set of tools that are most important collectively or nationally. These most-important processes and tools had two applications. First, they were used as input to define an *idealized state CZM program* relative to the issue of estuary and coastal wetland protection. This is described in narrative form in figure 4-1of the main report. Second, the most important processes and tools were used to develop criteria and scaling factors for (1) process indicator ratings, (2) process and tool summary ratings, and (3) process and tool overall ratings. These criteria are outlined below. The resulting state process evaluations provide a crude measure of *state CMP potential* for protecting estuaries and coastal wetlands as compared to the idealized CMP. They also create expectations for specific data for outcome evaluations. For example, if a state rates its tidal wetland regulatory program as High Importance for estuary and wetland protection, it would be expected that there would be on-the-gound outcome data to support that, such as area lost through permitting, and area regained through compensatory mitigation, assuming they had such a policy.

STEP 2.1 Transfer data from *State Profile Table C-1* on tool use, importance, and ranking to table 2 below.

STEP 2.2 For each of the six major categories of processes and tools (table 2), assign an OVERALL RATING using the *overall process and tool rating criteria* on the following page. Enter overall rating in the appropriate cell in table 2 . Include clarifying comments or qualifications in comments section and also note if program emphasis is TIDAL, NONTIDAL or BOTH.

STEP 2.3 Enter overall rating data in tables 4.

Table 2. Qualitative assessment of CZM effectiveness in DELAWARE based on process indicators: policies, processes, and tools.

CZM PROCESS OR TOOL	Used (yes)	How much?		State Rank	CZ USE RANK (1-5 H-L)	How effective? Notes
1. INFO/RESEARCH TOOLS RATING					H	Strong mapping program for tidal; good USFWS mapping for nontidal; database but no area data, no GIS to date
1a. Inventory and mapping	yes	H		5		
1b. Wetland functions assessment	yes	L				
1c. Wetland change monitoring	no					
1d. GIS, database, records	yes	L				
2. REGULATORY TOOLS RATING Percent of (1) tidal wetlands/waters or (2) nontidal wetlands in CZ covered under regulatory jurisdiction		Tidal 100%	Nontidal <10%		Tidal H	Nontidal M	*Only freshwater wetland >400 ac & nontidal waters covered; use fed. Consist./401 as alternative;* strong tidal wetlands program since 1970; FC now more important for FW wetlands
2a. State tidal wetlands permit	yes	H	n/a	1		
2b. State nontidal wetlands permit	yes	n/a	L			
2c. Local tidal or nontidal wetland permit	no					
2d. General permits/exemptions	yes	M	L			
2e. Federal consistency standards *in lieu*[3]	yes		H	4		
2f. State consistency standards *in lieu*[3]	yes		M			
2g. State CWA 401 certification *in lieu*[3]	yes		L			
2h. State tideland lease regulation *in lieu*[3]	no					
2i. Environmental impact assessment	yes	H				
2j. Non-water-dependent exclusion/limit	yes	H				
2k. Single-purpose dock exclusion/limit	yes	L				
2l. Other use exclusions/limits	yes	H				
2m. Compensatory mitigation required	no					
2n. Compliance monitoring/enforcement	yes	H				
2o. Mitigation banking	no					
2p. Development setback or buffer	yes	L				
3. PLANNING TOOLS RATING					H	local planning not well integrated into wetlands; just beginning a SAMP
3a. Land use planning /zoning	yes	L				
3b. Special area mangt. plan (SAMP)	no					
3c. GAPC, AECs, Critical Areas, MPAs	yes	L				
3d. Advanced Identification Plans (EPA)	no					

Table 2. Qualitative assessment of CZM effectiveness in DELAWARE based on process indicators: policies, processes, and tools (con't).

CZM PROCESS OR TOOL	Tool Used	How Important	State Rank	CATEGORY RATING	Process Effectiveness Notes
4. ACQUISITION TOOLS RATING				H	private ownership to MLW; major effort to purchase private-held tidal wetlands and some FW wetlands
4a *Fee simple*[4] acquisition with CZM$	no				
4b.*Less-than-fee*[4] acquisition with CZM$	no				
4c. *Fee simple* acquisition with other $	yes	H	2		
4d. *Less-than-fee* acquisition with other $	yes	L			
5. NONREGULATORY TOOLS RATING				H	major efforts in six areas stimulated by federal CZM $ for restoration research and demonstrations
5a. Restoration/enhancement (non-reg.)	yes	H	3		Case example
5b. Education and technical assistance	yes	L			
6. COORDINATION TOOLS RATING				H	especially important in restoration and regulatory re state and federal consistency
6a. Joint state-federal permit application	no				
6b. Interagency pre-application meetings	yes	H			
6c. Memoranda of agreement	yes	M			
OVERALL PROCESS INDICATOR RATING				H M	HIGH for tidal; MODERATE for nontidal due to lack af regulatory program

NOTES:

[1]For Regulatory processes and tools, importance ratings in this column are broken into tidal and nontidal if separate or only one or the other exists; if a single program covers both tidal and nontidal, the same rating is used for each.

[3]All states use federal consistency and 401 certification, but for evaluation purposes, only states that use state consistency or 401 criteria *in lieu of a permit program* (2a - 2c.) are recorded here.

[4]Fee simple acquisition is outright property purchase; less-than-fee acquisition includes purchase or donation of conservation easements, purchase of development rights, tax deferrals, etc.

PROCESS AND TOOL CATEGORY RATING CRITERIA FOR TABLE 2.

Note: References to 1a, 1b, 2a, 2b, etc. in rating criteria below refer to individual tools listed in first column of table 2.

INFO/RESEARCH TOOLS RATING:

HIGH

■ If **H** for 1a, and **H** or M for one other tool or L for two tools

MODERATE

❒ If 1a is M and two or more other tools are M

❒ If 1b, 1c, 1d have at least one H and one M among them

❒ Other combinations not H or L

LOW

❒ If 1a is M or L, and M for one tool or L for at least two or more tools

❒ If 1a is L, and only one other tool >L

REGULATORY TOOLS RATING (apply to tidal and nontidal separately or jointly as appropriate)

HIGH

❒ 2a (and/or 2b), 2m, and 2n are H

❒ 2c, 2m, and 2n are H

❒ 2e, 2m, and 2n are H

■ 2a (and/or 2b) or 2c or 2e are H, either 2m or 2n are H, and at least one other is H ***(TIDAL)***

MODERATE

❒ 2a (and/or 2b), 2m, and 2n are M

❒ 2c, 2m, and 2n are M

❒ 2e, 2m, and 2n are M

❒ 2a (and/or 2b) or 2c or 2e are M, either 2m or 2n are H, and at least one other is M

■ Other combinations not H or L ***(NONTIDAL)***

LOW

❒ 2a (and/or 2b) is M and no other M or higher

❒ 2c is M or L, and no other M or higher

❒ 2e is H, M or L, and no other M or higher

HIGH

❒ If H for either 3a, 3b, or 3c

MODERATE

❒ If no H, and M for either 3a, 3b, 3c

❒ Other combinations not H or L

LOW

■ If no **H** or M, and **L** for either 3a, 3b, 3c

ACQUISITION TOOLS RATING

HIGH

■ If H for 4c

❒ If H for either 4 a, 4b, or 4d, and M for 4c.

MODERATE

❒ If M for 4c

❒ If at least M for either 4 a, 4b, or 4d, and L for 4c.

❒ Other combinations not H or L

LOW

❒ If no H or M, and L for 4a, 4b, 4c, or 4d.

NONREGULATORY TOOLS RATING:

HIGH

■ If H for either 5a or 5b and M or L for other

MODERATE

❒ If no **H**, and M for either 5a or 5b

❒ Other combinations not H or L

LOW

❒ If no H or M, and L for either 5a or 5b

COORDINATION TOOLS RATING

HIGH

■ If H for either 6a, 6b, 6c

MODERATE

❒ If no H, and M for either 6a, 6b, 6c

❒ Other combinations not H or L

LOW

❒ If no H or M, and L for either 6a, 6b, 6c

PLANNING TOOLS RATING:

OVERALL PROCESS AND TOOL RATING CRITERIA FOR PROGRAM IN TABLE 2

Apply separately to TIDAL and NONTIDAL

HIGH

■ If Regulatory **H** and three of Info/Research, Planning, Acquisition, and Restoration are H, and Coordination M or L ***(TIDAL)***

❒ If Regulatory H and two of Info/Research, Planning, and Acquisition are **H**; Coordination M or L; and Issue Importance indicator "%LOSS" is L (table 1)

MODERATE

❒ If Regulatory M and three of Info/Research, Planning, Acquisition, and Restoration are at least M, and Coordination M or L

❒ If three of Info/Research, Regulatory, Planning, and Acquisition are all M; Coordination M or L; and Issue Importance indicator "%LOSS" is L (table 1)

■ Other combinations not HIGH or LOW ***(NONTIDAL)***

LOW

❒ If Regulatory L and at least two of Info/Research, Planning, Acquisition, Restoration and Coordination are L or not used

❒ If at least two of Info/Research, Regulatory, Planning, Acquisition, and Coordination are L; and Issue Importance indicator "%LOSS" is L (table 1)

State CZM Effectiveness Evaluation
STEP 3: ON-THE-GROUND OUTCOME INDICATOR WORKSHEET

Of the six categories of processes and tools examined in this study, only four result in on-the-ground outcomes as defined here: Regulatory, Planning, Acquisition, and Nonregulatory. Even within these four categories, only selected processes/tools were deemed to have outcome indicators that can be measured on the ground. On-the-ground outcomes for these selected processes and tools are rated using "on-the-ground outcome criteria." If a process or tool is used in a state, and data are available for a particular outcome indicator, it receives a *HIGH, MODERATE, or LOW* rating based on the data. If a tools is used and data are not available, it gets an *INCONCLUSIVE* rating.

Development and Use of Rating Criteria for Outcome Indicators
Data for outcome indicator rating comes from Part D of the State Profile. For each of the indicators in each category—Regulatory, Planning, Acquisition, Nonregulatory Restoration—available data are used to assign a rating based on the listed criteria. The criteria were developed from review of states who used a particular tool; an "H" rating is based on *reference standards,* which were derived using a combination of best professional judgement and actual empirical results from states with strong programs relative to each indicator. "M" and "L" ratings were determined by dividing the reference standard into three roughly equal classes. An "I" means that data are inconclusive, usually because a state does not keep records on this indicator or available data are insufficient. It is important to note that we did not ask the states to do extensive work to develop a data set; instead, we relaied on available or easily-compiled data.

Use of the Outcome Evaluation Data
The outcome effectiveness evaluation for a state helps determine whether or not the potential of a program— based on the policies, processes, and tools it uses to manage wetlands—has been achieved. It is based on on-the-ground indicators or measures (see definitions earlier in text). Process indicators merely suggest what a program could be. Outcome indicator data are proof positive that processes and tools are working as envisioned. Without substantial outcome data, effectiveness evaluations are rated *INCONCLUSIVE*, often with qualifications.

STEP 3.1 Fill out the on-the-ground worksheet below for the applicable outcome indicators (see state profile for data) and enter the results in table 3. For each process or tool category, the relevance of the tool for outcome evaluation is described, followed by indicators. *Where tool used but no data available, record outcome result as inconclusive (I).*

STEP 3.3 Assign Summary and Overall Ratings within table 3 using the criteria listed below following table 3.

STEP 3.4 Transfer the results recorded in table 3 to tables 4.

REGULATORY OUTCOME INDICATORS (RG)

A *regulatory permit program* for a specific jurisdictional area provides a degree of on-the-ground protection for the covered habitats. The actual protection provided relates directly to specific regulatory requirements, the level of enforcement as indicated by *violations* data, the types of penalties for violations. If *compensatory mitigation* is required for permitted losses, overall protection increases. Federal and/or state consistency programs, and CWA Section 401 water quality certification programs, when used in lieu of an actual regulatory permit program, serve similar purposes, but may not provide as strong a degree of protection for affected habitats. For evaluating program effectiveness, geographic area of program jurisdiction (tidal versus nontidal), exemptions, and other policy information area addressed as part of the process indicator evaluation. For outcome indicator purposes, data is presented for the appropriate regulatory tool and jurisdiction area indicated below.

REGULATORY RATING PROCEDURE

For each of the regulatory program outcome indicators below, check the appropriate area of jurisdiction box and assign ratings as appropriate. If you have data from two separate programs (e.g., one for tidal wetlands, one for nontidal), make one rating for each program for each outcome; if there is a single program covering both areas, just fill indicator and transfer that rating to both tidal and nontidal columns in table 3. If a regulatory tool s used for an area, but there are no data available to make a rating, assign an "I."

RG1 AREA OF ANNUAL PERMITTED LOSS/YEAR (as % of all jurisdictional waters/wetlands)

Rating Criteria	Applicable Area of Jurisdiction	Rating
H - <0.1%	❒ Both tidal and nontidal wetlands	_____
M - 0.1-1%	■ Tidal wetlands only	I
L - >1%	■ Nontidal wetlands only	I
I - Inconclusive (insufficient data)		

RG2 AREA OF ANNUAL VIOLATIONS LOSS/YEAR
(as % of all jurisdictional waters/wetlands *or* number/year as % of all permits)

Rating Criteria	Applicable Area of Jurisdiction	Rating
H - < 0.01% area or <5% number	❒ Both tidal and nontidal wetlands	_____
M - 0.01-0.1% area or 5% - 10% number	■ Tidal wetlands only	I
L - >0.1% area or >10% number	■ Tidal wetlands only	I
I - Inconclusive (insufficient data)		

RG3 AREA OF COMPENSATORY WETLAND MITIGATION replace (as % of RG1 losses)

Rating Criteria	Applicable Area of Jurisdiction	Rating
H - 90-100%	❒ Both tidal and nontidal wetlands	_____
M - 75-89%	❒ Tidal wetlands only	_____
L - <75%	❒ Nontidal wetlands only	_____
I - Inconclusive (insufficient data)		

RG4 TREND IN PERMITTED LOSSES (change in acres/permit/year)

Rating Criteria	Applicable Area of Jurisdiction	Rating
H - >60% decrease over a 5-yr interval	❒ Both tidal and nontidal wetlands	_____
M - 30-60% decrease over a 5-yr interval	■ Tidal wetlands only	I
L - >30% decrease over a 5-yr interval	■ Tidal wetlands only	I
I - Inconclusive (insufficient data)		

RG5 TREND IN VIOLATIONS LOSSES (change in area/permit/year *or* number/year)

Rating Criteria	Applicable Area of Jurisdiction	Rating
H - >60% decrease over a 5-yr interval	❒ Both tidal and nontidal wetlands	_____
M - 30-60% decrease over a 5-yr interval	■ Tidal wetlands only	I
L - >30% decrease over a 5-yr interval	■ Tidal wetlands only	I
I - Inconclusive (insufficient data)		

RG6 TREND in CWM (change in % mitigated/year)

Rating Criteria	Applicable Area of Jurisdiction	Rating
H - >60% increase over a 5-yr interval	❒ Both tidal and nontidal wetlands	_____
M - 30-60% increase over a 5-yr interval	❒ Tidal wetlands only	_____
L - >30% increase over a 5-yr interval	❒ Tidal wetlands only	_____
I - Inconclusive (insufficient data)		

PLANNING OUTCOME INDICATORS (PL)

Planning processes and tools provide varying degrees of protection for estuarine and coastal wetlands and may include local land use plans, SAMPs, and GAPC, AEC, and Critical Area planning. When planning programs result in land use classification or zoning designations that provide for varying levels of use and have an explicit implementation mechanism, such as a requirement for a permit, they are considered on-the-ground indicators of protection. Typical designations that translate to *HIGH* protection include protection, preservation, or natural zones. Ones that provide for *MODERATE* protection include conservancy, conservation, or limited use zones. The key to protection, of course, are the specific standards for development. The more exclusions and variances permitted, the less protection is provided. For evaluating program effectiveness, these details are addressed as part of the process indicator evaluation. For outcome indicator purposes, data is presented for the appropriate tool and planning area indicated below.

PLANNING RATING PROCEDURE

For each of the planning program outcome indicators below, assign ratings as appropriate. If you have data from two separate programs (e.g., one for tidal wetlands, one for nontidal), make a note of it below and in table 3. If a planning tool is used, but there are no data available to make a rating, assign an "I."

PL1 AREA AFFORDED *HIGH* PROTECTION BY LOCAL PLANNING/ZONING (as % of all water and/or wetland areas under local control as noted in table above)

Rating Criteria	Rating	Data
H - 75-100%	I	**No data on local planning re wetlands**
M - 50-75		
L - <30%		
I - Inconclusive (insufficient data)		

PL2 AREA AFFORDED *HIGH* PROTECTION BY SAMPs (as % of all water and/or wetland areas under SAMP control as checked below)

Rating Criteria	Rating	Data
H - 75-100%		
M - 50-75		
L - <30%		
I - Inconclusive (insufficient data)		

PL3 AREA AFFORDED *HIGH* PROTECTION BY GAPC, AEC, CRITICAL AREA PLAN (as % of all water and/or wetland areas under PROGRAM control as checked below)

Rating Criteria	Rating	Data
H - 75-100%	I	**No data planning re wetlands**
M - 50-75		
L - <30%		
I - Inconclusive (insufficient data)		

PL4 AREA AFFORDED *MODERATE* PROTECTION BY LOCAL PLANNING/ZONING (as % of all water and/or wetland areas under local control as checked below)

Rating Criteria	Rating	Data
H - 75-100%	I	**No data on local planning re wetlands**
M - 50-75		
L - <30% of area not HIGH protection		
I - Inconclusive (insufficient data)		

PL5 AREA AFFORDED *MODERATE* PROTECTION BY SAMP (as % of all water and/or wetland areas under SAMP control as checked below)

Rating Criteria	Rating	Data
H - 75-100%		
M - 50-75		
L - <30% of area not HIGH protection		
I - Inconclusive (insufficient data)		

PL6 AREA AFFORDED *MODERATE* PROTECTION BY GAPC, AEC, CRITICAL AREA PLAN (as % of all water and/or wetland areas under PROGRAM control as checked below)

Rating Criteria	Rating	Data
H - 75-100%	I	**No data on planning re wetlands**
M - 50-75		
L - <30% of area not HIGH protection		
I - Inconclusive (insufficient data)		

ACQUISITION OUTCOME INDICATORS (AQ)

Acquisition programs generally provide the best possible protection for estuary or coastal wetland protection. The larger and more coherent the area (e.g., as with National Estuarine Research Reserves (NERRs) and the more it is buffered from impacts outside the area, the more resources are protected. Outright, fee-simple purchase provides the highest potential for protection and even restoration and enhancement, except that is very expensive and used as a last resort in most situations. Less-than-fee techniques may be more feasible for relatively large areas because they cost less. Although they may provide virtually the same degree of protection as fee-simple purchase, they are often limited in time frame or scope, giving private landowners significant latitude; this limits protection. For evaluating program effectiveness, details of policies and programs are addressed as part of the process indicator evaluation. For outcome indicator purposes, data is presented for the appropriate tool and planning area indicated below.

ACQUISITION OUTCOME INDICATORS (also enter applicable data below)

AQ1 AREA PROTECTED - FEE SIMPLE PURCHASE WITH DIRECT FEDERAL/STATE CZM PROGRAM $ (% of tidal and nontidal wetlands combined that were not in public ownership)

H - >5%
M - 1-5%
L - <1%
I - Inconclusive (insufficient data)

RATING/DATA:

AQ2 AREA PROTECTED - LESS-THAN-FEE SIMPLE PURCHASE WITH DIRECT FEDERAL/STATE CZM PROGRAM $ (% of tidal and nontidal wetlands combined that were not in public ownership)

H - >5%
M - 1-5%
L - <1%
I - Inconclusive (insufficient data)

RATING/DATA:

AQ3 AREA PROTECTED - FEE SIMPLE PURCHASE WITH OTHER PROGRAM $ AND CZM ASSISTANCE (% of tidal and nontidal wetlands combined that were not in public ownership)

H - >10%
M - 5-10%
L - <5%
I - Inconclusive (insufficient data)

RATING/DATA: M (mostly tidal; 5,600 acres; -6%)

AQ4 AREA PROTECTED - LESS-THAN-FEE SIMPLE PURCHASE WITH OTHER PROGRAM $ AND CZM ASSISTANCE (% of tidal and nontidal wetlands combined that were not in public ownership)

H - >10%
M - 5-10%
L - <5%
I - Inconclusive (insufficient data)

RATING/DATA: no data

NONREGULATORY RESTORATION OUTCOME INDICATORS (NR)

Many states have had significant historic loss of coastal wetland or estuarine resources and have significant restoration potential in their coastal zones. Restoration of former or degraded wetlands under CZM programs increases the resource base and the functions and values of coastal ecosystems. Most of these areas are in public ownership or are in a private protected area (e.g., land trust) and thus relatively well-protected. For evaluating program effectiveness, details of policies and programs are addressed as part of the process indicator evaluation. For outcome indicator purposes, data is presented for the appropriate tool and planning area indicated below.

RESTORATION OUTCOME INDICATORS (also enter applicable data below)

NR1 AREA OF FORMER OR DEGRADED COASTAL WETLANDS RESTORED (NONREGULATORY) (as % of historic loss of coastal wetlands)

H - >10%
M - 5-10%
L - <5%
I - Inconclusive (insufficient data)

RATING/DATA:

OR

NR2 AREA OF FORMER OR DEGRADED TIDAL WETLANDS RESTORED (NONREGULATORY) (as % of historic tidal wetland loss) *(REF STD: DE)*

H - >10%
M - 5-10%
L - <5%
I - Inconclusive (insufficient data)

RATING/DATA: H (13,650 ac ~20% of losses)

AND/OR

NR3 AREA OF FORMER OR DEGRADED NONTIDAL WETLANDS RESTORED (NONREGULATORY) (as % of historic nontidal wetland loss)

H - >10%
M - 5-10%
L - <5%
I - Inconclusive (insufficient data)

RATING/DATA: No data

Table 3. Outcome effectiveness ratings for the State of DELAWARE.

OUTCOME INDICATOR	TIDAL RATING[1]	NONTIDAL RATING[1]	COMMENTS
REGULATORY INDICATORS			
RG1 Area permitted loss/yr	I	I	no data on area
RG2 Area violations loss/yr	I	I	no data on violations
RG3 Area mitigated/yr	N/A		no mitigation program
RG4 Trend: permitted loss/yr	I	I	
RG5 Trend: violations loss/yr	I	I	
RG6 Trend: mitigation/yr	N/A		
SUMMARY RATING[2]	I	I	Lack of useful outcome data from permit database
PLANNING INDICATORS			
PL1 Area high protection: local	I		no local data
PL2 Area high protection: SAMP	N/A		
PL3 Area high protection: other	I		
PL4 Area mod. protection: local	I		
PL5 Area mod. protection:SAMP	N/A		
PL6 Area mod. protection: other	I		
SUMMARY RATING[2]	I		SAMP underway, local wetland notification, but no other programs
ACQUISITION INDICATORS			
AQ1 Area protected: fee CZM $	N/A		
AQ2 Area protected: less CZM $	N/A		
AQ3 Area protected: fee other $	M		
AQ4 Area protected: less other $	I		
SUMMARY RATING[2]	M		Good state program, but only small CZM involvement
RESTORATION INDICATORS			
NR1 Area restored all wetlands	N/A		
NR2 Area restored: tidal wet	II		
NR3 Area restored: nontidal wet	I		
SUMMARY RATING[2]	II		Model for CZM-assisted program of applied research and demonstration projects
OVERALL OUTCOME RATING FOR CZM PROGRAM[2]	I (M)	I	INCONCLUSIVE outcomes for both tidal and nontidal, but probably moderate to high for tidal, on strength of acquisition and restoration programs

[1]If there is a single, integrated tidal-nontidal wetland program, give the same rating in each category; if a tool not used for one or both, it is left blank. Tidal and nontidal data are not differentiated for Planning, Acquisition, or Restoration, but note in comments section if tidal, nontidal, or both.

SUMMARY RATING CRITERIA FOR OUTCOME INDICATOR CATEGORIES IN Table 3.

REGULATORY (apply separately to TIDAL and NONTIDAL)

HIGH

❒ If H for either RG1 or RG4; and at least M for RG2 and RG3, or RG5 and RG6

❒ If H for either RG2 or RG5, and H for RG3 or RG6

MODERATE

❒ If M for either RG1 or RG4, and H or M for one other indicator

❒ If one H for other than RG1 or RG4, and one other M

❒ Other combinations not resulting in H or L

LOW

❒ If no H, and M for either RG1 or RG4, and no other M

❒ If no H and M and L other indicators

INCONCLUSIVE

■ Tool used, but insufficient data to make determination

PLANNING

❒ If H for either PL1, PL2, or PL3

❒ If M for PL1, PL2, and PL3, or H for at least two of PL4, PL5, or PL6

MODERATE

❒ If M for either PL1, PL2, or PL3 or H for either PL4, PL5, or PL6

❒ Other combinations not resulting in H or L

LOW

❒ If L for either PL1, PL2, or PL3 or M for PL4, PL5, or PL6

INCONCLUSIVE

■ Tool used, but insufficient data to make determination

ACQUISITION

HIGH

❒ If H for either AQ1 or AQ3

❒ If M for three of AQ1, AQ2, AQ3, and AQ4

MODERATE

■ If M for either AQ1 or AQ3

❒ If M for AQ2 or AQ4, and L for one of AQ1 or AQ3

❒ Other combinations not resulting in H or L

LOW

❒ If L for either AQ1, AQ2, AQ3, or AQ4

INCONCLUSIVE

❒ Tool used, but insufficient data to make determination

NONREGULATORY RESTORATION

HIGH

■ If H for either NR1, NR2, or NR3

MODERATE

❒ If M for either NR1, NR2, or NR3

Other combinations not resulting in H or L

LOW

❒ If L for either NR1, NR2, or NR3

INCONCLUSIVE

❒ Tool used, but insufficient data to make determination

OVERALL OUTCOME RATING CRITERIA FOR PROGRAM IN Table 3.

(Apply separately to TIDAL and NONTIDAL, counting Acquisition and Restoration equally for both)

HIGH

❒ If Regulatory, Planning, Acquisition, and Restoration are all H

❒ If Regulatory, Planning, Acquisition are H, and Issue Importance indicator "%LOSS" is L (table 1)

MODERATE

❒ If Regulatory, Planning, Acquisition, and Restoration are all M

❒ If Regulatory, Planning, Acquisition are M, and Issue Importance indicator "%LOSS" is L (table 1)

❒ Other combinations not HIGH or LOW

LOW

❒ If Regulatory, Planning, Acquisition, and Restoration are all L

❒ If Regulatory, Planning, Acquisition are L, and Issue Importance indicator "%LOSS" is L (table 1)

INCONCLUSIVE

■ Tools used, but insufficient data available to make above determination ***(TIDAL & NONTIDAL)***

State CZM Effectiveness Evaluation
STEP 4: OVERALL STATE EFFECTIVENESS EVALUATION WORKSHEET

The overall effectiveness or impact of a state CZM program on estuary and wetland protection, considering the importance of the issue in the state (*Step 1*), is evaluated through an assessment of program organization, policies, processes and tools used (*process indicators- Step 2*), followed by an assessment of on-the-ground outcomes (Step 3). The issue importance determination establishes expectations for what a state program might include, in terms of policies and programs, to meet CZMA goals. Outcome indicator data, if available, determines whether or not program implementation results in expected performance relative to the goals.

Use of Overall State Effectiveness Ratings
Individual state effectiveness evaluations are useful as a stand-alone product, especially for the state involved. However, their more important use is as part of the overall national assessment of CZM effectiveness. Data are entered from each state evaluation into the all-state comparison tables.

STEP 4.1 Compile data from state worksheets for Issue Importance (table 1), Process Indicator Evaluation (table 2), and Outcome Indicator Evaluation (table 3) and enter in Table 4.

STEP 4.2 Prepare state effectiveness narrative summary based on table 4 summary, other tables noted above, state profile information generally, and case examples (attach separate pages if needed).

DELAWARE: CZM Effectiveness in Protecting Estuaries and Coastal Wetlands

ISSUE IMPORTANCE (TABLE 1)
With major estuaries, important tidal and freshwater wetland resources, large wetland losses historically, the issue of estuary and wetland protection is at least of ***moderate importance*** in Delaware and probably increasing. Data showing relativley low population density and growth are somewhat deceiving, given the pressure for freshwater wetland conversion,especially in the south.

PROCESS INDICATOR RESULTS (TABLE 2)
Delawarer has a strong tidal wetlands and waters program, except there is no mitigation requirements for permitted losses. Nontidal, freshwater wetlands are only periphally covered (>400 acres or along inland waterways) and federal consistency only recently used to its potential; CZM agency has been attempting to get a comprehensive freshwater wetlands program passed since 1989. No planning programs of consequence, although new SAMP underway. Significant commitment at state level for funding wetland acquisition. Variety of good programs to restore tidal wetlands. Program consistent with importance of the issue in the state. Overall, the DCMP has ***high potential*** for estuary and tidal wetland protection and ***moderate potential*** for nontidal wetlands, as compared to the ideal program.

OUTCOME INDICATOR RESULTS (TABLE 3)
The only data available for permit program is number of permits per year and trends do not show anything about program outcomes. Tidal wetlands were lost at a rate of 444/acres per year between 1954-71 (Lesser 1971); this decreased to about 20 acres per year between 1973-79, the reduction being attributed in part to implementation of the 1973 Wetlands Act (Hardisky and Klemas 1983). Section 404 of the Clean Water Act was also being implemented at this time. The DCMP was approved in 1979, so CZM per se probably had little to with the changes; no data on losses are available since. Nevertheless, CZM inheritied a program that could be claimed to be effective, based on 1973-79 performance. Acquisition data and Restoration data were available and showed considerable accomplishments in these areas, more than meeting expectations. No planning data available.

PROGRAM EFFECTIVENESS ESTIMATE (TABLE 4)
For both tidal and nontidal waters and wetlands, the effectiveness of Delaware's policies and programs are ***inconclusive***, although outcome data available for the tidal wetlands program hint of ***moderate*** to HIGH effectiveness for that resource.
- secondary non-permit data for tidal waters and wetlands to suggest that the program has been effective in limiting alterations
- efforts to restore former and degraded tidal wetlands are impressive, both in area resored and creativity in financing
- acquisition is a strong program element as are new environmental education programs about wetlands

Opportunities for Improvement include:
- better monitoring and data management, especially for permit program, where area lost to permitting and trends over time would likely demonstrate effectiveness of the program; should keep similar data on violations and Corps-required mitigation
- need a simple database for wetland acquision (or wetlands as a subset of larger program) and a wetland restoration database
- needed policy improvements include freshwater wetland legislation (on hold), a no-net-loss of wetlands in short term (compensatory mitigation) and a net gain in long term policy (institutionalize restoration [program)
- as alternative to FW wetland legislation, consider including additinal standards in federal consistency regulations, including mitigation

Table 4. Summary rating table for issue importance, process indicators, and outcome indicators for DELAWARE.

CATEGORY	RATINGS		COMMENTS
	Tidal	Nontidal	
ISSUE IMPORTANCE[1]	M (2.29)		MODERATE, with significant estuarine areas, high historic loss of wetlands, development pressure along southern beaches and inland
PROCESS INDICATORS			
Information/Research	H		Excellent wetland mapping resources and NWI being updated
Regulatory	H	M	Tidal wetland change study shows loss reduced 444ac to 20 ac/yr
Planning	L		Little used tool; SAMP underway
Acquisition	H		Strong program with significant state investment
Nonregulatory	H		Major program emphasis, case example of successful tools
Coordination	H		Interagency coordination important in permit process
OVERALL PROCESS RATING[1]	H	M	HIGH potential for tidal; MODERATE for nontidal areas; stong regulatory and rstoration elements
OUTCOME INDICATORS			
Regulatory	I	I	Lack of useful outcome data from permit database
Planning	I		SAMP underway, local wetland notification, but no other programs
Acquisition	M		Good program, but only small CZM involvement
Nonregulatory Restoration	H		Model CZM-assisted program of applied research and demonstration projects
OVERALL OUTCOME RATING[1]	I (M)	I	INCONCLUSIVE outcomes for both tidal and nontidal, but probably moderate to high for tidal, on strength of acquisition and restoration programs
SUMMARY [1]	I (M)	I	INCONCLUSIVE outcomes for both tidal and nontidal, but probably moderate to high for tidal; excellent restoration program

[1]Overall and summary ratings are relative to the ideal CZM program, given issue importance.

Appendix B: Delaware State Evaluation

APPENDIX C

Summary State Evaluations:

Estuary and Coastal Wetland Protection

Two-page summaries for each state begin on the next page
so as to have state pages facing one another.

ALABAMA
CZM Effectiveness for Estuary and Coastal Wetland Protection

ISSUE IMPORTANCE

The issue of estuary and coastal wetland protection is of ***high importance*** in Alabama. Although the coastal area is primarily rural in nature, though marked with growing urban regions, the high historic loss and perceived importance of the issue have raised the level of concern paid to estuary and coastal wetland protection.

PROCESS INDICATOR RESULTS

Based on the policies, processes, and tools used in Alabama to protect estuaries and coastal wetlands, the Alabama CAMP should be ***moderately effective*** relative to the model program for protection of tidal and nontidal wetlands. While Alabama does not have a specific tidal/nontidal wetlands permit, the state does regulate all activities affecting all coastal area land/water through the use of federal consistency, non-water dependent use exclusions, and compensatory mitigation. The ACAMP also spends a lot of time and energy working with developers to locate development away from sensitive areas. Such coordination elements are an important part of the ACAMP. While there is no formal inventory of the coastal area's wetlands, informal inventories and program knowledge of area resources is relied upon. Local planning is pursued to a moderate degree: acquisition and restoration are not pursued strongly.

OUTCOME INDICATOR RESULTS

The lack of outcome indicator data results in a rating of ***inconclusive*** for the ACAMP. While the areas of designated GAPCs are known, not much actual planning occurs with them, so that this data is not particularly useful. Only the size of the Weeks Bay NERR is known: other acquisition areas are not. No regulatory outcome data is kept.

PROGRAM EFFECTIVENESS ESTIMATE

Overall, the effectiveness of Alabama's CZM policies and programs for estuary and coastal wetland protection is ***INCONCLUSIVE*** compared to the model program, due mainly to the lack of quantitative outcome data. No systematic, computer-based outcome records are maintained.

Opportunities for improvements include:

- Implement a more comprehensive wetland inventory and change monitoring program
- Establish a wetlands permit tracking system, with outcome data, to substantiate wetlands protection efforts that are now mostly anecdotal
- Identify geographic areas of concern where wetlands protection might be improved
- Given that wetland loss is high, develop wetland restoration program as part of state CZM
- Consider the use of CZM planning tools, such as special area management planning, for coastal zonme areas, particularly in the Mobile Bay region
- Continue to develop GIS and link it to regulatory program actions for better outcome monitoring

ALABAMA
Summary Ratings for Issue Importance, Process Indicators, and Outcome Indicators

CATEGORY	RATINGS		COMMENTS
	Tidal	Nontidal	
ISSUE IMPORTANCE[1]	H (2.71)		Large estuarine area: high concern for issue now and historically.
PROCESS INDICATORS			
Information/Research	H		
Regulatory	H	H	Federal consistency review based on state regulations plus coastal use permit for large projects; require mitigation and that uses be water dependent
Planning	M		Local level
Acquisition	M		Easements associated with permit actions: Weeks Bay NERR
Nonregulatory	L		Little effort in this area despite ~50% historic loss
Coordination	H		Important facet of ACAMP, particularly with USACE
OVERALL PROCESS RATING[1]	M		Lack of restoration, planning efforts is a weakness.
OUTCOME INDICATORS			
Regulatory	I	I	No data available.
Planning	I		No useful data available.
Acquisition	I		Weeks Bay NERR only area data for acquisition
Nonregulatory Restoration	N/A		No CZM program for restoration
OVERALL OUTCOME RATING[1]	I	I	no outcome data due to lack of quantitative record-keeping
EFFECTIVENESS SUMMARY [1]	I	I	INCONCLUSIVE, based on lack of data to make evaluation

[1] Overall and summary ratings are based on comparison with the *model state CZM program*

ALASKA
CZM Effectiveness for Estuary and Coastal Wetland Protection

ISSUE IMPORTANCE

Estuary and coastal wetland protection in Alaska is a ***moderately important*** issue for CZM, tending toward low importance. This is because of the minimal wetland loss (<1%), low population (<1 person/sq mi), and low development pressures on the vast estuarine and wetland resources of the state.

PROCESS INDICATOR RESULTS

Based on estuary and wetland protection policies, processes, and tools employed by Alaska, the highly networked ACMP should be ***moderately effective*** relative to the ideal program. The principal focuses of the program are the coordinated review of wetland-related decisions through federal and state consistency and through 401 certification of Section 404 permits. Another emphasis of the program is local planning for coastal districts and special area plans for rapidly developing urban areas.

OUTCOME INDICATOR RESULTS

Little data are available to evaluate outcome effectiveness of the ACMP, except for the Anchorage area, resulting in an ***inconclusive*** outcome indicator rating. Statewide permit data from the USACOE database was not useful for evaluating outcome indicators in this study. However, regulatory data available for just the Anchorage basin show significant loss reductions, both in absolute terms and for trends. Wetland losses in this region amounted to only a 1.0% loss in area/year for the 1984-90 period and were even less in the Anchorage Wetland Management Plan (AWMP) area---0.6%/year. Trend data for the Anchorage basin showed a 502% loss reduction comparing the 1982-83 time period with 1984 to 1990. For the AWMP area, there was 1140% reduction in wetland loss for the same periods. These data demonstrate the effectiveness of Alaska's targeted wetland management efforts. Better area data for consistency review and certification processes is needed to assess regulatory effectiveness with certainty. Planning data are limited to the AWMP area and suggest low effectiveness based on criteria for this study. About 40% of the 9,405 acres of wetlands in the Anchorage WMP area are in a *preservation* category and few of these have been developed. About 11% of the wetlands are in a *conservation* category, 42% in a *development* category and 6% in a *special studies* zone. Despite the low effectiveness rating, the reductions in loss over earlier periods, based on permit data above, show significant improvements over earlier periods. Further, recent changes in the plan that rezones wetlands based on quality should result in greater protection for high-value wetlands while streamlining the development process in lower quality wetlands.

PROGRAM EFFECTIVENESS ESTIMATE

Overall, the effectiveness of Alaska's policies and programs for coastal wetlands protection are ***INCONCLUSIVE.*** However, limited planning and regulatory outcome data that are available suggest the program has made significant strides in protecting wetlands. Given relatively low issue importance, the program seems consistent with needs. The heavy emphasis on local planning and regulation makes sense, given the enormous coastline, the mostly rural settlement pattern, and relatively concentrated urban development. The use of consistency review and certification processes also reduces regulatory duplication while providing coordination and oversight over federal actions.

Opportunities for Improvement

- develop or improve record-keeping for on-the-ground outcomes related to local district planning (zoning data for wetland areas), for regulatory review processes (wetland loss/gain data related to consistency and certification decision processes), and for enforcement in urban areas.
- develop or improve compliance monitoring and enforcement programs in both large and small urban areas
- given the enormous quantity estuary and coastal wetland resources in the state and the globally-significant ecological functions and values associated with them, the ACMP should mount a strong public education and awareness program to foster stewardship of both public- and privately-owned wetlands

ALASKA
Summary Ratings for Issue Importance, Process Indicators, and Outcome Indicators

CATEGORY	RATINGS		COMMENTS
	Tidal	Nontidal	
ISSUE IMPORTANCE[1]	M (1.71)		MODERATE importance, tending toward low
PROCESS INDICATORS			
Information/Research	H		Mapping/GIS important in wetland management plans (WMPs)
Regulatory	M	M	Federal consistency and 401 certification in-lieu of permits key tools
Planning	H		Local district plans and WMPs focus on developing areas
Acquisition	N/A		No acquisition element to ACMP
Nonregulatory	M		Education plays a role; little restoration associated with CZM
Coordination	M		Joint permit process valuable
OVERALL PROCESS RATING[1]	M	M	MODERATE potential for estuary and wetland protection
OUTCOME INDICATORS			
Regulatory	I (M)	I (M)	State uses Corps database; no data available that fits outcome criteria; data from AWMP shows good trends
Planning	L		Based on Anchorage area data (SAMP)
Acquisition	N/A		No program
Nonregulatory Restoration	I		Limited nonregulatory restoration program and no outcome data
OVERALL OUTCOME RATING[1]	I	I	INCONCLUSIVE, but probably moderate in developed areas
EFFECTIVENESS SUMMARY [1]	I	I	INCONCLUSIVE, but local planning, implemented through local permits and federal permits that are reviewed and certified by DGC, DEC, or DFG, are key program elements

[1] Overall and summary ratings are based on comparison with the *model state CZM program*

AMERICAN SAMOA
CZM Effectiveness for Estuary and Coastal Wetland Protection

ISSUE IMPORTANCE
Estuary and coastal wetland protection is a ***moderately important*** issue in American Samoa, based on environmental, social, and other factors. The lack of large wetland areas and estuarine (lagoon) areas is offset by the location of most wetlands in the narrow coastal strip, where high and rapidly growing population create significant development pressures. Once of low priority, the wetland protection issue now has high public visibility and support.

PROCESS INDICATOR RESULTS
Based on estuary and wetland protection policies, processes, and tools employed by American Samoa, the ASCMP should be ***moderately effective*** relative to the ideal program for estuaries and tidal and nontidal wetlands. The highest rated part of the program is the public education impact of the excellent village liaison-facilitator program that integrates regulatory, planning, and nonregulatory program elements. Parts of the program demonstrating moderate potential include a relatively strong, well-coordinated land use regulatory program—the Project Notice and Review System—with specific tidal and nontidal wetland protection provisions, development setbacks from sensitive wetlands, and good use of mapping and wetland functional assessment tools in the regulatory program. Planning would be strengthened by adoption of the comprehensive wetlands management plan, with its zoning of wetland areas; Pago Pago Harbor and Nu'uuli and Leone Mangrove areas are protected as special management areas; cumulative impacts are considered.

OUTCOME INDICATOR RESULTS
There are insufficient data available on on-the-ground results of implementation of the ASCMP, resulting in an ***inconclusive*** outcome indicator rating for estuary and coastal wetland protection. The only data available is for special management areas, which on Maleloa and Aunu'u give high protection to a 72 acre freshwater wetland and a 40 acre marsh respectively, probably resulting in a moderate outcome rating. No data on regulatory, other planning, or nonregulatory restoration are available to evaluate program outcomes.

PROGRAM EFFECTIVENESS ESTIMATE
Overall, the effectiveness of American Samoa's policies and programs for estuary and coastal wetland protection is *INCONCLUSIVE*. Although the program has moderate potential, relative to the ideal model, the lack of supporting outcome data prevent evaluation. Nevertheless, apparent strengths include the village liaison/facilitator program that integrates village governance and ownership system into the ASCMP planning, regulatory, and public awareness programs. Additionally, the well-coordinated regulatory and permit review process though PNRS includes development setbacks employed to help protect wetlands, and the use of wetland functional assessments in evaluating wetland development projects. The recent investments ($100,000) in wetland restoration, which is appropriate given historic losses, are also an impressive ASCMP activity.

Opportunities for Improvement
- establish easy-to-maintain database for wetland baseline data, tracking and reporting on wetland changes due to permit actions (loss and mitigation gains), nonregulatory gains in wetland area and function, and for assessing protection provided through plans
- strengthen requirements to exclude non-water dependent uses from wetlands
- strengthen compensatory mitigation requirements and link to functional assessments
- institute a more formal system of compliance monitoring and enforcement, perhaps through village liaison-facilitator program
- Review and implement the comprehensive wetlands management plan and proposed wetland zoning developed in 1992
- pass a proposal for wetland special management areas on Malaelda and Aunu'u
- reevaluate the potential use of government acquisition to protect particularly sensitive wetland areas

AMERICAN SAMOA
Summary Ratings for Issue Importance, Process Indicators, and Outcome Indicators

CATEGORY	RATINGS		COMMENTS
	Tidal	Nontidal	
ISSUE IMPORTANCE[1]	M (2.0)		MODERATE, based on population density and development pressures on wetlands, and increasing public support for resource protection
PROCESS INDICATORS			
Information/Research	M		MODERATE, based on mapping & regulatory functions assessment
Regulatory	M	M	MODERATE, based on strong regulatory program, buffers, enforcement, and mitigation
Planning	M		MODERATE, based on draft plans, local liaison/facil. program
Acquisition	NA		Tool not used or relevant given communal ownership of wetlands
Nonregulatory	H		HIGH, based on public/village educational efforts as key to protection efforts; restoration increasingly important
Coordination	M		MODERATE, strong interagency coordination through PNRS
OVERALL PROCESS RATING[1]	M	M	MODERATE, based on regulatory program, wetland buffers, & village liaison-facilitator program
OUTCOME INDICATORS			
Regulatory	I	I	INCONCLUSIVE, based on lack of data on regulatory program
Planning	I (M)		INCONCLUSIVE, but possibly moderate, based on SMA plans
Acquisition	NA		Not used and not relevant due village communal ownership
Nonregulatory Restoration	I		INCONCLUSIVE, based on lack of outcome data
OVERALL OUTCOME RATING[1]	I	I	INCONCLUSIVE, based mainly on insufficient records/data showing outcomes
EFFECTIVENESS SUMMARY[1]	I	I	INCONCLUSIVE, based on lack of outcome data; but good program potential and innovative local-state collaboration for village-level wetland protection

[1]Overall and summary ratings are based on comparison with the *model state CZM program*

CALIFORNIA
CZM Effectiveness for Estuary and Coastal Wetland Protection

ISSUE IMPORTANCE

Estuary and coastal wetland protection in California is a ***highly important*** issue for coastal management, both in San Francisco Bay and along the outer coast. Principal factors include historic wetland losses that have driven some wetland-dependent species to or near extinction, especially in the south, densely concentrated human population, and strong public and legislative interest in the issue. San Francisco Bay, the largest estuary on the west coast, has suffered significant past losses, is a major focus for protection and restoration of critical wetland resources.

PROCESS INDICATOR RESULTS

Based on estuary and wetland protection policies, processes, and tools employed by California, both the CCMP and the SFBCMP should be ***highly effective*** relative to the ideal program. Strong regulatory programs with wetland mitigation and enforcement provisions, an emphasis on a state-local partnership for planning land use in the California coastal zone, and a separate, well-funded acquisition and nonregulatory restoration program are key elements. Relatively little CMP control over upland areas is a major limitation of both regulatory programs.

OUTCOME INDICATOR RESULTS

For the **San Francisco Bay** CMP, regulatory, planning, acquisition, and restoration outcome data demonstrate ***high effectiveness***. Estuarine and wetland fills in the Bay have been reduced to levels approaching zero, with a net gain of more than 600 acres of wetlands over the past 20 years achieved through mitigation. Additional wetlands have been acquired and some returned to tidal circulation through CSCC efforts. For the **California** CMP that covers the rest of the coast, estuary and wetland protection receives an ***inconclusive*** outcome indicator rating. This is mainly because of the lack of wetland gain/loss data from local- and state-administered permit programs and the lack of data on the degree of protection provided through LCP zoning. CSCC data on acquisition and restoration programs demonstrate high effectiveness, but record-keeping is weak and data are somewhat anecdotal.

PROGRAM EFFECTIVENESS ESTIMATE

Overall, the effectiveness of California's policies and programs for estuary and coastal wetland protection are ***HIGH* for San Francisco Bay** and ***INCONCLUSIVE* for the California Coast**. Both programs have strong regulatory elements, although BCDC has outcome data to back up the potential the program exhibits on paper and the CCC does not. Estuarine and wetland protection and restoration are greatly enhanced throughout the coastal zone and its watersheds by CSCC acquisition, resource enhancement, and site and regional planning programs. Long-term significant funding of these programs by the people of California has been a key ingredient in this success. The quantity, quality, and functional capacity of California's estuaries and wetlands, however, are still highly degraded because of historical abuses and fragmentation, and are threatened by encroaching development, hydrologic alterations, and pollution from present uses and new construction. These were the principal findings of the CCC's excellent cumulative assessment pilot study for the Monterey Bay region (ReCAP).

Opportunities for Improvement

- develop and implement a regional and/or watershed-based aquatic ecosystem (lakes, streams, riparian zones, and wetlands) protection and restoration program following ReCAP recommendations, with priorities based on risk analysis of coastal areas; also, combine the nonregulatory resource enhancement capacity of the CSCC with the protection authorities of the CCC and local governments
- develop or improve compliance monitoring and enforcement elements in both BCDC and CCC areas of jurisdiction and track and report violation outcomes
- develop and implement database record-keeping for on-the-ground outcomes related to CCC and LCP-permitted development and violations; identify and track additional indicators of coastal wetland health to address issues such as fragmentation, hydrologic limitations, and wetland water quality, based on ReCAP
- CSCC should develop and implement acquisition and resource enhancement program databases that show contributions in BCDC and CCC areas, and that address area, function, and quality gains

CALIFORNIA
Summary Ratings for Issue Importance, Process Indicators, and Outcome Indicators

CATEGORY	RATINGS		COMMENTS
	TIDAL	NONTIDAL	
ISSUE IMPORTANCE[1]	H (2.57)		HIGH due to high loss, intensive development pressures, and perceived importance
PROCESS INDICATORS			**COMMENTS**
Information/Research	H		BCDC has excellent data.; CCC modernization underway
Regulatory	H	M	Relatively narrow coastal zone (0.57 mile-CCC; 100 feet-BCDC) limits jurisdiction over nontidal wetlands
Planning	H		SAMPs in SFB; local plans for CCC have limitations; restoration and watershed plans good addition
Acquisition	H		Case example for CSCC efforts; done in tandem with restoration and a major factor in program success
Nonregulatory	H		Case example for CSCC efforts; done in tandem with acquisition and a major factor in program success
Coordination	H		Probably more effective in BCDC jurisdiction than CCC
OVERALL PROCESS RATING[1]	H	M	HIGH potential effectiveness for tidal areas; MODERATE for nontidal; differences based on limited nontidal jurisdiction, state versus local authority, results of ReCAP for pilot area

OUTCOME INDICATORS	TIDAL		NONTIDAL		COMMENTS
	BCDC	CCC	BCDC	CCC	
Regulatory	H	I	H	I	BCDC good data, low losses, trend down; CCC-no avail. data
Planning	BCDC		CCC		BCDC: entire bay high protection; CCC: no LCP data available
	N/A		I		
Acquisition	H				CSCC unique agency, well funded; record-keeping weak
Nonregulatory Restoration	H				CSCC unique agency, well funded; record-keeping weak
OVERALL OUTCOME RATING[1]	BCDC	CCC	BCDC	CCC	HIGH for SFB and INCONCLUSIVE for rest of COAST, possibly moderate if CCC regulatory data available; CSCC strengthens both programs; BCDC has good records; CCC records are poor
	H	I (M)	H	I	
EFFECTIVENESS SUMMARY [1]	H	I (M)	H	I	**SFB:** BCDC has strong program in all areas with CSCC assist; **CA-COAST:** strong acquisition & restoration with CSCC assist; regulatory protection likely high to moderate, but limited data available; ReCAP illustrates complexity of wetland problems and solutions

[1]Overall and summary ratings are based on comparison with the *model state CZM program*

CONNECTICUT
CZM Effectiveness for Estuary and Coastal Wetland Protection

ISSUE IMPORTANCE

Estuary and coastal wetland protection in Connecticut is and has been a ***highly important*** issue for coastal management. For decades before the CZMA, Connecticut was attempting to stem the historic high amount of wetlands loss (50% of the original wetland base) through the 1939 Coastal Structures Dredging Law, 1969 Tidal Wetlands Law, and 1972 Inland Wetlands and Watercourses Law. High population densities and industrial/commercial development, particularly in the western portion of the state close to New York City, have all been contributing factors to wetlands loss. Long Island Sound is a major national and regional focus.

PROCESS INDICATOR RESULTS

Based on estuary and wetland protection policies, processes, and tools employed by Connecticut, the CCMP should be ***moderately effective*** relative to the ideal program. The state has a variety of mapping efforts, that with the 1995 updates and data digitization for GIS lead to a highly effective information/research program. Connecticut also has strong restoration and local land use planning programs. However, while the state has a strong preservation-oriented permit program, and thus probably does not have a strong use for mitigation, the compliance monitoring done by the state should be stronger.

OUTCOME INDICATOR RESULTS

While some outcome indicator data is available, there is insufficient data for an accurate estimate of outcome indicator effectiveness. As a result, the CCMP effectiveness rating is ***inconclusive*** for both tidal and non-tidal wetlands protection. While the state has a permit database which contains area information, the state does not think this data is accurate. There is no state summary of the amount of wetlands delineated for protection in the local coastal resource maps. Outcome data for the restoration program (1,500 acres of salt marsh restored) indicate a highly effective program.

PROGRAM EFFECTIVENESS ESTIMATE

Overall, the effectiveness of the CCMP in protecting coastal wetlands and estuaries is ***INCONCLUSIVE***. The CCMP on paper is likely of at least moderate effectiveness, given the lack of a strong compliance monitoring program. The regulatory program is likely highly effective, but without the compliance monitoring it is difficult to make objective assertions. The CCMP has been innovative in its consideration of possible storm water dilution impacts on wetland areas in the regulatory review process. The state has spent much time and effort on its planning elements recently, most particularly in the Connecticut River and Long Island Sound areas. Process indicator outcome, and outcome data for restoration and planning indicate that CT program is probably at minimum. Rates moderate overall, but needs regulatory outcomes.

Opportunities for Improvement

- The CCMP should strengthen compliance monitoring at the state level to augment the regulatory program and current monitoring activities performed by the permit applicant.
- The CCMP's permit database for regulatory program outcome data should be verified for accuracy and utilized to examine on-the-ground impacts of the regulatory program.
- An acquisition program for acquiring particularly sensitive, pristine areas should be implemented. Such a program has been utilized along the Connecticut River and should be expanded to use coast-wide.
- Wetlands protected under local plans should be inventoried on a statewide basis. Such an inventory could identify jurisdictions needing to increase the amount of wetlands designated for local protection.

CONNECTICUT

Summary Ratings for Issue Importance, Process Indicators, and Outcome Indicators

CATEGORY	RATINGS		COMMENTS
	Tidal	Nontidal	
ISSUE IMPORTANCE[1]	H (2.57)		Large estuarine areas; high population density and historic loss.
PROCESS INDICATORS			
Information/Research	H		Impressive array of projects
Regulatory	M	M	Preservation-oriented program, so not much call for mitigation.
Planning	H		
Acquisition	L		Not a major focus of CCMP attention
Nonregulatory	H		Restoration program is national leader.
Coordination	M		
OVERALL PROCESS RATING[1]	M	M	Compliance monitoring, acquisition are program weaknesses.
OUTCOME INDICATORS			
Regulatory	I	I	Inaccurate data
Planning	I (L)		Connecticut River SAMP; no local planning data
Acquisition	I		
Nonregulatory Restoration	M		1,500 acres of salt marsh
OVERALL OUTCOME RATING[1]	I	I	Lack of data, though indications for at least a MODERATE rating.
EFFECTIVENESS SUMMARY [1]	I	I	INCONCLUSIVE, based on lack of data to make evaluation.

[1]Overall and summary ratings are based on comparison with the *model state CZM program*

DELAWARE
CZM Effectiveness for Estuary and Coastal Wetland Protection

ISSUE IMPORTANCE

With major estuaries, important tidal and freshwater wetland resources, large wetland losses historically, the issue of estuary and wetland protection is at least of ***moderate importance*** in Delaware and probably increasing. Data showing relatively low population density and growth are somewhat deceiving, given the pressure for freshwater wetland conversion, especially in the south.

PROCESS INDICATOR RESULTS

Delaware has a strong tidal wetlands and waters program, except there are no mitigation requirements for permitted losses. Nontidal, freshwater wetlands are only peripherally covered (>400 acres or along inland waterways) and federal consistency only recently used to its potential; CZM agency has been attempting to get a comprehensive freshwater wetlands program passed since 1989. No planning programs of consequence, although new SAMP underway. Significant commitment at state level for funding wetland acquisition. Variety of good programs to restore tidal wetlands. Program consistent with importance of the issue in the state. Overall, the DCMP has ***high potential*** for estuary and tidal wetland protection and ***moderate potential*** for nontidal wetlands, as compared to the model program.

OUTCOME INDICATOR RESULTS

The only data available for permit program is number of permits per year and trends do not show anything about program outcomes. Tidal wetlands were lost at a rate of 444/acres per year between 1954-71 (Lessor 1971); this decreased to about 20 acres per year between 1973-79, the reduction being attributed in part to implementation of the 1973 Wetlands Act. The DCMP was approved in 1979, so CZM per se probably had little to with the changes; no data on losses are available since. Acquisition data and Restoration data were available and showed considerable accomplishments in these areas, more than meeting expectations. No planning data available. Overall, the outcome indicator rating is ***inconclusive (moderate)*** for tidal and ***inconclusive*** for nontidal.

PROGRAM EFFECTIVENESS ESTIMATE

For both tidal and nontidal waters and wetlands, the effectiveness of Delaware's policies and programs are ***inconclusive***, although outcome data available for the tidal wetlands program suggest at least a ***moderate*** effectiveness rating for that resource. Program strengths include:

- overall wetland change analysis for tidal waters and wetlands to suggest that the program has been effective in limiting alterations
- efforts to restore tidal wetlands impressive, both in area restored and creativity in financing
- acquisition is a strong program element as are new wetland education programs

Opportunities for Improvement include

- better monitoring and data management, especially for permit program, where area lost to permitting and trends over time would likely demonstrate effectiveness of the program; should keep similar data on violations and Corps-required mitigation
- need a simple database for wetland acquisition (or wetlands as a subset of larger program) and a wetland restoration database
- needed policy improvements include freshwater wetland legislation (on hold), a no-net-loss of wetlands in short term (compensatory mitigation) and a net gain in long term policy (institutionalize restoration program)
- as alternative to freshwater wetland legislation, consider including additional standards in federal consistency regulations, including mitigation

DELAWARE
Summary Ratings For Issue Importance, Process Indicators, and Outcome Indicators

CATEGORY	RATINGS		COMMENTS
	Tidal	Nontidal	
ISSUE IMPORTANCE[1]	M (2.29)		MODERATE, with significant estuarine areas, high historic loss of wetlands, development pressure along southern beaches and inland
PROCESS INDICATORS			
Information/Research	H		Excellent wetland mapping resources and NWI being updated
Regulatory	H	M	Tidal wetland change study shows loss reduced 444 ac to 20 ac/yr
Planning	L		Little used tool; SAMP underway
Acquisition	H		Strong program with significant state investment
Nonregulatory	H		Major program emphasis, case example of successful tools
Coordination	H		Interagency coordination important in permit process
OVERALL PROCESS RATING[1]	H	M	HIGH potential for tidal; MODERATE for nontidal areas; strong regulatory and restoration elements
OUTCOME INDICATORS			
Regulatory	I	I	Lack of useful outcome data from permit database
Planning	I		SAMP underway, local wetland notification, but no other programs
Acquisition	M		Good program, but only small CZM involvement
Nonregulatory Restoration	H		Model CZM-assisted program of applied research and demonstration projects
OVERALL OUTCOME RATING[1]	I (M)	I	INCONCLUSIVE outcomes for both tidal and nontidal, but probably moderate to high for tidal, on strength of acquisition and restoration programs
EFFECTIVENESS SUMMARY [1]	I (M)	I	INCONCLUSIVE outcomes for both tidal and nontidal, but probably moderate to high for tidal; excellent restoration program

[1] Overall and summary ratings are based on comparison with the *model state CZM program*

FLORIDA
CZM Effectiveness for Estuary and Coastal Wetland Protection

ISSUE IMPORTANCE
The issue of coastal wetlands and estuary protection in Florida is of ***high importance.*** Florida has the largest amount of wetlands of any state in the lower 48--over 11,000,000 acres state-wide. Florida has also seen very high rates of population growth with correspondingly high levels of historic wetlands loss. The Everglades area has received much national attention, due in part to the fact that the Everglades have been reduced by approximately 65%.

PROCESS INDICATOR RESULTS
Overall, the Florida CMP has ***high potential*** for the protection of both tidal and non-tidal wetland areas. Florida utilizes the Environmental Resource Permit statewide, except in the Northwest Water Management District, with mitigation and the use of federal consistency important parts of the regulatory program. Local and regional planning efforts, following state criteria, are important, with the ACSC program utilized in areas where local land use planning regulations provide an insufficient level of protection. The state's greatest effort in environmental protection is probably in its acquisition program, where hundreds of millions are spent. Somewhat surprisingly given the state's high historic rate of wetlands loss, the FCMP's nonregulatory restoration efforts are only of moderate potential. Information and research activities are also not a major focus of the FCMP, although the recent Florida Assessment of Coastal Trends is impressive.

OUTCOME INDICATOR RESULTS
The lack of outcome data makes assessment of on-the-ground outcome data not possible. As such, the outcome rating for the FCMP is ***inconclusive*** for both tidal and nontidal wetlands. The state permit database is utilized for administrative purposes only.

PROGRAM EFFECTIVENESS ESTIMATE
For both tidal and nontidal wetlands, the FCMP effectiveness estimate is ***INCONCLUSIVE***. Given the expected growth and development pressure of the next few decades, the protection of Florida wetlands is likely to become increasingly difficult. Strengths of the FCMP include:
- the state's acquisition efforts, though direct CZM involvement is likely not that great.
- the Florida Assessment of Coastal Trends, a good coastal health indicator program.
- on paper, anyway, the regulatory program. Coordination aspects are particularly impressive.

Opportunities for improvement
- No outcome data, no data on acquisition or regulatory efforts to see if programs are working or not.
- No statewide mapping/GIS efforts
- Increase restoration efforts in Everglades and other areas.
- Seems like improved coordination among State agencies would be helpful, but I'm not too sure of this.
- Improve wetland change monitoring to see if protection program stopping/slowing loss.
- Incorporate water-dependency into wetlands development requirements.

FLORIDA
Summary Ratings for Issue Importance, Process Indicators, and Outcome Indicators

CATEGORY	RATINGS		COMMENTS
	Tidal	Nontidal	
ISSUE IMPORTANCE[1]	H (2.57)		High amount of wetlands, high and growing population density. Huge amount of historic loss.
PROCESS INDICATORS			
Information/Research	L		
Regulatory	H	H	Same program for tidal and nontidal wetlands.
Planning	H		
Acquisition	H		Major effort statewide
Nonregulatory	M		Restoration not much of a state focus.
Coordination	H		
OVERALL PROCESS RATING[1]	H	H	
OUTCOME INDICATORS			
Regulatory	I	I	
Planning	I		
Acquisition	I		
Nonregulatory Restoration	I		
OVERALL OUTCOME RATING[1]	I	I	No outcome data
EFFECTIVENESS SUMMARY [1]	I	I	INCONCLUSIVE, based on lack of data to make evaluation.

[1]Overall and summary ratings are based on comparison with the *model state CZM program*

GUAM
CZM Effectiveness for Estuary and Coastal Wetland Protection

ISSUE IMPORTANCE

The protection of estuaries and coastal wetlands is of ***moderate importance*** in Guam. While Guam does not have a large wetlands/estuarine habitat base, its rapidly growing population and relatively high population density push the issue of wetland protection to moderate.

PROCESS INDICATOR RESULTS

Overall, the Guam CMP has ***high potential*** for the protection of estuaries and coastal wetlands. Guam's education and public outreach efforts are probably the strongest part of the Guam CMP with a variety of media used. The regulatory program is strong on paper, as the Territorial Land Use Commission has regulatory jurisdiction over both tidal and non-tidal wetlands. Compliance monitoring, and use limitations (particularly in the Seashore Reserve Area) are other strengths of the regulatory program. If implemented, the new wetlands master plan would further strengthen program (setbacks, etc.) Under the Guam zoning law, wetlands generally are placed in "agriculture" zone, which affords them high amount of protection. The Guam CMP coordinates its efforts closely with the EPA and COE.

OUTCOME INDICATOR RESULTS

Insufficient data exists to make an accurate assessment of the Guam outcome indicators; as such, the outcome rating is ***inconclusive***. While Guam does have a permit database, it contains the area of entire project, not specifying wetlands. No data is kept on area impacted through violations, or mitigation area. A moderate amount of planning outcome data indicates that Guam's planning efforts are likely rated moderate to high, given the Recreational Water-Use Management Plan coverage of ~7,680 acres of lagoonal area. Additionally, the territorial seashore park is "several thousand" acres; area of conservation reserves is unknown. No data is available for areas of wetlands restored or acquired.

PROGRAM EFFECTIVENESS ESTIMATE

For both tidal and nontidal wetlands, the Guam CMP effectiveness estimate is ***INCONCLUSIVE***. Strengths of the program include:

- Overall well-rounded program; given the almost low importance of the wetlands protection issue, is particularly impressive.
- Permitting program has strong protection requirements up-front and a strong compliance monitoring aspect.
- Simple zoning classifications; provides high degree of protection to wetlands.
- Education/Public outreach component of program is very strong. Close, good working relationship with COE, EPA.

Opportunities for improvement

- Wetland change monitoring to substantiate regulatory/planning programs.
- Database for tracking permitted losses, violations, and mitigated areas.
- Implement proposed Wetlands Master Plan.
- Increase restoration efforts.
- Increase acquisition of particularly sensitive, pristine areas.

GUAM

Summary Ratings for Issue Importance, Process Indicators, and Outcome Indicators

CATEGORY	RATINGS		COMMENTS
	Tidal	Nontidal	
ISSUE IMPORTANCE[1]	L (1.57)		Low amount of wetlands, but high population density and population increase.
PROCESS INDICATORS			
Information/Research	H		Mapping and functional assessment
Regulatory	H	H	Use restrictions and compliance monitoring strong
Planning	H		Various SAMP-like efforts
Acquisition	L		Not a program focus
Nonregulatory	H		Education efforts are very strong
Coordination	H		Good relationship with EPA, COE
OVERALL PROCESS RATING[1]	H		Perceived well-rounded program.
OUTCOME INDICATORS			
Regulatory	I	I	No data available.
Planning	M		Limited data available for area protected under RWUMP, Territorial Sea Plan
Acquisition	I		No data available
Nonregulatory Restoration	I		No data available
OVERALL OUTCOME RATING[1]	I	I	Lack of data
EFFECTIVENESS SUMMARY [1]	I	I	INCONCLUSIVE, based on lack of data to make determination.

[1]Overall and summary ratings are based on comparison with the *model state CZM program*

HAWAII
CZM Effectiveness for Estuary and Coastal Wetland Protection

Note: Hawaii chose not to participate in the CZM Effectiveness Study for this issue area; this assessment is based on document review only and is thus incomplete..

ISSUE IMPORTANCE
Relatively small area of estuaries and wetlands, low loss overall, and only moderate population density, growth rates, and perceived importance combine to make the issue of coastal wetland and estuary protection one of ***low importance*** in HAWAII. While events such as the Kanoehe Bay coral die-off have received national attention, these occurrences are relatively uncommon.

PROCESS INDICATOR RESULTS
Based on the policies, processes, and tools used in HAWAII to protect estuaries and coastal wetlands, the HAWAII CMP should be ***moderately effective*** relative to the ideal program. Hawaii's land use planning program is one of the nation's most extensive, affording sensitive resource lands (including wetlands) considerable protection. Local permitting, particularly in the designated Special Management Areas, is another key element in the protection of coastal wetlands and estuaries. In the permit process, use of environmental impact assessments is a program strength. However, the lack of strong compliance monitoring and mitigation requirements is a program weakness. Additionally, the Hawaii CMP does not place much emphasis on coordination, non-regulatory restoration, or education efforts.

OUTCOME INDICATOR RESULTS
The lack of data makes on-the-ground results of the HCMP ***inconclusive***.

PROGRAM EFFECTIVENESS ESTIMATE
Overall, the effectiveness of HAWAII policies and programs for coastal wetlands protection is ***INCONCLUSIVE*** compared to the ideal program. Hawaii did not participate in the CZM Effectiveness study, so data may be available to make an estimate.

HAWAII

Summary Ratings for Issue Importance, Process Indicators, and Outcome Indicators

CATEGORY	RATINGS		COMMENTS
	Tidal	Nontidal	
ISSUE IMPORTANCE[1]	M (1.57)		LOW, based on relatively low estuary and wetland area, and loss; and moderate population growth and issue importance for the CMP.
PROCESS INDICATORS			
Information/Research	H		UH Environmental Center database and mapping used for functional analysis.
Regulatory	M	M	Strong local permitting program, particularly in Special Management Areas; lack of compliance monitoring and mitigation requirement hurts.
Planning	H		Strong local land use planning program. Special Management Areas are afforded additional protection.
Acquisition	H		The Hawaii CMP utilizes various means of direct acquisition of wetlands with financial assistance from other agencies.
Nonregulatory	M		Restoration efforts not a strength of the Hawaii CMP. Public education and outreach is pursued to a degree.
Coordination	L		Not a Hawaii CMP focus.
OVERALL PROCESS RATING[1]	M	M	MODERATE potential, based on planning and acquisition programs
OUTCOME INDICATORS			
Regulatory	I	I	No area or other outcome data
Planning	M		
Acquisition	I		No area or other outcome data
Nonregulatory Restoration	NA		No area or other outcome data
OVERALL OUTCOME RATING[1]	I	I	INCONCLUSIVE; the state did not participate actively in the study; information in profile based on available state and OCRM literature
EFFECTIVENESS SUMMARY [1]	I	I	INCONCLUSIVE; the state did not participate actively in the study; information in profile based on available state and OCRM literature

[1]Overall and summary ratings are relative to the ideal CZM program, given issue importance.

LOUISIANA
CZM Effectiveness for Estuary and Coastal Wetland Protection

ISSUE IMPORTANCE

The issue of coastal wetlands and estuary protection is of ***high importance*** in Louisiana. High amount of wetlands, estuarine area, and the largest amount of wetland loss in the country are major factors. Protection of wetlands has been and remains very important to the Louisiana CMP. The Louisiana CZ has a low amount of population change, but what development occurs almost always has an associated wetlands impact, given sheer amount of wetlands in the CZ.

PROCESS INDICATOR RESULTS

Overall, the Louisiana CMP has ***high potential*** for protecting estuaries and tidal wetlands and ***moderate potential*** for the protection of nontidal wetlands. While Louisiana utilizes the same Coastal Use Permit for development in both tidal and non-tidal wetland areas, the permit is not required above the five foot elevation--therefore, the nontidal ranking is lower. In the regulatory program, the use of mitigation, environmental impact assessments under the geologic review procedure, and general permitting (which still utilizes geologic review) are all key factors. Few states use GIS in the permit review system the way that Louisiana does. Louisiana has a program for local planning, but local coastal management plans are voluntary. Various SAMPS and SAMP-like activities have been implemented, to a varying degree of success. Non-regulatory restoration program is major focus in state, though state coastal restoration program has not been RPI'd into the Louisiana CMP. The state has a $25,000,000 annual budget for restoration.

OUTCOME INDICATOR RESULTS

Based on available outcome data, Louisiana is rated as ***inconclusive (high)*** for tidal wetland protection and ***inconclusive*** for nontidal wetland protection. No data exists for violations losses, or for mitigation areas. Permitted losses are down from 1,925 acres in 1982 to 196 acres in 1990. As a percent of the ~3.2 million acres of coastal wetlands statewide, the 196 acres loss figure is excellent. Restoration efforts are expected to benefit over 306,270 acres, or ~10% of total coastal wetlands.

PROGRAM EFFECTIVENESS ESTIMATE

The overall rating of the Louisiana CMP is ***INCONCLUSIVE*** given lack of data. However, indications are that program would receive at least an M, given strong restoration and the hint of the strong regulatory program.
Strengths of the program include:

- the geologic review process and its impact on reducing permitted loss area.
- Restoration programs.
- Use of general permits, and use of geologic review with these permits. .
- Use of GIS in permitting process.
- Strong tidal wetlands permit program.

Opportunities for Improvement

- Expand permit program to cover all wetlands in CZ (not including fastlands); reevaluate 5' elevation requirement
- Push for more local coastal programs to be developed and implemented
- Expand acquisition program for key pristine areas

LOUISIANA
Summary Ratings for Issue Importance, Process Indicators, and Outcome Indicators

CATEGORY	RATINGS		COMMENTS
	Tidal	Nontidal	
ISSUE IMPORTANCE[1]	H (2.57)		Huge amount of wetlands and estuarine area; very large rate of historic loss.
PROCESS INDICATORS			
Information/Research	H		Use of GIS and functional assessment are particularly strong.
Regulatory	H	M	Applicability of coastal use permit only below 5 foot contour is program weakness.
Planning	M		Various efforts–SAMPs and local coastal programs.
Acquisition	M		With Nature Conservancy.
Nonregulatory	H		Restoration program is one of nation's strongest.
Coordination	H		Geologic Review Process.
OVERALL PROCESS RATING[1]	H	M	Exempting wetlands above five foot elevation from regulatory program is weakness.
OUTCOME INDICATORS			
Regulatory	I (H)	I	At least moderate; likely high if other data available.
Planning	I		No data available
Acquisition	L		No data available
Nonregulatory Restoration	H		>300,000 acres in restoration projects
OVERALL OUTCOME RATING[1]	I (H)	I	Based on limited regulatory data and restoration data.
SUMMARY [1]	I (H)	I	INCONCLUSIVE, based on lack of data to make evaluation.

[1]Overall and summary ratings are relative to the ideal CZM program, given issue importance.

MAINE
CZM Effectiveness for Estuary and Coastal Wetland Protection

ISSUE IMPORTANCE

The issue of coastal wetland and estuary protection is ***of moderate importance*** in Maine. A low population density and corresponding relative lack of wetlands loss perhaps keep the issue from stronger importance. In addition, through the Coastal Wetlands Act and the Shoreland Zoning Act, Maine has a history of protecting its coastal wetland areas.

PROCESS INDICATOR RESULTS

Based on the policies, processes, and tools used in Maine to protect estuaries and coastal wetlands, the Maine CZMP should be ***moderately effective*** relative to the ideal program. While permit programs for tidal and non-tidal wetlands are perceived to be strong, compliance monitoring is hindered by a lack of funding. Compensatory mitigation requirements and use could be stronger as well. Strengths of the program are centered around the various planning efforts incorporated into the MCZMP. Chief among these are the mandatory shoreland zoning act (requiring zoning of all areas within 250' of tidal waters), water zoning, local land use plans developed with State oversight, and the designation of "areas of environmental concern." Additionally, the MCZMP is involved in various wetlands inventories, commonly maps of specific habitats of interest, and the development of the State GIS. Acquisition and Non-regulatory activities are not strongly pursued; the MCZMP is more involved with education and outreach efforts than acquisition or restoration. Given the networked nature of the MCZMP, it is perhaps a little surprising that coordination efforts are not of more importance.

OUTCOME INDICATOR RESULTS

The lack of outcome data makes the on-the-ground results of the MCZMP ***inconclusive.*** Maine did develop a pilot wetlands database with information regarding area impacts as a result of the regulatory program, but data in the database is not considered accurate. Mitigation and violations data similarly does not lead to conclusive evaluations. The amount of wetlands zoned for protection under the Mandatory Shoreland Zoning Act is not known; likewise, wetlands protected under local planning is unknown. No acquisition data is available.

PROGRAM EFFECTIVENESS ESTIMATE

Overall, the effectiveness of Maine policies and programs for coastal wetlands protection is *INCONCLUSIVE* compared to the ideal program. The perceived strength of the planning efforts, regulatory program, and information/mapping suggest that the MCZMP could be rated of at least *MODERATE* effectiveness if data were available.

Opportunities for improvements

- given financial difficulties, develop acquisition programs for key or rare wetland areas. Utilize acquisition to protect select wetland areas; perhaps more important given high
- amount of private ownership of land along Maine's coast.
- expand mitigation requirements and compliance monitoring. Utilize compliance monitoring to examine success of mitigation projects.
- utilize non-water dependency exclusions in siting development along the coast; particularly along estuarine shores, expand on/continue permit database tracking of permit area information.
- Utilize pilot project as basis for database; track area affected and mitigated.
- implement wetland change monitoring program
- Given historic losses of wetlands, consideration should be given to a nonregulatory wetland restoration program

MAINE
Summary Ratings for Issue Importance, Process Indicators, and Outcome Indicators

CATEGORY	RATINGS		COMMENTS
	Tidal	Nontidal	
ISSUE IMPORTANCE[1]	M (2.00)		Low wetlands loss; low population density; many small estuaries/wetlands pockets throughout coast.
PROCESS INDICATORS			
Information/Research	H		Various mapping efforts centered on habitats; developing GIS.
Regulatory	M	M	Perceived strong program; compliance and mitigation components could be stronger.
Planning	H		Cornerstone of MCZMP.
Acquisition	M		Not pursued to any great extent; more prevalent historically
Nonregulatory	M		Education more of an effort than restoration
Coordination	M		
OVERALL PROCESS RATING[1]	M	M	With stronger compliance monitoring and/or mitigation, could be rated HIGH
OUTCOME INDICATORS			
Regulatory	I (H)	I (H)	Only pilot data, considered inaccurate
Planning	I		No data
Acquisition	I		No data
Nonregulatory Restoration	N/A		not pursued
OVERALL OUTCOME RATING[1]	I	I	No data to make evaluation
EFFECTIVENESS SUMMARY [1]	I	I	INCONCLUSIVE, based on lack of data to make evaluation

[1]Overall and summary ratings are based on comparison with the *model state CZM program.*

MARYLAND
CZM Effectiveness for Estuary and Coastal Wetland Protection

ISSUE IMPORTANCE

Estuary and coastal wetland protection is of ***high importance*** in Maryland. Factors include the national importance of Chesapeake Bay, the high rate of historic wetland loss, high population density, and high perceived importance on the part of coastal officials. Maryland has been protecting its tidal wetlands since 1970; freshwater wetlands are protected under the 1989 Nontidal Wetlands Protection Act.

PROCESS INDICATOR RESULTS

Based on the policies, processes, and tools used in Maryland to protect estuaries and coastal wetlands, the Maryland CZMP should be ***highly effective*** relative to the ideal program for protection of tidal and nontidal wetlands. Both of Maryland's tidal and nontidal wetland regulatory programs are strong, with the use of compensatory mitigation, compliance monitoring, and development setbacks all considered important components. Maryland has a well-rounded program: its planning programs (the Chesapeake Bay Critical Area Act), acquisition program (Project Open Space), non-regulatory programs (both education and restoration), information/research programs (mapping, use of GIS, and wetlands change monitoring), and coordination efforts are all strong and perceived to be effective.

OUTCOME INDICATOR RESULTS

Outcome data are available for most indicators, but not enough to avoid an ***inconclusive*** rating for the Maryland CZMP. Maryland's regulatory program is rated as *highly effective* for nontidal wetlands management because of available data; the nontidal program is inconclusive, but probably highly effective as well, but additional data are needed to get a conclusive rating. The protection of 513,269 acres designated as Resource Conservation under the Critical Area Program (80% of total area) indicates a *highly effective* planning program. Acquisition data are not available, so these program elements are rated ***inconclusive.*** Only limited restoration data area available for the nonstructural erosion control program, resulting in a *low effectiveness* rating; if other restoration data were available, the rating would likely be higher.

PROGRAM EFFECTIVENESS ESTIMATE

Overall, the effectiveness of Maryland CZMP policies and programs for coastal wetlands protection is ***INCONCLUSIVE*** compared to the ideal program. However, based on available regulatory and planning data, and the results of the process indicator evaluation, it is very likely that Maryland would be rated ***highly effective*** if additional data were available.

Opportunities for improvements

- strengthen non-water dependency requirements
- increase local involvement through local land use planning

MARYLAND

Summary Ratings for Issue Importance, Process Indicators, and outcome Indicators

CATEGORY	RATINGS		COMMENTS
	Tidal	Nontidal	
ISSUE IMPORTANCE[1]	H (2.57)		Importance of Chesapeake Bay and high rate of historic wetlands loss.
PROCESS INDICATORS			
Information/Research	H		Use of mapping, GIS, and wetlands change monitoring.
Regulatory	H	H	Both programs strong and provide protection to all wetlands.
Planning	H		Critical Area Program
Acquisition	H		Project Open Space
Nonregulatory	H		Both restoration and education efforts are strong.
Coordination	H		
OVERALL PROCESS RATING[1]	H		HIGH potential overall, with all essential program elements
OUTCOME INDICATORS			
Regulatory	I(H)	H	Likely High for both tidal and non-tidal wetland programs.
Planning	H		Critical Area Program
Acquisition	I		No data
Nonregulatory Restoration	L		No data
OVERALL OUTCOME RATING[1]	I (H)	I (H)	INCONCLUSIVE, based on lack of data and record-keeping. Strong likelihood of HIGH rating for both tidal and non-tidal, however.
EFFECTIVENESS SUMMARY [1]	I (H)	I (H)	INCONCLUSIVE, based on a lack of data to make determination. Available data indicates a HIGHLY effective program for both tidal and nontidal wetlands.

[1]Overall and summary ratings are based on comparison with the *model state CZM program*

MASSACHUSETTS
CZM Effectiveness for Estuary and Coastal Wetland Protection

ISSUE IMPORTANCE

Large amounts of salt marsh and estuarine areas such as Boston Harbor, Cape Cod Bay, and Buzzards Bay make the protection of coastal wetlands of ***high importance*** in the state. Additionally, Massachusetts historically has had a high population density with correspondingly high development pressure, particularly in coastal areas. Since 1963, Massachusetts has been protecting wetlands under State law. Tidal wetlands represent ~20% of the state wetland base.

PROCESS INDICATOR RESULTS

Based on the policies, processes, and tools used in Massachusetts to protect estuaries and coastal wetlands, the Massachusetts CZMP should be ***highly effective*** relative to the ideal program. Strengths of the program include mapping and GIS efforts, key to the developing watershed-based wetlands restoration effort. Regulatory protection for tidal and nontidal wetlands, with a particular emphasis on salt marsh, is strong. The state-local partnership of the permit program is an important facet. Mitigation requirements and compliance monitoring are key components. However, a lack of continuity due to turnover in the local commission memberships, and difficulties in keeping training of commission members current, are problematic. Planning efforts such as harbor management plans and the ACEC program are locally important and effective. Acquisition for open-space considerations and coordination efforts are also utilized. The MCZMP's role as coordinator between State and local government is important.

OUTCOME INDICATOR RESULTS

All 75,000 acres incorporated into the ACEC program receive a high degree of protection, with permit reviews in ACECs subject to a higher degree of scrutiny than elsewhere (for example, in cumulative and secondary impacts consideration). However, this information is the sole on-the-ground outcome data available regarding the effectiveness of the MCZMP. Regulatory impacts, acquisition amounts, and restored wetland areas are not available at this time. As a result, the on-the-ground effectiveness of the MCZMP is considered ***inconclusive.***

PROGRAM EFFECTIVENESS ESTIMATE

Overall, the effectiveness of Massachusetts policies and programs for coastal wetlands protection is ***INCONCLUSIVE*** compared to the ideal program. However, the significant protection through the planning programs (ACEC and harbor planning), the periodic acquisition efforts, the developing watershed-based wetlands restoration program, and the regulatory program all suggest that the program could be rated at HIGH effectiveness if data were available.

Opportunities for improvements

- adequate training in wetlands ecology/policy for local conservation/commission members.
- install a wetland change monitoring system
- install databases to track areal impacts from permitting (especially difficult given the local nature of the regulatory program, but also probably that much more important). Use of GIS in the wetlands restoration program could also lead to tracking of permit impacts on a watershed level, the "next step up" from a permit database. Tracking acquisition and restoration areas would be useful in documenting the successes of the MCZMP and identifying areas for further attention.
- increase local land use planning efforts. Programs such as harbor management plans and the ACEC program have proven successful and could be built upon.

MASSACHUSETTS
Summary Ratings for Issue importance, Process Indicators, and Outcome Indicators

CATEGORY	RATINGS		COMMENTS
	Tidal	Nontidal	
ISSUE IMPORTANCE[1]	H (2.43)		High wetland/estuary area; high population density/development pressure.
PROCESS INDICATORS			
Information/Research	H		GIS/mapping efforts strong.
Regulatory	H	H	Strong program, including mitigation requirements and compliance monitoring. Particular focused on protection of salt marsh areas.
Planning	H		ACEC program and harbor management plans
Acquisition	H		Mostly in terms of open-space efforts.
Nonregulatory	H		Watershed-based wetland restoration effort underway.
Coordination	H		Focus of MCZMP's efforts; includes joint permitting wherever possible.
OVERALL PROCESS RATING[1]	H		HIGH potential, well-rounded program, on paper.
OUTCOME INDICATORS			
Regulatory	I	I	Difficult to keep data from various local conservation councils; no data.
Planning	M		ACEC affords all incorporated areas high protection.
Acquisition	M		No data on acquisition.
Nonregulatory Restoration	I		No data on restoration.
OVERALL OUTCOME RATING[1]	I	I	Lack of data, particularly for regulatory program.
EFFECTIVENESS SUMMARY[1]	I	I	INCONCLUSIVE, based on lack of data to make evaluation.

[1]Overall and summary ratings are based on comparison with the *model state CZM program*

MICHIGAN
CZM Effectiveness for Estuary and Coastal Wetland Protection

ISSUE IMPORTANCE

Estuary and coastal wetland protection is a ***moderately important*** issue in Michigan, based on environmental, social, and other factors. Although wetlands make up a small proportion of the coastal zone (5.7%) and population has actually declined in coastal counties, significant historic wetland losses, relatively intense development in selected areas, and a strongly-held values the importance of the lakes and wetlands of the state result in a relatively high assessment of issue importance.

PROCESS INDICATOR RESULTS

Based on coastal wetland protection policies, processes, and tools employed by Michigan, the MCMP is potentially ***highly effective*** in comparison the ideal program. Strengths of the program include a long tradition of strong wetland protection through regulatory controls, including assumption of Section 404; high protection for selected critical wetlands through Environmental Area designation; a variety of state-funded acquisition programs applicable to wetlands; an active ongoing education program for regulators and enforcers as well as the general public. Michigan's program has all the elements needed to be highly successful in its wetland protection efforts.

OUTCOME INDICATOR RESULTS

Outcome effectiveness is ***inconclusive***. Given the long history of wetland protection in the state and the robust potential of the program, it is surprising how little data there are to assess the on-the-ground results of Michigan's program. No data are available for the regulatory program (the key program element) or for restoration efforts. Planning program outcomes for Environmental Areas do show that 275 miles (0.86%) of Michigan's lakeshores are in these critical protection areas and that 95% of these areas are wetlands. No area data are available on protection offered through voluntary local wetland planning. For acquisition, 4,300 acres of wetland have been purchased with CZM assistance in just two parcel transactions. However, there are reportedly many additional fee-simple and less-than-fee purchases of wetlands where the MCMP had some involvement, but there area no data available to support this.

PROGRAM EFFECTIVENESS ESTIMATE

Overall, the effectiveness of Michigan's policies and programs for coastal wetlands protection are ***INCONCLUSIVE***, but would likely prove to be at least moderate, if more data were available. The lack of regulatory program outcome data is especially problematic for evaluating the program. Strengths include:

- a strong protection for waters and wetlands of the state through regulatory controls, mitigation, and enforcement
- a targeted education program designed to assist local governments, regulators, and prosecutors in implementing permitting and enforcement efforts
- a critical area program focused on protecting especially valuable wetland resources (Environmental Areas)

Opportunities for Improvement

- Michigan is aware of its need to improve outcome-oriented record-keeping; the MCMP should identify key regulatory, planning, acquisition, and restoration outcome indicators for wetlands and include them in information management system plans. Going back to dig out historical information and then maintaining it for EAs (types and area of wetlands protected) and for wetland acquisitions facilitated or assisted through the MCMP should be relatively simple. By comparison, tracking wetland gains and losses, as well as quality changes, in the regulatory program will be more challenging, but probably more important.
- considering significant historical losses, the MCMP new emphasis on nonregulatory restoration should continue and accelerate, including a significant infusion of CZM funds for watershed-based efforts.
- improving enforcement is an ongoing state initiative that should continue or increase

MICHIGAN

Summary Ratings for Issue Importance, Process Indicators, and Outcome Indicators

CATEGORY	RATINGS		COMMENTS
	Tidal	Nontidal	
ISSUE IMPORTANCE[1]	M (2.00)		MODERATE, tending toward high, and based on long involvement and interest in wetlands management
PROCESS INDICATORS			
Information/Research	H		
Regulatory	N/A	H	All waters and wetlands jurisdictional in lake and inland areas
Planning	H		EA designation result in high protection for some key areas
Acquisition	M		Variety of state funding sources and significant wetland area involved
Nonregulatory	H		Education important for regulatory program, public, & schools
Coordination	H		404 Assumption key element of coordination with feds
OVERALL PROCESS RATING[1]	N/A	H	HIGH potential effectiveness, with Regulatory, Info/Research, Planning, and Restoration all HIGH
OUTCOME INDICATORS			
Regulatory	N/A	I	No data to make regulatory estimate; likely M to H, but uncertain
Planning	L		Key area protected - EA, but no local plan data
Acquisition	L		Significant areas acquired, but incomplete data
Nonregulatory Restoration	I		Some restored but no data; newer program and emphasis
OVERALL OUTCOME RATING[1]	N/A	I	INCONCLUSIVE, but likely moderate or possibly higher based on study criteria; lack of regulatory outcome data very problematic
SUMMARY [1]	N/A	I	INCONCLUSIVE, but likely moderate or higher due to strong regulatory program, planning protections for critical areas, acquisition, and coordination mechanisms

[1]Overall and summary ratings are relative to the ideal CZM program, given issue importance.

MISSISSIPPI
CZM Effectiveness for Estuary and Coastal Wetland Protection

ISSUE IMPORTANCE

The large areas of coastal wetlands and estuarine area in Mississippi makes the issue of estuary and coastal wetland protection at least of ***moderate importance*** in Mississippi. Tourism impacts, and development associated with tourism, has not been quantified but is likely, particularly with the advent of dockside gaming. Wetlands losses to processed such as sea level rise and storm damage is significant and a growing concern.

PROCESS INDICATOR RESULTS

Based on the policies, processes, and tools used in Mississippi to protect estuaries and coastal wetlands, the Mississippi Coastal Program should be ***highly effective*** for tidal wetlands and ***moderately effective*** for non-tidal wetlands relative to the ideal program. While the state has a permit program for tidal wetlands below MHW, with a strong mitigation requirement, Clean Water Act Section 401 Water Quality Certification is relied upon for protection of freshwater wetlands. Joint permitting with the USACOE is an important component of the regulatory program. The Wetlands Use Plan is the key planning effort aimed at protection of coastal wetlands and estuaries, covering the entire CZ and identifying preservation/limited use areas. Other local planning efforts have been attempted; there is no formal state review of local plans. Mapping through the NWI and other efforts is utilized to identify wetlands and the uses allowed. Functional assessment is a key part of the Coastal Wetlands Protection Law. The Coastal Preserve System is an important acquisition tool, containing ~20 sites. Non-regulatory restoration is not pursued.

OUTCOME INDICATOR RESULTS

Excluding coastal waters, ~50% of the area incorporated into the Wetlands Use Plan is designated as "preservation." No data on other planning programs is available. Based on this data, planning tools are likely at least of moderate effectiveness. The lack of other information makes on-the-ground results of the MCMP ***inconclusive***. Data for the State's regulatory and Coastal Preserve program outcomes is not available.

PROGRAM EFFECTIVENESS ESTIMATE

Overall, the effectiveness of Mississippi policies and programs for coastal wetlands protection is ***INCONCLUSIVE*** compared to the ideal program. The strength of the tidal wetlands regulatory program, the Wetlands Use Plan, strong acquisition program, and mapping/functional assessments suggest that the program would likely be rated at HIGH effectiveness for tidal wetlands if outcome data were available. The effectiveness of the state's freshwater wetlands protection efforts is likely not as strong.

Opportunities for improvements

- develop a freshwater wetlands regulatory program to afford wetlands above mean high water protection beyond cumulative impact consideration and 401 Water Quality considerations.
- continue and augment wetland change monitoring efforts. Could be utilized to identify freshwater wetland areas and policies necessary to ensure protection.
- develop database for tracking area impacts from permits, as well as violations losses. Use of GIS in this effort could be paired with developing a watershed based restoration program.
- develop non-regulatory restoration program, utilizing current and additional functional assessments perhaps on a watershed-based scale.
- work to remove dockside gaming exclusion from water dependency

MISSISSIPPI
Summary Ratings For Issue Importance, Process Indicators, and Outcome Indicators

CATEGORY	RATINGS		COMMENTS
	Tidal	Nontidal	
ISSUE IMPORTANCE RATING[1]	M (2.14)		Large expanses of wetlands/estuary area; low historic loss.
PROCESS INDICATORS			
Information/Research	H		Wetlands Use Maps; functional assessments.
Regulatory	H	M	Strong tidal wetlands program; rely on CWA Section 401 for nontidal wetlands.
Planning	H		Wetlands Use Plan is important; other local planning is important as well.
Acquisition	H		Coastal Preserve System is good example of CZM assisting in acquisition.
Nonregulatory	M		Education efforts pursued more strongly than restoration
Coordination	H		Joint permitting is important
OVERALL PROCESS RATING[1]	H	M	Lack of freshwater wetlands permit program is a weakness.
OUTCOME INDICATORS			
Regulatory	I	I	No area or violations data.
Planning	M		Based on Wetlands Use Plan.
Acquisition	I		Area of Coastal Preserve acquisitions not known.
Nonregulatory Restoration	N/A		Not pursued
OVERALL OUTCOME RATING[1]	I	I	No data except for Wetlands Use Plan area estimates.
EFFECTIVENESS SUMMARY [1]	I	I	INCONCLUSIVE, based on lack of data to make evaluation.

[1]Overall and summary ratings are relative to the ideal CZM program, given issue importance.

NORTH CAROLINA
CZM Effectiveness for Estuary and Coastal Wetland Protection

ISSUE IMPORTANCE

The issue of coastal wetlands and estuary protection is ***highly important*** in North Carolina. The state experienced significant agriculture and forest product production related impacts to wetlands prior to passage of 1969 Dredge and Fill Act and 1979 Coastal Area Management Act (CAMA). Rural coastal areas now threatened by urban and residential development.

PROCESS INDICATOR RESULTS

Based on the policies, processes, and tools used in North Carolina to protect estuaries and coastal wetlands, the NC CAMA should be ***highly effective*** for tidal wetlands, and ***moderately effective*** for nontidal wetlands, relative to the ideal program. There is no state non-tidal wetland regulatory program; in the coastal area, Section 401 Water Quality Certifications and federal consistency are utilized for freshwater wetlands protection. The tidal wetlands regulatory program is perceived as strong. As a result, there is a limited use of compensatory mitigation due to the lack of permitted wetlands loss. Other strengths of NCCMP include the NC-CREWS effort utilizing GIS technology in functional assessment of wetlands. Local planning and the designation of ACECs are critical components of NCCMP. Acquisition through the Coastal Reserve System is utilized to obtain and protect prime potential development sites. Coordination tools such as joint permitting and pre-application meetings are also important. Restoration efforts to date have been somewhat minimal, though the NC-CREWS project will be utilized for restoration site identification.

OUTCOME INDICATOR RESULTS

There is insufficient data for a definite effectiveness measure, so that the NCCMP effectiveness rating is ***inconclusive***. However, available data does point to a probable HIGH rating for protection of tidal wetlands. Annual permitted loss of wetlands is less than 0.1% of all jurisdictional wetlands; annual loss is less than one acre of tidal wetlands since 1985. The lack of mitigation or violations data renders the regulatory program of inconclusive effectiveness. Acquisition data, the 10,000 acre NERR and 2,000 acres of maritime forest acquired, indicates a rating of HIGH effectiveness for the acquisition programs. A lack of planning outcome data (i.e., ACEC areas, wetlands protected under local planning) leads to an INCONCLUSIVE rating.

PROGRAM EFFECTIVENESS ESTIMATE

The effectiveness of North Carolina policies and programs for coastal wetlands protection is ***INCONCLUSIVE*** compared to the ideal program. There is strong indication that the NCCMP is highly effective in protecting tidal wetlands from the regulatory and acquisition data that is available. ACECs and local planning are perceived to be strengths in protecting estuaries and coastal wetlands.

Opportunities for improvements

- Need better record-keeping to track violation losses and mitigation gains
- Examine freshwater wetlands losses; if losses high, consider expanding CZ regulatory program through CAMA regulations or legislation
- Expand restoration program utilizing NC-CREWS as planned
- Expand compliance monitoring effort

NORTH CAROLINA
Summary Ratings for Issue Importance, Process Indicators, and Outcome Indicators

CATEGORY	RATINGS		COMMENTS
	Tidal	Nontidal	
ISSUE IMPORTANCE[1]	H (2.43)		HIGH , due to large amount of wetland and estuarine area, high historic loss, and perceived importance
PROCESS INDICATORS			
Information/Research	H		NC-CREWS
Regulatory	H	M	Strong tidal wetlands program; freshwater wetlands protected through federal consistency/401 Water Quality Certifications
Planning	H		ACEC/local planning
Acquisition	H		NERR and maritime forest sites/Coastal Preserve System
Nonregulatory	M		Education efforts increasingly acknowledged as important; restoration will be enhanced through use of NC-CREWS
Coordination	H		Joint permitting; pre-application meetings for major projects
OVERALL PROCESS RATING[1]	H	M	Lack of freshwater wetlands regulatory program is potential weakness.
OUTCOME INDICATORS			
Regulatory	I (H)	I	Probable high rating from lack of loss allowed
Planning	I(H)		Substantial ACEC areas, but no quantitative data
Acquisition	H		NERR + Coastal Preserve System
Nonregulatory Restoration	I		No data
OVERALL OUTCOME RATING[1]	I (H)	I	Lack of Planning data.
EFFECTIVENESS SUMMARY [1]	I (H)	I (M)	INCONCLUSIVE, based on lack of data; data available does suggest indicated ratings.

[1]Overall and summary ratings are based on comparison with the *model state CZM program*

NEW HAMPSHIRE
CZM Effectiveness for Estuary and Coastal Wetland Protection

ISSUE IMPORTANCE
Estuary and coastal wetland protection is a ***moderately important*** issue in New Hampshire, based on environmental, social, and other factors, but tending toward high importance. A combination of significant growth and development pressure, limited upland development sites in some coastal areas, and high historic loss make this a central issue for the program.

PROCESS INDICATOR RESULTS
Based on estuary and wetland protection policies, processes, and tools employed by New Hampshire, the NHCP should be ***highly effective*** relative to the ideal program for estuaries, tidal wetlands, and nontidal wetlands. Strengths of the program include the statewide regulatory program, with strong enforcement procedures, a tidal buffer zone, and strong avoidance, minimization, public need, and mitigation criteria. Planning at the local level, while not officially part of the enforceable NHCP, links effectively to regulatory program. Acquisition efforts probably appropriate and mapping, GIS, and other data useful and improving.

OUTCOME INDICATOR RESULTS
Outcome data on estuary and coastal wetland protection and restoration indicators for New Hampshire are limited, resulting in an overall ***inconclusive*** rating. There are some data on regulatory program outcomes that suggest high effectiveness, and more data should be available as soon as databases under development are completed. Planning data are absent, in p[art because local plans are not part of the NHCP. Data for acquisition and nonregulatory programs rate low based on criteria used for this study, but the acquisition program is probably appropriate, given the strong protection provided without exerting public ownership.

PROGRAM EFFECTIVENESS ESTIMATE
Overall, the effectiveness of New Hampshire's policies and programs for coastal wetlands protection is ***INCONCLUSIVE***, primarily because data verifying the expected high to moderate effectiveness is lacking. Strengths of the program, based mostly on policies and tools and limited outcome data for the regulatory program include:

- strong regulatory protection for estuaries, tidal and nontidal wetlands, and upland buffers in tidal areas
- the high participation of coastal towns in local wetland and shoreland planning and regulation
- the high degree of protection provided for the Great Bay estuary complex as well as low density development provisions for the shorelines of this area

Opportunities for Improvement
- better baseline data (e.g., amount of nontidal wetlands in coastal towns) and record-keeping are needed for regulatory program wetland losses, violation losses, mitigation gains, and trends over time
- better record-keeping is needed for acquisition, restoration, and planning outcomes; OSP should undertake a comprehensive review of outcome monitoring and develop and implement a program to show on-the-ground results; this is underway for the permit program
- considering significant historical losses, OSP should work with DFG, the Wetland Bureau, other public agencies and private organizations, and landowners to promote both tidal and nontidal wetland restoration
- OSP might consider how to more fully link local government regulatory provisions, especially for nontidal areas, into the NHCP, even if in a nonenforceable policy context.

NEW HAMPSHIRE
Summary Ratings For Issue Importance, Process Indicators, and Outcome Indicators

CATEGORY	RATINGS		COMMENTS
	Tidal	Nontidal	
ISSUE IMPORTANCE[1]	M (2.14)		MODERATE issue importance, approaching high; highly valued resource in the state
PROCESS INDICATORS			
Information/Research	H		Mapping resources especially useful for planning and change detection; full GIS and database capability soon
Regulatory	H	H	All wetlands plus tidal buffer zone regulated; strict permit criteria and enforcement
Planning	H		Local planning contributes indirectly to NHCP strength in estuary/wetland protection
Acquisition	M		Little used, but have plan and involvement where needed
Nonregulatory	H		Increasing involvement in restoration activities in tidal areas
Coordination	H		SPGP from USACOE key coordination/streamlining feature
OVERALL PROCESS RATING[1]	H	H	HIGH potential for estuary and wetland protection, based on strong regulatory program, and other complementary elements
OUTCOME INDICATORS			
Regulatory	I (H)	I (H)	INCONCLUSIVE, based on limited data available, likely will be HIGH for both tidal and nontidal when data compiled
Planning	I		INCONCLUSIVE, based on lack of data; could be anywhere from LOW to HIGH based on local plan consistency link to state permit decision-making
Acquisition	L		LOW, but in reality, program appears to have used this tool judiciously, considering lack of need due to strong regulatory protection
Nonregulatory Restoration	L		LOW, but increasing area of emphasis
OVERALL OUTCOME RATING[1]	I (H)	I (M)	INCONCLUSIVE for both estuary/tidal wetlands and nontidal wetlands, but likely HIGH and at least MODERATE if more supporting data were available
EFFECTIVENESS SUMMARY [1]	I (H)	I (M)	INCONCLUSIVE for tidal and nontidal areas; regulatory program and upland buffer some key program elements; given historic loss of both tidal and nontidal, more emphasis on restoration is warranted

[1] Overall and summary ratings are based on comparison with the *model state CZM program*

NEW JERSEY
CZM Effectiveness for Estuary and Coastal Wetland Protection

ISSUE IMPORTANCE
Significant estuarine areas and wetlands, high historic loss, highly concentrated coastal population, moderate development pressures, and a high level of public and governmental awareness of wetland issues combine to make the issue of coastal wetland and estuary protection one of ***high importance*** (2.57) in New Jersey. Early program emphasis was related to tidal wetlands, with nontidal wetlands a new focus since the mid-1980s.

PROCESS INDICATOR RESULTS
Based on the policies, processes, and tools used in New Jersey to protect estuaries and coastal wetlands, the New Jersey CMP should be ***highly effective*** relative to the model program. The clear strength of the program is its regulatory programs for both tidal and nontidal, freshwater wetlands. Coastal wetland setbacks and freshwater wetland buffers provide protection from indirect and secondary impacts. Research and large scale wetland inventories are in digital form and in GIS used in regulating wetlands. Planning and acquisition also contribute to protection through SAMPs and Greenacres acquisition program. The real weaknesses of the program is the minimal efforts in public education and the lack of a significant nonregulatory program, especially when considering the high historical loss and restoration opportunities.

OUTCOME INDICATOR RESULTS
The limited amount of outcome data available for New Jersey requires an ***inconclusive*** for outcome effectiveness; however, there is sufficient data to suggest a *probable high* effectiveness rating for tidal wetlands and *moderate* effectiveness for nontidal, freshwater wetlands. There are anecdotal data for the tidal wetlands program, and excellent data for freshwater wetland permit activity for a five year period—1988-93 (0.03% wetland loss/year with 35% of that loss mitigated); no subsequent data readily available. There are also no data available on violations. There is also very limited planning data (for Hackensack Meadowlands), no data on wetlands acquired under state programs, and there is no restoration program.

PROGRAM EFFECTIVENESS ESTIMATE
Overall, the effectiveness of New Jersey policies and programs for coastal wetlands protection is *INCONCLUSIVE* compared to the model program. Strong inventory and mapping resources, very strong regulatory programs that separately cover tidal (coastal) and nontidal (freshwater) wetlands in the coastal zone, and a strong acquisition program that includes wetlands, together suggest that the NJCMP is probably of HIGHLY effective for tidal areas and MODERATELY effective for nontidal wetlands.

Opportunities for improvements
- incorporate tidal wetland regulatory action data (coastal wetlands) into the permit tracking system; also develop a means to track losses associated with violations; finally, develop a standard annual reporting process to track trends in wetland loss, mitigation, and violations and use this as a management tool
- develop a CZM-focused nonregulatory restoration program, using the state's significant GIS resources to identify and set priorities for restoration opportunities in a regional or watershed context
- develop and implement an estuary and wetland public education program (general public, schools, local planners, developers) as a strategy to reduce losses and build public support

NEW JERSEY
Summary Ratings For Issue Importance, Process Indicators, and Outcome Indicators

CATEGORY	RATINGS		COMMENTS
	Tidal	Nontidal	
ISSUE IMPORTANCE[1]	M (2.57)		HIGH, based on large estuary and wetland area, high loss, and perceived importance of issue
PROCESS INDICATORS			
Information/Research	H		Wetland regulatory databases and statewide wetland data in GIS at large scale
Regulatory	H	H	Arguably strongest program in US; assumed 404, covers tidal and nontidal, buffers and setbacks, mitigation, enforcement
Planning	H		SAMPs protect significant areas in threatened ecosystems
Acquisition	H		Little CZM $, but state Greenacres program buys wetlands, including significant coastal acquisitions
Nonregulatory	L		Little restoration effort associated with CZM; not much wetland education outreach
Coordination	H		MOAs with USACE on 404 assumption; significant regulatory coordination
OVERALL PROCESS RATING[1]	H	H	HIGH potential, strong in all areas except nonregulatory restoration and education
OUTCOME INDICATORS			
Regulatory	I (H)	I (H)	Data and record-keeping for tidal wetlands program weaker than for freshwater program, but data not routinely monitored and reported
Planning	I		LOW rating by criteria, but probably should be higher given intensely urban area of SAMP
Acquisition	I		Significant wetland included in state acquisition program but no break-out data
Nonregulatory Restoration	N/A		No program, weak area
OVERALL OUTCOME RATING[1]	I (H)	I (M)	INCONCLUSIVE, probably high for tidal based on CAFRA ; probably moderate or high for nontidal, based on freshwater wetlands law; general lack of data; no restoration program
EFFECTIVENESS SUMMARY [1]	I (H)	I (M)	INCONCLUSIVE, high issue importance, high program potential, lack of adequate record-keeping hurts accountability; lack of wetland restoration program given significant loss, is biggest weakness

[1] Overall and summary ratings are based on comparison with the *model state CZM program*

NEW YORK
CZM Effectiveness for Estuary and Coastal Wetland Protection

ISSUE IMPORTANCE
Large wetlands areas, particularly around Long Island, and estuarine regions from the Great Lakes to Long Island Sound have a New York concern for a long time, as shown by the 1973 and 1975 passages of the Tidal and Freshwater Wetlands Acts, respectively. This and the high amount of historic loss have made the issue of coastal wetlands and estuary protection of ***high*** importance. While population growth has eased somewhat for the state overall, development pressure continues to grow in rural coastal areas.

PROCESS INDICATOR RESULTS
Based on the policies, processes, and tools used in New York to protect estuaries and coastal wetlands, the New York CMP should be at least ***moderately effective*** relative to the ideal program. The State tidal and nontidal wetlands regulatory programs, in particular the application of federal consistency and the use of environmental assessment, are key linchpins of the NY CMP, as are the voluntary Local Waterfront Revitalization Plans. The mapping requirements of the wetlands programs are key components to tidal and nontidal wetlands protection. The use of GIS for wetlands change monitoring has occurred as well. The NY CMP is generally not involved in acquisition efforts. More surprisingly, restoration efforts directed at wetlands are not a focus of the NY CMP, which is surprising given the high amount of historic loss of wetlands in New York. The lack of pre-application meetings and joint permitting is a weakness as well.

OUTCOME INDICATOR RESULTS
While New York keeps a variety of permit data, none really get at on-the-ground outcomes. Data for areas protected under Local Waterfront Revitalization Plans is likewise not available. Other data examining the on-the-ground effectiveness of the NY CMP in protecting coastal wetlands and estuaries is not present. Therefore, this lack of data makes the on-the-ground effectiveness determination ***inconclusive***.

PROGRAM EFFECTIVENESS ESTIMATE
Overall, the effectiveness of New York policies and programs for coastal wetlands protection is ***INCONCLUSIVE*** compared to the ideal program. Given the strong emphasis on regulatory programs, permit data is key to identify the NY CMP's effectiveness. The process indicator evaluation indicates an overall rating of MEDIUM effectiveness, which seems accurate given the lack of CZM acquisition, restoration, and coordination programs.

Opportunities for improvements
- Close or reduce 12.4 acre minimum area for freshwater wetlands protection through the permit program.
- Given significant historic wetlands losses, develop function-based restoration program; include NYCMP more in acquisition program.
- Pursue joint permits, pre-application reviews, other coordination efforts.
- Expand permit database to allow on-the-ground assessment of permit programs. Alternately, expand current GIS efforts to track wetlands losses from permitted activity to augment current wetland change monitoring.
- Improve compliance monitoring efforts.
- Provide incentives for local governments to write Local Waterfront Revitalization Plans.

NEW YORK

Summary Ratings for Issue Importance, Process Indicators, and Outcome Indicators

CATEGORY	RATINGS		COMMENTS
	Tidal	Nontidal	
ISSUE IMPORTANCE[1]	H (2.57)		High wetland/estuary areas; high amounts of historic loss and development pressure.
PROCESS INDICATORS			
Information/Research	H		Mapping/GIS important in regulatory efforts and wetland change monitoring.
Regulatory	H	H	Major portion of NY CMP effort to wetlands protection is on its regulatory program.
Planning	H		Waterfront Revitalization Plans and harbor management plans are the key planning effort in the CZ.
Acquisition	L		Not a focus of the NY CMP.
Nonregulatory	L		No restoration efforts are part of the NY CMP; education efforts are considered important.
Coordination	M		
OVERALL PROCESS RATING[1]	M	M	Lack of restoration/acquisition programs is a bit surprising, given high historic loss.
OUTCOME INDICATORS			
Regulatory	I	I	Data kept by the state is for administrative purposes.
Planning	I		No data on areas incorporated into planning programs.
Acquisition	I		No data.
Nonregulatory Restoration	NA		Restoration is not a program element.
OVERALL OUTCOME RATING[1]	I	I	No data to examine on-the-ground effectiveness.
SUMMARY[1]	I	I	INCONCLUSIVE, based on lack of data to make evaluation.

[1]Overall and summary ratings are based on comparison with the *model state CZM program*

NORTHERN MARIANA ISLANDS
CZM Effectiveness for Estuary and Coastal Wetland Protection

ISSUE IMPORTANCE

Despite having few estuarine and wetland resources, the issue of coastal wetland protection is at least of ***moderate importance*** in the Northern Marianas. This is due mainly to high historic losses in developed lowlands and intense development pressure, particularly for new tourism development.

PROCESS INDICATOR RESULTS

Based on the policies, processes, and tools used in the Northern Mariana Islands to protect estuaries and coastal wetlands, the CNMI CRMP should be ***moderately effective*** relative to the ideal program. Strengths of the program include the program to protect Areas of Particular Concern, including the Lagoon and Reef APC and the Wetlands and Mangrove APC. These are implemented through a relatively restrictive permit program. An acquisition program, now in abeyance, has also been an important tool for protection of wetlands. Program weaknesses include regulatory enforcement, lack of a wetland restoration element (despite significant historic losses), and limited interagency coordination.

OUTCOME INDICATOR RESULTS

100% of lagoons, and about 2/3 of wetlands, including all mangroves, are given high protection through APC designation and permit program implementation. This suggests moderate to high effectiveness for planning tools, but the lack of other outcome data make on-the-ground results of the program ***inconclusive***. Data for the most important estuary and wetland protection tools—the acquisition and regulatory programs—are not available to make needed assessments.

PROGRAM EFFECTIVENESS ESTIMATE

Overall, the effectiveness of the Northern Mariana Islands policies and programs for coastal wetlands protection are *INCONCLUSIVE* compared to the ideal program. However, the significant protection afforded by APCs, combined with the regulatory program, and the acquisition program that purchased many wetlands in private hands, suggest the program could be rated either at LOW or MODERATE effectiveness if data on these programs were available.

Opportunities for Improvement

- the GIS system being introduced to the NMI CRMP should be designed so as to provide outcome data on estuary and wetland protection efforts; permit data, including mitigation, mapping of APCs and wetlands within APCs, lands acquired by the Commonwealth, including wetlands therein, and opportunities for habitat restoration should be mapped with detailed information in associated databases
- alternatively, and until a GIS is fully operational, simple databases to track wetlands acquired and wetlands lost/gained through permitting should be developed; if these have a geographic reference, they can easily be linked to GIS in the future
- given significant historical losses of wetlands, wetland restoration opportunities should be assessed; if significant potential exists, a wetland restoration policy and program to achieve a net gain of wetlands over long term should be developed and implemented
- the on-the-ground effects of exempted activities on mangroves and wetlands should be evaluated to determine the degree of impact of exempted activities on wetlands; if impacts are significant, the exemptions should be revised to lessen them

NORTHERN MARIANA ISLANDS
Summary Ratings for the Issue Importance, Process Indicators, and Outcome Indicators

CATEGORY	RATINGS		COMMENTS
	Tidal	Nontidal	
ISSUE IMPORTANCE[1]	M (2.14)		Small estuary-wetland areas, but high loss and development pressure
PROCESS INDICATORS			
Information/Research	H		Significant mapping, functional assessment efforts
Regulatory	M	L	Weak enforcement program
Planning	H		
Acquisition	M		Highest ranked program for wetlands protection
Nonregulatory	H		Some education effort, no restoration
Coordination	H		Variety of mechanisms, but not important for wetland protection
OVERALL PROCESS RATING[1]	M	L	MODERATE, lack of restoration element especially weakens program; weak enforcement
Regulatory	I	I	Few permits, those issued require mitigation, but no data
Planning	M		APC act as large protection zones; uncertain as to exact % area protected
Acquisition	I		No data on acquisition
Nonregulatory Restoration	NA		No program element
OVERALL OUTCOME RATING[1]	I	I	INCONCLUSIVE, with little data except for planning areas
SUMMARY[1]	I	I	INCONCLUSIVE, based on lack of data to make evaluation

[1]Overall and summary ratings are based on comparison with the *model state CZM program*

OREGON
CZM Effectiveness for Estuary and Coastal Wetland Protection

ISSUE IMPORTANCE

With many small but important estuaries, large historic losses of tidal wetlands and unknown freshwater wetland loses, estuary and coastal wetland protection is at least of ***moderate importance*** in Oregon and probably increasing for freshwater wetlands. Data showing low population density and moderate growth are deceiving, given local and state perceptions. Oregon continues to rate this as a very important issue. Freshwater wetlands are most at risk from the direct impact of new development, but estuaries are adversely affected through indirect impacts, such as sedimentation and other nonpoint source pollution.

PROCESS INDICATOR RESULTS

Oregon has a strong state-level regulatory program for both tidal and nontidal waters and wetlands, supported by no-net loss mitigation requirements, comprehensive enforcement authority, and interagency coordination. Local freshwater wetland inventories are increasingly important for sorting out local development-wetland conflicts through planning. The state invests few resources in wetlands acquisition and nonregulatory restoration planning and does not interact much with other state, federal, or local stewardship initiatives. Overall, the OCMP has ***moderate potential*** for estuary and wetland protection as compared to the ideal program.

OUTCOME INDICATOR RESULTS

The combination of land use planning for estuarine areas and the state regulatory program have resulted in low absolute loss (0.02% of tidal areas between 1977-87) and decreasing loss rates in estuarine wetlands and subtidal areas (69% reduction in tow five-year increments). Poor post-1988 record-keeping precludes recent evaluation, but results would probably be comparable for tidal areas. Data on nontidal, freshwater wetlands is not available, again, due to inadequate record-keeping, so planning and regulatory outcome evaluation are inconclusive. There is also no information on violation losses for either tidal or nontidal areas, leading to more uncertainty with respect to program effectiveness on-the-ground. Acquisition is little used and the lack of a nonregulatory restoration element is a significant program weakness relative to estuary and coastal wetland protection.

PROGRAM EFFECTIVENESS ESTIMATE

Overall, the effectiveness of Oregon's policies and programs for coastal wetlands protection are ***MODERATE*** for estuary and tidal areas, although there is some uncertainty due to lack of recent outcome data. For nontidal wetlands, effectiveness is ***INCONCLUSIVE***. Strengths of the Oregon program include:

- Local land and water use planning for estuaries and adjacent shorelands, implemented through the state regulatory program, provide a strong basis for avoiding alterations of estuaries and tidal wetlands
- Pioneering work in estuarine mitigation and mitigation banking through CZM has become a hallmark of wetland management nationally and internationally
- Recent freshwater wetland inventories, Goal 5 planning efforts, combined with existing state regulatory program, are strengthening wetland protection in urban and urbanizing areas along the coast
- The OCMP's emphasis on education and assistance to local planners and officials—through DSL—plays a key role in wetland protection is probably very important, but no data are available to confirm this

Opportunities for Improvement

- better regulatory program monitoring and data management, with separation of tidal and nontidal data, would allow for a better estimate of program assessment and attribution of program effectiveness overall
- opportunity to establish a nonregulatory wetland restoration program, particularly for tidal wetlands that have been significantly altered through diking, but also for freshwater wetlands; tidal restoration program would fit well into the Coastal Salmon Restoration Initiative, aimed at heading off listing of coho salmon
- opportunity to coordinate and assist various land stewardship programs in the coastal zone, working as a partner in the Oregon Wetlands Joint Venture and with other state and federal agencies; should establish, at a minimum, a database to track acquisitions
- needed policy improvements: promotion of a net gain of wetlands in long term through a wetland restoration element within the OCMP, implemented through local watershed councils.

OREGON

Summary Ratings for Issue Importance, Process Indicators, and Outcome Indicators

CATEGORY	RATINGS		COMMENTS
	Tidal	Nontidal	
ISSUE IMPORTANCE[1]	M (1.86)		MODERATE leaning toward high, based on historic losses and perceived importance in the state
PROCESS INDICATORS			
Information/Research	H		Good estuarine/tidal wetland mapping; new emphasis on nontidal wetlands
Regulatory	H	H	Comprehensive statewide regulatory program
Planning	H		Estuary planning significant strength; nontidal wetland planning weak
Acquisition	M		Little involvement of CZM
Nonregulatory	M		Little involvement of CZM
Coordination	H		Joint permit, interagency coordination strong
OVERALL PROCESS RATING[1]	M	M	MODERATE program potential to protect estuaries and coastal wetlands
OUTCOME INDICATORS			
Regulatory	M	I	No data for nontidal; data for estuarine/tidal only for 1977-87
Planning	M		Good data and significant protection for estuaries and tidal wetlands
Acquisition	L		Little involvement
Nonregulatory Restoration	NA		No nonregulatory program
OVERALL OUTCOME RATING[1]	M	I	MODERATE for tidal, INCONCLUSIVE for nontidal; latter due to lack of data
SUMMARY[1]	M	I	MODERATE for tidal, INCONCLUSIVE for nontidal; overall effectiveness limited by lack of acquisition and nonregulatory restoration programs

[1]Overall and summary ratings are based on comparison with the *model state CZM program*

PENNSYLVANIA
CZM Effectiveness for Estuary and Coastal Wetland Protection

ISSUE IMPORTANCE
Pennsylvania's coastal zone consists of two short strips of shore and waters, one along the upper Delaware River estuary and the other along Lake Erie. Although it does not have a great deal of estuarine or wetland resources, protection of what exists there is a ***moderately important*** issue in the state, owing to significant historical losses and present-day scarcity, continuing direct and indirect development pressures, and the recognition of the important role these systems play in maintaining ecological functions of the landscape.

PROCESS INDICATOR RESULTS
Pennsylvania has a strong state-level regulatory program applicable to both tidal and nontidal waters and wetlands, supported by no-net loss mitigation requirements, and comprehensive enforcement authority and interagency coordination. A recently-updated NWI and annual compliance monitoring and enforcement surveys are important program components, as are general permits for selected activities, some of which may actually weaken the program (e.g., single-family dwelling GP). There are no important planning, acquisition, or nonregulatory restoration elements and involvement of local governments protection efforts through land use planning is minimal. Overall, the program has ***moderate*** potential for estuary and wetland protection as compared to the ideal program.

OUTCOME INDICATOR RESULTS
Regulatory program outcome data are limited to compliance monitoring and enforcement data, resulting in an overall ***inconclusive*** outcome indicator rating. Enforcement data, based on a multi-faceted monitoring and inspection effort, show dramatic reduction in violations and wetland losses overall. In the Delaware estuary coastal zone, there were 110 violations detected between 1980-86; 50 violations in the 1986-89 period; 5-7 per year between 1990-93; 3 in 1994; and 0 in 1995. A similar but less intensive effort in the Lake Erie coastal zone showed 30 violations in the 1986-1989 period and none in 1994. Another major process outcome, has been the improved coordination among agencies with enforcement authority, particularly the sharing of responsibility. Other outcome data are limited, suggesting some uncertainty with respect to overall program effectiveness.

PROGRAM EFFECTIVENESS ESTIMATE
Overall, the effectiveness of Pennsylvania's policies and programs for estuary and coastal wetland protection are ***INCONCLUSIVE***, compared to the ideal program. Uncertainty about the program effectiveness stems from the lack of more comprehensive regulatory outcome data, and limitations imposed by lack of significant wetland planning, acquisition, and nonregulatory restoration elements.

- regulatory program violations data suggest that the program is well-understood by the regulated public and that avoidance of wetlands in the development process is the norm
- the state has recently expanded its CZ boundary to include areas hydrologically connected to coastal waters, mainly to help identify potential wetland restoration sites for its payment-in-lieu mitigation program
- better regulatory program monitoring and data management has been implemented, *in part as a result of this study*, with separation of tidal and nontidal data, and coastal zone and non-coastal zone; this will allow for a better estimate of program assessment and effectiveness overall

Opportunities for Improvement
- opportunities to restore degraded or former wetlands in a nonregulatory context should be explored; it is recognized, however, that private property rights and extensive historic and recent development probably limits restoration potential, at least in the Delaware estuary coastal zone; promotion of local watershed-level stewardship programs should be explored in this regard
- exploration of opportunities to involve local governments in wetland protection through their land use planning authorities and stormwater planning responsibilities should be explored
- more public education on wetland protection could enhance the operation of the strong regulatory program

PENNSYLVANIA
Summary Ratings for Issue Importance, Process Indicators, and Outcome Indicators

CATEGORY	RATINGS		COMMENTS
	Tidal	Nontidal	
ISSUE IMPORTANCE[1]	M (2.29)		High wetland loss historically, significant development pressures today
PROCESS INDICATORS			
Information/Research	H		Strong emphasis in support of regulatory program
Regulatory	H	H	This is the strongest program element; general permits weaken somewhat
Planning	L		GAPC not useful for protection; should consider integrating with local plans
Acquisition	L		Not area of emphasis, but has potential based on site priorities it has developed
Nonregulatory	M		Education element, but no nonregula-tory restoration—program weakness
Coordination	H		Strong emphasis in support of regulatory program admin/enforcement
OVERALL PROCESS RATING[1]	M	M	Regulatory program excellent; lack of planning/nonreg. restoration weakens
OUTCOME INDICATORS			
Regulatory	M	M	Better record-keeping on outcomes could push to H
Planning	I		No data
Acquisition	N/A		No program to evaluate, but probably not as important as planning/restoration
Nonregulatory Restoration	N/A		No program to evaluate; considering high historical loss, should consider
OVERALL OUTCOME RATING[1]	I (M)	I (M)	INCONCLUSIVE, but could be considered moderately effective based on regulatory program alone
SUMMARY [1]	I (M)	I (M)	INCONCLUSIVE; overall effectiveness limited by lack of planning and nonregulatroy restoration elements; also need more consistent regulatory record-keeping

[1]Overall and summary ratings are relative to the model CZM program, given issue importance.

PUERTO RICO
CZM Effectiveness for Estuary and Coastal Wetland Protection

ISSUE IMPORTANCE

Estuary and coastal wetland protection is a ***highly important*** issue in Puerto Rico, based on environmental, social, and other factors. Extensive estuarine lagoons with large mangrove areas, significant nontidal freshwater wetland areas in the coastal zone, very high historic wetland loss, especially mangroves (75%), high population density and development pressures combine to give Puerto the highest issue rating of all programs evaluated.

PROCESS INDICATOR RESULTS

Based on estuary and wetland protection policies, processes, and tools employed by Puerto Rico, the PRCMP should be ***moderately effective*** relative to the ideal program for estuaries and tidal wetlands, and of ***low effectiveness*** for nontidal wetlands. The protection afforded special planning areas, particularly mangroves, is strong, and other planning tools used add to these protections, at least for tidal areas. Research and mapping efforts, use of educational programs for youth, and coordination mechanisms also suggest high potential, but again, just for tidal areas. Acquisition capacity is also significant, both for direct purchases and for working with other state and private programs.

OUTCOME INDICATOR RESULTS

Outcome data are available for one planning tool—special planning areas, which are essentially a high protection area for all mangroves, and for direct fee simple acquisition. Both are rated high. Outcome for other planning tools (SAMP, local plan zoning, nature reserves) are lacking, as are data from the regulatory program and restoration efforts, which are minimal. There are insufficient data to make an overall determination of on-the-ground results PRCMP implementation, resulting in an ***inconclusive*** outcome indicator rating for estuary and coastal wetland protection.

PROGRAM EFFECTIVENESS ESTIMATE

Overall, the effectiveness of Puerto Rico's policies and programs for estuary and coastal wetland protection is ***INCONCLUSIVE.*** However, outcome data for some planning and acquisition tools, and potential in other areas, suggests a possible HIGH rating for tidal wetlands and a LOW rating for nontidal. More data are needed to confirm these. Strengths of the PRCMP include:

- special planning area protection for mangrove wetlands that have virtually eliminated further loss of this resource
- a variety of acquisition tools and programs that suggest greater potential use for this tool
- an emphasis on public education that focuses on schools—the next generation of conservationists

Opportunities for Improvement

- PRCMP should establish easy-to-maintain database tracking and reporting on wetland changes due to permit actions (loss and mitigation gains), nonregulatory gains in wetland area and function, and for assessing protection or wetland area provided through plans
- extend regulatory permit program used in tidal areas to nontidal wetlands, establishing strong policies requiring wetland avoidance, impact minimization, alternatives, public need, and compensatory mitigation
- establish policy excluding non-water dependent uses from tidal wetlands
- strengthen compensatory mitigation requirements for tidal wetlands
- institute a more formal system of compliance monitoring and enforcement

PUERTO RICO
Summary Ratings for Issue Importance, Process Indicators, and Outcome Indicators

CATEGORY	RATINGS		COMMENTS
	Tidal	Nontidal	
ISSUE IMPORTANCE[1]	H (2.71)		HIGH IMPORTANCE, based on estuarine and wetland areas, historic losses, population pressures, and high profile
PROCESS INDICATORS			
Information/Research	H		Good mapping resources for planning; GIS capacity
Regulatory	M	M	MODERATE for tidal, based on mangrove regulatory authority; LOW for nontidal, due to lack of jurisdiction and limited 401 program
Planning	H		HIGH based on SAMPs and special planning area policies
Acquisition	H		MODERATE based on limited program; mostly direct NERR
Nonregulatory	M		HIGH due to public/school education programs; but little restoration
Coordination	L		HIGH, based on PRCMP networking of relevant development & protection agencies
OVERALL PROCESS RATING[1]	M	M	MODERATE for tidal, based on combination of planning and regulatory protection; LOW for nontidal with few program elements
OUTCOME INDICATORS			
Regulatory	I (H)	I	INCONCLUSIVE for tidal with limited data suggesting little change or possible gain; no nontidal program and little use of federal consistency or 401 certification
Planning	H		HIGH, based on mangrove protection in SPAs; more potential data
Acquisition	H		HIGH, based on mangrove acquisition for JBNERR
Nonregulatory Restoration	I		INCONCLUSIVE, limited program emphasis with no data
OVERALL OUTCOME RATING[1]	I (H)	I (L)	INCONCLUSIVE, but possibly HIGH for tidal, based on planning program protections; very LOW for nontidal
SUMMARY [1]	I (H)	I (L)	INCONCLUSIVE, but possibly HIGH for tidal, based on planning, acquisition, regulatory potential; and very LOW for nontidal due to lack of authority and program emphasis

[1]Overall and summary ratings based on comparison with the *model state CZM program*

RHODE ISLAND
CZM Effectiveness for Estuary and Coastal Wetland Protection

ISSUE IMPORTANCE

The issue of coastal wetland protection is of ***high importance*** in Rhode Island, due largely to the high population density and high historic loss. While the state does not have the large expanses of tidal marsh such as states further south, this lack of wetland area has focused preservation efforts on existent wetlands.

PROCESS INDICATOR RESULTS

Based on the policies, processes, and tools used in Rhode Island to protect estuaries and coastal wetlands, the RI CRMP should be ***moderately effective*** relative to the ideal program. Rhode Island has separate, highly effective regulatory programs for tidal and nontidal wetlands. Mitigation and non-water dependent use exclusions are strong components of each. Salt marshes in particular are strongly protected. Rhode Island is a national leader in the use of SAMPs; four are currently being implemented, all with positive results. Harbor management plans are in the developing stage. The state's various mapping efforts include the NWI, Coastal Region priority use map, and current efforts to map SAV (eelgrass), and Narragansett Bay habitats. The RICRMP has a moderate level of involvement in acquisition, education/ outreach efforts, and various coordination mechanisms. Nonregulatory restoration is not pursued by the RI CRMP, somewhat surprising considering the high level of historic wetlands loss.

OUTCOME INDICATOR RESULTS

At least 3,300 acres of the ~3,600 acres of land and water (including a substantial amount of wetlands area) incorporated into Rhode Island's SAMPs are afforded high protection. Based on this data, the use of planning tools in Rhode Islands is likely of high effectiveness. The lack of other outcome data makes on-the-ground results of the RICRMP ***inconclusive***. Data for the tidal and non tidal wetlands regulatory program are not available.

PROGRAM EFFECTIVENESS ESTIMATE

Overall, the effectiveness of Rhode Island policies and programs for coastal wetlands protection is **INCONCLUSIVE** compared to the ideal program. The perceived strength of the regulatory program, and the utilization of SAMPs, suggest that the RICRMP could be rated of at least MODERATE effectiveness if data were available. The lack of non-regulatory restoration is a program weakness, given the historic high loss of wetlands.

Opportunities for improvements

- install wetland change monitoring system to monitor effectiveness of permitting programs (and wetlands loss to other causes)
- with wetland change monitoring, establish database for tracking wetlands losses/mitigation/ violations through regulatory programs. Verify strength of regulatory programs.
- improve compliance monitoring
- improve and develop nonregulatory restoration efforts. GIS and current mapping efforts could be used to develop functional, watershed based restoration programs.

RHODE ISLAND
Summary Ratings for Issue Importance, Process Indicators, and Outcome Indicators

CATEGORY	RATINGS		COMMENTS
	Tidal	Nontidal	
ISSUE IMPORTANCE[1]	M (2.29)		HIGH, based on significant historic loss and a high population density having high pressure on wetland areas remaining.
PROCESS INDICATORS			
Information/Research	H		Various mapping efforts valuable to wetland protection efforts
Regulatory	H	H	Perceived strong separate tidal and nontidal wetlands permit programs
Planning	H		Use of SAMPs to address wetland and other resource issues nationally recognized
Acquisition	M		
Nonregulatory	M		Restoration is not a RI CRMP pursuit; education and outreach efforts are more important
Coordination	M		Variety of mechanisms utilized
OVERALL PROCESS RATING[1]	M	M	MODERATE potential for both tidal and nontidal; lack of restoration program is weakness
OUTCOME INDICATORS			
Regulatory	I	I	No area data available; no violations data available (for either permit program)
Planning	H		Based on >90% protection of estuary and wetland areas covered under several SAMPs
Acquisition	I		Area data not available
Nonregulatory Restoration	I		Limited effort and no data
OVERALL OUTCOME RATING[1]	I	I	INCONCLUSIVE, based on lack of data and record-keeping; SAMPs only source of outcome data
SUMMARY[1]	I	I	INCONCLUSIVE, based on lack of data for adequate assessment

[1]Overall and summary ratings are based on comparison with the *model state CZM program*

SOUTH CAROLINA
CZM Effectiveness for Estuary and Coastal Wetland Protection

ISSUE IMPORTANCE

The relatively low population density across the CZ and the relatively low estuary area combine to make the issue of coastal wetland and estuary protection one of ***moderate importance*** in South Carolina. The state does have a large amount of tidal wetlands, particularly salt marsh; this and the historic loss of wetlands have helped keep the issue of wetlands protection perceived as very important.

PROCESS INDICATOR RESULTS

Based on the policies, processes, and tools used in South Carolina to protect estuaries and coastal wetlands, the South Carolina CMP should be ***moderately effective*** relative to the ideal program. Strengths of the program lie in the regulatory programs protecting critical areas, including tidal wetlands below mean high water, and the use of federal consistency for protecting freshwater wetlands within the CZ. Compliance monitoring, the use of Clean Water Act Section 401 Water Quality certifications, and non-water dependent use exclusions are also strong components of the regulatory package. Coordination efforts, including interagency coordination forums and pre-application meetings are important as well. Mapping, wetland change monitoring, and GIS are not utilized to any great extent. Education/outreach efforts are more impressive than restoration efforts. While SAMPs may involve a good deal of local planning, and other planning efforts are not that widespread. Similarly, acquisition has been used sparingly, though the NERRs in South Carolina cover 100,000+ acres.

OUTCOME INDICATOR RESULTS

The lack of data makes on-the-ground results of the SCCMP ***inconclusive***. While there are violations data, it is not evident that any trends are present. No area impact data beyond area of fill requested contiguous or isolated wetlands exists; there is no data on actual amount of fill which occurred or amount of impact from other causes. There is no area data for tidal wetlands. Similarly, there is no data for wetlands protected under SAMPs (except for the Ashley River SAMP), or wetlands restored. The NERR sites in South Carolina encompass 100,000+ acres, but data for other types of acquisition is not available.

PROGRAM EFFECTIVENESS ESTIMATE

Overall, the effectiveness of South Carolina policies and programs for coastal wetlands protection is ***INCONCLUSIVE*** compared to the ideal program. The strong regulatory and planning programs suggest that the SC CMP is at MODERATELY effective at protecting coastal wetlands and estuaries, although the lack of mapping activities and restoration is a program weakness.

Opportunities for improvements

- improve wetland mapping and inventory efforts, particularly for freshwater wetlands that are more threatened; digitizing updated NWI into a GIS and linking it to watershed-based assessment of wetland functions would serve as a good tool for implementing freshwater wetland project reviews
- develop and implement a wetland change monitoring program; this could be accomplished suing the suggested GIS mapping and function analysis suggested above; the results could be used to monitor the on-the-ground effectiveness of the SCCMP regulatory programs.
- increase and develop non-regulatory restoration efforts; again, using GIS-based assessment, restoration sites or at least general areas might be identified
- legislatively establish a nontidal, freshwater wetland regulatory program to extend more complete protection to these resources

SOUTH CAROLINA
Summary Ratings for Issue Importance, Process Indicators, and Outcome Indicators

CATEGORY	RATINGS		COMMENTS
	Tidal	Nontidal	
ISSUE IMPORTANCE[1]	M (2.29)		MODERATE, tending toward high, based on large area of wetlands and perceived importance of the issue.
PROCESS INDICATORS			
Information/Research	L		Not a major effort; weak portion of SCCMP
Regulatory	H	H	Strongest part of CMP; effective use of federal consistency/401 cert. to protect freshwater wetlands
Planning	M		SAMPs particularly important
Acquisition	M		Various means for acquisition, though amounts unknown
Nonregulatory	M		Education efforts stronger than nonregulatory restoration
Coordination	H		Variety of mechanisms important to wetlands protection
OVERALL PROCESS RATING[1]	M	M	MODERATE potential, lacks restoration program, weak mapping/ inventory programs
OUTCOME INDICATORS			
Regulatory	I	I	Area data available covers only fills in contiguous and isolated wetlands; doesn't cover other impacts. No area data for tidal wetlands.
Planning	I		No area data for SAMPs other than Ashley River.
Acquisition	I(M)		NERR areas are known, but no area for other acquisitions.
Nonregulatory Restoration	I		New effort; no data
OVERALL OUTCOME RATING[1]	I	I	INCONCLUSIVE, insufficient data to make assessment
SUMMARY[1]	I	I	INCONCLUSIVE, based on lack of data to make evaluation

[1]Overall and summary ratings are based on comparison with the *model state CZM program*

VIRGINIA
CZM Effectiveness for Estuary and Coastal Wetland Protection

ISSUE IMPORTANCE
Estuary and coastal wetland protection is a ***moderately important*** issue, based on environmental, social, and other factors. Very large amounts of estuarine habitat in Chesapeake Bay, and the James, York, and Rappahannock Rivers, and a moderate amount of wetlands help make the issue of wetland protection an important one. Passage of the 1972 Coastal Wetlands Law was in part due to the recognition of high historic losses of valuable tidal wetlands.

PROCESS INDICATOR RESULTS
Based on estuary and wetland protection policies, processes, and tools employed by Virginia, the VCRMP should be ***moderately effective*** relative to the ideal program for estuaries and tidal and nontidal wetlands. Strengths of the VCRMP include the interaction with VIMS for tidal marsh inventories and mapping, wetland functional assessments, and environmental assessments in the permit review process. The VCRMP has been a national leader in the use of SAMPs, in particular the Northampton County SAMP. The Chesapeake Bay Preservation Area Program extends a high degree of protection to tidal wetlands and connected nontidal wetlands; development setbacks around designated critical areas are important as well. However, mitigation requirements and compliance monitoring could both be stronger. There is no state freshwater wetlands protection program specifically; Clean Water Act Sections 404 and 401 are relied upon. Acquisition, non-regulatory restoration, and coordination efforts have all been pursued to some degree.

OUTCOME INDICATOR RESULTS
The lack of outcome data makes determination of the on-the-ground effectiveness of the VCRMP in protecting coastal wetlands and estuaries ***inconclusive***. Data for the regulatory program under the Coastal Wetlands Law is available for only one year (1988); wetland areas incorporated into the Chesapeake Bay Preservation Area Program is not known.

PROGRAM EFFECTIVENESS ESTIMATE
Overall, the effectiveness of Virginia policies and programs for coastal wetlands protection is ***INCONCLUSIVE*** compared to the ideal program. There is no state freshwater wetlands protection program. However, given the significant protection afforded to wetland areas by the Chesapeake Bay Preservation Area Program, and the Coastal Wetlands Law, the VCRMP could be rated likely at MODERATE effectiveness for tidal wetlands if data were available. The partnership with VIMS is a big success story that other states should examine.

Opportunities for Improvement
- better monitoring, record-keeping and data management to track regulatory decisions related to wetlands losses and gains, and acquisition, restoration, and planning outcomes
- increase nontidal wetlands protection
- institute a wetland change monitoring program to determine on-the-ground losses
- fully develop the pilot VIMS database with area impacts and enter historic data to determine recent trends
- improve mitigation/compliance monitoring efforts
- increase the already strong restoration efforts

VIRGINIA
Summary Ratings for Issue Importance, Process Indicators, and Outcome Indicators

CATEGORY	RATINGS		COMMENTS
	Tidal	Nontidal	
ISSUE IMPORTANCE[1]	H (2.43)		HIGH, based on high loss and national importance and attention given to Chesapeake Bay
PROCESS INDICATORS			
Information/Research	H		Mapping, functional assessment efforts of VIMS and other agencies
Regulatory	M	M	Weak compliance monitoring and mitigation requirements; CWA 404 and 401 only for freshwater wetlands
Planning	H		Chesapeake Preservation Area Program and use of SAMPs are key
Acquisition	M		Various programs where suitable and funding allows
Nonregulatory	M		Restoration of riparian buffers and habitat is a current priority
Coordination	M		Variety of mechanisms utilized to some extent
OVERALL PROCESS RATING[1]	M	M	MODERATE potential only, due to lack of compliance monitoring, mitigation, and freshwater wetland regulatory program
OUTCOME INDICATORS			
Regulatory	I(H)	I	VIMS pilot database in 1988 had extensive data.
Planning	I		
Acquisition	I		Only data for direct acquisition from 1991-1995 available, none for other efforts.
Nonregulatory Restoration	L		No data available
OVERALL OUTCOME RATING[1]	I	I	Lack of data
SUMMARY[1]	I	I	INCONCLUSIVE, based on lack of data to make evaluation.

[1]Overall and summary ratings are based on comparison with the *model state CZM program*

VIRGIN ISLANDS
CZM Effectiveness for Estuary and Coastal Wetland Protection

ISSUE IMPORTANCE

Estuary and coastal wetland protection is a ***highly important*** issue in the Virgin Islands, based on environmental, social, and other factors. Estuarine lagoons, salt ponds, seagrass beds, and mangroves are relatively small areas, limited by steep island topography, but this does focus the CZM program on the coastal strip. High population density, high growth rates and development impacts, particularly secondary effects such as sedimentation, along with high historic losses combine to make estuary and wetland protection an increasingly important issue.

PROCESS INDICATOR RESULTS

Based on estuary and wetland protection policies, processes, and tools employed by Virgin Islands, the VICZMP should be ***moderately effective*** relative to the model program for estuaries and tidal wetlands. There is, however, no regulatory program for nontidal wetlands. For tidal wetlands, a comprehensive regulatory program, with environmental assessment and mitigation requirements, and high degree of monitoring and enforcement, is the major program strength. A variety of planning designations and opportunities exist to increase wetland protection, but none appear to be fully implemented. There are no acquisition or nonregulatory restoration elements to the program.

OUTCOME INDICATOR RESULTS

There are no data to make an overall determination of on-the-ground results of VICZMP implementation, resulting in an ***inconclusive*** outcome indicator rating for estuary and coastal wetland protection.

PROGRAM EFFECTIVENESS ESTIMATE

Overall, the effectiveness of Virgin Islands' CZM policies and programs for estuary and coastal wetland protection is ***inconclusive.*** Regulatory policies, process, and tools suggest program potential for achieving CZMA objectives, at least in part, but there are no outcome data for that program from which to draw conclusions. Strengths of the VICZMP include:

- a comprehensive regulatory program, with environmental assessment and mitigation requirements, and aggressive project monitoring and enforcement
- a comprehensive planning framework with a number of estuary and wetland protection mechanisms, including zoning and APC policies and designations

Opportunities for Improvement

- the VICZMP should establish easy-to-maintain database tracking and reporting on wetland changes due to permit actions (loss and mitigation gains) and for areas protected through planning mechanisms, including the degree of protection
- clarify the extent of nontidal wetlands in island upland areas and extend protection to them, especially for the role that they might play in controlling secondary impacts, such as sedimentation and other nonpoint pollution from construction activities and other runoff
- alternatively, develop federal consistency review standards and/or 401 certification standards to control direct and secondary impacts to both nontidal and tidal wetlands
- adopt and implement the proposed wetland and salt pond buffer zones, again to control secondary impacts to wetlands establish policy excluding non-water dependent uses from tidal wetlands
- investigate nonregulatory incentives for preservation of privately owned wetlands, such as tax abatement or deferral, that would reduce development pressures on these resources and/or create a basis for public acquisition and management

VIRGIN ISLANDS
Summary Ratings For the Issue Importance, Process Indicators, and Outcome Indicators

CATEGORY	RATINGS		COMMENTS
	Tidal	Nontidal	
ISSUE IMPORTANCE[1]	H (2.29)		HIGH issue importance due to high historic loss, significant threats from population and development-related degradation
PROCESS INDICATORS			
Information/Research	L		LOW, but lacks good inventory and other assessment tools
Regulatory	H	N/A	HIGH for tidal, based on permit program, mitigation and enforcement efforts
Planning	M		MODERATE, based on planning capacity and framework
Acquisition	N/A		NOT APPLICABLE; not used due to high cost of shoreline areas
Nonregulatory	L		LOW, based on limited efforts
Coordination	M		MODERATE, based on pre-application conferences
OVERALL PROCESS RATING[1]	M	I	MODERATE for tidal, based on regulatory program strength; iNCONCN/A for nontidal
OUTCOME INDICATORS			
Regulatory	I	I	No data compilations or database record-keeping on permit actions; no nontidal program
Planning	I		18 APCs, but no plans for protection of resources within them; other planning tools
Acquisition	I		No acquisition program
Nonregulatory Restoration	I		No nonregulatory restoration program
OVERALL OUTCOME RATING[1]	I	I	INCONCLUSIVE, based on lack of outcome data; no nontidal program
EFFECTIVENESS SUMMARY [1]	I	I	INCONCLUSIVE, based on lack of data to demonstrate regulatory and planning outcomes; no nontidal program

[1] Overall and summary ratings are based on comparison with the *model state CZM program*

WASHINGTON
CZM Effectiveness for Estuary and Coastal Wetland Protection

ISSUE IMPORTANCE

Estuary and coastal wetland protection is a ***moderately important*** issue, based on environmental, social, and other factors. Several large coastal estuaries and Puget Sound are dominant physical features in the coastal zone. There are relatively few wetlands in the state, but protecting them has been an important CZM goal from the outset, with emphasis first on tidal wetlands and later freshwater wetlands. Wetland losses, particularly in the Puget Sound region, have been high.

PROCESS INDICATOR RESULTS

Based on estuary and wetland protection policies, processes, and tools employed by Washington State, the WCZMP should be ***moderately effective*** relative to the ideal program. Strengths of the program include the substantial technical assistance and public education program that serves as a national model; the protection given to all tidal wetlands and a limited strip of freshwater wetlands through the SMA; and the state EIA law that applies to SMA actions. WCZMP weaknesses include the lack of state or local regulatory controls on freshwater wetlands outside the narrow 200-foot shoreline boundary and limited investment in wetland restoration, despite significant historical losses. Several existing state authorities with wetlands protection provisions are not incorporated into the WCZMP.

OUTCOME INDICATOR RESULTS

Outcome data for wetland acquisition shows that the state has been moderately effective in using this tool to protect significant tidal and nontidal wetland areas. Recently, there has been a small investment in a single wetland restoration project. However, there is insufficient data available on on-the-ground results of implementation of estuary and wetland regulatory and planning elements of the WCZMP. Part of the problem documenting results is that local governments have different levels of technical capacity to implement and document SMP decisions. Further, permits under issued the program are not wetland permits per se, but are development permits that sometimes involve wetlands. Wetlands are not the primary focus of decisions. Also, WDOE does not keep the adequate federal consistency decision records involving wetlands (primarily Section 404 permits) to track of wetland losses and gains.

PROGRAM EFFECTIVENESS ESTIMATE

Overall, program effectiveness of Washington's policies and programs for coastal wetlands protection are ***INCONCLUSIVE***. The lack of regulatory jurisdiction of the program over the bulk of freshwater, nontidal wetlands beyond the narrow shoreline boundary limits its reach and effectiveness. Strengths include:

- strong protection for tidal wetlands through planning, regulatory controls, and a standard EIA process
- a highly-regarded and emulated wetland public education and technical assistance program that has raised public awareness and provided useful wetland management tools and resources to local government and private stewardship groups

Opportunities for Improvement

- better baseline data, monitoring, and data management is needed to track decisions related to wetlands losses and gains, and acquisition, restoration, and planning outcomes; WDOE should undertake a comprehensive review of outcome monitoring and develop a program to show on-the-ground results
- Considering significant historical losses, WDOE should invest more CZM funds in wetland restoration
- a "recent status and trends" analysis to determine how wetlands are faring in the coastal zone would be useful for determining where regulatory problems exist, both in terms of jurisdictional gaps (beyond SMA area) and with violations; this could help determine what is needed to strengthen the program
- WDOE should consider incorporating WDNR, WDFW, and other agency wetland authorities into the WCZMP to take advantage of federal consistency benefits; WDOE believes CZM funding constraints may limit opportunities for such integration
- WDOE should consider developing a more robust federal consistency review and/or wetland water quality review that could serve, through 401 certification, as an oversight process for federal 404 permits; this would provide the state with increased influence over development decisions affecting coastal wetlands; this would be especially useful outside SMA areas

WASHINGTON
Summary Ratings For Issue Importance, Process Indicators, and Outcome Indicators

CATEGORY	RATINGS		COMMENTS
	Tidal	Nontidal	
ISSUE IMPORTANCE[1]	H (2.43)		Large estuarine areas, significant wetland loss, highly rated by state
PROCESS INDICATORS			
Information/Research	L		Main contribution has been technical assistance
Regulatory	M	L	only small portion (~20%) of nontidal wetlands under SMA jurisdiction
Planning	H		Local SMP planning and SAMPs in critical areas have been effective tools
Acquisition	M		Clear WDOE authority for wetlands
Nonregulatory	H		New wetland-watershed restoration program shows promise
Coordination	M		State has little authority to coordinate, except with local governments
OVERALL PROCESS RATING[1]	M	L	Weakness is limited area of SMA jurisdiction over nontidal areas
OUTCOME INDICATORS			
Regulatory	I	I	No consistently-maintained data on SMA decisions related to wetlands
Planning	I		No shoreline "environments" data and outcome data for only on SAMP (GH)
Acquisition	M		Key tool for NERR and demonstrates long-term strategic acquisition
Nonregulatory Restoration	L		not much activity and little data
OVERALL OUTCOME RATING[1]	I	I	INCONCLUSIVE based mainly on lack of outcome data
EFFECTIVENESS SUMMARY [1]	I	I	INCONCLUSIVE, but likely M for tidal and L for nontidal; technical assistance and public education emphasis strength

[1] Overall and summary ratings are based on comparison with the *model state CZM program*

WISCONSIN
CZM Effectiveness for Estuary and Coastal Wetland Protection

ISSUE IMPORTANCE
With major lake and inland freshwater wetland resources, ~50% historic wetland losses, the issue is at least ***moderately important*** and probably increasing. Data showing low population growth are somewhat deceiving, given continuing losses in the southeast and Superior areas from growth and development.

PROCESS INDICATOR RESULTS
Wisconsin has a relatively strong program based on its excellent wetlands inventory and supporting regulatory programs. About 25% of wetlands are covered though local permitting under local shoreland-wetland zoning and permitting and remaining 75% through the NR 103 water quality certification process. The emphasis on public education and on increasing local and state technical capacity for wetlands management is an important program component. Program weaknesses include lack of enforcement of NR 103 reviews on federal Section 404 permits, and lack of wetland compensatory mitigation requirements for unavoidable wetland losses. Despite major wetland losses, the WCMP invests little of its funding in wetland acquisition or restoration. Overall, the WCMP has ***moderate potential effectiveness*** compared to the model state CZM program.

OUTCOME INDICATOR RESULTS
Wetland loss reductions (based on USACOE permit data for the entire state) after implementation of State Wetland Water Quality Standards (NR 103) in 1991 are dramatic, decreasing 440% from about 275 acres for the 1982-91 period to 62 acres per year from 1991-95 in the coastal zone. Rates of loss relative to total coastal wetland area were low for the first period, but were lower still for the second (0.023% down to 0.005% per year), a testament to the effectiveness of the NR 103 process. However, since NR 103 is not applied to wetlands in the Shoreland Zone (local governments handle), it is unclear how loss rates have changed in this important zone. One would expect that the significant technical assistance and educational programs provided to local governments have contributed to the above loss reductions, but there is no hard data to support this contention. With respect to planning, the state's Shoreland-Wetland Zoning provides an important level of protection for all of the estimated 304,000 acres of wetlands that fall within shorelands. WCMP collaboration with the USEPA provides increased protection for about 25,000 additional acres. These planning programs are essentially regulatory jurisdictional zones with built-in standards. There are no acquisition or restoration data, although there is some minor CZM activity in this area.

PROGRAM EFFECTIVENESS ESTIMATE
Overall, the effectiveness of Wisconsin's policies and programs for coastal wetlands protection are ***INCONCLUSIVE***, although significantly decreased losses due to water quality certification improvements in 1991 suggest MODERATE to HIGH effectiveness in the regulatory area.

- wetland acquisition and restoration as part of state-funded wildlife and natural area programs are probably significant, based on descriptive information, but no numbers are available to confirm this and the state programs are not well-integrated with WCMP
- the WCMP's emphasis on education and technical assistance to local governments that play a key role in wetland protection is probably very important, but no data are available to confirm this
- the Wisconsin Wetlands Inventory—detailed, readily available in digital and map form, and now being updated—is a great asset to all of the state's protection programs.

Opportunities for Improvement

- better regulatory program monitoring/data management, with separation of data according to program jurisdictional areas, would allow for a more refined assessment and attribution of program effectiveness
- need simple databases to track wetlands acquired through the various Stewardship Programs and wetlands restored through state programs and enhancement projects that involve CZM contributions
- needed policy improvements: (1) a policy for no-net-loss of wetlands in short term achieved through a wetland compensatory mitigation and (2) a policy for a net gain of wetlands in long term through a wetland restoration element within the WCMP

WISCONSIN
Summary Ratings For Issue Importance, Process Indicators, and Outcome Indicators

CATEGORY	RATINGS		COMMENTS
	Tidal	Nontidal	
ISSUE IMPORTANCE[1]	M (2.17)		Moderate importance, based on significant coastal wetland resources and 47% historic loss
PROCESS INDICATORS			
Information/Research	H		Wisconsin Wetland Inventory good data
Regulatory	n/a	M	100% of wetlands covered by various state programs; mitigation not required
Planning	H		Applies only to 25% of wetlands within shoreland boundaries
Acquisition	H		State programs not well-integrated into WCMP
Nonregulatory	H		State programs not well-integrated into WCMP
Coordination	M		
OVERALL PROCESS RATING[1]	n/a	M	Good program; lacks compensatory wetland mitigation and enforcement elements for NR 103 decisions
OUTCOME INDICATORS			
Regulatory	n/a	M	Low absolute losses and trend in losses down 440%
Planning	L		Only covers 25% of coastal wetlands
Acquisition	I		no data
Nonregulatory Restoration	I		no data
OVERALL OUTCOME RATING[1]	n/a	I M)	Need outcome data on Acquisition and Restoration
EFFECTIVENESS SUMMARY [1]	n/a	I (M)	INCONCLUSIVE, but likely moderate if more definitive data were available

[1] Overall and summary ratings are based on comparison with the *model state CZM program*

APPENDIX D

Case Examples of Effective Estuary and Coastal wetland Management

Case Examples of Effective Estuary and Coastal Wetland Management

Case examples provide the richness and detail not apparent in the dry numbers and ratings of the evaluation process and are particularly valuable in this study because most states did not have sufficient outcome data to be rated for outcome effectiveness. State CMPs have used the processes and tools examined in this study in a variety of particularly innovative or effective ways to better protect, preserve, and restore estuaries and coastal wetlands in the US. Every state program has its success stories and innovations, and all are included in individual state profiles. This appendix describes some of the more outstanding examples from each category of processes and tool, with emphasis on the *most important processes and tools* described earlier. Another criterion for selection of examples was their potential for application elsewhere. Where available, selected outcome data and interpretations are also described.

Information and Research Case Examples

Wisconsin's Wetland Inventory

The Wisconsin Wetland Inventory (WWI), first authorized by the legislature in 1978, supplants National Wetlands Inventory (NWI) in the state. With USFWS support, the Department of Natural Resources has developed a special classification system unique to Wisconsin wetlands. The original WWI is in the process of being updated in the coastal zone with WCMP-CZM support, with the Lake Superior shore completed with 1990-91 photography and the Lake Michigan shore completed with 1987-88 photos. The inventory is at 1:24,000 scale and identifies wetlands as small as 2 acres, with even smaller wetlands indicated by points instead of polygons. In addition to paper maps, digital data are available for all coastal counties a statewide mapping effort (1:24000 scale) based on original 1978 photos. Having greater detail than the NWI, the WWI is also used as a baseline for wetland change monitoring The WWI is a key tool for implementing shoreland and shoreland-wetland zoning programs, state permit programs, and the State Wetland Water Quality Standards process.

North Carolina's Coastal Region Evaluation of Wetland Significance (NC-CREWS) Program

One of the more sophisticated large-area functional assessment systems for existing wetlands is the *North Carolina Coastal Region Evaluation of Wetland Significance (NC-CREWS)* system (NCDEHNR 1994). Using digital data for a number of GIS data layers: wetland boundaries, wetland types [a modified wetland type system that integrates NWI data with hydrogeomorphic classes], soils, land use/cover, hydrology, watershed boundaries, endangered species occurrences, estuarine primary nursery areas, and water quality classifications. The *NC-CREWS* procedure system analyzes these data to determine wetland functions at a landscape scale, generally the watershed level. The rating results can be used to set priorities for protection of significant wetlands. The *NC-CREWS* system has also been adapted to identify and evaluate the restoration potential of former and degraded wetlands. Using similar GIS techniques to those described above, the potential for sites to perform hydrologic, water quality, and habitat functions are evaluated qualitatively, scored or rated, and combined to give an overall restoration potential rating. The functional assessment capabilities of NC-CREWS have also been earmarked for local land use planning and classification mapping, as well as in the federal consistency review of CWA Section 404 permits. The NC-CREWS is also a key analytical and

funding component of the recently passed state legislation on wetland restoration. This project began with CZM funding, with the major additional funding from USEPA.

Regulatory Case Examples

New Jersey's Freshwater Wetland Protection Act

New Jersey's Freshwater Wetlands Protection Act (FWPA) (N.J.S.A. 13-9B) provides strong state regulation over virtually all activities in freshwater wetlands in the coastal zone and the rest of the state. It also regulates the discharge of dredge or fill into "open waters" of the state and provided the statutory authority for assumption of Clean Water Act Section 404 permitting. Although the FWPA has never been formally added to the NJCMP, the Rules on Coastal Zone Management do draw on FWPA authority and the Bureau of Coastal Regulation administers the FWPA in the coastal zone (central and south Jersey areas). Wetlands under the FWPA are classified for different degrees of protection, including buffers, as either: Wetlands of exceptional resource value (150 foot buffer required); wetlands of ordinary value; and wetlands of intermediate value (50 foot buffer required). The FWPA covers all freshwater wetlands, unless they meet stringent exemption test. Before Act, freshwater wetlands were protected only if CAFRA permit would be required. Based on statewide data extrapolated to the coastal zone, the FWPA has resulted in significant wetland loss reductions. Between 1980 and 1984, 40 post-CWA wetland fill cases in northern New Jersey documented about 800 acres of freshwater wetland impacts due to illegal filling, about 160 acres per year in this area. From July 1988 to December 1993 under the more stringent FWPA regulations, the DEP authorized 2896 activities (526/year) under the SGP and 107 individual permits (IP) (19/year). Freshwater wetland impacts under the SGP amounted to 438 acres and IP authorizations an additional 164 acres, or a total of 602 acres. For the 5½ -year period, this loss amounts to 109 acres per year, or about 0.03 percent of total 416,000 freshwater wetland acres in New Jersey. The bulk of this loss—63 percent—was in the heavily urban areas of northern New Jersey and the Delaware River, whereas lands adjacent to Delaware Bay and the Atlantic coastal region accounted for just 9 percent of the total. Further, compensatory mitigation for IP authorizations amounted to 212 acres, a 1.3:1 mitigation ratio for IPs; net freshwater wetland loss is reduced to about 71 acres per year (Torok, Lockwood, and Fanz 1996).

South Carolina's Use of Federal Consistency Standards to Protect Nontidal Wetlands

Nontidal wetlands within the eight-county coastal zone are not directly protected under the statutory authorities that make up the South Carolina's Coastal Resources Management Program. However, they are regulated by the USACE through CWA Section 404 permits, providing the South Carolina Office of Coastal Resources Management (SCOCRM) with oversight through the Coastal Zone Consistency Certification and Review process. In this review process, SCOCRM applies strict guidelines for permits. The guidelines require that "project proposals which would require fill or other significant permanent alteration of a productive freshwater wetland will not be approved unless no feasible alternative exists and an overriding public interest can be demonstrated, and any substantial environmental impact can be minimized." SCOCRM has aggressively implemented these procedures, becoming a major player in the USACE permit process. Because their consistency review sets a higher standard for protection, nontidal wetland loss has decreased, mitigation ratios have increased, and developers have begun preparing

"master plans" that explicitly include wetland protection provisions. One of the major bases for SCOCRM's injection into the 404 process has been to protect well-documented stormwater retention and filtering functions of nontidal wetlands, which in turn protect coastal water quality generally. In addition to increased protection over Section 404, this process has resulted in stronger protection than would have been provided by wetlands protection legislation that was considered by the South Carolina Legislature, but not passed. Unfortunately no data are available from SCOCRM about the on-the-ground results of this process, but it would make for an excellent case study.

Wisconsin's State Wetland Water Quality Standards

Wisconsin's Department of Natural Resources, the key networked CZM agency for wetland protection in the state, developed and implemented in 1991 its State Wetland Water Quality Standards (SWWQS)—known as the NR 103 process. Ranked as the number one coastal wetland protection tool by the state, the SWWQS are used as the decision-making process and criteria for state actions affecting wetlands, and for CZMA federal consistency and CWA Section 401 certification of USACE Section 404 individual, nationwide, and general permits. Implementation of the SWWQS has had a dramatic impact, expanding jurisdiction to cover all isolated wetlands in the state, including the coastal zone (previously, only about 25 percent of wetlands were covered under shoreland and navigable waters authorities). Wetland losses since 1991 have declined 77 percent over the previous period. Based on statewide data prorated to the 15 coastal counties, loss has declined from about 275 acres/year (0.023 percent of all wetlands) for the 1982-91 period to about 62 acres/year (0.005 percent) for the 1991-95 period. CZM funding assistance was used to help develop and is being used to implement the process.

New Hampshire's Tidal Buffer Zone

In 1989, the New Hampshire Dredge and Fill Law (RSA 482-A) was amended to add the Tidal Buffer Zone (TBZ) extension to Wetland Bureau jurisdiction. The TBZ is defined as upland areas 100 feet inland of the highest observable tide line, as determined by the strand or wrack line, the edge of a salt marsh, or a bulkhead line. The purpose of the TBZ is to protect the uplands adjacent to salt marshes for their functions and values, including transitional habitat for plants and animals, flood water storage, filter strips for sediments and contaminants, and aesthetics. Unpublished studies prior to the law also showed that salt marshes adjacent to undeveloped uplands had a higher diversity o bird and other wildlife, and that they suffered less from infestation by exotic species, such as common reedgrass. Dredging or excavation, filling, and new construction in the TBZ require permits from the Wetlands Bureau, but repairs of existing structures do not. TBZ projects are classified as to their potential impact as major, minor, or minimum. based in part on whether the project is in a developed or undeveloped area. All projects in undeveloped areas are considered major, whereas in developed areas, many projects are considered of minor or minimum impact and more easily permitted. Although there is no quantitative outcome data available on the numbers of permits and the degree of impacts within the TBZ, permit and enforcement personnel report that the TBZ has prevented significant alterations of natural, vegetated shorelines adjacent to tidal wetlands and waters since 1989 (Richardson, Personal Communication 1997). Once the Wetlands Bureau database and GIS are completed, more definitive data on the role this tool plays in wetland protection will be available. In the meantime, the tool deserves examination by other states seeking to solve the shoreline development buffer problem.

Pennsylvania's Wetland Regulatory Compliance Monitoring and Enforcement Program

In 1989, the PCZM Program, in collaboration with other state and federal agencies, initiated the Delaware Estuary Wetland Enforcement Initiative. Agencies involved included PCZMP, DEP's Bureau of Water Quality Protection, USACOE, EPA, and the USFWS. The goals were to reduce wetland losses and promote compliance with the regulatory program. The initiative grew out of a preliminary aerial photo assessment of violations between 1980 and 1986, when more than a hundred illegal projects were found. PCZM was alarmed by the continuing wetland losses. The 1989 initiative began a process of annual flights and photointerpretation, supplemented by helicopter overflights and site inspections, to detect violations on a more regular basis and provide a defensible legal basis for initiating timely corrective actions. In most violation cases, several agencies simultaneously initiate enforcement action, but principal responsibility for follow-up is divided among them. If problems develop in one agency, responsibilities may be passed along to another, maintaining pressure on violators for resolution of the problem. The disposition of any given violation varies, but may include fines, site restoration, or an after-the-fact permit and mitigation. The most important outcome of the initiative is the dramatic reduction in violations and wetland losses overall. In the Delaware estuary coastal zone, there were 110 violations detected between 1980-86; 50 violations in the 1986-89 period; 5-7 per year between 1990-93; 3 in 1994; and 0 in 1995. A similar but less intensive effort in the Lake Erie coastal zone showed 30 violations in the 1986-1989 period and none in 1994. Clearly, the "word" has gotten out and compliance increased. A side benefit has been the education of the development community about the importance of wetlands and the desirability of avoiding them from both an ecological and simpler development process perspective. Another major outcome, process-wise, has been the improved coordination among agencies with enforcement authority, particularly the shared responsibility for enforcement actions.

Louisiana's Geologic Review Process

The Geologic Review Process (ranked number one for estuary and coastal wetland protection by the state) was instituted in 1982 to help reduce the effect of oil and gas production on wetlands (Harder and others 1991). While the Coastal Use Permit was employed to regulate oil and gas facilities, the Coastal Management Division (CMD) did not have the resources to adequately insure compliance with the 1978 State and Local Coastal Resources Management Act (SLCRMA), which called for balancing of development and resource utilization with conservation, preservation, and restoration of coastal land. To address the technical needs for reviewing such projects, the CMD began the Geologic Review Process. In the process, applicants and agencies are given the opportunity to discuss the engineering, geology, and economic impact associated with proposed projects. The Louisiana Geological Survey provides a petroleum engineer and petroleum geologist to review an applicant's geologic, engineering, and economic information. Review results are then presented at a meeting including the CMD analyst, state DEQ, DWF, federal agencies such as the USFWS, NMFS, and EPA, as well as the permit applicant. At this review decisions are made regarding relocation of a site's wells, relocation of the surface location, or relocation of access to avoid/minimize wetlands impact. Usually a Review results in one recommendation acceptable to all parties. With respect to on-the-ground outcomes, the Geologic Review Process has reduced the area impacted by oil and gas operations from 767 acres per year to just under 77 acres per year in 1989 (Harder and others 1991). Average canal lengths for those projects allowed in wetland areas have decreased 79 percent and

the total area disturbed per location has been reduced 45 percent. The average acreage of wetlands permitted for each oil and gas canal has dropped steadily from 5.181 acres in 1982 to 2.866 acres in 1989. Another success of the project is that the oil and gas industry is continuing to provide important economic benefits to the Louisiana economy while preserving wetlands. Further, the New Orleans District Corps of Engineers has also decided to join the Review process for evaluating permits under Section 404 of the Clean Water Act, improving overall coordination. Beyond increased review of 404 permitting, the inclusion of the Corps led to the Geologic Review Procedure being adopted for all proposed well canals, not just those over 500 feet in length; once this was common knowledge, requests for proposed 500 foot canals dropped significantly, from 35 in 1984 to 1 in 1989.

Planning Case Examples

Rhode Island's Special Area Management Plans (SAMPs)

Rhode Island is one of the national leaders in the use of special area management plans (SAMPs) to address complex resource management issues in the coastal zone. Four of these plans have been developed and implemented in the state: the Providence Harbor SAMP resolved conflicts over urban and port development needs, disposal of dredged material, including contaminated sediments, and revitalization. The Pawcatuck and Little Narragansett Bay SAMP was one of the few bi-state examples of SAMP (Rhode Island and Connecticut) habitat protection, water quality, public access, and scenic values. The Narrow River SAMP and the Salt Ponds SAMP both dealt with very complex water quality-related development issues; the latter serves as a detailed example of how the state uses the process and some of the issues involved. The salt pond region in southern Rhode Island includes six coastal lagoons and their surrounding watersheds. Principal issues include deteriorating water quality, sedimentation, over-fishing, hurricane/storm surge mitigation, and resource-user conflicts (Rhode Island Coastal Resources Management Council 1984). Beginning in the late 1970's, four years of scientific research attempted to identify the causes and significance of environmental damage. Development of small lots, platted before the CZM program, was one of the causes. The number of houses grew from 1,775 in 1950 to 5,570 in 1980 and zoning in 1984 provided for three times the current number of houses and seven times the population. In addition, as many as 150,000 tourists visited the coast on a typical summer day. Salt pond ecology had changed drastically by the artificial stabilization of inlets, dredging, altering freshwater inflow, and urban and agricultural run-off. Based on the findings of this research, and after two years of planning and negotiation among government agencies, and important interest groups such as fishermen, environmentalists, and developers, a draft plan was approved. Through this process, conflicts were resolved prior to the plan becoming public, so that upon declaration of the draft plan public support was strong across the board. The CRMC adopted the plan formally in 1984. The Salt Pond SAMP has relied as much on non-regulatory programs as on more traditional rules and regulations. An Action Committee was set up to coordinate non-regulatory initiatives and set priorities on an annual basis. Local zoning has been changed to be consistent with SAMP density requirements. Construction setbacks have been put in place, as have restrictions on development and lot rezoning, resulting in limitations on new septic tanks in the immediate vicinity of the salt ponds. This in turn helps to maintain higher water quality and better overall habitat for these important coastal features. Buffer strips have been utilized to help reduce non-point source pollution. An

estimated 1,475 acres of wetlands are included in the Salt Pond SAMP region and received significant protection as a result.

Oregon's Integrated Estuary-Coastal Shoreland Planning

As part of its statewide planning program, Oregon adopted planning requirements in 1976 (the coastal goals) that promoted integrated estuary-shoreland planning at the local level, but with active state and federal agency participation. The planning framework that resulted was subsequently used to prepare plans for all 17 Oregon estuaries and their adjacent shorelands. The planning framework had several innovative features, some of which have since been adopted more generally into estuary and wetland management programs around the country; these include:

Overall Estuary and Individual Estuary Classification Systems. Oregon has classified estuaries based on the highest level of development that can occur in each (Natural, Conservation, Shallow Draft Development, and Deep Draft Development). Together with the system of estuary management units (Natural, Conservation, and Development) for individual estuaries laid out in Goal 16 and corresponding shoreland zoning criteria, a sound basis for estuary and adjacent shoreland management was established and applied that is still largely intact after 15-20 years.

An Integrated Planning Approach. The planning framework and process established under estuary policies also promoted a regional, multi-jurisdictional approach to coastal planning for each estuary area, promoting consensus, bringing together disparate interests, and promoting regional approaches to decision making. The result was increased predictability for both protection and development; concentration of port and water dependent development in already developed or other areas suitable for such development; sufficient lands for development to promote investment and maintain competitiveness. Coast-wide, the plans have protected 98 percent of tidal wetlands through local zoning and, subsequently, the state permit program. The combination of protective zoning and mitigation requirements has resulted in limited and decreasing wetland filling and dredging over the last ten years.

Mitigation and Mitigation Banking. One of the cornerstones of Oregon's estuarine wetland policy was the nation's first requirement for compensatory estuarine wetland mitigation (1976) for unavoidable losses and the initiation of the first mitigation banking policy in the nation (1979).

Outcome Effectiveness Accounting. Oregon developed and published GIS data layers for estuarine habitat and land and water use designations, providing an accurate assessment of how much wetland and other habitat have been zoned as *Natural Management Units*—high protection areas, and as *Conservation Management Units*—moderate protection areas (*Oregon Estuary Plan Book*, ODLCD 1987).

North Carolina's Areas of Environmental Concern (AEC)

The AEC program provides one of the cornerstones for habitat protection through the state Coastal Area Management Act. Various types of AECs are designated providing critical habitats protection beyond that of other state and local planning and regulatory programs. Types of AECs in North Carolina's coastal zone include:

Estuarine Waters. Conservation is granted highest priority; water dependent used are second priority. Protection is for biological, social, aesthetic social, and economic values (NC Administrative Code 1990).

Estuarine Shoreline. Extends 75 feet landward of mean high water of non-ocean shorelines; 575 feet from waters classified as Outstanding Resource Waters.

Coastal Wetlands- defined in NC Administrative Code as a marsh subject to "regular or occasional" flooding by tides (except for hurricane or storm tides). Conservation of coastal wetlands is given highest priority.

Public Trust Waters. Defined from mean high water to seaward extent of state jurisdiction.

Ocean Hazard. Areas along the Atlantic Shore which are vulnerable to erosion or other hazards; can include beaches, dunes, inlets.

An important sub-category which can be found in estuarine waters, estuarine shoreline, or coastal wetlands AECs are *Primary Nursery Areas*, consisting of any area where larval development of fin fish and/or crustaceans takes place. Non-water-dependent development is statutorily not allowed in coastal wetlands, estuarine waters, and public trust AEC areas. While the Coastal Resources Commission CR. could allow a private development project which contained overriding public benefit, had no feasible alternative site, and took every possible measure to mitigate impact, none have been allowed in more than eight years (Roger Schecter, DCM, Personal Communication 1996). State data suggest that development impacts are still occurring within AECs, but at a low level. Lacking outcome data for either areas included under the AEC program or projects impacting them, quantitative assessments of the significance of the program are mostly anecdotal.

Alaska's Anchorage Wetland Management Plan

Alaska has more than 26,000 square miles of wetlands and has lost less than 1 percent statewide, yet has used a SAMP-like processes to develop successful wetland management plans in Juneau and Anchorage. Anchorage, Alaska is a geographically large urban area (over 2000 square miles) and is surrounded on three sides by the ocean and mountains on the fourth. There are 15,000 acres of wetlands interspersed within its borders, mostly bogs and wet meadows. Due to the large amount of wetlands and a lack of large developable upland areas, wetland impacts in Anchorage have been significant in the past. In 1982, the Anchorage Wetlands Management Plan (AWMP) was one of the first comprehensive wetland management plans in the nation. The cooperative planning process involved state and federal agencies, local developers, and environmental groups. Permitting in the Anchorage area had been problematic in the past due to the short construction season and general unpredictability of the permitting process. The original purpose of the AWMP was to 1) identify and classify wetlands, 2) protect high value wetlands and provide for the development of low value wetlands, 3) link wetland and municipal planning processes, and 4) develop compensatory mitigation strategies. Wetlands were classified into development, preservation, conservation, and special studies categories. When the AWMP was adopted, the city of Anchorage was awarded one of the first USACOE 404 state programmatic general permits (SPGP) in the nation. One of the stipulations of the SPGP was that any development in preservation wetlands required compensatory mitigation. The AWMP has been relatively successful in limiting impacts on wetlands. A study conducted on historic wetland impacts in the Anchorage basin between 1950 and 1990 estimated that almost 10,000 acres of wetlands were filled. Between 1982 and 1990, after the initiation of the AWMP, 2,143 acres of wetland were permitted and only 965 actually filled, so the implementation of the AWMP would seem to be somewhat successful in controlling wetland loss, especially given high population

growth rates during this period. The AWMP was reauthorized in 1995, allowing changes in the plan which had presented problems in the 13 preceding years. The initial plan designated conservation, preservation, and development categories based on land ownership rather than value. Much of the high value wetland in private hands was delineated as development or conservation, while low value wetlands which were owned publicly were determined to be preservation. Critics of the plan claimed that because of this method of delineation, wetlands that should have been in the preservation category had no real protection. A new system of A, B, C, and D wetlands was created in 1995 which considered value to a greater extent than ownership. Additional buffers and setbacks, as well as conditions on development, were included in the 1995 plan. There is no data available since the recent reauthorization, but it would seem to offer greater protection to high value wetlands while easing development of low value areas.

Maryland Critical Areas Protection Program

The 1984 Critical Areas Protection Act protects more than 640,000 acres of estuary shorelands using a 1,000-foot buffer zone extending landward from mean high water. Its main purpose is to protect the waters and wetlands of Chesapeake Bay, the largest and most productive estuary in the US. Considered one of the most progressive state initiatives to manage growth along estuarine shorelines, the act establishes criteria for development water-dependent facilities, dealing with shoreline erosion, forest protection, agriculture, mining, parks, habitat protection areas, buffers, threatened and endangered species, wetlands, fish propagation, and plant and wildlife habitats. Local governments have developed management plans for the critical areas within their jurisdiction, and must notify the Critical Areas Commission of any action they plan to take within the areas. Local governments zone lands as *intensely developed, limited developed* or *resource conservation*. Resource Conservation areas allow one dwelling per 20 acres. Areas can be managed for habitat protection in any of the categories. Significant protection has resulted based on the zoning that has been put in place:

- Limited Development: 95,835 acres (15 percent)
- Intensely Developed: 29,665 acres (5 percent)
- Resource Conservation: 513,269 acres (80 percent)

The amount of acreage tied into the resource conservation category indicates the preservation orientation of the Critical Areas Protection program. Wetland areas incorporated into these categories are not known, but they are significant. Local maps delineating the Critical Areas are kept on the local level, though, and do define wetland areas. More importantly is that the critical areas serve as vital buffers to protect tidal wetlands and waters from pollution. The Critical Areas Commission's principal responsibilities are to provide local government oversight, project review, and planning and technical assistance.

Nonregulatory and Acquisition Process and Tools

Maryland's Nonstructural Erosion Control Program Using Created Wetlands

The non-structural erosion control program (NSSEC) was pioneered by the coastal zone management program and is now run through the Department of Forestry. The CZMP funds provide technical support and one staff position. The program provides a 50-50 matching grant to reimburse property owners for the design and implementation of a non-structural erosion control project to arrest erosion. In areas where wind and wave erosion is moderate, marsh grasses are planted to stabilize the shoreline. This approach to controlling shoreline erosion

creates fringe wetland habitat. Currently it is more commonly used on Maryland's shorelines that traditional structural methods. The program has been in place for 7 years. Results are impressive. Non-structural shoreline erosion methods have been used on 115,000 ft (~20 miles) of shoreline to protected or created new fringe wetlands on 50 acres of shoreline. These wetlands are estimated to be stopping 92,000 tons of sediment/year, 67,000 lb. of nitrogen/year and 84,000 lb. of phosphorous/year from entering the open waters of the Chesapeake Bay (Len Larese-Cassanova, pers. comm. 1996).

Tidal Wetland Restoration in Delaware

The Division of Fish and Wildlife, a key networked CZM agency, has successfully used CZM funds for six research and demonstration projects: (1) Open Marsh Water Management (OMWM); (2) Phragmites control; (3) Restoration and management of high-level, high-salinity coastal impoundments; (4) Beaver management plan; (5) Restoration and management of low-salinity coastal impoundments in urban areas; and (6) Identification and implementation of wetland improvement projects on State Wildlife Lands. Three of these are briefly described below with the problem, the program, its results, and CZM funding.

Open Marsh Water Management (OMWM)

Problem: grid ditching and heavy insecticide use for mosquito control had degraded 45,000-60,000 acres of Delaware's 90,000 acres of tidal marsh.
Program: OMWM involved the development and implementation of environmentally-compatible ponding and ditching techniques to control saltmarsh mosquito breeding, reduce the amount of insecticide use (80 percent reduction target), and at the same time provide habitat restoration benefits for waterfowl, wading birds, and fishes. Ultimate goal is to restore 15,000 acres.
Results: 5,000 acres of high-level impoundments had been restored to multiple functions by 1996.
CZM Funding: $100,000 per year for four years.

Phragmites Control

Problem: Over the past 40 years, *Phragmites australis* (common reed) has invaded and degraded *Spartina* marshes (cordgrass) such that it is now monodominant over 11 percent of tidal wetlands and codominant on an additional 22 percent (DCMP 1992a)
Program: This project developed and refined a herbicide-and-burn technique to control the spread of phragmites and allow impacted areas to revert to *Spartina.*
Results: This project led to a 50:50 state-funded cost-share program with private landowners, with about 6,000-8,000 acres treated thus far on 20-30 sites. DFW seeks to expand this program in a more area-wide comprehensive program, beginning in the Lower Blackbird Creek marsh (DNREC 1994). Based on a settlement with a New Jersey nuclear power plant (Public Service Electric and Gas), $1.9 million will be used to treat an additional 4,600 acres in Delaware.
CZM Funding: $70,000 per year for four years

Restoration and management of low-salinity coastal impoundments in urban areas

Problem: 10,000 acres of tidal freshwater and brackish marshes along the Christina and Delaware Rivers in northern Delaware have been degraded by low-level impoundments constructed as early as the 17th century and subsequent filling of areas for urban development.

Program: The Northern Delaware Wetlands Rehabilitation Program (NDWRP) has identified 31 sites totaling about 10,000 acres for nonregulatory restoration, has developed a watershed-based plan with agency and public involvement.
Results: In its first success story, the 210-acre Broad Dyke Marsh has had a sophisticated water control structure installed to control flooding of upland property while regaining marsh functions. More than 1,400 other acres of marsh have been restored at three other sites, six other sites are targeted in a "top ten" list, and 21 additional sites are slated for eventual restoration.
CZM Funding: $50,000 per year for two years.

Michigan's Low-cost Section 306A Construction Grants to Protect Wetlands from Overuse
As the first and other demonstration state, Michigan pioneered use federal CZM money for funding low cost construction projects which would enhance coastal program objectives, an innovation that led to the Section 306A amendment to the CZMA and subsequent nationwide application of the low-cost construction project concept to provide public access to wetlands and other coastal resources while protecting sensitive areas. These grants have subsidized the construction of structures such as boardwalks and stairs that have allowed access to shoreline areas and protected the intermediate areas from impact. The MCMP currently allocates approximately one-third of its CZM funding to local governments for low cost construction projects and similar activities as a result of the past successes. Due to the success of the Michigan program, all participating coastal states can now apply for Section 306A project grants to enhance public access and resource protection.

California's State Coastal Conservancy
The CSCC is part of a unique CZM partnership between a nonregulatory authority (CSCC) and California's two regulatory CZM agencies, CCC and BCDC. With respect to estuary and coastal wetland protection and restoration, the CSCC has effectively used its nonregulatory authorities and ample funding resources to (1) acquire property interest in threatened wetland resources, thereby allowing for preservation and restoration, (2) fund the planning, construction, and monitoring of nonregulatory wetland restoration and enhancement projects, (3) assist with particularly difficult compensatory mitigation situations through mediation and plan development, or by establishing mitigation banks for smaller projects, (4) facilitate the establishment of nonprofit land trusts and help them develop their capacity to raise funds and restore additional wetland areas, and (5) establish a watershed action planning program that has resulted in stream, riparian, and wetland restoration at a landscape scale using citizen volunteer groups. Many CSCC projects were facilitated through their dispute mediation services, another unique aspect of agency operations and valuable contribution to California's coastal management effort. These various nonregulatory programs and services are the most generously funded and effective among the coastal states and worthy of emulation, even at a smaller scale.

Acquisition. Approximately 59 sites totaling about 21,400 acres have been acquired by CSCC; among them are some of the nation's most critically endangered (Josselyn, Zedler, and Wright 1990; Holderman, pers. comm. 1996). These same sites have also been enhanced or restored and are included the total restoration acreage below.

Restoration and Enhancement. At least 150 sites totaling 37,000 acres; Josselyn, Zedler, and Wright (1990) selected 22 of these projects for evaluation of restoration or enhancement success. Contrary to findings of limited success for many regulatory mitigation projects (Race and Fonseca 1996), they found that 60 percent of the projects were successful in either meeting

project goals or in terms of wetland function or National Research Council restoration criteria (NRC 1992).

Mitigation Assistance. Eleven mitigation projects with CCC and BCDC including two mitigation banks: Bracut Marsh in Humboldt Bay and Huntington Beach in southern California (Holderman, Personal comm. 1996; ELI 1993)

Land Trusts. Between 1983 and 1996, CSCC provided 209 grants to 87 nonprofit organizations totaling $43 million. Beginning in mid-1996, CSCC has designated $250,000 for nonprofit grants for conservation work on the ground, planning, or capacity building; so far, $125, 000 for 20 projects has been expended and a new cycle is underway. Similar amounts are projected for the future.

Watershed Planning. CSCC has used $19 million to fund development of 55 river and watershed plans since 1982, when the Buena Vista Lagoon watershed plan was initiated for sediment reduction. Twenty-four of these plans have been completed and are being implemented. Plans have a variety of purposes, but are increasingly comprehensive.

Education and Technical Assistance in Washington State

One of principal strategies to protect and enhance coastal wetlands in Washington State has been to provide landowners, public agencies, and nongovernmental organizations with technical assistance, and to develop and deliver wetland educational programs and media for educators and the public. This strategy was developed in part because the state does not have direct regulatory control over wetland alterations in the coastal zone, and because of the limited shoreline area regulated by local government (only about 25 percent of the state's wetlands fall within the Shoreline Management Act's jurisdiction area statewide). Examples include:

Landowner Assistance. Assistance to private and public landowners has focused on how wetland regulatory processes work—aimed at the development community and small private landholders, and on wetland preservation and enhancement or private land. Key titles include:

- Wetlands Regulations Guidebook (88-5)
- Wetlands Preservation - An Information and Action Guide (90-5)
- At Home with Wetlands: A Landowners Guide (90-31)

Technical Assistance. Washington CZM technical assistance efforts have focused on local governments, CZM agency staff, other state and federal agencies, and nonprofit organizations, often in collaboration with the Washington Sea Grant Marine Advisory Program. Many of the key titles below have resulted from applied research projects, another key element in Washington's wetlands protection program. Perhaps their most ambitious technical effort to date is underway, the development of a hydrogeomorphic classification system and functional assessment methodology. Another outreach-oriented effort is the development of a *Wetland*

Stewardship Initiative. Aimed at local governments and nongovernmental land trusts and similar groups in the state. Just a few examples among many titles include:

- Washington State Wetlands Rating System - Western Washington (91-58)
- Wetland Mitigation Replacement Ratios: Defining Equivalency (92-08)
- Wetland Buffers: Use and Effectiveness (92-10)
- Wetland Mitigation Banking (92-17)
- Designing Wetlands Preservation Programs for Local Governments: A Guide to non-Regulatory Protection (92-18)
- Restoring Wetlands in Washington: A Guidebook for Wetland Restoration Planning and Implementation (93-17)

• Guidelines for Developing Freshwater Wetlands Mitigation Plans and Proposals (94-29)

Public Education. WDOE's contributions include curriculum development on wetlands and teacher workshops to integrate the curricula into schools statewide; high quality videos and public service TV announcements that reach millions, and other materials designed for general public and targeted classroom audiences. Some examples include:

• Discover *Wild* Wetlands Curriculum (88-16)
• Wetlands (92-49) and Los Humedales (93-26)
• Washington's Wetlands (92-105)
• Videos: Fabulous Wetlands!, Washington's Wetlands, Yellowlegs

If imitation is the sincerest form of compliment, then Washington's CZM-funded technical assistance and educational programs and materials can be described as an unqualified success. Their materials have been used directly by several states, including Oregon and California, while other materials have been adapted. With an increasing emphasis national on nonregulatory approaches to resource protection, Washington State's pioneering efforts put them in the lead nationally. Outcomes of technical assistance and education programs, however, are notoriously difficult to evaluate, particularly on-the-ground outcomes. WDOE has evaluated some of its education programs, examining participants immediately after programs and two years later; they found, for example, that 88 percent of participants taught *Discover Wetlands* activities each year.

Wisconsin's Wetland Education Program

Wetland education and technical assistance is a primary role for the Wisconsin Coastal Management Program (their number two ranked tool). WCMP created a wetlands curriculum, *Project WULP: Wetland Understanding Leading to Protection,* a comprehensive, multidisciplinary wetlands unit for middle school students. To extend the human-resource capacity of the state to implement wetland programs, the WCMP has sponsored development of a *Wetland Professional Certification Process* that includes training on wetland ecology, identification, delineation, and functional assessment. Associated with this effort is the WCMP-produced *Basic Guide to Wisconsin's Wetlands and Their Boundaries.* General public education is also a key program element. May in Wisconsin is traditionally designated by the Governor as Wetlands Protection Month and the WCMP sponsors numerous activities which highlight wetlands education and protection efforts in the coastal zone, including an "Adopt-a-Wetland" program for schools in coastal counties.

Washington's Stillaguamish Basin Wetland Restoration Plan

The wetland restoration planning for the Stillaguamish watershed in northern Puget Sound was designed as a public-private collaborative program. Although the technical tasks involved with watershed analysis are one of the program cornerstones, there are other critical components as well: community identification of needs that restoration might address, public and landowner participation, and technical and funding assistance from state and federal agencies are equally important. The technical aspects of watershed analysis that fed into this process involves four steps: (1) characterization of the river basin, (2) stratification of wetland resources, (3) functional characterization of wetlands by stratified class, and (4) the identification and prioritization of potential wetland restoration sites, based on potential wetland functions. Geographic information system mapping and analysis plays an important part in the process.

Step 1: River basin characterization uses existing information to provide a basic understanding of water movement, both above and below ground, soil types, wetland plant community dynamics,

status and trends in fish and wildlife, and past and present land use practices. This is essentially an inventory step.
Step 2: Wetlands depicted on the NWI are stratified according to a regional application of the HGM classification system developed for the Stillaguamish pilot project (see table 5-5 for classes and subclasses).
Step 3: Once existing wetlands in the watershed are grouped by their landscape position and hydrologic properties, modules are developed for each of 17 different functions that wetlands in the watershed perform. A stratified sample of wetlands in each HGM class are then assessed using these modules. The results of the field work are used to calibrate GIS analysis methods that are then applied to remaining wetlands in the watershed.
Step 4: A similar process is used to identify and classify (HGM) potential wetland restoration sites, with GIS analysis of existing wetlands, landscape position, water movement, hydric soils, and other historical information playing a major role. As with existing wetlands, a sample of restoration sites are field verified and rated for potential functions.
The Stillaguamish planning effort is still underway; as a pilot program, it is an adaptive, learning process from both technical and planning process perspectives. The goal is to apply the lessons learned here to other Puget Sound watersheds, and other plans are already on the drawing board.

Coordination Processes and Tools

American Samoa's Village Liaison/Facilitator Program
More than 90 percent of the land in American Samoa communally owned; historically, the village-based system of government included village ownership and control over village lands, including wetlands. Under the American Samoa Coastal Management Program (ASCMP), wetlands must be delineated for the government to take jurisdiction. Permission from village chiefs was required before delineation could proceed and subsequent protective measures established. This led the ASCMP to establish *the village liaison/facilitator program.* The role of the facilitator was to organize village council meetings in which various wetland issues important to the village were brought up in the village setting. Acceptance of this program from the villages was gained by allowing each village to select their own liaison; ASCMP selected the facilitator. Together, the two people would guide the village in adopting a village wetland protection resolution, and village ordinances to be enforced by the Village Council. The village liaison/facilitator program plays a very important role in wetlands delineation and management as currently practiced. Wetlands are delineated using the 1987 USACOE manual and by allowing the village to stake out an area of disagreement. The two lines are professionally surveyed and mapped; a final line is obtained through formal meetings and negotiations, and once agreement is reached the final wetland boundary is set. Included in this end delineation is an inside the wetlands use agreement, which attempts to balance agricultural uses with maintaining natural vegetation. The wetlands delineations are then utilized by the Review Board during the Project Notification and Review Process, the principal tidal and freshwater wetland protection mechanism in the territory. ASCMP officials believe that without this village facilitator/liaison program, mapping, surveying, and subsequent protection of wetlands would not have been possible. The village liaison/facilitator program is an excellent example of how traditional village-centered government can be successfully integrated with more western-style governmental institutions to protect resources valued by both.

APPENDIX E

Data Availability for Outcome Effectiveness Evaluation

Data Availability for Outcome Effectiveness Evaluation

Data availability was classified as either *GOOD* (i.e., data were sufficient to assign high, moderate, or low outcome ratings); *LIMITED* (i.e., some data available, but only enough to suggest a "probable" rating); *INSUFFICIENT* (i.e., little or no data, resulting in an inconclusive outcome rating); or indicator *NOT APPLICABLE* (i.e., the indicator does not apply because associated processes and tools were not used by the state).

More often than not, there were insufficient data available to assess on-the-ground performance of state CZM programs (table F-1). These results were more or less expected because national coastal managers have not identified outcome indicators they would like states to monitor. Several observations can be drawn from the results of the data availability analysis using this classification. With respect to the *individual* outcome indicators (table F-1):

- Of the 750 possible outcome indicator determinations (30 state programs x 25 indicators), 168 cases (22%) were found to be *not applicable* because states did not use some of the processes and tools that generate outcomes. Examples include the Wisconsin and Michigan programs, which do not have tidal wetlands to manage; and the New Jersey program, which has not mounted a nonregulatory wetland restoration element.

- For the remaining 584 outcome indicators where states did use the processes and tools, data were considered *GOOD* in just 83 or 14% of the cases. Examples include North Carolina, Louisiana, and San Francisco Bay who all received *high* outcome ratings for their management of tidal waters and wetlands; and Washington, who received a *moderate* outcome rating for their CZM-funded fee-simple acquisition efforts.

- In an additional 15 cases (3%), data were *LIMITED*, allowing the assignment of probable outcome indicator ratings. An example is Puerto Rico, who earned an *inconclusive (high)* outcome rating for wetland loss trends in tidal areas.

- However, in fully 484 or 83% of the cases, *INSUFFICIENT* outcome indicator data were available to make even a probable determination.

- *INSUFFICIENT* data availability was fairly evenly spread among the five outcome indicator categories, with Planning at 86 percentof possible cases, Nontidal Regulatory at 85 percent , Acquisition at 84 percent , Tidal Regulatory at 83 percent , Nonregulatory Restoration at 75 percent .

Similar but subtly different observations can be drawn from examination of data availability to assign outcome *category* ratings and *overall* ratings for tidal and nontidal areas (table F-1). For example:

- Of the 150 possible outcome category ratings for states (30 state programs x 5 categories), 15 or 10 percent were rated not applicable because no tools in those categories were used by states (table F-1); for overall outcome ratings, just two states (7 percent) had not *applicable*

Table F-1. Data availability for assessing outcome indicators for estuary and coastal wetland protection (tabulated from table 12 of the full report).

OUTCOME INDICATOR[1]	Data Availability for Rating Outcome Indicators[2]			
	GOOD DATA	*LIMITED DATA*	*INSUFFICIENT DATA*	*Indicator Not Applicable*
RG1 - Tidal permitted loss	7	4	17	2
RG2 - Tidal violation loss	1	0	27	2
RG3 - Tidal mitigation gain	4	0	23	3
RG4 - Tidal permitted loss trend	5	3	20	2
RG5 - Tidal violation loss trend	2	0	27	2
RG6 - Tidal mitigation gain trend	3	0	24	3
States with RG-T Indicator Results in This Data Class	22	7	138	14
States with RG-T Category Results in This Data Class	4	8	16	2
RG1 - Nontidal permitted loss	**7**	**1**	**22**	**0**
RG2 - Nontidal violation loss	**1**	**0**	**29**	**0**
RG3 - Nontidal mitigation gain	**3**	**0**	**25**	**2**
RG4 - Nontidal permitted loss trend	**5**	**2**	**23**	**0**
RG5 - Nontidal violation loss trend	**2**	**0**	**28**	**0**
RG6 - Nontidal mitigation gain trend	**2**	**1**	**25**	**2**
States with RG-N Indicator Results in This Data Class	**19**	**4**	**152**	**4**
States with RG-N Category Results in This Data Class	**4**	**5**	**21**	**0**
PL1 - local plan high protection	2	0	24	4
PL2 - SAMP high protection	4	0	12	13
PL3 - other plan high protection	7	2	18	3
PL4 - local plan moderate protection	1	0	25	4
PL5 - SAMP moderate protection	2	0	15	13
PL6 - other plan moderate protection	1	0	26	3
Number of Cases with Results in This Data Class	17	3	120	40
Number of States with Results in This Data Class	13	3	14	0
AQ1 - CZM $ fee simple acquisition	**7**	**1**	**8**	**14**
AQ2 - CZM $ less-than-fee acquisition	**3**	**0**	**5**	**22**
AQ3 - Other $ fee simple acquisition	**5**	**0**	**18**	**7**
AQ4 - Other $ less-than-fee acquisition	**1**	**0**	**16**	**13**
States with AQ Indicator Results in This Data Class	**16**	**1**	**47**	**56**
States with AQ Category Results in This Data Class	**11**	**1**	**14**	**4**
NR1 - all nonregulatory restoration	3	0	12	15
NR2 - tidal nonregulatory restoration	6	0	4	20
NR3 - nontidal nonregulatory restoration	0	0	11	19
States with NR Indicator Results in This Data Class	9	0	27	54
States with NR Category Results in This Data Class	9	0	12	9
Total States with Individual Indicator Results in This Data Class	**83**	**15**	**484**	**168**
Total States with Indicator Category Results in This Data Class	**41**	**17**	**77**	**15**
Total States with Overall Outcome Effectiveness Results in this Data Class (Tidal)	**3**	**8**	**18**	**2**
Total States with Overall Outcome Effectiveness Results in this Data Class (Nontidal)	**2**	**5**	**23**	**0**

[1] See table 10 for complete definitions of outcome indicators; all outcome indicator row totals = 30, the number of state programs evaluated for each indicator (California separated into San Francisco Bay and the Outer Coast)

[2] Data Availability Classes: *GOOD* - sufficient data to make clear, affirmative determinations of outcomes; *LIMITED* - some data available, but only enough to suggest a probable rating; *INSUFFICIENT* - little or no data, resulting in an inconclusive outcome rating; *Indicator Not Applicable* - the indicator does not apply because associated processes or tools are not used by the state.

ratings for tidal (Michigan and Wisconsin on the Great Lakes) and none for nontidal. These results compare to 24 percent *not applicable* for all indicators in all categories, as discussed above (compare figure 4-10 with figures 4-11 and 4-12). These differences are in part an artifact of the rating criteria system, whereby a state may receive a categorical rating or overall rating based on only one or two indicators.Of the remaining 133 outcome category ratings for state programs, data were *GOOD* in 41 or 31 percent of the instances and *LIMITED* in 17 or 13 percent of the instances. This means that at least probable ratings could be assigned for nearly half (44 percent) of the applicable outcome indicator categories. For overall state tidal ratings, two states had *GOOD* data and eight had *LIMITED* data, so that more than one-third (36 percent) of the states could be assigned at least probable outcome ratings. For nontidal, comparable figures were one with *GOOD* data and eight with *LIMITED* data, or nearly one-third (31 percent) of the states.

- Data were *INSUFFICIENT* to assign overall outcome ratings for 18 states for tidal (64 percent) and 21 states (70 percent) for nontidal. Thus, roughly two-thirds of state programs could not be assigned overall outcome ratings due to a lack of data. This compares to 83 percent *INSUFFICIENT* data availability for individual indicators noted earlier. The difference is due to the fact that categorical and overall outcome ratings can be assigned based on outcome results from a variety of tools. For example, a Planning category rating may be assigned if there are *GOOD* data on protection from either local plans, SAMPs, or critical area planning. This is reasonable because different states use different tools to accomplish the same purpose.

Appendix E: Data Availability for Outcome Effectiveness Evaluation

FINAL REPORT

STATE COASTAL MANAGEMENT EFFECTIVENESS IN PROTECTING BEACHES, DUNES, BLUFFS, ROCKY SHORES: A NATIONAL OVERVIEW



Prepared by Tina Bernd-Cohen and Melissa Gordon
As Part of the Sea Grant National CZM Effectiveness Study
for the Office of Ocean and Coastal Resource Management
National Ocean Service, NOAA, DOC

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FINAL REPORT

STATE COASTAL MANAGEMENT EFFECTIVENESS IN PROTECTING BEACHES, DUNES, BLUFFS, ROCKY SHORES: A NATIONAL OVERVIEW

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STATE COASTAL ZONE EFFECTIVENESS IN PROTECTING BEACHES, DUNES, BLUFFS AND ROCKY SHORES: A NATIONAL OVERVIEW

EXECUTIVE SUMMARY

The Importance of the Coastal Zone Management Act for Protecting Beaches, Dunes, Bluffs and Rocky Shores

Prior to enactment of the federal CZMA, state efforts to address protection of natural shoreline features such as beaches, dunes, bluffs and rocky shores were highly variable. State coastal management programs (CMPs) developed since passage of the CZMA were designed specifically to balance resource protection and development. State coastal programs have resulted in more attention to issues such as erosion, sea level rise, and cumulative adverse impacts resulting from development on receding beach and bluff shorelines and sensitive natural habitat areas. State CMPs have been at the forefront in addressing shoreline use conflicts such as the demand for shoreline armoring to protect existing upland structures to the detriment and loss of natural beach systems. Beach nourishment has been promoted by some coastal states as an alternative to continued loss of developed recreational beaches through shoreline hardening. Likewise, some coastal states have funded research into sand loss from inlet dredging and have demanded that beach quality sand from inlet dredging be placed on down-drift beaches. Whereas excavation of sand for coastal development was a common practice in the past, state CMPs prohibit such practices today and wage educational campaigns on the importance of protecting stabilized dune systems.

State CMPs serve as the institutional focus for addressing ongoing competing public and private demands for the use of our limited and sometimes fragile coastline resources. Our understanding of natural shoreline processes and the impacts of human development on these processes has grown. Today, we are no longer building as close to the shoreline. The development that does occur is better built to withstand coastal storm events. Efforts are made to guide access across fragile vegetated dunes. We are becoming better stewards of our natural coastal heritage through state CMP efforts. Balancing private property rights with natural resource protection goals remains a challenge.

Summary of Research Findings

The national objective of protecting coastal resources is being achieved through implementation of federally-approved state coastal management programs (CMPs). State CMP efforts are effective overall in addressing protection of beaches, dunes, bluffs, and rocky shores, given that the CZMA requires states to balance competing needs and demands such as protection of properties from hazard risks and promotion of recreational use of the shoreline. Determination of CMP effectiveness has been based on process indicators and case examples. Process indicators such as state regulatory setbacks to keep development away from the immediate shoreline were used to determine program effectiveness. Throughout this report and in the appendices are 31 case examples which illustrate and document ways state CMPs are effectively protecting natural shoreline resources.

Coastal states are utilizing a wide variety of tools to achieve resource protection including regulatory setbacks and controls over shoreline development in combination with planning, stewardship of state lands, coastal land acquisition, and research and public education about shoreline processes and

human interaction. All but three coastal states identified protection of natural resources and/or minimization of loss of life and property from coastal hazards as a high priority management issue. Although all coastal states own coastal properties, only three use state ownership and land management as the primary tool. Of the twenty-five tools identified with beach and dune protection, the fewest tools used by a state is eleven and the most is twenty-three. Of the thirteen tools related to bluff and rocky shore protection, the fewest tools used by any state is five and the most is eleven.

Regulatory controls are the most significant tools employed nationwide to protect shoreline resources, since the majority of the oceanfront shoreline is in private ownership, migrating and subject to development pressures. Protection is achieved through setbacks; regulation of shoreline development and shoreline stabilizations; restrictions on pedestrian and vehicular access; habitat protection; and permit compliance/permit tracking systems. Setbacks are particularly effective-- acting as natural buffer areas and reducing hazard risks. Planning tools, when combined with regulatory, improve natural resource protection by offering either long-range vision or site-specific goals for the protection and development of selected coastal areas. Stewardship of coastal lands, through state land management and acquisition, is also an important component of all state coastal programs. All coastal states own state parks along the shoreline, and most have natural protection areas and guided accessways. Many states have also acquired additional coastal land holdings.

States are upgrading their CZM programs. CZM is a growing and changing process meeting changing needs. As state CMPs recognize problems or management gaps, they take corrective action. States have made hundreds of significant changes to their programs. This study has documented over 60 significant changes in the way coastal states protect their natural shoreline resources. Most of these program changes involve alteration of the state CMP regulatory or planning tools. States are giving greater consideration to natural shoreline processes, even when addressing other concerns such as the need to protect developed eroding shoreline using structural measures.

More systematic resource protection is occurring through regulatory reviews. State CMPs are providing more systematic, extensive and intensive planning and regulatory review of projects along the shoreline. This regulatory review is minimizing adverse impacts of improper development and erosion on natural systems and adjacent properties and structures. Greater attention is being given to cumulative effects of individual permit decisions. More states are measuring erosion rates and establishing construction setbacks. Concerns about the adverse long-term effects of shoreline armoring on natural beach sand transport are being addressed and opportunities are being taken to employ nonstructural solutions to coastal erosion. As a result, less inappropriate development is occurring in hazardous areas such as migrating beaches and eroding bluffs.

There is insufficient nationally compatible outcome data to determine on-the-ground effectiveness. Due to the scarcity of outcome data, it is not possible to determine the on-the-ground effectiveness of state CZM regulatory, planning, land management and acquisition programs. Regarding regulatory data, most coastal states have computerized permit tracking systems. However, no state maintains a statewide database on the miles affected, the area affected, or the resources affected by state or local coastal permits; or the results of pedestrian access and vehicular access restrictions and protected habitat areas. States with local plans tend to have information on the number of plans approved. However, the data stops there. Only some states have inventories of their coastal land holdings-- such as number of shoreline miles in state parks or percent of shoreline in public ownership. Even states that are active stewards of their public coastal land holdings, do not routinely document accessways installed, dunes restored, beaches restored, and other protection results. Coastal states which utilize acquisition have some data on the number of parcels acquired or acres of coastal lands acquired. However, for most states, these data are not categorized by type of resource area acquired, and very few states have data on amount of money spent or acquisition priorities. Therefore, determining "effectiveness" of state coastal programs in protecting natural coastline resources based on *on-the-ground outcome indicators* is elusive. Determining the "effectiveness" of state coastal programs in protecting natural coastline resources based on *process indicators* and case examples is more possible, but still difficult. Case examples can be effective in illustrating how a management tool has been implemented in a certain geographic area and the results of such implementation.

Competing demands for the use of the shoreline and competing government policies continue to require balance, so the dilemma remains. State CMPs continue to face decisions regarding competing demands for recreation and tourist development, protection of existing threatened properties and the rights of private property owners versus public health and safety. Shrinking federal and state dollars for state CMP administration, coupled with increased demand and expectations for CMP services, are long-term concerns for coastal programs. Several federal agencies, state CMPs, local coastal governments, and other non-profit organizations play a role in managing our nation's coastline resources. Inconsistencies between certain federal agency programs and state CMP objectives are ongoing concerns. For example, the FEMA flood insurance program and the federally-funded shoreline protection projects of the USACE achieve objectives which undermine some state CMP natural resource protection objectives. The unique role of state coastal zone management programs has been and continues to be to focus attention and resources on improving the state and local land use controls and other tools to minimize the adverse impacts on natural resources.

Recommendations

Develop a computerized CZM database - NOAA should seek funding from Congress to establish a computerized monitoring and tracking program for state and federal agency CZM activities, the results of which should be published in a biennial state-of-the-coast report to Congress. This should include a computerized coding system and an information tracking and recovery system for all information submitted by coastal states. NOAA should prepare up-datable state CZM program summary files for each coastal state with information about the state program, periodic changes to the program, program activities, CZM projects undertaken, results and reports produced.

Share Information Through the Internet - NOAA should create a home page on the Internet and a CD-ROM of the National CZM Effectiveness Study and other CZM databases.

Incentives for Coastal States to Refine and Expand their Process and Outcome Data Collection and Record Keeping - NOAA should seek funding from Congress to form a coastal states task force with the objective to change the coastal states reporting requirements under 306, 309, and 312 to better address results of state CZM activities and their effectiveness in meeting state and national CZM objectives. This should include accepted methods for organizing, collecting, storing, and reporting accurate and precise data on program activities and results which include trend data usable in future assessments of CZM effectiveness.

NOAA/OCRM should also encourage coastal states to: a) improve their daily record keeping and yearly reporting to NOAA/OCRM on program implementation and results; b) develop and refine computerized permit tracking systems regarding permitted activities and refine the individual permit entries to include data on type of project, area and resources affected, length of shoreline affected, size of project, permit restrictions/conditions and other data which, when analyzed yearly, could assess the individual and cumulative impacts of projects permitted along the coast; c) monitor, collect and report on local implementation and results for states that delegate implementation to local governments; d) explore the use of in-depth case studies as a way to provide more meaningful explanations of how CZM works and the on-the-ground results, rather than relying on case examples and success stories; and e) explore the use of aerial photo interpretation for measuring long-term changes in develop and resources along the coast.

Utilize 309 Assessment Process to address issues associated with shoreline change. OCRM and the Coastal States should continue to utilize the section 309 Assessment process to address substantive issues associated with protection of natural coastal systems. Significant changes to state coastal programs such changes in activities exempt, shoreline armoring allowed and the landward extent of regulatory jurisdiction should be carefully scrutinized for their long-term effects on natural coastal systems.

Federal agencies should monitor changes to the coastal environment and report on changes every 5 years. Congress should fund activities to monitor changes along our nation's coastlines including: 1) federal level aerial surveillance and photo interpretations of shoreline development and changes in development patterns; 2) USACE to conduct follow-up national shoreline studies at least

every ten years on erosion, shoreline armoring, beach nourishment, and public ownership of the coast; 3) USDOI to compile data on coastal endangered species and habitat loss/protection changes and role of federal and state agencies in this effort; 4) NOAA to compile data from U.S. Bureau of the Census on population changes in coastal counties; 5) USDOI to compile data on private development occurring on designated CBRAs and federal/state agency actions affecting CBRA designations and implementation success.

Indicators of effectiveness. To evaluate state CZM program effectiveness in protecting beaches, dunes, bluffs and rocky shores, the following "*indicators of effectiveness*" and "survey methods" should be used:

Regulatory Program Outcomes:

1. No further or reduced rate of encroachment into coastal resource areas.
2. No further or reduced rate of hardening of undeveloped beachfronts through shoreline stabilizations.
3. Controlled shoreline accessways.
4. Healthy and maintained intact natural habitat areas along the coast

Adopted Plan Outcomes:

1. Achievement of Plan Objectives through implementation and monitoring

State Coastal Land Management and Acquisition Outcomes:

1. Extent of state land holdings in parks/preserves containing beach, dune, bluff or rocky shores.
2. Active public natural resources stewardship of coastal land holdings
3. Coastal lands acquired

Survey Methods- for collecting data and measuring outcomes starting with a baseline followed by time series or periodic updates:

(a) aerial photography interpretation;

(b) computerized permit data collection and analysis -- showing trends in permitted shoreline structures or shoreline stabilizations on the beach and dune system, eroding bluff, coastal hazard areas, coastal floodplain, or immediate shoreline.

(c) periodic physical surveys of the condition of coastal resources protection areas;

(d) shoreline mapping of controlled accessways; delineating shoreline acres and miles where pedestrian and/or vehicular access is restricted; delineating habitat protection areas.

(e) state and local permit data on activities permitted within approved plan areas, area and linear miles affected, and consistency with plan objectives -- such as protection of designated "coastal resource areas" or "natural habitat areas", dune restoration; inlet management to place dredged sand on downdrift beaches, and designated coastal hazard areas where development is prohibited.

(f) documentation of direct state or local actions undertaken-- such as miles/acres of dunes revegetation; cubic yards of sand transferred due to installation of inlet sand transfer plant; coastline acres and linear shoreline miles in state ownership with resources present; number of accessways, marked trails, boardwalks, dune crossovers and demonstrated public use; acres or shoreline miles in state coastal lands designated as conservation, preservation or protection areas; miles and acres and type coastal shoreline resource areas acquired by the state.

Study Approach

This research project involved three stages. *Stage I* included data collection and creation of 29 state profiles. Five states were selected as pilot states to test our survey instrument, followed by surveys of all remaining coastal states. The state profiles documented state tools and available outcome data on protection of natural beaches, dunes, bluffs and rocky shores. Case examples were compiled as part of the state profiles. Data collection also included a search of evaluation literature, national context factors, and national data sources on resource protection. *Stage II* involved evaluation of state CZM program effectiveness in protecting beaches, dunes, bluffs and rocky shores, drawing from the state profiles and national summary tables. *Stage III* involved creation of the national CZM effectiveness evaluation synthesis report. The national overview report contains background and context information; a summary of the regulatory, planning, state land management and acquisition tools used by coastal states to protect natural beaches, dunes, bluffs and rocky shores; the importance of resource protection to coastal states; and the key role, process indicators and outcome indicators of state CZM program effectiveness in protecting natural shoreline resources. The report also contains recommended improvements related to tracking and document state CZM program effectiveness in meeting CZM objectives.

1 INTRODUCTION

The purpose of the National Coastal Zone Management (CZM) Effectiveness Study has been to assess the overall effectiveness of the state CZM programs in addressing five core objectives of the Federal CZM Act. This section of the report investigates the effectiveness of coastal resource protection at the state level. In particular, this section looks at the coastal management tools state CZM programs employ to *protect natural beaches, dunes, bluffs and rocky shores* and the effectiveness of these management tools in achieving national policy objectives. Both process and on-the-ground outcome measures are used to assess CZM program effectiveness. This section also contains recommendations for improving federal and state accounting of the results of coastal management programs in achieving national policy objectives.

The Congressional declaration of national policy related to protection of beaches, dunes, bluffs and rocky shores includes:

> "(A) the protection of natural resources, including ...beaches, dunes, barrier islands, coral reefs, and fish and wildlife and their habitat, within the coastal zone.
>
> (B) the management of coastal development to minimize loss of life and property caused by improper development in flood-prone areas and in areas likely to be affected by or vulnerable to sea level rise, land subsidence, and saltwater intrusion, and by the destruction of natural protective features such as beaches, dunes, wetlands and barrier islands."
> (Section 303 of the Federal Coastal Zone Management Act of 1972)

All coastal states with federally-approved coastal programs have adopted policies which interpret and implement the national policy objectives and call for the protection of natural resources and minimization of loss of life and property along the coast.

State coastal programs were designed to balance resource protection and development. The economic development pressures along the oceanfront and shoreline are tremendous. Shorefront property is scarce and highly valued. As a result, policies to protect natural resources are tempered by policies which meet other objectives. The most obvious conflicts involve balancing protection of the natural beachfront and bluff-front shoreline resources and processes (erosion and accretion) against protection of (a) existing development built too close to the water's edge and threatened by coastal erosion; (b) private property owners' rights to develop on their coastal lands; and (c) public access and recreational use of beach and dune areas.

This report covers the *background and context* for resource protection; the *research methodology*; *research findings and conclusions*; and *recommendations*.

2 BACKGROUND AND CONTEXT

State CZM programs which protect beaches, dunes, bluffs and rocky shores are each influenced by a variety of physical, social and economic context factors including: (a) the type and extent of the natural resources in a given state; (b) coastline erosion processes and storm events; (c) coastline ownership and development; (d) human interference with natural processes; (e) competing demands placed on natural coastal resources and state priorities for balancing these demands; (f) shared coastal management responsibilities between states, federal agencies and non-governmental organizations; and (g) the unique role of the CZM program in the state. Historic and cultural factors are also important in some states. See **Table 1,** for selected national context data by state. Also see **Appendix A** for data related to these national and state context factors.

Beach and Dune, Bluff and Rocky Shore Resources

Beach resources are present along portions of all coastal state shorelines, though the length and character of such beaches vary considerably. Sandy beaches can be categorized into three distinct types: barrier beaches, mainland beaches, and pocket beaches. The Gulf of Mexico and Atlantic Coast is characterized by a system of *barrier beaches* and a relatively wide continental shelf, as is much of Alaska. Barrier beaches are part of a complex integrated system of beaches, marshes, bays, tidal flats, and inlets. These beaches are constantly migrating, eroding and building in response to natural processes and human activities. *Mainland* beaches stretch unbroken for many miles, some low standing and prone to flooding, others backed by steep headlands. They received sediment from nearby rivers and eroding bluffs. Examples include Long Island, northern New Jersey and southern California. *Pocket beaches* form in small bays surrounded by rocky cliffs or headlands. The headlands protect the sandy alcoves from erosion by winter storms and strong currents. Pocket beaches are common in Maine and the Pacific Northwest. Other coastline variations are based on plate tectonics or type of wave forces. Difference and variations in beach and dune coastline systems within a state, between states and within regions are factors affecting states enactment and implementation of certain beachfront management tools. [1]

Headland/rocky shorelines and bluffs/cliffs are present along the West Coast, the North East Coast, the Great Lakes Coast, and Territorial shores. These features are absent along the low elevation Southern and South Atlantic coastlines. The underlying geology of active tectonics, faulting and earthquakes or glaciers, ice gouging and rafting, or ice and strong wind determine shore stability and erosion factors which effect state management responses. [2] Eroding bluffs and cliffs of the Great Lakes states, creating beaches and dunes, are subject to highwater levels which, when driven by storm winds and waves cause flooding and lakefront deterioration.[3]

Table 1 provides the length of the US coastline, using NOAA, U.S. Department of Commerce data, that includes two measures, one of direct oceanfront miles where they cross bays and sounds and the other tidal shoreline miles which extend inland to the head of tidewaters or to a point where tidal waters narrow to a width of 100 feet. The national shoreline, as measured by the US Army Corps of Engineers, to the head of tidewaters, or to the point where tidal waters narrow to 100 feet is also shown. Percent of direct ocean coastline in beaches, rocky shores and bluffs is also indicated from state CZM program estimates. For 8 of the 29 coastal states, their entire ocean coastlines are sandy beaches with no rocky shores or bluffs. All other 21 coastal states have beaches and rocky shores, backed by bluffs or sand dunes.

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[1]Beatley, Timothy, David J. Brower, and Anna k. Schwab. 1994. An Introduction to Coastal Zone Management

[2]Ibid.

[3]National Committee on Property Insurance. 1998. America's Vanishing Coastlines: A New Concern for the Voluntary and Residual Property Insurance Markets. p,23

Table 1: National Context Factors Affecting State Protection of Beaches, Dunes, Bluffs, and Rocky Shores

State	Resource Protection-Importance of Issue: High- H Medium-M Low-L (1)	Open Ocean Coastline Miles (1)	Tidal Shoreline Miles (2)	National Shoreline Miles and % Critically Eroding (3)		% State Land Area % State Population in Coastal Zone (4)		Coast Pop. Density 1990 (4) person per sq. mile	% Coast Pop Chg 1970-90 (5)	Presence of Natural Coastal Resources and Beach and Rocky Shore as Percent of the State's Open Ocean Coastline. Beach, Bluff and Rocky Shore as Percent of Non-Open Ocean (CT & Great Lakes States) Shoreline (6)				Major Barrier Islands Number/ Miles (7)	USACE Major Shoreline Protect Projects 1950-93 (8)
		Miles	Miles	Miles	% CE	Area	Pop.		%	Beaches	Dunes	Bluffs	Rocky Shores	Miles	
AL	H	46*	607	352	9	6	12	171	27%	y-100%	n	n	n	–	-
AK	H	6640	33904	47300	>1	67	85	1	89%	y-nd	?	y	y	nd	-
AS	H	126	126	nd	nd	100	100	607	72%	y-nd	n	y	y-nd	nd	-
CA	H	840	3427	1627	4	24	73	605	39%	y-nd	y	y	y-nd	–	13
CT	M	0	618	270	9	47	62	887	8%	y-31%	Y-rare	y-25%	y-14%	–	8
DE	H	25*	381	226	12	100	100	338	22%	y-100%	y	n	n	1- 6 mi	4
FL	H	1266*	8426	6266	5	100	100	228	90%	y-65%	y	n	n	49-560m	33
GU	H	108*	110	nd	3	100	100	637	57%	y-37%	n	y	y-63%	nd	-
HI	H	750	1052	nd	2	100	100	174	44%	y-25%	y	y-nd	y-nd	nd	-
LA	L	149*	7721	1943	2	37	49	171	16%	y-50%	y	n	n	–	4
ME	H	228	3478	2500	>1	39	72	72	29%	y-10%	y	y	y-90%	–	-
MD	H	32*	3190	1939	9	66	70	507	12%	y-100%	y	n	n	2- 31 mi	4
MA	H	192	1519	1200	11	45	75	1272	5%	y-??	y	y	y-nd	2- 18 mi	7
MI	H	0	3224	nd	nd	55	50	154	-5%	y-nd	y	y-nd	y-nd	–	-
MS	H	44*	359	247	15	4	12	192	30%	y-41%	n	n	n	–	3
NH	H	18*	131	40	5	12	32	331	67%	y-70%	y	n	y-30%	–	5
NJ	H	125*	1792	469	26	76	90	1219	6%	y-100%	y	n	n	10-100m	12
NY	H	125*	1850	638	47	37	84	858	-3%	y-100%**	y	y	y	4- 93 mi	13
NC	H	320*	2625	3661	15	19	11	75	39%	y-100%	y	n	n	20-285m	10
NM	H	184*	206	nd	nd	100	100	236	255%	y-nd	n	y	y-nd	nd	-
OR	H	362*	1410	500	13	20	38	82	46%	y-72%	y	y	y-28%	–	-
PA	H	0	140	nd	nd	4	25	1701	-9%	y-19%	n	y-81%	n	–	3
PR	H	311	700	nd	nd	12	100	856	30%	y-50%	y	y	y-nd	nd	-
RI	H	40	384	340	7	100	100	950	6%	y-68%	y	y	y	–	1
SC	H	181*	2876	3063	2	26	24	114	57%	y-100%	y	n	n	18- 96 m	2
VI	H	Nd	175	nd	nd	100	100	771	63%	y-nd	?	y	y-nd	nd	-
VA	H	200*	3315	993	26	22	62	423	40%	y-100%	y	n	n	9- 67 mi	2
WA	H	171	3026	2337	>1	31	70	172	46%	y-35%	y	y	y-65%	–	-
WI	M	0	820	nd	nd	19	39	177	0%	y-10%	y	y-72%	y-8%	–	-
Total	26H 2M 1L	Nd	85770	31513***	nd	nd	44	nd	nd	y-29	y21 n8	y18 n11	y17 n12	nd	124

KEY: y-yes n-no ?- unknown nd- no data H- high M-medium L-low

* denotes where state coastline miles data differs from General Coastline miles data in US DOC, NOAA 1975. The Coastline of the United States

** New York- Atlantic Ocean only covered under this study. *** Does not include the Great Lakes States or the Island Territories and Commonwealths.

(1) Individual State CZM Profiles.

(2) US DOC, NOAA. 1975. *The Coastline of the United States.*

(3) USACE. 1970. *National Shoreline Study.*

(4) Coastal Ocean Policy Roundtable, The 1992 Coastal Status report: A Pilot Study of the US Coastal Zone and its Resources, Tables 2 and 3.

(5) US DOC, NOAA, OCRM. *Table 2: Coastal County Percent Population Per Decade and Percent Change Per Decade.* (unpublished in-house data)

(6) Individual State CZM Profiles on Protection of Beaches, Dunes, Bluffs and Rocky Shores

(7) Ringold, Paul and John Clark. 1980. *The Coastal Almanac,* Table 8.

(8) USACE, *Shoreline Protection and Beach Erosion Control Study: Phase 1.*

Human Interactions

Coastline Ownership

State jurisdictional ownership of beaches usually begins at mean high water and extends seaward. This leaves extensive dry sanding beach and dune systems in private ownership, except where governments have acquired beachfronts for recreation or preservation. Seventy percent of our nation's shoreline is in private ownership (excluding Alaska where 99% is publicly owned). As of 1970, three-fifths of the shoreline was undeveloped (excluding Alaska).[4] Development pressures vary depending on geography and climate issues. Inaccessible and hard to develop shorelines, such as rocky shores, are less prone to

development than accessible sandy beach areas. A state's beach and dune management varies depending on the extent of public ownership. For the 20 coastal states (not including the islands or the Great Lake States), public owneship ranges from a high of 99% for Alaska to a low of 3% for Maine. For 11 of the 20 states, over 1/4 of the shoreline is in public ownership. (See **Table 1**)

Coastline Development and Economic Pressures on Shoreline Properties

As early as the late 1800s, recreational tourism began along our nation's beaches. With the advent of the automobile, seasonal seaside resorts evolved. The summer homes and fishing villages of the 1940s and 1950s were transformed by the 1970s into "cities on the beach."[5] Today, due to population and economic pressures, over half of our nation's population lives within 50 miles of the coast and our nation's coastal zone is over four times more densely populated than the national average. [6] In addition to the retirees who migrated to the coast and other year round residents, tourists and conventioneers are demanding beachfront coastal resorts. This is most pronounced along our coastal barriers at high risk due to coastal flooding, hurricanes and erosion. Billions of dollars in private development and pubic recreation and infrastructure is invested on these unstable coastal barriers. [7] The demand for coastal waterfront property has lead to increased residential development pressures along our nation's coastal bluffs and rocky shores.

The cost of purchasing oceanfront and waterfront properties along our nation's shorelines are considerably higher than for non-waterfront properties. The seasonal beachfront cottages of yesterday have given way to much larger and more expensive developments, often high-rise multi-family condominiums. The result is intensive, extensive and expensive investments in known coastal high hazard areas. Barrier islands have become a magnet for retirees and vacation homes.[8] About half of all residential and non-residential construction in the U.S. between 1970 and 1989 occurred in coastal areas. The most dramatic growth has occurred in the Florida and California.[9] Despite the environmental degradation associated with population growth, these shoreline areas remain in strong demand for commercial, residential, tourism and recreation.

The persistent development along our nation's coastline had lead to destruction of coastal dunes systems and placement of structures in jeopardy from both short and long-term erosion. Shoreline development prior to the 1970s were frequently armored with seawalls, revetments, bulkheads or other shoreline stabilization structure to protect upland private and public investments from erosion. Such stabilization structures accelerated the loss of sandy beaches. [10] **Table 1** shows coastal county population change between 1970 and 1990. For 16 of the 29 CZM states, population growth was 30% or greater (major impact); for 5 population growth was between 10% and 29% (moderate impact); and for 8 population declined or growth was 0% to 9% (minimal impact).

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[4]Ibid.

[5]Platt, Rutherford H. et al. 1987. Cities on the Beaches: Management Issues of Developed Coastal Islands.

[6]U.S. Department of Commerce, NOAA. 1990. 50 Years of Population Change along the Nation's Coasts: 1960-2010.

[7]Platt, Rutherford, et al. 1992. Coastal Erosion: Has Retreat Sounded?, p.12.

[8]U.S. Department of Commerce, NOAA, NOS. 1992. Building Along America's Coasts: 20 Years of Building Permits, 1970-1989, p.5

[9]Ibid

[10]Ibid., p.8

Coastline Erosion

Coastal erosion, the landward displacement of the shoreline, is a normal process that has been going on for many years along most of our nation's sandy beaches. Gradual long-term erosion from normal wave action (of 1-3 feet per year) is accelerated by severe storm events during hurricanes and winter storms, sea level rise, the greenhouse effect; and man-made shoreline stabilizations. [11]

The only nationwide survey of shoreline erosion, published by the U.S. Army Corps of Engineers in 1971, estimates that at least 7% of our nation's coastline is critically eroding where properties are in imminent danger of collapse and 25% is experiencing significant erosion. [12] In addition to long-term erosion, many coastal states have experienced shoreline loss and property destruction through periodic storm events. Bluff recession is a particular problem along the Great Lakes States and potions of the west coast.

The average rate of erosion is determined locally through historical shoreline records or shoreline modeling. A few examples of documented shoreline retreat dramatize the management urgency of coastal erosion. Cape Shoalwater, Washington has been eroding at the rate of more than 100 feet a year since the turn of the century. it's sparsely settled sand dunes have retreated an outstanding 12,000 feet, or more than 2 miles since 1910. [13] Most of the barrier islands along the east and gulf coasts are retreating landward by 1 to 10 feet per year--rates of up to 20 feet are not uncommon for specific locations.[14] Every coastal state is affected by shoreline change and erosion.[15] **Table 1** shows, by state, the amount of coastal shoreline threatened by critical erosion.

Sea level rise and land subsidence, as a contributer to shoreline erosion, are recognized problems along portions of our nations' coastline. If accurate, the long-term costs to protect existing development, shoreline stabilizations, and infrastructure would be staggering[16]

Coastal Storm Events

Coastal storms and hurricanes exacerbate long-term erosion, shifting the position of beaches and sand dunes and splintering and collapsing erodable bluffs. Rapid shoreline erosion caused by high storm surge and wave heights overtop dunes and damage beachfront buildings in harms way. Wave attack at the base of steep slopes, undercut and collapse overhanging banks and topple properties perched on such bluffs. Large tsunamis waves with speed and height have inflicted great damaged to California and Hawaii coastal areas. Between 1980 and 1995, 11 separate billion-dollar weather disasters struck coastal areas of the US: 9 hurricanes, 1 Nor'easter and 1 tropical storm resulted in over $46 billion in damages.[17]

Human-Interference with Natural Processes

Beach systems, and sandy beaches in particular, are dynamic. They advance and retreat, but over several cycles maintain state of equilibrium. Beginning as early as the 1890s, a variety of human modifications to the physical shoreline have been undertaken to achieve objectives that run counter to the protection and dynamic equilibrium of natural beach/dune systems. This host of human interferences have adversely affected the natural sand transport system, destroyed or caused dune instability, and increased erosion. These include the damming of coastal rivers; dredged navigational channels with jetties for shipping and dredged tidal inlets for commercial fishing and recreational boating; the placement of dredged spoil and

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[11]Kaufmam, W., and O.H. Pilkey, Jr. 1983. The Beaches are Moving.

[12]U.S. Army Corps of Engineers. 1971. National Shoreline Study.

[13]National Committee on Property Insurance. 1988.

[14]Ibid

[15]U.S. Army Corps of Engineers. 1971.

[16]S.D. Lyles, L.E. Hickman., and H.A. Debaugh.1988. Sea Level Variations for the United States. 1855-1986: US Department of Commerce, National Oceanic and Atmospheric Administration, Rockville, Maryland.

[17]U.S. Department of Commerce, NOAA, NCDC. Home Page http://ncdc.noaa.gov/publications/billionz.html

beach quality sand offshore beyond the littoral sand transfer system; shoreline armoring; sand-trapping structures such as groins and breakwaters; sand mining for development; and sand scraping practices. Efforts to recreate natural beach/dune systems include sand fencing and dune revegetation, beach nourishment, and inlet sand transfer.[18]

The *damming of coastal rivers*, to protect urban areas downstream from flooding and provide hydro-electric power, has trapped sediment that would normally feed coastal beaches. Sediment starved beaches occur most on the west coast, but some east coast beaches are also affected by river diversions. *Inlet dredging* to maintain established boating and shipping access through coastal barrier passes that open and close with storm events has, until recently involved disposal of dredge material offshore beyond the littoral sand transfer system. The loss of this sand to the nearby beaches has increased erosion. For major navigational channels, the installation of *jetties* to stabilize the such inlets results in trapping sand on the updrift side of the inlet and staving the downdrift beaches. *Offshore breakwaters* used primarily to stop wave action and create a quiet water area for safe boat moorings obstruct the free flow of sand along the coast and starve downstream beaches.

Shoreline armoring through placement of seawalls, revetments, bulkheads, or riprap to protect private oceanfront structures and public infrastructure from erosion has occurred at the expense of lost recreational beaches. These wave-resistant walls may withstand wave action and protect upland properties but rapidly remove sand from the beach and eventually fail or require more substantial armoring.[19] *Groins*, structures extending into the water to interrupt and accumulate sand on the updrift shore, also starves downdrift adjacent beaches. Most of our nation's urban oceanfronts have been armored, although the percent of our nation's beachfront/oceanfronts that has been armored is unknown.

Sand mining, the removal of sand from beaches, dunes, adjacent areas, or riverbeds near was common practice in many states for road construction and development fill. This resulted in a loss of sand and protective dune areas, making such areas vulnerable to coastal flooding from storm events and accelerating erosion. *Sand scraping*, the practice of moving sand accumulated at one portion of the beach to another to build back a dune or the practice of leveling sand in front of a beachfront development to provide visual access to the water, has been allowed in many states. The negative effects include unstable dunes and low-lying dune areas vulnerable to breaching in storms.

Three activities have been used to try to recreate the natural beach/dune system. Dune restoration through *Sand fences and dune revegetation* has been used to stabilize and re-build dune areas. This helps limit breaching and creation of new inlets during major storms. *Beach renourishment and period nourishment* has become a popular alternative to armoring, in attempting to artificially create or recreate a beach area through the importing of compatible sand and pumping/placing it on the eroded beach area. The flattened beach profile and wider beach width mitigates erosion losses and storm-induced inundation. In certain high erosion areas, however, sand is rapidly washed away. Finding suitable sand source borrow areas also poses challenges. *Sand transfer facilities* which pump sand from updrift accumulation areas to downdrift beaches has ameliorated this problem. In Florida, for example, over 80% of the beach erosion on the state's Atlantic coast is estimated to be caused by 19 maintained inlets, most stabilized with jetties.

Balancing Competing Demands for Protection of Natural Resources with the Use of Hard Structures to Protect Private Oceanfront Properties and Public Infrastructure

Sandy beaches backed by dunes or bluffs, rocky shores and wetlands constitute the three types of natural shoreline features along our nation's coastline. The natural resource protection values of these features are often in conflict with social and economic values as reflected in shoreline use and development. State CZM programs were created, in part, to provide institutional mechanisms and management tools to balance the competing demands paced on these shoreline features.

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[18] US Army Corps of Engineers. 1971 and Platt. 1992.

[19] U.S. Army Corps of Engineers. 1971. Shore Protection Guidelines. pp32-33

The natural resource protection values of beaches and dunes commonly identified by state coastal programs include the first line of defense and protection of upland properties from storms and high tides; and wildlife habitat for marine life such as sea turtle nesting areas, bird nesting and staging areas, and endangered species habitat. Key use values of beaches and dunes are recreation, tourism and access to coastal waters. On the flip side of the coin, social and economic demands have also made oceanfront properties highly desired places for second-homes, resorts and year-round residences. Beachfront and bluff-front development built too close to the edge and now in jeopardy has led to shoreline armoring which has destroyed the natural beach/dune systems which attracted people to the coast in the first place. In addition, cutting and maintaining of inlets for recreational and commercial navigation has permanently disrupted the natural transport of sand along the beachfront, accelerating the loss of recreational beaches.

Coastal bluffs, sitting behind extensive or minimal beaches, have been thought of as excellent features for providing coastline vistas. In a few states, select bluff areas have been acquired and managed as natural resource protection areas or scenic vista areas. Most are managed as high erosion areas where development and other activities are regulated to minimize erosion risks rather than protect valuable natural resource features. The social and economic pressures for ocean vista developments have resulted in the siting of development along bluff recession areas in harms way.

Rocky shores, located within the inter-tidal zone, are recognized as high energy environments and valuable marine habitat. The inter-tidal areas are under state ownership an management. Although public access and recreational enjoyment of these areas has not been restricted, states are beginning to limit public access to avoid over-utilization and destruction of tide pool areas. Rocky shoreland areas have for the most part been resistant to erosion and therefore not managed as high hazard areas. Likewise, they have not been considered developable, though development often occurs immediately landward of these features.

Balancing such competing demands has become a key role of state CZM programs (see below). As our understanding of the impact (both individual and cumulative) of human activities on natural systems grows, coastal managers are looking for alternative management approaches to allow activities but minimize their negative impacts on resources of known public benefit. The U.S. is based on strong private property rights laws. The private property takings issue in the regulation of coastal land and water uses is of paramount importance in the development and implementation of coastal management tools. Over the years, states priorities in balancing resource protection and development have varied and altered. Today, coastal programs are required to justify their management decisions basing complex technical data sets. Refinements to shoreline setbacks, based on historical erosion rates, demands sophisticated and complex computer modeling programs.

Government has invested billions in public infrastructure along our nation's coastlines from highways and bridges to water and sewer systems to support mainly private development and some public facilities including military facilities, coast guard stations, hospitals schools and recreation facilities. Beginning in the 1980s, in recognition of the hazardous nature of barrier islands, federal and state agencies have begun to limit their public investments in such areas.

Shared Coastal Management

Several federal agencies have a long history of involvement with our nation's coastlines, all pre-dating the Federal CZM Act of 1972. Key federal players involved in activities affecting beaches, dunes, bluffs and rocky shores include the U.S Army Corps of Engineers, the Federal Emergency Management Agency, the U.S. Department of Interior/National Park Service/US Fish and Wildlife Service. Staring in 1972, the U.S. Department of Commerce/Office of Ocean and Coastal Resource Management became responsible for administering the Federal CZM Act.

The Army Corps of Engineers (COE) administers the 1) federal shoreline protection program through research, planning, design, construction management, federal cost-sharing; 2) authorized navigation channel dredging; and 3) federal permits for dredge and fill involving any construction or other activity which

affects navigable waters including federal guidelines for beach nourishment and shoreline stabilizations. The COE Published the National Shoreline Study in 1971, and is working on analysis of Federal shore protection program for Congress.

The COE shoreline protection program covers construction projects for hurricane and storm damage reduction, beach erosion control, navigation, mitigation and recreation. Since 1930, Congress has authorized 137 projects or studies involving 19 of the 29 CZMA states plus 4 coastal states not in the CZM program. A total of 82 Federally-sponsored shore protection projects were constructed between 1950 and 1993 in areas of concentrated development experiencing severe erosion and/or property damage from storms. The projects protect 226 miles or less than 0.3 % of the 84,240 mile of tidal shoreline of the U.S. and only 8% of the 2,700 miles of COE identified "critical-erosion" coastline.[20] Of the 82 projects, 56 were large projects costing $1,177.3 million in 1993 dollars. The cost-sharing was 60% federal and 40% non-federal (state, locals, and private) sponsors.[21] These projects involve one or more of the following: 1) initial beach restoration, sometimes with dune filling; 2) periodic beach nourishment; 3)shoreline structures-groins, seawalls, revetments, breakwaters, bulkheads, or sand transfer plants; 4) emergency measures to repairs storm damaged projects. The significant shift from reliance on fixed structures in the 1950s to beach restoration and periodic nourishment in the 1970s by the COE, is based on a realization that fixed structures protect upland property but destroy recreational beaches. Artificial beaches as a primary means of shore protection has become a major component of the COE program. the concept of replicating the protective characteristics of natural beach and dune systems. However, beach renourishment is not without its critics. In 1983, 1 million square yards of sand placed on the beaches of Ocean City, New Jersey at a cost of $5.5 million. Within a few years, storms removed and redistributed much of the sand. [22] In 1993, the COE initiated an investigation and analysis of the benefits, environmental effects, and the existence of induced development resulting from Federal shore protection program. [23]The small percent of our nation's coastal erosion problem covered by the COE, leaves state CZM program with major responsibilities to cope with and address appropriate erosion responses. See Table 3 in Appendix A for shoreline protection projects by state between 1950-1993.

The COE navigation channel dredging program began with the Harbors Act of 1890. Since then Congress has authorized 830 navigation projects for channels for shipping, commerical fishing and recreational boating involving every coastal state, territory and commonwealth.[24]

The COE permit program for dredge and fill projects in navigable waters is subject to federal consistency provisions. Only one coastal state, Alaska, relies on the minimum standards contained in the COE regulations for placement of shoreline stabilizations. All other coastal states have their own state regulatory programs covering shoreline stabilizations and other activities over coastal waters.

The Federal Emergency Management Agency (FEMA) administers the Federal Flood Insurance Program that produces rate insurance maps and insures properties within the 100-year flood zone for local community participating in the program. Insured coastal structures, when damaged or destroyed, receive insurance claim payments to repair or rebuild. Critics have argued that, despite local code requirements, the NFIP promotes subsidized inappropriate development in coastal high hazard areas, impeding state management efforts to restrict new development and redevelopment in these areas.

In 1994, Congress required FEMA tro conduct an evaluation of the economic impact of mapping coastal erosion areas and then denying flood insurance for existing and new stuctures in such areas, establishing actuarial rates, and changes in the tax base of communities.[25] As of 1992, there were over 66,000 NFIP policies in effect covering structures in the hazard zone (V-Zone) .

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[20] U.S. Amry Corps of Engineers. 1971.

[21] U.S. Army Corps of Engineers. 1994. Shoreline Protection and Beach Erosion Control Study: Phase I: Cost Comparison of Shoreline Protection Projects of the U.S. Army Corps of Engineers.

[22] Nordstrom, Pilkey et al. 1986. Living with the New Jersey Shore. Durham, N.C. Duke University Press.

[23] U.S. Army Corps of Engineers. 1995. Shore Protection and Beach Erosion Control Study: Economic Effects of Induced Development in Corps-Protected Beachfront Communities.

[24] U.S. Army Corps of Engineers, Institute of Water Resources, Table D, Unpublished Report.

[25] FEMA. Undated. "Section 577 of the National Flood Insurance Reform Act of 1994--"Evaluation of Erosion Hazards": Overview of Study Plan." (provided by Mark Crowell, FEMA)

Under the Upton/Jones Program 1988-1995, FEMA allowed for payment of flood insurance claims to demolish or relocate buildings imminently threatened by erosion. A total of 434 claims have been approved under this program. 73% for demolition. (See Table 4 in Appendix A for claims by state). FEMA is currently conducting an evaluation of economic impact of mapping erosion hazard areas for Congress.

U.S. Department of Interior (DOI), National Parks Service (NPS) created and manages 10 National Seashores covering 592,627 acres and 4 National Lakeshores covering 228,716 acres **The DOI U.S. Fish an Wildlife Service (USFWS)** enforces federal wildlife and endangered species laws and maintains system of national wildlife refuges. In cooperation with states and local communities, USFWS identifies and protects beach and dune areas which provide nesting sites for endangered sea turtles and birds through limitations on sand fencing and beach nourishment during nesting season. Rocky shores, habitat for the Stella Sea Lion and other endangered mammals. There are several National Wildlife Refuges along our nation's coastline. These national wildlife refuges are managed by USFWS to preserve the natural beach/dune systems.

DOI/USFWS also administers the Coastal Barrier Resources Act of 1982 and Coastal Barrier Improvement Act of 1990. The purpose of the Act is to minimize loss of human life, wasteful Federal expenditures, and damage to fish, wildlife and associated natural resources. The Act restricts federal expenditures and financial assistance that have the effect of encouraging development on designated coastal barriers along the Atlantic, Gulf and Great Lakes shorelines. This includes prohibitions on National Flood Insurance, HUD assistance, public infrastructure, and other financial assistance. The system includes 582 units, comprising over 1.3 million acres and 1,276 miles of shoreline that are not publicly owned or otherwise protected. An addition 173 units of otherwise protected areas are covered under the 1990 Act which includes public barrier holdings in federal, state and local ownership. These areas include national wildlife refuges, national parks and seashores, state and local parks and conservation lands. (See Table 5 in Appendix A)

The U.S. Department of Defense owns coastal properties within military bases, some significant tracts along the eroding coastline. The closing of certain bases and disposal of coastal properties will pose choices between sale for development or transfer for public preservation. [26]

Nonprofit conservation organizations have played a significant role in preserving certain coastal barrier lands. **The Nature Conservancy, the National Audubon Society and the Trust for Public Lands** and their partners have selectively acquired parcels for protection. Just over half of the shoreline of coastal barriers on the Atlantic and gulf of Mexico are protected through public or quasi-pubic ownership.[27]

Unique Role of States CZM Programs

All coastal states are involved with the protection of their natural resources through a variety of state and local management controls. 29 of the 35 coastal states, territories and commonwealths have federally-approved CZM programs. The management tools these states utilize to protect beaches, dunes, bluffs and rocky shore include regulatory, planning, direct land management, acquisition and other techniques. These tools are discussed in detail in this study. In most states, local governments participate through local land use controls. The unique role of state CZM programs has been the creation of unified state programs which articulates the conflicts among competing uses, the policies of the state and the balance or method used to resolve conflicts; and utilizes land use controls, both state and local, to manage shoreline uses.

State CZM programs have become increasingly involved in identifying the problems of eroding beach/dune systems and developing coordinated responses through statewide beach management and erosion control plans. States concern about adverse affects on downdrift beaches from federal dredging of navigation channels, offshore disposal of dredged materials, and loss of recreational beaches from shoreline armoring, has lead states CZM programs to take a proactive role in shaping state and federal policies and programs. In recognition of the adverse effects on recreational beaches from shoreline armoring. For example, the South Carolina CZM Program pushed for Congressional recognition that COE dredging of

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[26]Platt, 1992.

[27]Ibid.

Charleston Harbor was causing severe beach erosion on the sand-starved downdrift beaches and led to the Folly Beach renourishment mitigation project.[28] The State of Florida passed legislation requiring that suitable beach quality sand from be inlet and navigational channel dredging be placed on the down-drift beaches and used federal consistency and state-funds to negotiate with the COE to place 1.4 million cubic yards of sand from St. Mary's inlet dredging on the down-drift beaches rather than losing the sand to the offshore system.[29] Several states have passed legislation limiting the use of new shoreline stabilizations, in an effort to protect beach and dune systems at the expense of private upland properties.

The inappropriate siting of structures on coastal barriers, in coastal flood zones and on erodable bluffs is a problem which state CZM programs inherited. Thus when the state CZM programs began in the 1970s, certain portions of our nation's coastline were already committed to intense development and other areas already zoned and platted for development. Shoreline erosion was a recognized problem, but land use controls were not well developed. State CZM programs would provide the testing grounds for land and water management to balance competing demands along our shoreline and minimize adverse impacts on valued natural coastal resources. State CZM programs would be at the forefront of the "quiet revolution in land use controls" and "integrated coastal management."

State Profiles, developed as part of this study, capture some of the complexity and diversity of geographic, geologic, and social context factors which are unique to each coastal state and its CZM program. The authors found no significant correlation between these factors and management tools employed by a group of states. These context factors have proven helpful, however, in understanding the unique set of conditions in states that influence coastal management program actions. For example, the Connecticut, New Jersey and portions of the New York coastlines were *already intensely developed* at time of program approval, so population growth between 1970 and 1990 was not a major concern. In Connecticut, management attention has therefore focused on coastal erosion-based permits for improvements and additions to existing structures and development on the few remaining lots within the coastal erosion zone. In New York and New Jersey, attention has been given urban waterfront redevelopment and erosion response to protect existing structures. The islands of Guam, Northern Mariana Islands, Virgin Islands, and American Samoa have each experienced *significant population growth* (>50%) between 1970 and 1990. Tourism development on these islands has placed pressures on the natural resources and infrastructure. Continued development along the narrow low-lying coastal plains has exacerbated coastal hazard risks on these already storm-vulnerable islands. Agricultural use and some new develop on steep slope areas is causing landslides and soil erosion. At least eight states are experiencing *critical erosion* along more than 10% of their shoreline. All but a few states have areas where existing coastline development is falling into the water or in imminent danger of collapse as a result of being constructed too close to an eroding beach or receding coastal bluff. The management responses to shoreline erosion, both on beaches and bluffs, vary by state --from setbacks to requiring moveable structures, to prohibiting shoreline stabilization structures-- but each state with such erosion has sought management solutions. Although all states have beach resources, the demand and utilization varies. Alaska and Florida have extensive *barrier beach resources*. The *warm sub-tropical climate* places Florida's beaches in high demand for recreation and development, while the *bleak Arctic climate* of Alaska along with extensive public holdings makes beachfront development a non-issue. Oregon and Maine have *rocky shore resources* of high scenic value. *Easy linear access* along the Oregon coast has made protection of rocky intertidal areas from over-use a significant issue. In contrast, the *irregular and inaccessible* nature of the Maine coastline reduces the need for protection measures. Several states have coastal bluff resources, but *bluff erosion and bluff development pressures* vary. Where new development along unstable bluffs is occurring-- such as PA, OR, CA, MI-- a variety of management responses are being developed. American Samoa, Guam, Hawaii, and Northern Mariana Islands have *historic and traditional cultural values* which affect coastal management. In American Samoa, most properties are owned by the aigas (communal villages) with tribal chieftains making decisions about communal use of the land consistent with traditional cultural values.

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[28]U.S. Army Corps of Engineers. Water Resources Development in South Carolina. 1993. p.44

[29]State of Florida. Florida Castal Management Program. Best Projects Report. 1988. p.19

National Perspective
Context factors are helpful when evaluating the overall national effectiveness of state CZM Programs. For example, the length of coastline and type and extent of natural coastline features highlight the relevant areas needing coastal management attention; the extent and change in coastal erosion along our nation's shoreline help define the magnitude of erosion as a national coastal management problem; the extent of public versus private ownership of the coastline puts the relevancy of various management tools (direct land management, regulatory controls and land acquisition) into perspective; and the population and economic pressures along the coastline bring into focus the competition between resource protection and development interests.

Issue Identification
All but three of the twenty-nine coastal states identified issues associated with protection of natural coastal resources and/or minimization of loss of life and property from coastal hazards as a high priority management issue for their program. Two states ranked the issue of moderate importance: Connecticut has no open-ocean coastline and was already intensely developed at time of program approval; Wisconsin considers wetlands protection a higher priority. Louisiana ranked the issue as low, since only a small portion of the coastline is sandy beach and wetlands are the highest priority issue. (See **Table 1**)

Diversity of State Policy Objectives
The tools states employ reflect each state's policy priorities to address competing uses along our nation's beachfront and shoreline areas. This study focuses on a cross-state analysis of the key tools, selected provisions, and on-the-ground outcomes of tools employed. It should be noted that the policy intent behind the tools employed vary, even among similar types of tools employed. **Table 2** illustrates the diversity of policies behind state setback regulations.

Overview of State CZM Programs

This study covers the twenty-nine coastal states, territories and commonwealths with federally-approved coastal zone management programs as of 1995. For the purpose of simplicity, all twenty-nine programs are hereinafter referred to as "coastal states," which term is intended to include states, territories and commonwealths. The state coastal programs were approved between 1976 and 1988. (See **Appendix C**) Each of the twenty-nine coastal states was required to develop and describe its program in a CZM Plan and a draft and final Environmental Impact Statement (EIS), prior to program approval. These documents contain some baseline data on resources. They also describe the key tools to be employed in the program to address resource protection and other issues.

Under the CZMA (Section 306(d)(11); 15 CRF, Section 923.42-.44), states were required to develop coastal programs with means for controlling coastal land and water uses in one or more of three ways: Technique A- state establishment of criteria and standards for local implementation; Technique B- direct state land and water use planning and regulation; or Technique C- state review on a case-by-case basis of actions affecting land and water uses subject to the management program. Ten of the states developed programs based on direct state land and water use planning and regulatory programs (Technique B). Nineteen of the states used a combination of state controls and local controls based on state standards. (See **Appendix C**)

Looking at primary authorities and tools employed by state CZM Programs to protect beaches, dunes, bluffs and rocky shore resources, twelve states employ state-level regulatory programs; seventeen states employ a combination of direct state and local planning and regulatory programs. Although all states own coastal properties, for three states ownership and direct land management is a primary tool. (See **Appendix C**) Most coastal states are finding ways to provide for local participation in coastal management decisions. Even states that do not rely on local controls as part of their approved programs are providing for voluntary or mandatory local participation. For example, in 1995 New Hampshire began requiring local shoreland ordinances and setbacks. In 1994, Florida added local comprehensive planning to

its tool box. In 1990, South Carolina began requiring local beach management plans tied to access and beach nourishment funding.

Table 2: Diversity of policies behind state coastal setback regulations

Commonwealth of Northern Marianas	Preserve visual open space.
Virgin Islands, Guam	Retain public access.
Puerto Rico	Retain public access and prevent shadows on the beach.
Hawaii	Protect shoreline resources vital to the economy and environment, protect natural shoreline processes, provide public access.
Maine	Conserve wildlife habitats and other vital resources, protect natural functions of frontal dunes.
Michigan and Pennsylvania	Keep development away from bluff-recession hazard areas. Both address reasonable use of parcels subdivided prior to setback laws. Michigan allows moveable structures. PA uses a variances process.
Oregon	Protect public access, protect life and property from hazards including ocean flooding, to prohibit development on beaches, active foredunes,and other conditionally stable foredunes and intertidal dunes.
Rhode Island	Multiple setbacks: to protect foredunes, coastal features - beaches, dunes, bluffs, rocky shores; to reduce loss of life and property in designated coastal hazard areas; to reduce public expenditures for infrastructure and flood disaster relief on barrier islands.
South Carolina	Preserve beaches and keep development off the active beach and dune. However, as a result of taking cases, the state allows certain development along the oceanfront if not located on primary dune.
American Samoa, Florida, New Jersey Carolina, other states	Consider the type and/or size of development (single North family, commercial and/or square footage/number of units) in setting development back from the shoreline.
several states	Erosion-rate based setbacks to respond to beach dynamics and to keep development out of coastal erosion areas.
most states	Variance provisions to avoid "taking" issues associated with private property rights.

Source: State CZM Profiles.

3 METHODOLOGY

A detailed description of the methodology is provided in **Appendix B-1**. The following is a summary containing the research question, research design, and approach to determining effectiveness.

Research Question and What is Covered

The basic research question utilized is "how effective overall have the individual and collective state CZM program efforts been in addressing protection of beaches, dunes, bluffs and rocky shores?"

Research Design

The overall research framework is described in the introduction to the entire study. A specific survey instrument was developed for collecting process and outcome data on protection of beaches, dunes, bluffs and rocky shores. This survey instrument was sent to all twenty-nine CZM states. In addition, the instrument was used in completing follow-up phone interviews with state contacts. The survey results served as the basis for completion of individual state CZM profiles. (See **Appendix B-2** for a copy of the Survey Instrument)

In addition, the authors reviewed information from state CZM documents including Final Environmental Impact Statements (FEIS); 309 Assessment and Strategy Reports and state laws and regulations pertaining to resource protection. Where provided by OCRM or the coastal state, the authors reviewed documents on beach and dune protection, state coastal parks, land acquisitions, and selected state CZM progress reports, annual reports, and 312 evaluation reports.

Follow-up phone interviews and data requests were made to each coastal state, usually to multiple state agency or bureau staff. It was typical to contact more than one staff in the state CZM program office, the state land management agency, a state environmental regulatory agency, the state land acquisition agency, and the state wildlife protection agencies.

Determination of Effectiveness

"Coastal Management Tools" are the processes, tools, and techniques a state coastal management program employs or utilizes to address a coastal management issue and to implement its program.

"Process Indicators" are the specific management programs, tools or techniques that states have developed to address coastal problems. Examples include key provisions of regulatory programs such as coastal setbacks from primary dunes or control zones which protect natural functions of resources; plans with enforceable policies that address beach renourishment, inlet management, dune restoration or special area resource protection; state land management of coastal parks which guide access or protect unique habitat areas; and acquisition programs to purchase beaches, dunes, bluffs or rocky shore areas.

"Outcome Indicators" are the specific on-the-ground measurable effects that result from implementation of CZM programs, tools, and techniques. Examples include linear and/or area data on permits issued reflected in miles of beachfront shoreline developed or armored through permitting; area restricted from vehicular access through access plan and regulations; miles and/or acres of coastal shoreline in state land management or protection status; miles and cubic yards of beaches restored or dunes revegetated; miles and/or acres of coastal shoreline acquired for resource protection.

"CZM Program Effectiveness" means the special role of CZM in using process tools to affect outcomes sought under the CZMA, namely the protection of natural beaches, dunes, bluffs and rocky shores. Effectiveness is measured by: 1) process indicators (tools) and outcome indicators (results) and their

linkage within each of the 29 state programs; 2) state CZM program implementation through case examples where no statewide data is available; and 3) the unique role of CZM as only one of many government and non-government agencies involved in coastal management.

Research Limitations

There are several limitations to this research project. The greatest limitation involves a lack of historical information and databases on state CZM management tools and outcomes. The following is a list of some of the problems and weaknesses which limit meaningful cross-state comparisons of CZM tools and results, and the assessment of CZM effectiveness:
(1) diversity among state CZM programs with regard to natural resources, size, region, coastal population, development, priorities for balancing resource protection and development, organizational and management framework, and application of similar management tools;
(2) multiple state agencies involved in the coastal area with separate management mandates, and a lack of coordination among agency programs to achieve common objectives;
(3) lack of database at OCRM on state CZM program tools, activities, outcomes including a lack of standardized and consolidated reporting in performance evaluations, grants, annual reports which is reflected in an inadequate reporting process between the coastal states and OCRM; inadequate computerized permit tracking data regarding miles, acres, resources, areas affected, length of projects permitted, and assessment of cumulative impacts of multiple permits; and lack of federal standards for measuring state CZM performance coupled with a lack of measurable data provided by OCRM and the coastal states;
(4) lack of documentation, bibliographies and dissemination of CZM technical reports and program results;
(5) reliance on case examples and success stories, in the absence of statewide data on CZM outcomes, as indicated in biennial reports to Congress and state submissions to OCRM;
(6) significant changes to state CZM programs over the years which are not documented by OCRM;
(7) turn-over among state CZM staff and the lack of institutional memory about CZM activities and results;
(8) compounding factors which influence and shape state coastal policies and programs and affect CZM results including economic development, environmental pressures, political and social factors.

4 RESULTS

NATIONAL OBJECTIVES BEING ACHIEVED

The national objective of protecting coastal resources is being achieved through implementation of federally-approved state coastal management programs. State CZM programs efforts are effective overall in addressing protection of beaches, dunes, bluffs and rocky shores, given that CZM requires states to balance competing needs and demands such as protection of properties from hazard risks and promotion of recreational use of the shoreline. Determination of CMP effectiveness has been based on process indicators and case examples.

TOOLS EMPLOYED BY COASTAL STATES TO PROTECT RESOURCES

Coastal states are utilizing 26 widely varying processes to achieve resource protection including regulatory setbacks and controls over shoreline development in combination with planning, stewardship of state lands, coastal land acquisition, as well as research and public education about shoreline processes and human interations. A summary ***list of the tools*** each of the twenty-nine coastal states employ to protect beaches and dunes is shown in **Table 4**. Tools used to protect bluffs and rocky shores are shown in **Table 5.** Coastal management tools are continually evolving. The summary represent management tools in place as of the summer of 1995. All but three state coastal programs identified issues associated with protection of natural resources and/or minimization of loss of life and property from coastal hazards as a high priority management issue. Although all coastal states own coastal properties, only three use state ownership and land management as the primary tool. Of the twenty-five tools identified with beach and dune protection, the fewest tools used by a state is eleven and the most is twenty-three. Of the thirteen tools related to bluff and rocky shore protection, the fewest tools used by any state is five and the most is eleven.

Regulatory tools are the most significant tools employed nationwide to protect shoreline resources. Protection is achieved through setbacks; regulation of shoreline development and shoreline stabilizations; restrictions on pedestrian and vehicular access; habitat protection; and permit compliance/permit tracking systems. Setbacks are particularly effective--acting as natural buffer areas and reducing hazard risks. Regulatory controls are needed because the majority of the oceanfront shoreline is in private ownership and is subject to significant shoreline change and development pressures. The scope, policies, and provisions of state coastal regulatory programs afford greater natural resource protection. In addition to construction setbacks, almost all coastal states regulate activities within defined coastal construction control areas in ways that minimize adverse impacts on the natural shoreline resources and protect critical habitat areas. Most coastal states regulate the use of shoreline stabilization structures to minimize adverse impacts on beach systems. Many coastal states restrict pedestrian and vehicular access along portions of the shoreline. Pedestrian access restrictions channel human encroachment along boardwalks or dune crossovers, minimizing dune destabilization and limiting adverse impacts on fragile shoreline resources. Vehicular access restrictions keep vehicles off sensitive coastal habitat areas or limit vehicular use to government vehicles or off-road vehicles in areas planned for their use. Almost all coastal state have permit compliance programs to enforce their regulations and permit tracking systems. Only a few coastal states prohibit shoreline stabilization structures, thereby placing protection of beach systems as a policy priority over protection of upland structures.

Planning tools, when combined with regulatory, improve natural resource protection. Most coastal states with beach or bluff resources employ some type of planning tool. Locally-delegated permitting combined with mandatory local planning in eight coastal states provides the key management tool in protecting beaches, dunes, bluffs and rocky shore resources. Planning programs are more effective when combined with implementation through state regulation or local land use regulations, zoning and subdivision ordinances and other actions. Adopted plans offer long-range vision or site-specific goals for the protection and development of selected coastal areas and resources.

Stewardship of coastal lands, through direct land management and acquisition, is an important component of all state coastal programs. All coastal states own state parks along the shoreline that encompass one or more beach, dune, bluff or rocky shore. Most coastal states have natural protection areas and guided accessways and many have acquired additional coastal land holdings. Almost half of the coastal states use boardwalks or dune crossovers to protect dune vegetation and minimize adverse impacts on natural resources and employ sand fencing and dune creation to restore the natural function of damaged dune systems. Over half of the coastal states use beach nourishment to recreate recreational beaches which are eroding away. Eleven coastal states have chosen to armor or repair existing shoreline stabilization structures in high erosion areas, primarily to protect coastal highways or other public infrastructure investments.

Nonregulatory and research tools support regulatory, planning, acquisition and direct land management activities. All coastal states employ some types of nonregulatory and research tools. For example, education and technical assistance to local governments function to improve local coastal planning and regulation. Likewise, research and technical reports on shoreline erosion rates function to improve state regulatory controls over development in erosion prone areas. **Table 2** identifies the key nonregulatory and research tools that states use in shoreline management. No attempt was made to collect outcome data for these tools. Any further analysis of these tools was beyond the scope of this study.

UPGRADING CZM PROCESSES

Coastal states use a wide variety of management tools to protect beaches, dunes, bluffs and rocky shores. CZM is a growing and changing process meeting changing needs. As state CZM programs recognize problems or management gaps, they take corrective action. **All but two coastal states have made significant changes to their programs in the way they protect resources. (See Table 3 and Appendix C)**

When looking from the time of original federal program approval in 1972 to the present, a more than 20 year time span, coastal states have made *hundreds* of changes and refinements to their programs. Some changes involved program amendments, others were just routine program improvements. **This study has documented over 60 significant changes made by state coastal programs solely to protect natural shoreline resources.** Most of these program changes involved alteration of the state CZM regulatory and planning tools. Significant changes have commonly included expansion of the geographic area or types of activities covered by shoreline setbacks or regulations and changes to limitations on shoreline stabilizations. Most states are giving greater consideration to natural shoreline processes, even when addressing other concerns such as the need to protect developed eroding shoreline using structural measures. Examples of significant program changes to state CZM program tools are provided in **Table 3.**

With few exceptions, most of these program changes have occurred in the 1980 and 1990, after several years of program implementation. The fact that state coastal programs are changing complicates efforts to assess program effectiveness based on measurable results of program implementation. Although not the methodological approach taken in this study, a review of changes which strengthen or weaken resource protection programs could be used as a way to assess CZM program effectiveness.

Table 3: Examples of ***significant changes*** to State CZM program tools which affect protection of beaches, dunes, bluffs, and rocky shores:

* California adopted coastal hazard landform alteration policy guidance in 1993 to address geologic stability of bluff top development.

* Connecticut amended its regulatory program in 1987 to include permits for seawalls which had previously been exempt from review.

* Florida amended its beachfront regulatory program in 1985 to establish a 30-year erosion zone and prohibit major development seaward of that zone line.

* Hawaii amended its setback provisions in 1989 to limit variances and improve enforcement of setbacks and variances.

* Maine amended its sand dune rule in 1989 and 1993 to broaden and clarify permit requirements for development on sand dunes. In 1995, Maine amended its natural resource protection act to allow existing seawalls and other shoreline stabilizations to be fortified and built bigger/stronger to protect existing threatened oceanfront development. This was contrary to the sand dune rule which promotes retreat from erosion-prone areas.

* Massachusetts passed a state endangered species act in 1990 which expanded beach management from flood control and storm damage protection to include protection of wildlife habitat and endangered species.

* Michigan amended its shorelands protection and management act in 1992 to expand the definition of bluff-line to cover non-bluff shoreline and extended the inland setback requirements to address severe short-term erosion events.

* New Hampshire revised the definition of the high water mark in 1995 extending more landward state permit jurisdiction.

* New Jersey amended its oceanfront permits program in 1988 and 1990 to expand its jurisdiction landward and include single family, commercial development and shoreline stabilizations previously excluded. Amendments also created erosion hazard areas and erosion-rate setbacks within these areas.

* North Carolina amended its program in 1985 to prohibit hard erosion control devices designed to harden or stabilize beaches, and modified its law in 1989 to allow stabilizations to protect historic structures.

* Oregon adopted a Territorial Sea Plan in 1994 which includes a Rocky Shores Strategy. Areas are inventoried, classified and designated under one of four classifications. Within these areas access/use is restricted.

* South Carolina amended its beach management act in 1988 and 1990. Since 1988, the state prohibits new shoreline stabilization structures; since 1990, reconstruction of shoreline stabilizations & rebuilding of certain damaged structures is restricted.

* The Virgin Islands adopted 18 Areas of Particular Concern in 1994 which include sea turtle nesting beaches for special protection.

Source: State CZM Profiles

Table 4: Summary of State CZM Tools Employed to Protect *Beaches and Dunes*

TOOLS	AL	AK	AS	CA	CT	DE	FL	GU	HI	LA	ME	MD	MA	MI	MS	NH	NJ	NY	NC	NM	OR	PA	PR	RI	SC	VI	VA	WA	WI	Total Yes
REGULATORY & PLANNING TOOLS																														**29**
Restrict Construction	y	y	y	y	y	y	y	y	y	y	y	y	y	y	n	y	y	y	y	y	y	n	y	y	y	y	y	y	y	27
Setbacks	y	n	y	y	n	y	y	y	y	n	y	y	n	y	*	y	y	y	y	y	y	*	y	y	y	y	y	y	y	23
Control Areas	y	y	y	y	y	y	y	y	y	y	y	y	y	y	*	y	y	y	y	y	y	*	y	y	y	y	y	y	y	27
Restrict Shoreline Stabilizations	y	n	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	28
Restrict Pedestrian or Vehicular Access	y	y	n	y	y	y	y	y	y	n	y	y	y	y	y	n	y	y	y	y	y	n	n	y	y	n	y	y	y	23
Protect Habitat, Other Restrictions	n	y	y	y	y	y	y	y	y	n	y	y	y	y	y	y	y	y	y	n	y	n	y	y	y	y	y	y	y	25
Permit Compliance Program	y	y	y	y	y	y	y	y	y	y	y	y	y	y	n	y	y	y	y	y	y	y	y	y	y	y	y	y	y	28
Local Plan and/or Regulate	y	y	n	y	y	n	y	y	y	y	y	y	y	y	y	y	y	y	y	n	y	n	n	n	y	n	y	y	y	22
Special Area Management Plans	n	y	n	y	n	n	n	y	y	n	y	n	y	n	n	n	n	n	n	y	n	n	y	y	n	y	y	n	y	12
Other Adopted Plans	n	n	y	y	n	n	y	n	n	y	n	y	y	y	n	y	n	y	y	y	y	y	n	n	y	n	y	n	y	16
DIRECT LAND MGT. RESTORATION																														**29**
Shoreline in State Parks Management	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	29
Natural Areas Protected	y	y	n	y	y	y	y	y	y	n	y	y	y	y	n	y	y	y	y	y	y	n	y	y	y	y	y	y	y	25
Dunes Revegetated	y	n	n	y	y	y	y	n	n	y	y	y	y	n	n	y	n	n	y	n	n	n	n	n	y	n	y	n	n	13
Beaches Nourished or Renourished	n	n	n	y	y	y	y	n	n	y	y	y	y	n	y	y	y	y	y	n	y	y	n	n	y	n	y	n	n	17
Shoreline Armoring & Repairs	n	n	n	y	y	n	y	n	y	y	n	y	y	n	n	y	y	n	n	n	n	y	n	n	y	n	n	n	n	11
Coastal Lands Acquired	n	n	n	y	y	y	y	y	y	n	y	y	y	y	n	y	n	y	y	n	y	y	y	y	y	n	y	y	y	21
NON-REGULATORY TOOLS																														**29**
Public Investment Restrictions	n	n	n	y	y	y	y	n	n	n	y	y	y	y	n	n	n	y	y	n	n	n	y	y	n	y	n	n	n	13
Public Investment Incentives	n	n	n	n	n	y	y	n	n	n	n	y	y	n	n	n	n	n	n	n	n	n	n	n	y	n	n	n	n	4
Coastal Property Disclosure	n	n	n	n	n	n	y	n	n	y	n	y	n	n	y	n	n	n	n	n	y	n	n	n	y	n	n	n	n	6
Education/Outreach/Technical Assist.	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	n	y	y	y	y	y	y	y	28
Financial Assistance	y	y	y	n	y	n	y	y	y	y	y	n	n	y	y	y	y	y	y	n	y	y	n	n	y	n	y	y	n	20
RESEARCH TOOLS																														**29**
Methodologies for Shore	y	n	n	y	y	y	y	y	y	n	y	y	n	y	y	y	y	y	y	n	y	n	y	n	y	n	n	n	y	19
Beach Profiles	y	n	n	y	y	y	y	y	y	y	y	y	n	y	y	y	y	y	y	y	y	n	y	y	y	n	y	n	y	23
Natural Areas Inventory	y	y	y	y	y	y	y	y	y	n	y	y	y	y	y	y	y	y	y	y	y	n	y	y	y	y	y	y	y	27
Technical Reports	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	29
Aerial Photos	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	29
Sea Level Rise Considerations	n	n	y	y	y	y	y	n	y	y	y	y	y	n	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	25
Total Tools Employed – 25																														

KEY: y- Yes, Management Tool employed by state n- No, Management Tool not employed by state

* For MS, all beaches are artificial and open to the public. There is no regulation above MHW.

* For PA, the only major beach is in public ownership and under state land management. All bluffs are regulated by setbacks and control zones.

Total Tools Employed out of 25: Al-15, AK-13, AS-12, CA-22, CT-21, DE-19, FL-24, GM-17, HI-19, LA-16, ME-21, MD-23, MA-20, MI-18, MS-15, NH-20, NJ-18, NY-20, NC-21, NM-14, OR-20, PA-11, PR-16, RI-16, SC-23, VI-13-, VA-20, WA-15, WI-18.

Source: Individual CZM Profiles

Table 5: Summary of State CZM Tools Employed to Protect *Bluffs and Rocky*

STATES	AK	AS	CA	CT	GU	HI	ME	MA	MI	NH	NM	OR	PA	PR	RI	VI	WA	WI	Total YES
RESOURCE PRESENT																			
Bluffs/ Rocky Shores	y y	y y	y y	y y	y y	y y	y y	y y	y y	n y	y y	y y	y n	y y	y y	y y	y y	y y	17 17
REGULATORY TOOLS																			
Restrict Construction Bluffs/ Rocky Shores	y y	y y	y y	y y	y y	y y	y y	y y	y n	- y	y y	y y	y -	y y	y y	y y	y ?	y y	17 15
Other Regulatory Controls Bluffs/ Rocky Shores	n n	y y	y y	y y	n n	y y	y y	y y	y n	- y	? ?	y y	y -	n n	y y	y y	y ?	y y	13 11
PLANNING TOOLS																			
Local, state, or special area	y y	y y	y y	y y	y y	y y	y y	n n	n n	- y	n n	y y	y -	y y	y y	y y	y y	n n	13 13
DIRECT LAND MGT																			
State Owns and Manages Bluffs/ Rocky Shores	y y	n n	y y	y ?	y y	y y	y y	? y	y ?	- y	? ?	y y	y -	y y	y y	? y	y y	y y	13 13
Natural Areas Protection Bluffs/ Rocky Shores	y y	n n	y y	y ?	y n	y y	y y	? y	y ?	- y	? ?	y y	n -	y y	y y	? y	y y	y y	11 12
ACQUISITION TOOL																			
Lands Acquired Bluffs/Rocky Shores	n n	n n	y y	? ?	n n	y y	y y	? ?	y ?	- y	n n	n y	y -	n n	? ?	n n	y y	y y	7 7
NON-REGULATORY TOOLS																			
Public Investment Restriction	n n	n n	y n	y n	n n	n n	n n	? ?	y ?	- n	n n	n n	n -	y y	n n	y y	n n	n n	5 2
Coastal Property Disclosure	n n	n n	n n	n n	n n	n n	n n	n n	n n	- n	n n	y y	n -	n n	n n	n n	n n	n n	1 1
Education/Outreach/ TA	y n	y y	n n	y y	n n	y y	n n	y y	y ?	- y	n n	y y	y -	n n	y y	y y	y n	y y	12 9
Financial Assistance	y y	y y	n n	y y	n n	y y	n n	n n	y ?	- y	n n	n y	y -	n n	n n	n n	y y	n n	7 7
RESEARCH TOOLS																			
Inventories/ Designate protection area	y y	y y	n n	y y	y y	y y	y y	y y	y ?	- y	n n	y y	y -	? y	n y	y y	y n	y y	13 13
Technical Reports	y y	y y	y y	y y	n n	y y	y y	y y	y ?	- y	n n	y y	y -	y y	y y	? ?	y n	y y	14 12
Total Tools Employed–13	9 8	8 8	9 8	11 8	6 5	11 11	9 9	6 8	11 7	- 11	2 2	10 12	10 -	7 8	8 8	7 8	11 6	9 9	

Key :
y- YES, Management Tool employed by state
n- NO, Management Tool not employed by state
- not applicable
? unknown, not state data or insufficient data to determine answer
Source: CZM profiles Version 12/1/96

Resource Presence Summary:
17 States with Bluffs: AK, AS, CA, CT, GU, HI, ME, MA, MI, PA, NM, OR, PR, RI, VI, WA, WI
17 States with Rocky Shores: AK, AS, CA, CT, GU, HI, ME, MA, MI, NH, NM, OR, PR, RI, VI, WA, WI
13 States with No Coastal Bluffs: AL, DE, FL, LA, MD, MA, MS, NH, NJ, NY ocean coast only, NC, SC, VA
12 States with No Coastal Rocky Shores: AL, DE, FL, LA, MD, MS, NJ, NY ocean coast only, NC, PA, SC, VA

5 PROCESS INDICATORS OF EFFECTIVENESS

Coastal states are utilizing twenty-six (26) widely varying processes to achieve resource protection including regulatory, planning, state land management, acquisition, non-regulatory and research tools. A summary list of the tools each of the 29 coastal states employ to protect beaches and dunes as of 1995 is shown in **Table 4.**[30] From these twenty-six (26) tools, a subset of ten (10) were selected as process indicators of effectiveness. These ten indicators are summarized in **Table 6.**

The ten process indicators are: six regulatory categories (representing each of the six regulatory tools), one adopted plan category (representing the combination of the three original planning tools), and three state land management categories (representing a combination of the five original state land management and acquisition tools). Non-regulatory and research tools were deleted as process indicators. The rationale for deleting these two categories is that nonregulatory and research tools support the four other management categories (regulatory, planning, state land management and coastal acquisition) and that, with limited resources, attention should be placed on the tools which might show on-the-ground results.

Key provisions of selected management tools are used as ***process indicators*** of effective state CZM programs in protecting ***beaches, dunes, bluffs and rocky shores.*** States with the suite of regulatory, planning, direct land management and acquisition provisions listed in **Table 6** are presumed to have effective programs.

Appendix C contains summary tables which describe the ***key provisions*** of regulatory and planning tools each of the twenty-nine coastal states utilizes to protect **beaches, dunes, bluffs, and rocky shores**, including setback requirements, regulations within construction zones, restrictions on shoreline stabilizations, access restrictions, and protection of critical habitat areas. Appendix C also contains summary tables on direct land management and acquisition tools associated with state ownership and management and land acquisitions, including coastline miles, miles of beachfront, state oceanfront park (miles, acres, number, and beach parks as subset), number of boardwalks or dunes crossovers installed, dunes revegetated, beaches renourished, shoreline armored, natural areas protected and lands acquired in beach/dune, bluff or rocky shore. Findings regarding state CZM process indicators of effectiveness in protecting ***beaches, dunes, bluffs and rocky shores*** are presented on the following pages.

KEY ROLE OF STATE CZM IN COASTAL REGULATORY PROGRAMS

The inappropriate siting of structures on coastal barriers, in coastal flood zones, and on erodable bluffs is a problem which state CZM programs inherited. Thus when the state CZM programs began in the 1970s, certain portions of our nation's coastline were already committed to intense development and other areas were already zoned and platted for development. Shoreline erosion was a recognized problem, but land use controls were not well developed. State CZM regulatory programs have provided institutional mechanisms to balance competing demands along our shoreline and to minimize adverse impacts on valued natural coastal resources. State CZM programs have created new or implemented and refined existing coastline regulatory controls such as setbacks from beaches/bluffs, and controls over shoreline development and stabilizations. CZM programs have played a leadership role in the policy shift towards beach nourishment and shoreline retreat.

[30] This study also covered protection of bluffs and rocky shores and data on management tools employed. Indicators of effectiveness in protecting these resources are contained in the technical report only.

Table 6: Process Indicators of Effectiveness

Regulatory Programs:

(a) **Coastal Setbacks** for development and redevelopment from beach, dune, bluffs, or rocky shores: the farther inland the setback, the more effective; the fewer exceptions allowed within the setback, the more effective.
(b) **Coastal Construction Controls Areas** along the shoreline with regulations governing activities affecting beach, dune, steep slope bluffs, erodable bluffs, and rocky shores and limits on size, type, design or location of permitted construction to minimize adverse impacts on beach/dune/bluff systems; controls over new significant activities with few exceptions, controls over additions/repairs/rebuilding; the more restrictive, the more effective.
(c) **Shoreline Stabilization Regulations** which place limitations on the use of shoreline stabilization structures in favor of nonstructural solutions.
(d) **Access Restrictions** with requirements for boardwalks or dune crossovers to minimize adverse impacts on dunes; and areas designated where pedestrian and/or vehicular access is restricted to protect resources.
(e) **Habitat Protection and Other Controls** over critical habitat areas where uses are restricted to protect habitat protection values.
(f) **Permit Tracking and Enforcement Provisions** which are used to monitor permits and violations.

Planning:

(a) **Adopted Plans** for areas containing enforceable policies that address resource protection, beach nourishment, inlet management, dunes restoration, or special area resource protection or conservation; the larger the resource area covered, the more of the shoreline included, and the more restrictive the enforceable policies, the more effective.

State Coastal Land Management and Acquisition:

(a) **State Coastal Land Holdings** including inventory of the number, acres and shoreline miles of state lands in state oceanfront parks and preserves.
(b) **State Coastal Land Management and Stewardship** including park management plans; boardwalks, dune cross-crossovers or other guided pedestrian access; dune restoration and beach nourishment where appropriate; enforceable policies restricting the use of shoreline stabilization structures; and designated natural resource habitat protection areas.
(c) **State Coastal Land Acquisition Program** with coastal land acquisition as a priority.

COASTAL SETBACKS

* All 29 coastal states with federally-approved CZM programs have controls over certain land and water activities along portions of their coastlines. All coastal states with developable beach/dune systems or bluffs have some form of state-mandated regulatory mechanism by which they prohibit or restrict certain types of *new development* in designated portions of their shoreline. The strength of the individual state setback or coastal construction control laws vary considerably depending on the setback distance, activities permitted, exceptions allowed, reconstruction provisions, level of government regulating development, and permit compliance and monitoring.

* 22 of the twenty-nine coastal states have adopted land use regulations in the form of ***setback requirements for new structures*** that can be built on the shoreline. Another 2 states use locally-created setbacks.

* Setback laws have a dual purpose: protecting the natural beach and dune or bluff systems as storm buffers and reducing the loss of life and property from hurricanes and winter storm events. Implementation

of these laws has reduced the number and size of new structures that can be built on the shoreline and, for those built, located these structures as far landward from the water's edge as possible to prevent erosion from reaching the structures during their expected useful life. However, naturally migrating beaches have over time resulted in houses sitting on open beaches and then collapsing into the water. Setbacks have been of limited success in protecting natural beach and dune or bluff systems, since development is often allowed on portions of the dune systems usually behind the crest of the foredunes where restricting private property rights is more difficult.

* 10 of the 22 states **measure their setback lines** based on an arbitrary distance inland from the shoreline; 4 use erosion rates; 4 use resource features; and 5 use a combination of feet, erosion rates, and/or features. Determining which states have the most extensive landward setback boundaries is not practical, since the ways setback lines are measured vary considerably, as do the state geography and resources. For example, states vary in the shoreline location inland from which they measure their setbacks (mean high water, mean low tide, normal high water, crest of dune, elevation, or contour line.) The landward boundary also varies (feet, erosion rates, feet landward of coastal features.)

* 16 of the 22 state setback laws contain provisions for ***exceptions*** which tend to weaken the effectiveness of the setback requirements. Examples include single-family dwellings within the setback if the land was platted before the effective date of the statute, or small parcels where there is not enough land to build behind the setback line. In some states, exception provisions have been added to state laws to avoid private property taking claims. Other types of exceptions include in-filling in developed areas, water-dependent uses, public interest activities, recreational activities, swimming pools, fences, boardwalks.

* Coastal setback provisions for each state are shown in **Table 7**, including setback distance and exceptions allowed seaward of the setback. Data was not collected on the methodology for setting the baselines and other technical information. There was insufficient data to determine the number of shoreline miles covered by state setback laws.

Table 7: State coastal setback distance provisions and exceptions and type of setback

States	Setback distanced measured in **feet or meters:**
AL	40 feet landward of crestline (120-450 feet landward of MHWL). Exceptions- SF
AS	25 feet for residential; 50 ft for commercial from OHWL
DE	100 feet landward of seawardmost 7-ft elevation above NGVD. Exceptions-yes, if not sufficient land.
GU	Public access zone MHW and 25 feet inland from 2 foot contour line of Geodedic Survey. 35 feet from MHW bounding beach. No higher than 25 feet. w/in 75 feet of MHW. Exceptions- shoreline w/cliff/bluff higher than 25 feet, village lots >100 square meters in residential areas before WWI. Variances- recreation, commercial.
HI	40 feet. along most shorelines to upper reaches of wash of waves, usually evidenced by edge of vegetation growth, debris. Variances- 20 feet for small lots, shoreline stabilizations in public interest or hardship.
MD	75 feet from Normal High Water (NHW). Exceptions- fences, boardwalks.
NH	100 feet from High Ordinary Tide Line (HOTL) bordering tidal waters. Exceptions- public good, rebuilding. 5 feet from Mean High Water (MHW) for primary structures; 75 feet for septic tanks.
NM	In shoreline Area of Particular Concern (APC), 0-35 feet no construction from MHW; between 35-75 feet, no construction that obstructs visual openness; Between 75-100 feet, only SF allowed.
PR	6 meter public right of way w/no structures. 50 meter setback from TM. 2.5 time height setback
w/in	400 meters of Territorial Maritime Zone (TMZ). Exceptions- urban zone lot, adjacent structures setback less, water-dependency.
WI	75 feet from Ordinary Mean High Water (OMHW). Exceptions- piers, boat hoists, boathouses.

Table 7: State coastal setback distance provisions and exceptions and type of setback (continued)

States	Setback distance measured by **erosion rate, landward extent of resource feature or combination of measures**
FL	30-year erosion line for major structures from SHWL. Exceptions- SF (Erosion Rate)
MI	Sand dune setback 100 feet landward from crest of first landward ridge not a foredune. Bluff high risk area setback 30-year erosion projection plus 15 feet.Exceptions- substandard lots approved prior to law. (Erosion Rate)
PA	Bluff setback of 50 times annual rate of recession from the bluff-face for residential; 75 times for commercial, at least 50 feet. Exceptions- parcels subdivided prior to law if structure moveable. (Erosion Rate)
VA	30-year erosion rate or 20 times local recession rate from MHW for barrier islands Exception- public interest activities. (Erosion Rate)
NY	No moveable structures or major additions within "environmental hazard areas." (Features)
OR	No building within "beach zone." No building on beaches, active foredunes, other conditionally stable foredunes subject to ocean undercutting and wave overtopping, and intertidal plains subject to ocean flooding. Exceptions- in-filling where protection provided, on older-stabilized dunes. (Features)
SC	From MHW to crest of primary oceanfront sand dune. Exceptions- swimming pools. (Features)
ME	No structures on frontal dunes seaward of 100 year floodplain and sea level rise area. Shoreline setback 75 feet for residential; 25 feet for general development/commercial; 250 feet from Normal High Water Line (NHWL) in Resource Protection Areas. (feet & resource)
NJ	V-zone setback for residential. Exceptions- beach related commercial. 30-year erosion for 1-4 DU.; 60-year erosion setback for larger in erosion hazard areas. Baseline for setback varies by site (crest of coastal bluff, dune crest, first line of vegetation, landward edge of 8-foot. elevation). Exceptions- SF and duplex in-fill, shore protection. 25 feet setback from shore protection structures for all permanent structures. (erosion rate and feet)
NC	Structures less than 5,000 sq. feet, setback landward of 30-yr erosion rate, crest of primary dune, toe of frontal dune, 60 feet from 1st line of stable vegetation. Exceptions- lots platted before law. Structures greater than 5,000 sq. feet, 60-yr. erosion rate or 120 feet from mean vegetation line. (erosion, feet, features)
RI	50 ft from coastal features or 25 feet from coastal buffer zone. Exception- water-dependent activity; 30-year erosion rate up to 4 units, 60-yr erosion rate larger structures in critical erosion areas. Dune construction setback on 3 barrier beaches seaward of utilities/wall of existing development. No development on beach face, sand dune, undeveloped barrier beaches. Exception-stabilizations, access, public utilities, public welfare.
VI	50 feet from MLT or inland boundary of natural barrier. (feet & resource)

Key: MHLW- mean high water line OHWL- ordinary high water line SF single family DU dwelling unit
Note: 22 states with state setbacks. 2 states with local setbacks- CA, WA.
5 states with no setbacks: AK, CT, LA, MA, MS.
Source: State CZM profiles on Protection of Beaches, Dunes, Bluffs and Rocky Shores.

The North Carolina's strong oceanfront setback law uses erosion rates to determine setbacks and keep development out of ocean hazard areas. *Within the "Ocean hazard Areas of Environmental Concern"-- sand dunes, ocean beaches, and other areas exhibiting substantial possibility of excessive erosion-- setback are based on average annual erosion rates, natural site features, and the nature of the proposed development. The setback is measured from the first line of stable natural vegetation or aerial photos/ground survey where no stable vegetation. New structures smaller than 5,000 square feet and fewer than 5 residential units must be set back the farthest landward of the following: 1) a distance equal to 30 times the long-term annual erosion rate; 2) the crest of the primary dune; 3) the landward toe of the frontal dune, or; 4) 60 feet landward of the vegetation line. Larger structures must be set back 60 times the average annual erosion rate or 120 feet landward of the vegetation line. Where erosion rates exceed 3.5 feet per year, the setback line for larger structures is set at 30 times the erosion rate plus 105 feet. The law was passed in 1974, made part of the coastal program in 1978, and amended in 1981 to allow*

single-family residences on pre-existing lots not deep enough to meet the erosion setback requirements, as long as they are set back at least 60 feet. The coastal program has focus attention on studying erosion rates used in determining setbacks.

The Pennsylvania Bluff Recession and Setback Act provides a long-term regulatory approach to reducing property losses from bluff recession along Lake Erie. *The act requires municipalities in bluff recession hazard areas to administer bluff setback ordinances which restrict new development from bluff areas and limit improvements to existing structures within the minimum bluff setback. Setback distance is based on the rate of erosion (feet per year) multiplied by the life span of the structure. Life span for residential development is 50 years; commercial is 75 years; and industrial is 100 years; or at least 50 feet from the crest of the bluff. The major effect of this program has been to keep new development a safe distance from bluff recession hazard areas. CZM provides technical assistance to Lake Erie property owners affected by bluff recession, consisting of on-site inspections and recommendations on surface and groundwater control, bluff stabilization and the role of vegetation to stabilize loose soil conditions. In the first seven years of the service (1981-1988), approximately 3/4 of the surveyed property owners followed CZM's recommendations, resulting in an estimated property damage savings and property value enhancement of $5.2 million. Pennsylvania is the only Great Lakes state to offer this service.*

COASTAL CONSTRUCTION CONTROL AREAS

* The coastal construction control areas are smaller geographic areas or subsets of the states' coastal zones, focusing regulatory permit controls over activities along the *immediate shoreline*. In most cases, a state's coastal zone extends more landward to cover watersheds and other inland features. Regulatory controls along the immediate shoreline, such as setbacks and contruction regulations, may not apply to more landward areas within the state's coastal zone.

* 27 coastal states have established land use regulations using a ***coastal construction control area or zone*** within which they regulate the location, size, and other conditions of development. Provisions used to protect natural beaches and dunes include siting and design guidelines to locate structure as landward as possible, minimizing disruption of dune vegetation, dune revegetation and landscaping requirements to recreate dunes and vegetation destroyed during construction, and limitations on development square footage and density. 23 coastal states use both a ***setback and construction control area*** approach.

* The purpose of coastal control areas is to allow activities along the shoreline but to minimize their negative impacts on natural shoreline resources and adjacent properties. Control area regulations presume that some adverse effects will occur in balancing coastal development and resource protection. Some coastal states have strengthened their regulatory program by eliminating exemptions, extending regulatory jurisdiction, and placing limitations on additions, repairs and rebuilding. As a result, less harmful and inappropriate development is occurring along out nation's shorelines, and the development that is permitted is taking into account the resultant negative and cumulative impacts.

* 19 of the 27 coastal states with regulatory control areas ***exempt*** certain activities from the permit program. Examples of exempted activities include single-family, water-dependent uses, public purpose uses, recreation, agriculture, decks, walkways, in-filling, and small lots platted before law took effect. Such exempted activities tend to weaken the effectiveness of the control zones in protecting resources. In addition, only 10 of the 27 states with regulatory control areas contain ***limitations on additions*** to structures built within the setback area or within the construction zone. Limitations include maximum square footage, moveable structures, and location landward of setback.

* 12 of the 27 coastal states with regulatory control areas place ***restrictions on the repair or rebuilding of a structure damaged*** during a coastal storm event. For example, structures that are damaged in excess of a specified threshold (e.g., 50% of assessed value) may not be repaired or rebuilt. 16 states

participated in the relocation or demolition benefits under the Upton-Jones Act, prior to its termination in 1995. State requirements often differ from NFIP standards. (See Appendix A, Table 4)

* Each of the 27 states with coastal construction control area programs has ***unique regulatory features*** which reflect their particular physical, social, economic or political priorities. **Table 8** shows the diversity of regulatory jurisdictions, activities exempted, and restrictions on additions and repairs.

The Maine Coastal Program illustrates the complexity of regulating diverse resources *such as beaches, bluffs and rocky shores. Maine uses three coastal construction regulatory program. Under the Natural Resources Protection Act, coastal frontal sand dunes and back sand dunes are mapped and protected. There is a de facto setback from frontal dunes. In back dunes, there is a size limit of 2,500 square feet, the structure must be moveable, and elevated above 3" sea level rise, with multifamily elevated higher. Reconstruction of structures damaged >50% is prohibited unless all new building standards are met, including minimal damage to dunes, lot restrictions, bird habitat protection, and revegetation of disturbed areas. Additions may not expand floor area or volume by more than 30% of existing structure. Exceptions include maintenance and repair of existing structures, temporary structures, walkways, open decks smaller than 200 square feet, and underground storage tanks outside the V-zone. State permits are also required for activities within "protected natural resource areas" which include the 100-year flood zone, moderate/high value wetlands, and steep slopes greater than 20%. Development in "protected areas," with the exception of single family residential, must be set back 250 feet from normal high water line. The Municipal Shoreland Zoning Act mandates local zoning with a 75-foot setback for residential and 25 ft for general development/commercial.*

The Rhode Island Coastal Program is an example of a strong regulatory program with defined criteria addressing identified resources, activities, and management issue areas. *Activities are regulated within and 200 feet landward of defined coastal features—coastal beaches and dunes, barrier beaches, bluffs, cliffs and banks, rocky shores, and manmade shoreline. Complex coastal zoning designates what types of activities are permissible on shoreline features, tied to 6 state water classifications. About 75% of the shoreline is adjacent to Type I Waters (Conservation) or Type 2 Waters (Low Intensity Use Areas) where alteration or construction or shoreline features and undeveloped barrier beaches is prohibited. In addition, activities are regulated by different setbacks from beaches and dunes, critical erosion areas, and coastal buffer zones. There are also regulations for specific types of activities (such as dredging, filling, new residential structures) as well as 17 designated coastal hazard areas and 18 identified erosion-prone areas. On barrier beaches, all residential and non-water dependent structures on dunes destroyed >50% may not be reconstructed regardless of insurance carrier coverage. Additions are allowed only to structures designated priority permissible uses.*

Table 8: State coastal construction control area jurisdictions and provisions

State	Regulatory Jurisdiction--Distance Inland	Activities Exempt	Restricts Additions	Restricts Repairs.....
AL	40 ft inland from crestline to 10-ft. elevation line	SF	no	y--if damaged<50%
AK	District Control Zones- flood/hazard/erosion areas	uk	no	no
AS	1) 200 feet from MHW	PP, R, WD, SF	no	no
	2) coastal hazard areas	no	no	no
	3) territory-wide grading,excav.,fill,steep slopes	no	no	no
CA	MHT to 1st public road or 300 ft. from beach/bluff or MHT if no beach	SF	yes-except SF	yes-except SF
CT	MHW inland to 1000 feet or 100 feet from state regulated areas	SF, A, O	yes-except minor	yes-except minor
DE	landward of 100 foot setback inland 100 yards North of Wilmington to ~12 miles in SE.	no	no	y-damaged >75% y-foundation >50%
FL	SHW to landward extent of 100-year floodplain.	no	no	no
GU	1) Seashore Reserve seaward to 10 fathom contour, all islands, inland from MHW to 10 meters or edge of public right of way.	Maintenance Dredging	yes-except SF	y-if damaged >50% no-SF >$7500
	2) flood hazard area	no	no	no
HI	1) SMAs: 100 yds inland, cover resource areas or to inland coastal road.	SF, uses<$25,000	no	no
	2) Island-wide land use boundary changes	no	na	na
	3) Nat.Resource Conserv. District use permit	no	no	no
LA	Inland to intracoastal waterway, highways, natural ridges, parish boundaries.	SF	no	no
ME	1)On mapped coastal dunes. Frontal dune inland 125-175 feet.	O	y- floor area>30%	yes-new standards
	2) protected natural resource areas, 100-year floodplain	SF	no	no
MD	On coastal sand dunes 250 feet from NHW.	SF outside dunes	no	no
MA	Tide-flowed tidelands, filled tidal flats between waterway and 1st public way or 250 ft. from water	no	no	no
MI	1) designated critical dune areas w/in 250 ft.dune	>3 acres,>4 units	no	yes-exceptions
	2) high risk bluff erosion areas inland 1000 ft + 15 ft.	no	no	yes-moveable
	3) 500 feet of stream for earth change permit	no	na	na
NH	1) HOTL inland 100 feet bordering tidal waters.	public good, in-fill	no	no
	2) OHTL inland 250 feet	A, O	no	no
NJ	1) MHW inland 500 feet	no	no	no
	2) erosion hazard areas	SF, duplex in-fill	no	no
	3) dunes, overwash areas, beaches, bluffs	no alternative	no	no

Table 8: State coastal construction control area jurisdictions and provisions (continued)

State	Regulatory Jurisdiction--Distance Inland	Activities Exempt	Restricts Additions	Restricts Repairs.....
NY	Designated erosion hazard areas- a) beach dune,shoal, bar, spit, barrier island, bluff, wetland, assoc.natural vegetation; b) 40-year erosion area.	no	yes-except moveable structures	no
NC	AECs-Ocean Hazard Areas 1) ocean erodable areas MLW inland to 145- 700 feet., 2) high-hazard flood areas; 3) inlet hazard areas 4) unvegetated beach areas.	Lots platted before law, minor permits <60,000 sq ft. get local permits	y-setbacks apply	y-setbacks apply
NM	4 APCs: a) shoreline APC MHW inland 150 feet.	no	no	no
OR	1)extreme low tide and line of vegetation 2) coastal town boundaries	no no	na no	na no
PA	landward of crest of bluff 50 to 200 feet. depending on erosion rate and type of development.	yes-parcels subdivided before law if moveable, utilities, 3 miles non-erosion bluff area	yes	yes if >50% market value
PR	1) 1000 meters inland from shoreline 2) flood areas 3) maritime zone-territorial waters, submerged lands	yes-depends on Zone no no	no yes no	no yes-must protec no
RI	Inland 200 ft. from coastal feature- beach, dune, beach, coastal bluff, rocky shore, etc.	yes*	yes-if not priority use	yes- on barrier bch
SC	40-year erosion zone	no feasible alt., swimming pools, O	>5000 sq ft.	y-damaged >662/3%
VI	Mapped are based on roads, landmarks, property lines.	minor activity <$17,000	no	no
VA	Coastal primary dunes and beach	uk	uk	uk
WA	200 feet inland from shore	uk	no	no
WI	OHWM inland 100 feet.	piers, O	no	no

Key: SF- single family, PP-public purpose, WD- water dependent, R- recreation, A-agriculture, O- other such as temporary structures, decks, walkways. uk- unknown Activities Exempt- covers activities not subject to regulations

* RI has complex regulations with exceptions tied to water type and priority uses.

NOTE: 28 States with control zones along beach, bluff, or rocky shoreline. 2 States with no control zone along beach- MS, PA.

Source: State CZM Profiles on Protection of Beaches, Dunes, Bluffs and Rocky Shores.

The Michigan Coastal Program is a multi-faceted program which has specialized regulatory controls for different types of areas. *Under the Shorelands Protection and Management Act (SPMA), three types of areas are regulated: 1) high risk areas--subject to bluffline recession; 2) environmental areas--fish and wildlife habitat ; and 3) flood risk areas--flood-prone areas due to changes in Great Lakes water level. The "high risks erosion areas" have been surveyed and designated. Included are all areas with erosion > 1 foot per year over 15 or more years. This area can extend inland from MHW as far as 1,000 feet from the bluffline. Setbacks are required and based on 30-year bluffline erosion projections. Within the setback area, new permanent structures are prohibited. and lakeward relocation of existing structures is prohibited. Existing structures in front of the setback line cannot be moved lakeward and any addition must be located landward of the setback line. Repairs to deteriorated or damaged structures >60% of building's replacement value must meet new setback standards. If less than 60%, structures can be restored to previous condition. Exceptions to the setback for small lots granted if waste handling system is landward of the structure, the structure is moveable and located as far landward as possible, and the building meets engineering standards. For structures in danger from erosion with access routes too narrow or steep to relocate the structure, shoreline stabilization permits may be granted, but only after all other options are exhausted and sewer and engineering standards are met.*

Major regulatory amendments in 1992 expand the definition of bluffline to include non-bluff areas subject to erosion. All 'zone of imminent danger"-- area landward of bluffline where erosion anticipated in the next 10 years-- must be designated. An additional 15 feet was added to the setback to address severe short-term erosion or landslides or high water. Construction requirements were eased. Additions are allowed if existing building and addition are moveable, the addition and the foot-print does not exceed 25% of the building's foundation, and located landward of zone of imminent danger. Reconstruction of substantially damaged structures (60-100% of replacement value) is allowed if damage not caused by erosion and if structure is not reconstructed in zone of imminent danger and is readily moveable. Small structures (.3,500 square feet foundation and >5 units) must be moveable if built between setback and 2 times setback distance. For larger structures, the setback is doubled.

The Sand Dunes Protection Act of 1976, strengthened in 1989, protects critical dune areas within 2 miles of the Great Lakes, much farther inland than the 1,000 feet SMPA high risk erosion are jurisdiction. Regulations may extend inland 250 feet from a critical dune area. A 100-foot setback from the crest of the dune is required unless dune stability standards are met. Development, silveculture and recreation affecting dunes and contour changes is regulated. Building is not allowed on slopes 25-33% without registered plan or slopes >33% without a special exception. Special use projects are regulated including industrial, commercial, multi-family >3 acres or>4 units per acre. Variances can be granted for rebuilding of nonconforming structures within critical dune areas if built prior to act and destroyed by fire or non-erosion forces or made nonconforming due to erosion.

The Puerto Rico Coastal Program is characteristic of state CZM programs adopted by the island states, territories and commonwealths where regulations are island-wide. *Puerto Rico regulates development through island-wide land use policies and zoning districts In addition to three shoreline setback areas, permits are required for activities within 1000 meters of the shoreline or farther inland to include important natural resources, as well as all offshore islands. There are 14 zoning districts within which specific activities are allowed. For example, no subdivisions are allowed in the following three Districts: Conservation of Resources District (CR); Conservation and Restoration of Resources District (CRR); and Resource Preservation District(PR). Exceptions granted in CR District for tourist-related recreation if the public interest and natural environment not adversely affected. In the Public Beaches District (PP), subdivisions and development allowed for hotel/vacation facilities, tourist villas, restaurants, recreation, wharves, docks and other water-dependent or water-related activities. Puerto Rico also required Flood Areas permits for activities in Floodprone zones. In Zone 1 (floodways) development and major renovations are prohibited. Exception-existing structures cannot be expanded unless protected. Zone 1M(v-Zone) and Zone 2 (low areas) allows new development and modifications to existing subject to design/building requirements. There is also a relocation program in coastal high hazard flood areas. Effective beginning in 1992, there is a Maritime Control Zone and required state Authorizations and Concessions for nonconforming uses in the maritime zone- mapped territorial waters, submerged lands, inland to reaches of low lands beneath by ebb/flow of tides.*

SHORELINE STABILIZATION REGULATIONS ✪

* The primary purpose of shoreline stabilization structures is to protect upland structures affected by coastal erosion, by stabilizing the shoreline. Most types of shoreline armoring impede natural sand migration, thereby causing erosion and resulting in the loss of natural beach. States which prohibit the use of shoreline stabilizations give priority to the protection of natural beach processes. As a result of inappropriate development along migrating shorelines, the accepted practice prior to CZM was to allow seawalls, bulkheads and groins in an effort to protect structures threatened by coastal erosion. Greater awareness of the negative impacts of shoreline stabilization structures on adjacent properties and coastal resources has caused CZM programs to more carefully scrutinize such activities and weigh the private and public benefits.

* 28 coastal states **regulate the use of shoreline stabilizations structures**. All 28 require permits for *new* shoreline stabilizations and place conditions on *new* activities to minimize adverse impacts on adjacent land, natural resources, sand supply, erosion, and drainage. Protection of existing upland structures is a common reason for granting permits.

* 22 coastal states generally ***allow new*** shoreline stabilizations if impacts are minimized. Most approval must meet criteria such as water-dependency, public benefit, erosion present, nonstructural alternatives not feasible, etc. A few states require structures to be designed to meet 30-50 storm/erosion events.

* 6 coastal states ***prohibit new*** shoreline stabilization structures along all or portions of their coastline. Exceptions are granted by some states if structures or infrastructure are in imminent danger of collapse from erosion. (AL, ME, NE, SC, VA, RI)

* 7 coastal states do not require permits for the ***repairs or reconstruction*** of shoreline stabilizations. 4 states set 50% damage thresholds and 2 require a rebuilding permit while 2 do not require a rebuilding permit. South Carolina prohibits repair or rebuilding of stabilizations if structures are damaged over a certain percent. Oregon prohibits erosion repairs on oceanfront lots platted before 1977 where no infrastructure improvements exist.

* Most coastal states have regulatory language which ***promotes nonstructural solutions.*** Some states require applicants to exhaust nonstructural alternatives before granting structural permits.

* Each of the 28 states regulating shoreline stabilization structures has ***adopted unique provisions*** which reflect their level of shoreline development, erosion pressures, and political priorities. **Table 9** summarizes the restrictions associated with shoreline stabilizations.

Table 9: State coastal shoreline stabilization structure restriction provisions

State	Restriction provisions
AL	No SSS allowed on Gulf-front. Exceptions, case-by-case, if structure built prior to law and threatened by erosion. Allowed by permit on Bay, a permit required for repair/reconstruction.
AS	Allowed by permits only in developed areas to protect property from erosion and if public safety/health risk; no feasible alternatives, habitat affected evaluated; adverse affects on nearby areas and habitat, drainage and shoreline alternations minimized.
CA	Allowed by permit for coastal-dependent uses, to protect existing structures or public beaches in danger of erosion if designed to eliminate/mitigate adverse impacts on local shore sand supply. Can replace SSS damaged >50% without permit. Along cliffs, allowed to stabilize slope or check marine erosion where no less damaging alternative.

Table 9: State coastal shoreline stabilization structure restriction provisions (Continued)

State	Restriction provisions
CT	Allowed by permit to protect infrastructure, for water-dependent uses, existing inhabited structures, if bluff slope not greater than 3:1. Groins/jetties allowed where non-structural alternatives infeasible.
DE	Allows by permit new and repair to existing SSS.
FL	Allows by permit new and repairs to existing SSS.
GU	Permit required, but none since 1970s issued. Relies on USACE standards.
HI	Allows but requires variance to demonstrate public interest or hardship. No SSS which interferes with beach processes. State regulates from shoreline seaward. Counties regulate above shoreline.
LA	Allows new but regulates to minimize downstream land loss. No restrictions or permit for repairs/rebuilding if damaged >50%.
ME	Prohibits new rip-rap, seawalls, groins, other SSS on sand dune system, except existing seawalls may be maintained and repaired unless building behind SSS damaged more than 50%. Effective 1995, existing seawalls can be fortified, build bigger and deeper if undermined. Within 32 designated natural coastal barriers, no state funds for new SSS if incompatible with protection values.
MD	Allows new and repair of existing. Nonstructural stabilization encouraged.
MA	Allowed to stabilize shore, rehabilitate existing structures, if minimize encroachment in waterway. Seawalls, bulkheads, revetments must be located landward of MHW, except for proper tieback placement, obtain slope stability, or be compatible with abutting SSS below MHW. Encourages Nonstructural alternatives where feasible. No restrictions on reconstruction. If adverse impacts occur, state may require modifications/removal.
MI	Allowed but must be designed to meet/exceed 20-year storm event for small structures; 50 year storm event for large structures. Must be 30 feet from erosion zone and landward of zone of imminent danger.
MS	Allows new and repairs to existing SSS.
NH	Allows new. No restrictions on reconstruction. SSS considered in public interest and generally allowed for protection of upland structures. Considered a major project if in dune, tidal wetland or within 100 feet of HOTL. Minor projects include beach nourishment <10 cu yd or removal of sand, rock, gravel <20 cu yd. Minimal impact projects- repair retaining wall.
NJ	Allowed based on 7 conditions- to protect water-dependent uses, heavily used public recreation areas or existing structures and infrastructure in developed shorefront areas. Although nonstructural solutions preferred, SSS deemed essential given NJ's urbanized shoreline.
NY	Allows new by permit. Repair/reconstruction allowed without permit. SSS must be designed to control erosion for 30 years, be unlikely to increase erosion, minimize adverse effects on natural protective features, other erosion structures and natural resources. Must include long-term maintenance program. Variances from regulations for hardship and not alternative site, mitigation measures, safe from flood/erosion damage, public benefit if public funds used.

Table 9: State coastal shoreline stabilization structure restriction provisions (Continued)

State	Restriction provisions
NC	Effective 1985, no new SSS. Temporary sand bags and beach nourishment allowed. Repairs to existing do not require permit, but replacements require permits. Exceptions to SSS prohibition- emergency DOT SSS to protect historic sites, groin at north end of Pea Island to protect bridge foundation across Oregon Inlet- only road access to barrier island. Policy preference for beach nourishment and relocation of structures.
NM	Allows new and repairs. Must not interfere with coastal processes or inhibit access to shoreline.
OR	Allows new, but must be built as far landward as possible above MSL to prevent encroachment. Allows repairs/replacement if within 3 years of damage. Prohibits erosion repair on lots where no physical improvements (i.e., building, road, water lines, sewer lines) on existing oceanfront lots platted before 1977. Promotes nonstructural solutions, SSS must be designed to minimize adverse impacts. Allows emergency new and repair SSS if property in imminent peril from erosion.
PA	Allowed from MHW lakeward. Groins allowed 50 feet from water's edge. No regulation of SSS above MHW. No permit required for repair/reconstruction. Priority is bluff-erosion prevention.
PR	Allowed for new and repairs. Relies on USACE standards.
RI	Allowed but must exhaust nonstructural alternatives. Prohibits new SSS on barriers in type 1 waters. Limits use of riprap to protect septic systems/ancillary structures. Permitted SSS must demonstrate that erosion exists, SSS will control erosion, nonstructural SSS does not work, no reasonable alternatives, will not increase erosion, long-term solution and maintenance program and financial commitment. Repair/reconstruction SSS damaged >50% requires a new permit.
SC	Since 1988, no new SSS along beach except to protect public highways in existence in 1990. Since 1990, restricts reconstruction of SSS based on degree damaged in certain years. After 2005, structures damaged >66 2/3% above grade cannot be repaired or rebuilt. Sand bags, sand scraping and beach nourishment allowed as exceptions.
VI	Allows new by permit and environmental assessment. Repairs/reconstruction do not require permits. Prohibited within 50 feet of open shore setback and siting policies to minimize adverse impacts.
VA	Effective 1990, new SSS prohibited under any circumstances. Prior to 1990, preference for nonstructural measures. Exception-SSS allowed on portions of Virginia Beach where private upland structures in imminent danger from erosion.
WA	Allowed, except no new groins or jetties since 1985.
WI	Allows new and repair.
Total	28 states regulate SSS through state permits; 1 state (AK) relies on USACE permit.

Key: SSS- Shoreline Stabilization Structures- refers to erosion control devices designed to harden the beach or shoreline. Includes seawalls, rip-rap, revetments, groins and jetties.

Source: State CZM profiles on Protection of Beaches, Dunes, Bluffs and Rocky Shores.

South Carolina Developments Erosion Retreat Policy. *The 1988 Beachfront Management Act and the 1990 Amendments established an erosion retreat program which requires the SCCC to develop setback lines derived from expected beach erosion over 40 years. Beachfront development prior to 1977, the year that the State CZM statute was enacted, and from 1977 to 1988 resulted in a steadily increasing loss of the State's public beach resources. No better example of this trend exists than the development of the Garden City areas in Horry County. This unincorporated beachfront community in Horry County developed from 1977 till 1985 from single family beach cottages to high rise hotels and condominiums at the water's edge. In each case, the buildings and swimming pools occupy virtually the entire square footage of the beachfront lots behind seawalls and revetments that leave little or no dry sand beach for much of the day. This development has taken place since the State CZM program was enacted in 1977. This law provided little consideration for the protection and conservation of the public beach or for the dynamics of the changing beachface from erosion and storms. The proliferation of hard erosion control structures in this area has significantly narrowed the beach and flattened the beach profile resulting in a much less appealing tourist destination when compared to other areas with healthier beaches. The storm hazard potential has also been greatly heightened. The policy of retreat established in the 1988 legislation will require decades to correct this problem, while repeated, expensive attempts at beach renourishment will be required in the short run to rebuild public beach. State-of-the art scientific and technical expertise has been and continues to be used to refine the methodologies on which the state bases its shoreline construction retreat policy. This includes methodologies to protect structures from shoreline erosion and damage from storms. (Source: Chris Brooks, South Carolina Coastal Program)*

California allows by permit new stabilization construction and repair to existing shoreline stabilization structures. *In 1992, the California Coastal Commission (CCC) undertook a pilot Regional Cumulative Impact Project (ReCAP) to study development impacts along an 83 mile-long coastal stretch covering the two central California coastal counties of Santa Cruz and Monterey. This study looks at policies governing shoreline armoring activities; resource conditions measured by changes in amount of armoring, and permitted activity related to shoreline armoring. A major finding of the study is that the current coastal policies support the use of public shoreline and public resources to protect private property, and if the current situation continues, more and more of the public shoreline will be lost as a public resource. On-the-ground outcome data indicates that, between 1978 and 1993, the percent of the shoreline armored in the ReCAP pilot area increased from 9.6 miles to 12.0 miles. Approximately 1/8th of the shoreline is now armored. This estimate does not include lengths of beaches protected by breakwaters, jetties, or groins, nor do the figures for length reflect maintenance and additions of rock to existing walls. Much of the increase in armoring between 1978 and 1986 is thought to have been constructed in response to storms in the late 1970s and early 1980s. Future demand for shoreline protection will depend on trends in development along the shoreline, erosion potential and storm frequency. Based on private property ownership, land use and physical characteristics, development patterns, and continued implementation of existing policies, it is estimated that 1/3 of the ReCAP coastline, or 27 miles, could be armored in the future.*

Armoring has led to cumulative impacts to beach areas and access opportunities, affecting sand supply and landward retreat of the beach. Along the ReCAP shoreline, data indicate that protective structures cover ~25 acres of beach. Permits granted since 1978 represent about 5 acres, or 20% of this total. Although shoreline armoring data indicates that armoring and encroachment has slowed under CZM, the impact from such encroachment may still be significant. Many of the armoring projects were approved in the popular recreational areas of Santa Cruz County. Armoring is often put in place following emergency storm events. However, permits are approved with little or no technical analysis, review of alternatives, or review of mitigation for adverse impacts on resources, and no followup permit. Therefore, such projects do not receive full regulatory review or monitoring, and are usually in areas of significant long-term or storm related erosion. As a result, impacts from these projects have not been fully assessed or mitigated.

The policies governing shoreline development and building setbacks for much of the shoreline development in urban portions of the ReCAP pilot are often inadequate. CC Act policies are inconsistent. One requires that new development be stable without construction of protective devices to minimize hazards. Another policy allows shoreline armoring to protect existing structures. There is no cutoff date for when a structure can be considered existing. Storm damaged structures are exempt from permits if

reconstructed in same footprint, thereby, precluding more landward redevelopment, risk avoidance, and reduction of dependence on protective devices. Setbacks are a common LCP management approach to avoid armoring. However, most are based on long-term average erosion and do not incorporate episodic events which may exceed setbacks. This leads to structures in harms' way and future need for armoring. In the ReCAP region, LCPs generally develop setbacks based on 50-year economic lifetime for new development. Those structures exceeding that lifetime will ultimately require armoring for long-term protection. Development on infill lots is allowed to be as seaward as adjacent existing development, exacerbating erosion risks and the need for armoring. Current policy does not restrict development in areas of high hazard. Future development is likely to continue with adverse impacts on coastal resources and public costs involved in protecting private development. Regional Plans are recommended to address adverse impacts of shoreline armoring.
Source: ReCAP Pilot Project; Executive Summary and Findings and Recommendations.

ACCESS RESTRICTIONS, HABITAT PROTECTION AND OTHER CONTROLS

* The purpose for regulating beach access is to two-fold. One reason is protect the stability of the vegetation within the beach, dune and bluff system and retaining their storm buffer benefits. The other is to protect critical natural habitat areas from human encroachment. Coastal beaches, dunes, bluffs and rocky shore areas provide critical habitat for certain animals and plant species that are endangered or threatened with extinction such as bird nesting sites, sea turtle nesting sites or other state-designated essential wildlife habitat set-aside and regulated as part of the state CZM programs. Coastal endangered bird species include shorebirds and seabird such as the bald eagle, piping plover, northern harrier, osprey, upland sand piper, and common tern.

* 22 coastal states ***restrict pedestrian access*** by requiring the use of boardwalks, trails, dune cross-crossovers, beachfront stairs, and other structural accessways. Prior to the 1970s, public access cutting through and breaching dunes was a common practice. With CZM, guided access on both private and public dunes has become accepted practice.

* 22 coastal states ***restrict vehicular access*** along portions of the beachfront or shoreline. Types of restrictions include only allowing beach clean-up, emergency or law enforcement vehicles, prohibiting driving on public beach areas or designated habitat areas, allowing only certain types of vehicles, and creating physical barrier to the shoreline. Certain beachfronts historically were public transportation routes or beaches used as race-ways. Today, driving and parking on hard sandy beaches with access through vehicular access ramps is considered locally acceptable ways to provide public beach access.

* 28 coastal states ***protect coastal shoreline habitat*** through regulation. The most common areas protected are bird staging and nesting areas along the coast. Other areas include turtle nesting sites, endangered species habitat, natural areas, and natural heritage areas. Regulation of turtle and bird nesting sites is seasonal and tend to cover only a small portion of the coastline.

* 25 coastal states ***regulate other activities*** which affect natural coastal resources. This primarily includes sand mining, dune reshaping, sand scraping, and dune creation. Both on-shore and offshore sand extraction can have long-term adverse impacts on beach and dune systems. Historically, dunes and beach areas were used commercially as a source of sand for construction, resulting in the loss of many beachfront dune areas. Commercial use of sand remains an issue in a few states, but most now restrict or prohibit the taking of beachfront sand. Sand dune grading and dune reshaping are issues affecting accreting coastlines where too great accumulations of sand obstruct views and access. Dune creation and sand scraping are issues along storm-event and long-term erosion affected coastlines.

The Florida Coastal Program requires state permits for boardwalks and dune crossovers to the beach. Thousands of permits are issued for these accessways. The South Carolina Coastal Program allows construction of walkways over sand dunes as an exception if the accessways are no greater than 6 feet wide and other criteria are met. *Wider accessways and handicap access requires state permit approval. In both states, the goal is to minimize the adverse effects of vertical access through fragile dune areas to the sandy beaches. Whereas dune breaching was common practice prior to state regulations, guided accessway over dunes to avoid damage to the natural and protective functions of dunes is the accepted practice.*

The Oregon Coastal Program restricts vehicular traffic by Parks Department administrative rule. *Along certain beach/dune areas, vehicular access is restricted to protect endangered snowy plover habitat, recreation, and avoid use conflicts. Beach vehicular accessibility is shown on the Official State Map of Oregon 1995-1996. Vehicles are prohibited year-round or from May to September along an estimated 70% of the coast.*

The Maine Coastal Program protects shore bird nesting or breeding areas. *Bald eagles, roseate tern, least tern, piping plover are coastal endangered species and their habitat are mapped and protected under Maine Endangered Species Act as "essential wildlife habitat" by Inland Fisheries and Wildlife. Designated areas include: seabird nesting islands; shorebird nesting, feeding and staging areas; atlantic salmon spawning areas; and critical waterfowl and waterbird areas. The Department of Inland Fisheries and Wildlife reviews state and local permits to ensure these habitat are protected. Prior to issuance of a local or state permit, the applicant is required go through a consultation process with the Department staff. Construction of new fences and reconstruction of closed fences are prohibited; open fences are allowed only to protect dune vegetation or bird nesting areas.*

Table 10: Coastal restrictions on pedestrian and vehicular access, habitat protection and other activities

State	Pedestrian Access	Vehicular Access	Habitat Protected	Other Activities
AL	y-boardwalks n-dune crossovers	y- only clean up, law vehicles allowed on bch	y- turtle & tern nesting, beach mouse habitat	no
AK	y-trails regulated	y-transportation routes	y-bald eagles	y-sand mining
AS	no	no	y-case-by case habitat	no
CA	y-boardwalks/walkways	y	y- env. sensitive areas	y-sand mining
CT	y-pedestrian corridors	no	y- bird nesting habitat	y-dune reshape
DE	y-dune cross-crossovers	y-only 4 wheel drive veh.	y-bird nesting sites	y-sand mining
FL	y-boardwalks & dune cross-crossovers	y- 5 counties allow driving on the beach	y- sea turtle nesting sites	no
GU	y-boardwalks	y-no vehicles public bch	y-public conservation areas	y-sand mining, corals
HI	y-natural resource areas	y-only gov't vehicles	y-natural areas/sanctuaries	y-sand mining, corals
LA	no	no	y-bird nesting sites	y-sand scraping, dune reshape
ME	y-boardwalks	y-no new roads, drives parking in V-zones	y-shorebird nesting wildlife habitat areas	y-sand fencing, bn, ss, removal
MD	y-boardwalks	y-no vehicles on beach	y- bird nesting sites	y- sm, erosion control, bn
MA	y-boardwalks	y-local plan for ORVs allowed on beach	y-natural heritage endangered species habitat	y-sand scraping, mining
MI	y-bchfront stairs, bdwalks, trails	y-restricted along 23% coast	y-natural preserves, critical coastal dunes, high erosion areas	y- ss,ds, sand mining
MS	y-boardwalks	y-no vehicles on beach	y-bird nesting sites	y- ss, sm, bn
NH	y-boardwalks	no	y-natural sites	y-mining
NJ	y-boardwalks	y-local restrictions	y-bird nesting sites	y-ss, mining, dune creation
NY	y-boardwalks	y-no driving on vegetation	y-bird nesting fish WL sites	y- ss, sn, dune creation
NC	y-structural accessways	y-local restrictions	y-100 mi. undisturbed area	y-dune creation, ss, dr
NM	no	no	y-beaches, pristine areas	y-sand mining
OR	y-boardwalks, walkways sidewalks	y-vehicles restricted near habitat areas	y-bird & endangered species habitat areas	y-sand grading, sand dune mgt.
PA	no	no	y-public beach/bluff	no
PR	y-public access restricted in some Districts, Rec.trails,etc.	y-no cross-country vehicles on bathing beaches, some Dist.	y-natural area reserves, SPA endangered species habitat	y-sand, gravel, stone extraction
RI	y-dunewalk-crossover, decks	y-vehicles prohibited on barrier beach, foredunes	y-APRs, CMAs, habitat areas	y-sand mining, dune alteration
SC	y-boardwalks	y-only emergency vehicles	y-sea turtle nesting	y-sm, ss, sr, dune creation
VI	no	no	y-rec.beaches, turtle nesting	y-dredging, sand mining
VA	y-dune cross-crossovers, trials	y-no vehicles in park areas	y-sea turtle nesting sites	y-dune creation/veg, sm
WA	no	y-no driving on beaches	no	y-dune grading, sand mining
WI	no	y-no vehicles in navig. waters	y- 300 areas statewide	y-sand mining
Total	**yes no**	**yes no**	**yes no**	**yes no**
29	**22 7**	**22 7**	**28 1**	**25 4**

Key: y- yes n-no sm- sand mining, ss-sand scraping, dr- dune reshaping, bn-beach nourishment, ORV- offroad vehicles, WL- wildlife, SPA- special planning areas., APR- areas of particular concern, CMAs- conservation and Management Areas
Source: State CZM Profiles

PERMIT TRACKING AND ENFORCEMENT

* 26 coastal states have permit tracking systems. Only 19 have computerized permit tracking systems for habitable structure permits, 20 for shoreline stabilization permits. These permit tracking systems primarily serve as a tool for tracking individual permit status through the permit system and do not contain detailed information on the type or size of project, location and impact on natural resources, or other relevent data for determining individual or cumulative impacts of permit decisions. However, a few states have begun to explore ways to add such data to their permit tracking systems.

* 28 coastal states have permit compliance programs usually with field inspections, some with aerial surveillance.

* **Table 11** identifies which states have computerized or paper permit tracking systems and summarizes each CMP's coastal permit compliance mechanisms.

Table 11: State Coastal Permit Tracking Systems and Permit Compliance Tools

STATE	Permit Tracking System Permit Compliance Tools
AL	y-computer listing of permit number, subdivision lot, and party name y-post-permit monitoring
AK	y-agency review, inspection, monitoring y- pre-issuance field inspections, post-issuance field inspections, agency project reviews
AS	y- permit database for Land Use Permits since 1984. Covers all permits island-wide, not coded by geographic area (shoreline, steep slope) or resource area (beach, cliff). Sam with Building Permit data.
CA	y-paper files. For CCC permits, developing statewide electronic logging system. y-cease and desist order for activity without permit or inconsistent with permit conditions. Penalties. Reported violations inspected by district office field staff and public records.
CT	y- DEP monitoring of municipal Site Plan Review decisions through quarterly reports y-periodic aerial photo surveys at 5 year intervals, MSPR permits monitored through third party complaints, DER field enforcement staff investigations, clipping service, hearing notices at local level.
DE	y- computer tracking system y- small permit compliance staff make phone calls and inspections
FL	y- computerized database, DEP sends area inspectors to monitor areas y- violations reported, inspector informed, inspector surveys and files report with DEP Bureau of beaches and Coastal Systems, Bureau reviews reports and set penalties/fines.
GU	y- no on-going computer tracking system. Database developed for actions from 1987-1993 only. y- no Territory-wide permit data base dating back to 1979. All permit data is island-wide since Guam's upland jurisdiction is the entire island. This makes it impossible to identify and separate out shoreline development permits from inland development. A database was developed for TLUC actions 1987-1993.

Table 11: State Coastal Permit Tracking Systems and Permit Compliance Tools continued

STATE	Permit Tracking System Permit Compliance Tools
HI	y- 1994 CZM Program computer system and software training for county staff. Database for Kauai County Planning to track permits and violations. City and County of Honolulu utility program that downloads for CZM data analysis, permit tracking. y- monitoring notices of state and county permit actions for compliance with HCZMP.
LA	n- no computer tracking system y- violations monitored through coordination between Enforcement Section and field investigators
ME	y- NRPA computerized permit file. y- Under NRPA, DER staff, & DMR marine patrol officers jointly enforce and monitor for permit violations. Under MSZA, Code Enforcement Officers notify in writing violations and investigate complaints, submit Biennial reports to DEP on applications, permits approved, variances, violations, etc.
MD	y- joint state and USACE permit tracking system used. Permit and compliance database maintained. y- MDNR, Inspections and Compliance Program monitors authorized projects. Regional inspections. Significant violations corrected through restoration and/or fines after referral to the state AG office.
MA	y- computerized tracking system y- certificates of compliance required for all permitted projects and it must be registered with the deed. DEP takes enforcement actions against state-issued permits. Local conservation commissions are generally responsible for enforcement of locally-issued permits.
MI	y- Coastal and Inland Waters Permit tracking System y- inspection, enforcement, and handling of public complaints.
NH	y-new GIS system in 1995. Prior to that old GIS system very limited, mostly paper files y- 2 wetland Board inspectors serve 17 coastal communities, field inspections, public education. Periodic aerial surveillance to monitor waterfront properties, dunes restoration projects, harbor dredging.
NJ	y- computer database, inspectors, monitoring y- Coastal Enforcement Unit/monthly meetings on enforcement, violations, pending decisions, bulletins, press releases of enforcement actions, monthly reports of over flight inspections, responses to complaints of violations, field inspections, etc.
NY	y- computerized data y- specific application requirements
NC	y- permit application tracking system and separate GPS/GIS base system y- inspection, monitoring, tracking, mego database within permit and enforcement section.
NM	y- paper files, computer database being developed y- field staff inspections, monitoring permit compliance, cease and desist orders, civil fines.
OR	y- no statewide database on local permits; separate computer permit tracking for OPI-PRD and R/F-DSL permits, but no information on length of shoreline stabilizations (in paper files)

Table 11: State Coastal Permit Tracking Systems and Permit Compliance Tools continued

STATE	Permit Tracking System Permit Compliance Tools
PA	y- permit tracking system for shoreline stabilizations but only since 1994. no surveillance system. permit data for bluff setback permits in written reports only. y- Shoreline stabilizations -site inspections, violations taken to court, complaint response, penalties. bluff permits- Township Code enforcement officers monitor for violations.
PR	n- no permit tracking system, but developing a GIS based computer system y- each regulatory agency has authority to issue compliance, cease/desist orders, impose fines.
RI	y-computerized permit database begun in 1987, upgraded and input permit data back to 1971. y- violation fines/fees, newspapers publish CRMC list of violators, follow-up on every cease/desist orderand notice of violation, field staff, condition on CRMC Assent permits.
SC	y- computer tracking system begun in 1980s on D-base. Permit name and #, category of activity, when issued, appeal date. y- routine inspections, aerial surveillance, Creek and Bay Watch citizens reporting program with 800-number, enforcement manual.
VI	y- all paper files, no computerized data base. y- Bureau of Enforcement monitors enforcement. CCA Commissioner may issue cease and desist orders and initiate judicial proceedings with AG office.
VA	y- computerized tracking system. y- certificates of compliance, must be registered with deed. DEP enforces state-issued permits. Local conservation commissioner responsible for local permits.
WA	y- In process of refining and expanding permit tracking database system. y- State DOE review authority over local shoreline substantial development permits; enforcement authority over local government actions.
WI	y- computerized permit tracking system links DNR offices throughout the state. Non-computerized tracking system for federal consistency. y- monitoring is a goal of DNR, no specific permit compliance tools.
Total:	26 States with Permit Tracking Systems 28 States with Permit Compliance Tools 1 State with no Permit Tracking and Permit Compliance Tools: MS

Key: y- yes n-no
Source: State CZM profiles on Protection of Beaches, Dunes, Bluffs and Rocky Shores

KEY ROLE OF STATE CZM IN PLANNING

Since passage of the 1972 CZMA, several states have adopted legislation mandating state and local comprehensive planning and/or growth management programs. Some mandatory local planning programs have been incorporated into state CZM Programs, others have not. In addition, state coastal programs have funded numerous planning studies which look at resource protection issues. These eventually lead to adoption of enforceable policies and regulatory programs addressing a wide array of state-wide and area-specific issues such as erosion hazard management and habitat protection.

Planning programs, when combined with implementation through local land use regulations, zoning and subdivision ordinances and other actions, can provide protection of shoreline resources. The level of protection provided varies depending on: the extent of the resource covered by the plan, the type of protection policies, standards and provisions; and the specified exemptions and variances. There was insufficient resources, as part of this project, to conduct an analysis of the key provisions of each local and state CZM plan affecting resource protection. Attention was given instead to reviewing key provisions of regulatory programs resulting from CMP planning and collecting on-the-ground outcome data for which there proved to be very little.

* State CMPs employ various types of plans including general land use planning or comprehensive planning as well as special area planning such as beach, inlet, bluff, rocky shore, natural reserves, habitat conservation, erosion or hazard area management planning. All but one of the 29 coastal states employ some type of planning affecting their beachfront; 21 rely on local permit delegation in combination with local planning; 23 utilize special area management plans or a variety of other plans; 10 coastal states use more than one planning tool. **(See Table 12)**

Table 12: Planning Tools- local permit delegation, local planning, other plans affecting protection of beaches, dunes, bluffs, rocky shores

State	Local Permit Delegation	Local Planning	Other Plans (SAMPS, etc)
AL	no	voluntary	no
AK	yes	mandatory	Areas of Special Merit
AS	no	no	Territory-Wide Zoning serves as land use plan
CA	yes	mandatory	Coastal resource/environmentally sensitive areas; Local blufftop management plan
CT	yes	voluntary	no
DE	no	no	no
FL	yes	mandatory	Beach Erosion Control Program; Inlet Management Plans
GU	yes	no	Seashore Reserve Plan; Flood Hazard APC; Erosion Control Plan; Recreation & Water Use Management Plan
HI	yes	mandatory	Natural Area Reserves; Marine Life Conservation Districts; Wildlife Sanctuaries.
LA	yes	voluntary	Mash Management Plan & Beneficial Use of Dredged Material Policy
ME	yes	mandatory	Resource Protection Zones

Table 12: Planning Tools- local permit delegation, local planning, other plans affecting protection of beaches, dunes, bluffs, rocky shores continued

State	Local Permit Delegation	Local Planning	Other Plans (SAMPS, etc)
MD	yes	mandatory	Beach Erosion Control District Plan
MA	yes	voluntary	Areas of Critical Environ. Concern; Local Beach Mgt. Plans for ORV
MI	yes	no	Sand Dune Protection Act & Shorelands Protection/Mgt. require designation of critical dunes & high erosion areas through local zoning; Soil Erosion & Sediment Control Act
MS	no	voluntary	no
NH	yes	voluntary	Hampton Harbor Inlet Mgt.Plan; Seabrook Beach/Dune Plan
NJ	yes	voluntary	no
NY	yes	no	Local Waterfront Revitalization Plans; Local Coastal Erosion Plan
NC	yes	mandatory	Sate Beach Mgt; Shore Erosion Response; Inlet Mgt.Plans
NM	no	no	Siapan Lagoon Management Plan; Coastal Hazard APC
OR	yes	mandatory	Territorial Sea Management Plan
PA	y-bluff only	bluff only(v)	Presque Isle Peninsula State Park
PR	yes	no	Natural Reserves; Special Planning Areas; Island of Culebra
RI	no	no	Salt Pond Regions; Pawcatuck River Estuary & Little Narragansetts Bay
SC	no	no	State Beachfront Management Plan
VI	no	no	APC Management Plans
VA	yes	voluntary	Northhampton County Sustanable Development Initiative; Erosion & Sediment Control Plan
WA	yes	mandatory	no
WI	yes	no	Carol Beach Plan; 3-year Harbor Plans
Total	**21- yes 8- no**	**9- mandatory 10- voluntary 11- no plans**	**23- yes 6-no**

Key: SAMP- Special Area Management Plan

Source: State CZM profiles

ROCKY SHORES PLAN 

* Oregon is the only coastal state to have developed and implemented, through regulations, a rocky shore plan for its entire coastline. This plan serves as a model for other states with rocky shore resources.

The Oregon Ocean Plan was adopted in 1992, followed in 1994 by the Territorial Sea Management Plan *which covers rocky shores, intertidal areas and ocean resources in an ecosystem management process. The Plan provides an ocean policy framework with management standards to be used in managing the marine resources in Oregon's territorial seas. The Plan includes a Rocky Shores Strategy to protect Oregon's rocky marine habitats while providing people the opportunity to use them. Under the strategy, four classifications of rocky shores are designated to guide agency programs on the ground: They include: 10 "habitat refuges" along 4% of the rocky shore where access is limited; 7 "research reserves" along 7% of the rocky shore where access is discouraged and harvest is limited; 8 "marine gardens" along 10% of the rocky shore which encourage visitors to highly popular areas; and 29 "marine shores" along 79% of the rocky shore which are small areas open to public but not heavily used. In addition, 9 areas have been identified but not yet designated and 7 priority offshore rocks/reefs identified for future study.*

A key aspect is "local site management plans" for rocky shore sites with mandatory policies to address complex site conditions, biological resources, human uses, and agency management concerns. The strategy provides clear policies for all agencies to follow and a process for intergovernmental coordination. Education and public awareness through communications and interpretive programs are crucial parts of the strategy to manage growing usage and impacts on rocky-shore areas.

On-the-ground results of site management plans indicate that four Marine Gardens have been closed to taking of marine invertebrates, clams (except razor clams at Cape Perpetua), and mussel (except single mussels for bait). Pyramid Rock in Rogue Reef, a critical habitat site for Steller sea lions and under increased fishery use, under the plan is closed within 1,000 feet to all fishing activity from May-August. Permit or management conditions have been placed on all rocky shore sites to protect the natural resource values of these areas.

BEACH MANAGEMENT PLANS 

* State CZM programs have become increasingly involved in identifying the problems of eroding beach/dune systems and developing coordinated responses through statewide beach management and erosion control plans. States' concerns about adverse affects on downdrift beaches from federal dredging of navigation channels, offshore disposal of dredged materials, and loss of recreational beaches from shoreline armoring, have led state CMPs to take a proactive role in shaping state and federal policies and programs.

* Florida, North Carolina, South Carolina, Maryland and several other states have state-level beach management or erosion control planning. The key purpose of these planning efforts is to address erosion hazard issues. The plans usually identify areas of high erosion, properties affected, and erosion responses that have historically been undertaken. For most, plan implementation is tied to the coastal regulatory programs and state land management and beach restoration or armoring programs.

Coastal States Address Causes of Beach Erosion. *The South Carolina CMP pushed for Congressional recognition that USACE dredging of Charleston Harbor was causing severe beach erosion on the sand-starved downdrift beaches; this led to the Folly Beach renourishment mitigation project. The State of Florida passed legislation requiring that suitable beach quality sand from inlet and navigational channel dredging be placed on the down-drift beaches; the state then used federal consistency and state-funds to negotiate with the USACE to place 1.4 million cubic yards of sand from St. Mary's inlet dredging on the down-drift beaches rather than losing the sand to the offshore system. After planning and debating the issue, certain states have passed legislation limiting the use of new shoreline stabilizations, in an effort to protect beach and dune systems at the expense of private upland properties.*

BLUFF PLANS 

* California, Oregon and Washington states require local plans that address development along eroding coastal bluffs. These programs are all implemented through state and local regulatory programs. Pennsylvania requires local governments to implement state established bluff setbacks, but this is not considered a planning program.

LOCAL COASTAL PLANS 

* 19 coastal states employ local planning, 10 with mandatory local planning and 9 with voluntary local planning; 10 states do not use local planning. Locally-delegated permitting responsibility combined with mandatory local planning are key management tools employed by Alaska, California, Hawaii, Maine, Maryland, North Carolina, Oregon, and Washington in protecting beaches, dunes, bluffs and rocky shores. Several of the regulatory setback and control zone provisions described earlier are administered by local governments. In states that set the enforceable regulatory guidelines, local implementation is strictly administration of the regulation rather than local planning.

***The California Coastal Program requires Local Coastal Programs (LCPs)** with CCC certification and oversight. LCP Regulations require that each local coastal program identify specific coastal resources, hazard areas, coastal access, use priorities and significant cumulative impacts on coastal resources and access of development; and adopt a land use plan, zoning ordinances and zoning district maps to reflect the level and pattern of development consistent with Policies in Chapter 3 of CC Act. Land use plans are required to incorporate resource protection policies. Zoning ordinance are required to their implement land use policy plan. CCC Certification of a LCP results in delegation of coastal development permit authority.*

There are a total of 73 LCP jurisdictions which have been divided into 126 LCP segments for planning purposes, of which 88 have CCC-certified Programs (Plans and Implementation) and local permit delegation responsibilities. Certified LCPs regarding oceanfront property and its development vary widely. Some encourage purchase of remaining undeveloped properties and impose rigorous guidelines for any new development. Others encourage shoreline development adjacent to coastal erosion areas. 24 coastal jurisdictions recognize coastal geologic hazards through designation of special zones, geologic hazard ordinances, or comparable techniques. 18 jurisdictions use liability releases for projects proposed in hazardous areas. Regarding bluff-top development, some local jurisdictions use predetermined, fixed setbacks that vary from 10 to 320 feet. Others employ a cliff retreat rate, most commonly over a 50-year period. Most communities compromise safe setback considerations in "infilling" areas. The lack of state guidelines for safe beach-level development has led to continued development and reconstruction in hazardous locations. San Mateo has a combined Open Space and Conservation Elements which is implemented by a Resources Management District Ordinance that covers the Coastal Policy requirements.

The CCC Interpretive Guidelines (adopted May 3, 1997) address "Geologic Stability of Blufftop Development." These guidelines specify that alternation of cliffs and blufftops, faces, or bases by excavation or other means should be minimized and that cliff retaining walls should be allowed only to stabilize slopes, or seawalls at the toe of the seacliffs or to check marine erosion where no less environmentally-damaging alternative exists and where necessary to: 1) to maintain public recreational areas or public services such as highways, energy facilities, port areas; 2) protect principal structures in existing developments that are in danger of erosion; or 3) in LA, Orange and San Diego Counties, infilling small section of wall in subdivisions where wall already in place and infilling have no substantial adverse effect. The guidelines call for a geologic investigation and report when a development is proposed in an unstable "area of demonstration of stability". In areas of geologic hazard, the Commission may require that a development permit not be issued without a waiver of all claims against the public for future liability or damage resulting from permission to build. All such waivers should be recorded with the County recorder's office.

SAMP PLANS 

* The 23 states that use SAMPs and other specialized plans employ them to address a variety of issues. Most are used for natural resource area protection. Other uses include flood hazard management, erosion control, resolving recreation use conflicts, economic development, state land management, and multi-issue management. These plans are used to supplement or supersede state coastal regulatory provisions for selected planning areas.

The Guam Coastal Management Program developed and adopted the Recreational Water Use Management Plan in 1990-1991. *The plan covers a 6 miles stretch along the coast and in the water. It addresses user conflicts along this stretch of beach and water. Bird nesting areas are identified and protected, and Manahac fish-runs protected. The plan prohibits jet skis except in management plan areas. The plan provides for "use zones" for certain water activities in planned areas, and requires buoyed areas for jet-ski-type vehicles and mechanized vehicular closure during predictable Manahac runs. Minimum operating age is 16 years for all mechanized water vehicles. Jet skis can only be operated in planned areas-- two such areas have been adopted, and a third area being finalized. The first area planned, Agana Bay to Piti, encompasses 6 linear miles of coast to a distance varying from two hundred yards to half a mile. The second area, Cocos Lagoon, is a triangular shaped lagoon 3 miles long on the land side, extending 2 miles seaward. The third area is Apra Harbor, which is Guam's commercial port, the Navy port and Guam's Harbor of Refuge.*

The Rhode Island Coastal Program adopted four SAMPS, *as a supplement to the regulatory program for specific areas: Two SAMPS cover oceanfront areas. The main focus of SAMP planning in Rhode Island has been on cumulative and secondary impacts of development in, and adjacent to, poorly flushed estuaries, nonpoint source pollution, groundwater contamination, and on-site sewage disposal systems. The Salt Pond Regions SAMP: Ninigret to Point Judith Ponds covers 32 square miles. Just over 11% was in public ownership and 50% undeveloped as of 1984. The shoreline miles and miles in beaches and rocky shores are unknown, but the Rhode Island Coastal Resources Management Program is developing a GIS data base and will be able to provide this data in future. The SAMP expands the inland boundary to include a watershed; establishes coordinated permit review procedure; amends policies for dredging in Ninigret and Green Hill Ponds to allow dredging in Type 2 waters; and changes water use designations for Port of Galilee to allow port expansion. It also specifies dredging of navigational channels and restoration of overwash channels, and requires disposal of sand dredged materials to replenish the following adjacent beaches: Sand Hill Cove, East Mantunuck; Charlestown Beach; Quonochontaug barrier beach. It prohibits, for beach restoration, mechanical removal or redistribution of sand from the intertidal zone of the beach to increase the profile of the beach scarp or to construct artificial dune since they destabilize beaches, increase erosion along beaches and sedimentation in ponds. It specifies how beach sand shall be placed on beach. It identifies priority areas for acquisition. The SAMP plan sets density limitations for "self-sustaining lands" and "lands of critical concern." Subdivisions in these areas cannot exceed more than 1 residential unit per two acres and sewers are prohibited. The goal is to keep residential development low. The percent of area and shoreline miles covered under these two classifications is not available, but RICRMP is developing a GIS system that should be able to provide this information in the future. Also, the plan is under revision. (Source: RI Salt Pond Region SAMP, 1984, and 1993 Addendum and phone interview with Jeff Willis, RI Coastal Program Manager)*

KEY ROLE OF STATE CZM IN PUBLIC LAND MANAGEMENT AND ACQUISITION

Regarding public land management, most of the state beachfront and oceanfront parks had been acquired and placed under state park management prior to enactment of state CZM program. The unique role of the state coastal program has included funding or promotion of detailed resource inventories and specialized management plans to balance resource protection and public use of these sensitive lands; installation of boardwalks over dunes and other sensitive habitat; sand fencing to avoid dune destruction; walking trails to limit damage to park resources; beach profiles, sand transport and erosion studies, and beach management planning; beach and dune restoration; and policies limiting state infrastructure investments on state beachfront park shorelines. Beach renourishment has been promoted by some coastal states as an alternative to continued loss of developed recreational beach through shoreline hardening. Likewise, some states have funded research into sand loss from inlet dredging and have demanded that beach quality sand be placed on down-drift beaches. Whereas excavation of sand for coastal development was a common practice in the past, state CZM programs prohibit such practices today and wage educational campaigns on the importance of protecting stabilized dune systems.

Although many state land acquisition programs were in existence prior to enactment of state CZM programs, some state CZM programs have played a major role in creating new land acquisition programs and in helping their state set priorities for coastal land acquisitions. State CZM programs have funded land inventories, land appraisals, negotiated purchases and land swaps. Land inventories have included both high value natural resource properties and vacant coastal lands suitable for recreation. State CZM programs have served as advocates for state acquisition of oceanfront and shoreline properties.

States that are effective stewards of their shoreline parks and preserve lands use park inventories and management plans; install boardwalks, dune crossovers or other guided pedestrian access; use dune restoration and beach nourishment where appropriate; enforce policies restricting the use of shoreline stabilization structures; designate natural resource habitat protection areas; and acquire additional holdings.

ACTIVE MANAGEMENT OF STATE COASTAL LANDS ◆

* State ownership and management of state-held lands along the coast can afford a high level of natural resource protection, subject to competing use demands placed on such lands. State lands developed for recreational use, such as beachfront parks, can also protect natural resources if management plans are adopted and implemented which restrict pedestrian and vehicular access, set aside fragile habitat from human use, and employ other methods to maintain the natural landforms. Protection also varies depending on priority uses given to such state holdings. Those lands with wildlife preserves or conservation areas generally afford more restrictions on uses than state parks and recreation areas.

* The installation of boardwalks and dune crossovers serves to protect natural dunes through stabilization of dune vegetation and avoidance of dune breaching. Dune creation and restoration through sand fencing and dune revegetation serve to stabilize and rebuild dune areas, limit breaching during coastal storms, and recreate natural dune systems.

* The identification, designation and protection of natural resource areas within beach/dune systems function to sustain the natural habitat conditions and values present and provide long-term protection. However, to the extent that such protection is only seasonal, such as temporary turtle or bird nesting site fencing, pedestrian access over such areas at other times of year may destroy the habitat values long-term.

* All 29 coastal states own state parks along the shoreline that encompass one or more beach, dune, bluff or rocky shore; 26 have natural resource protection areas and guided accessways, and 21 states have acquired additional coastal lands.

* Only 17 states have inventory data on their state coastal land holdings such as number of shoreline miles in state parks. The data gaps regarding state coastal parks and state beachfront parklands is discussed

under the outcome data section that follows. 5 states do not have information on the total number of beach miles. 5 do not know the number of state coastal parks. 10 do not know the number of beachfront coastal parks they own. 12 do not have information on the miles of state coastal parklands they own. 11 do not know the number of miles in state coastal lands. See **Table13**.

* 14 states use boardwalks or dune crossovers within their state coastal parks to guide pedestrian traffic over fragile beach and dune resources. Sand fences have been installed to keep pedestrians off the beach. Prior to CZM, unguided access resulted in the trampling of many public beachfront dune areas.

* 13 coastal states employ dune creation on state beachfront parks to repair and enhance the natural functions of their state-owned beach and dune systems.

BEACH NOURISHMENT ◆

* Beach renourishment has become popular as a tool to artificially create or recreate a beach area through the importing of compatible sand. The position of NOAA is that "...while beach nourishment may indeed, under certain circumstances, be a technically viable alternative, there are many other considerations that must be deliberated prior to supporting this approach to erosion management... include(ing) the role of beach nourishment in inducing development in high hazard areas, ...other erosion management approaches, whether beach nourishment is economically justified, appropriate cost-sharing, and the environmental issues..." (MEMO March 19, 1996. NOAA Position on the National Academy of Sciences' Report "Beach Nourishment and Protection.") For this study, if a state employs beach nourishment in lieu of armoring with sufficient documentation of benefits and tradeoffs, it is generally considered a positive impact on protecting natural beach/dune systems. However, the author agrees that unconditioned use of beach nourishment may indeed adversely affect natural systems and may not be the most suitable management approach to protect natural beach/dune areas.

* 17 coastal states have used beach nourishment or renourishment as a management tool, 15 in conjunction with the USACE. See **Table 14.** Historically, the lead agency in beach renourishment has been the USACE with local governments participating as project sponsoring. With increased state regulatory oversight and the federal consistency provisions of the CZMA, beginning in the 1970s, coastal states have take a more active role in setting policies and priorities for beach nourishment.

* With the increased use and cost of beach nourishment, states in addition to local government have been called upon to provide matching funds for projects. The state and local share is usually 20% of the total cost of a project. There is insufficient data to determine the number of miles of beachfront or cubic yards of sand placed in state-funded beach renourishment projects. Table 3 in Appendix A provides data on USACE major shore protection projects in CZM states between 1950 and 1993. Most states appropriate money from the legislature as needed to match USACE beach nourishment projects. Only a few states, like Florida and South Carolina, have begun to take a proactive role in setting state priorities for beach nourishment projects and seeking dedicated funding for beach nourishment.

* There were insufficient resources to conduct an in-depth study of state-sponsored beach nourishment projects. Furthermore, state data was sparse on projects funded, success or failure of such projects, and tradeoffs made in selecting beach nourishment as the appropriate management response.

SHORELINE ARMORING ◆

* Most of our nation's urban waterfronts have been armored. Shoreline armoring is a practice which began prior to CZM programs, in an effort to protect private oceanfront structures and public infrastructure from erosion. Greater awareness of the negative impacts of shoreline stabilization structures on adjacent properties and coastal resources has caused CMPs to more closely scrutinize such activities and weigh the private and public benefits. This is particularly the case, along public recreational beaches, where armoring to protect roads and public access to the shoreline results in the loss of natural beach. Armoring and

armoring repair through construction of shoreline stabilization structures acts to accelerate the loss of sandy beaches. For this study, if a state employs armoring on state beaches, it is considered a negative impact on natural beach/dune systems.

* 10 coastal states have funded armoring or repair existing armoring structures in high erosion areas along their coastline. 15 states have had federal USACE shoreline protection projects built along their coastlines. In all cases, these armoring project were built to protect existing upland infrastructure such as roads, public accessways or public buildings inappropriately sited along the eroding coastline. The cost of relocation such existing uses, particularly coastal highways, was weighed against the loss of natural recreational beaches and armoring was selected as the management option of choice.

STATE COASTAL LAND ACQUISITION ◆

* Acquisition programs place private lands into public holdings. Along the coast, these acquisitions tend to serve both recreational use demands and some resource protection goals. Acquisition of large resource systems, or acquisition of lands adjacent to existing holdings can afford improved natural resource protection opportunities.

* 21 coastal states are utilizing acquisition to purchase additional valuable coastal resources. Data is not generally available on all state land acquisitions, so it was not possible to determine whether coastal land acquisition was a priority over inland acquisitions. Although some states do not have formal land acquisition programs, they have utilized CZM funds and other funds to acquire significant parcels.

A full range of state coastal land management activities occur along New Hampshire's 18 miles of highly developed oceanfront where the immediate shoreline is mainly (78%) in public ownership. *State coastal park management plans have been completed for several of the 9 beachfront parks and 7 rocky shore parks in state ownership including studies of archeological, historical, recreational, and natural resources. Twenty (20) natural resource inventories funded by CZM provide baseline data on habitat areas and are used in permitting by Wetlands Board and in public education programs. The Seabrook Back Dunes, the only major undeveloped back dunes remaining along the New Hampshire coast, was acquired by the Town of Seabrook with partial funding ($100,000) from the CZM Program. This 53 acre parcel is managed as a conservation and passive recreation area. CZM funded an Education Brochure Trail Guide to the Seabrook Dunes Area (1985), Coastal Endangered Plant Inventory on Seabrook Dunes (1983), Seabrook Dune Management Plan (1985), Dunes Valuation Analysis and Acquisition Report 1984, and Final Appraisal (1986). The state also acquired other parcels to expand their coastal land holdings for recreation and conservation. New Hampshire has completed a multi-year Seabrook Foredunes Restoration Project on a 15 acre town-owned Seabrook Beach. The project involved restoring badly eroded dunes, the planting of American beach grass to stabilize the dunes, and the construction of walkways from the street to the beach to control access and minimize adverse impacts on dunes. Signs along walkways inform the public about dunes restoration work and the importance of using walkways. Route 1-A borders the ocean along most of the coastline. The state periodically repairs and maintains protective seawalls running between the beach and the road, as well as seawalls protecting state beachfront parking lots.. Two USACE-built harbor jetties are maintained and as is the state-built jetty at Hampton Harbor Inlet. New Hampshire periodically dredges its harbor channels and beach-quality sand has been placed on adjacent beaches. The USACE also periodically dredges the Hampton Harbor entrance channel, but the sand is not always used for beach nourishment*

Nearly half (47%) of California's 1100 mile long coastline is in public ownership and active public management. *The State Department of Parks and Recreation (DPR) is one of the largest landowners along the California coast, with over 375 miles or 34% of the ocean shoreline in the state parks system. There are ~ 87 bluff-front state parks and ~32 rocky shore state parks. Management of these parks is a major activity, some of which are located in coastal hazard areas. About 10% of state-owned park units are administered by local governments. The state parks include reserves, beaches, historic parks, and unclassified units. They cover beaches, dunes, bluffs, rocky shores and some*

underwater state reserves. The state has installed ~20 boardwalks to guide pedestrian traffic. The DPR acquisition program for beaches and dunes, through special site-specific legislation and some bond-funds, has acquired 26,838 acres of state beaches, ~6,000 acres of unclassified beach areas, 27.3 miles of land in five state parks and one state reserve, and 2.8 miles of dunes. California has also acquired bluff and rocky shore areas through special legislation and surplus property bills, but the amount of shore acquired above mean high tide is unknown.

The Coastal Conservancy awards grants to local governments and non-profit organizations for coastal restoration and coastal resources enhancement projects. Funds are also used for Resource Protection Zones, buffer areas surrounding public beaches, parks, natural areas and fish and wildlife preserves in the coastal zone. Between 1978-1995, 600 projects were initiated and 400 projects were completed involving access, wetlands protection, trail, recreational pier restoration, conflict resolution and farm lands protection. Between 1978-1992, $175 million general obligation bonds acquired 29,000 acres.

The California Department of Parks and Recreation (DPR) administers a statewide resource management, stewardship, and donor program which includes dune creation/ restoration. Through this program 9 dune areas were revegetated on state lands.

The California Department of Boating and Waterways (DBW) administers a "shoreline erosion fund" which provides funds to state agencies and local governments for construction of shoreline protective devices and beach nourishment on public beaches and park lands with 75% state funding and 25% local match funding. Nineteen (19) beach erosion control projects were funded between 1980-1996. Since 1980, there has been approximately 20 miles of beachfront replenished, restored, or renourished with 15 million yards with joint federal/state/local funding. Several properties have seawalls with a well-documented history of repeated destruction and reconstruction. In 1984, the DPR adopted a coastal erosion policy to discourage armoring in state beachfront parks and to avoid construction of new permanent facilities in areas subject to coastal erosion and to promote use of expendable or movable facilities in areas subject to erosion. However, the DPR rebuilt a timber seawall for seventh time with little design modifications. This armoring to protect a parking lot and access is not typical.

Table 13: STATE COASTAL LAND HOLDINGS AND ACQUISITIONS

State	Beach Miles	State Coastal Parks # Parks # Beach Parks	State Coastal Parks Mi Parks Mi Bch P	State C. Parks Acres Park Acres Beach	Coastal Lands Acquired (acres/miles)
AL	46	1 all beach	3 all beach	6,000 all beach	n
AK	nd	63 nd	nd nd	990,335 nd	n
AS	nd	nd nd	nd nd	nd nd	n
CA	nd	119 71	377 280	145,540 26,838	B/D: 26,838 acre; BL: yes-nd; RS: yes-nd
CT	85	nd 6	nd 6.75	nd 3003	B/D: 1,439 acre
DE	24.5	3 all beach	18	nd nd	B/D: yes, but nd
FL	825 343 Public 42% Public	24	~500	~11,500	B/D: parcels: 980 acres: 294,968 miles: nd
GU	40	14 (only beach)	5.1 13%	nd nd	yes through trades -nd
HI	185	24 16	16%	14,814 322	62 acres-B, BL, RS combined
LA	>4 mi does not include barrier island shore	2	nd >1 mi.	Nd 345	n
ME	23 B/D 20%-S 205 RS	25 10	nd 4.6	11090 2380	B/D & BL & RS properties: 8 acrs: 4828 miles: ~20
MD	32	3	17	nd all beach	parels:2 acres: nd miles: 2
MA	222	18 nd	64 nd	nd nd	State Acres:2250 miles: nd Local Grants Projects: 17 Acres: 273 miles: nd
MI	270 50% state	29 nd	114 nd	nd nd	136,000 statewide coastal: nd
MS	18	1	nd	nd	n
NH	10 B/D 7.8 RS	16 9	12.5 10	~580 101	B/D & RS acres: 131 Miles: nd
NJ	125 9% state	2	12	3192	n
NY	125 30% state	10 all beach	46.5 all beach	11,600 all beach	CA: 2000 acres
NY-Great Lks	No Data Collected				
NC	320 3.4% state	3	11	nd	7,000 acres beachfront 27,439 beach access sites

Table 13: STATE COASTAL LAND HOLDINGS AND ACQUISITIONS Continued

State	Beach **Miles**	State Coastal Parks **# Parks** **# Beach Parks**	State Coastal Parks **Mi Parks** **Mi.BchP**	State C. Parks **Acres** **Park** **Acres** **Beach**	Coastal Lands Acquired **(acres/miles)**
NM	nd	nd nd	nd nd	nd nd	n
OR	262 B/D 56% Public 30% state 100 RS 65% public 53% state	64 nd	129.5 76.3-B/D 53.2-RS	27,107 nd	B/D & RS acres: 94.3 miles: .75 B/D only
PA	Lake Erie 10-B 99% state 53-BL 11% public 10% state	Lake Erie 2 1	Lake Erie 13.4 9.9 B 3.5 BL	Lake Erie 3110 10 B 3100 BL	B/D: Spoil Island mile: .25 acres: 10 BL: mile: 3.5 acres:3,100
PR	154	nd 15	nd nd	nd. nd	n
RI	27.3 84% state	14 nd	nd nd	1501 nd	y-nd
SC	181	4	68	nd	y-nd
VI	nd	nd nd	nd nd	nd nd	n
VA	200 10% state	1	6	4700	y-nd
WA	60 B 111 RS	120 nd	nd nd	27,000 nd	75,000 acres statewide coastal: >10,748 acres
WI	820 10%-B 72%-BL 8%-RS	30 nd	nd nd	nd nd	637 acres: 77 beach/560 dunes
Total	y-29 nd-5	nd-5 nd-10	nd-12 nd-11	nd-15 nd-16	y-20 n-9

Key:
B/D Beach/Dune
BL Bluff
RS Rocky Shore
CA Coastal Area
y yes
n no
nd no data provided or unknown

Source: State CZM Profiles on Protection of Beaches, Dunes, Bluffs and Rocky Shores.

Table 14: Active State Coastal Land Management

State	Board-Walks- # Dune Cross-Overs- #	Dunes Revegetated # projects feet & mile	Beaches Renourished # Projects Federal * State (# & Mi)	Armoring Projects Federal * State	Natural Protection Areas
AL	y-7	y-1 500ft	n n	n n	40 acres for Perdido beach mouse; ~3 mi. sea turtles nesting season; 25 acres for terns.
AK	n	n	n n	n n	49,000 acres protected for Bald Eagles
AS	n	n	n n	n n	n
CA	y-~20	y->19 nd	y-7 y-nd	y-5 y-12	Resource Mgt. Plans designate trails, roads, parking, zone units for reserves, preserves, habitat protection and public use. Endangered species habitat protected bird nesting sites.
CT	nd	9 nd	y-6 y-1 .25 mi	y-2 y-3	408 acres Natural Area Preserve; 806 acres Coastal Reserve; Nature trail
DE	y-2-bdwk y-3-cross	y-nd 18 mi	y-2 y-nd 6 mi.	y-1 n	Endangered species habitat-such as piping plover- case by-case and during nesting season.
FL	y-many nd	y-100 mi	y-26 y-nd ~94 mi.	y-6 y-nd	Sea turtle nesting sites during season.
GU	n	n	n n	n n	28,197 acres (20.73% Guam total land area) 15,600 acres submerged lands.
HI	n	n	n n	n n	7 coastal Natural Area Reserves 48,102 acres, 83,200 miles of Wildlife Sanctuaries, 9 Marine Life Conservation District 1346 acres
LA	y-1	y-6 ~20 mi barrier Is.	y-2 y-nd ~20 mi.	y-1 y-20	n
ME	y-1%	y-5 4 mi.	n y-6 USACE Habor Proj. >1 mi	n n	3 state beachfront parks, dunes protection, pedestrian accessways; sea bird nesting sites fenced off during nesting season. 1 Rocky Islanc Sanctuary-access restricted
MD	y-1	y-1 2 mi	y-2 y-2 10 mi.	y-1 y-nd	Seasonal restirctions for nesting birds along entire beachfront.
MA	nd	y-nd	y-5 y-nd 3 mi.	y-2 y-nd	5 coastal pk. mgt. plans for 4,673 acres 14 ACECs covering 75,000 acres.
MI	nd	n	n n	N N	- 860 mi.total: ~250 mi. natural preserv; ~300 mi critical dunes areas; ~310 mi.high risk erosion areas.
MS	y-1	n	y-2 y-1 18 mi.	y-1 n	n
NH	1	y-2 nd	y-3 y-5 2 mi.	y-2 y-3	Pedestrain access restricted area; 5 acres. piping plover nesting site.
NJ	n	n	yes-8 y 27 mi	y-4 y	B/D acres: 2,500 miles: 11.57 Included 100 acre bird sanctuary; 1200 acres beach research/wildlife sanctuary; 1,000 acre beach nature area; 3 other nature areas 1201 acres.
NY	3	n	y-8 y-1	y-4 n	7 protection areas covering 566 acres in state parks. >50 miles beachfront bird nesting areas. 200 fish/wildlife habitat areas.
NC	2	y-nd	y-6 y-12 5 mi	y-2 n	314 miles of beach, plus spoil islands. 100 miles undisturbed areas/Reserves; 50 ac nesting colonial birds; 11 miles sea turtle nes

Table 14: Active State Coastal Land Management Continued

State	Board-Walks-# Dune Cross-Overs-#	Dunes Reveg. # projects feet & mile	Beach Nourishment # Projects Federal * State # & Mi	Armoring Projects Federal * State	Natural Protection Areas
NM	n	n	n nd	n n	Offshore islands as bird sanctuaries, beacehs as turtle nesting sites
OR	n	n	n y-1 >1 mi.	n n	Vehicles prohibited on 70% of coastline. State park mgt. trails, restricted access.
PA	n	n	y-2 y- 1 area 6 mi	y-1 y-1	Lake Erie only n- beach y- D. Roderick Wildlife Refuge
PR	n	n	n n	n n	19 Nature Reserves and 8 Special Planning Areas
RI	y-1	n	n n	y-1 n	All undeveloped barrier beaches
SC	4	y-3 58 mi	y-1 y-4 45 mi.	y-1 y-nd groins repair	68 miles in parks/wildlife preserves.
VI	n	n	n n	n n	Salt River Bay
VA	n	y	y-1 y-5 nd	n n	6 miles sea turtle nesting at False Cape.
WA	nd	n	n n	n n	Many- 7 areas with >6336 acres harbor seals, falcons, eagles and other bird nesting areas.
WI	y-several nd	n	n n	n n	~300 natural areas statewide coastal: nd
Total	y-14 n-11 nd-4	y-13 n-16	federal y-15 state y-17	federal y15 state y 10	y-26 n-3

Key:
y- yes
n- no
nd- no data provided or unknown, no data provided.

Source: State CZM Profiles on Protection of Beaches, Dunes, Bluffs and Rocky Shores.
*US Army Corps of Engineers, *Shoreline Protection and Beach Erosion Cnbtrol Study: Phase 1: Cost Comparison of Shoreline Protection Projects of the U.S. Army Corps of Engineers.*

6 OUTCOME INDICATORS OF EFFECTIVENESS

Outcome indicators are used to measure the on-the-ground effects that result from implementation of CZM tools. Outcome indicators of CZM effectiveness in implementing regulatory, planning, direct land management and acquisition tools associated with the protection *of beaches, dunes, bluffs and rocky shores* are shown in **Table 15**. The "coastal resource areas" referred to in Table 15 include the landward extent of beach and dune systems, eroding bluffs, coastal hazard areas, coastal floodplains, and the immediate shoreline. The "natural habitat areas" referred to in Table 15 include coastline areas with unique or fragile natural flora or fauna. States' definition, identification, designation, and protection of such areas vary.

The outcome indicators mirror the key tools states employ in resource management: 1) regulatory; 2) planning; and 3) land use management and acquisition. Under *regulatory programs*, four desired results are identified followed by one or more standard survey methods for measuring outcomes *For adopted plans*, methods were identified for measuring results against plan objectives. *Under state coastal land management and acquisition*, there are suggestions for documenting results of state ownership and acquisition and active state natural resource stewardship.

An example of regulatory outcome indicator data was linear and/or area data on permits issued which would reflect the desired outcome of either few or no permits for activities seaward of a setback line or within identified natural resource areas, such as active beach and dune systems or eroding bluff areas. Counter-indicators would be miles of beachfront shoreline developed or armored through permitting. With this and other kinds of data, such as aerial photos, changes in develop patterns along our nation's coastline and in specific natural coast resource areas could be documented. If baseline and time series data existed, an attempt to trace the rate of reduced impact or reduced rate of encroachment into fragile coastal areas as a result of CZM regulatory controls could be achieved.

What our research documented was that coastal states and federal agencies are not routinely collecting the types of outcome data we identified as valuable in measuring on-the-ground results of CZM programs in achieving the national objectives such as coastal resource protection.

OUTCOME INDICATOR DATA AVAILABILITY

It is not possible to determine on-the-ground outcomes or effectiveness of implementing state CZM regulatory programs, planning programs, state land management, and state acquisition programs to protect beaches, dunes, bluffs and rocky shores, based on data and information provided by OCRM and the coastal states. For the most part, there was insufficient data to assess the on-the-ground effectiveness of state CZM programs. Monitoring and reporting of on-the-ground outcomes of CZM program activities have not been required, as part of OCRM's annual reporting on grants and activities and the periodic 312 program evaluations. Although most states have developed permit tracking systems, these are primarily administrative efforts to track individual permits through the regulatory process and not designed to contain program evaluation data. State reporting on plan implementation, where available, is descriptive rather than analytical. Data on shoreline ownership and inventories of shoreline resources have not been updated since program approval and outcome data on results of active state coastal lands stewardship is scarce.

Table 15: Outcome Indicators of Effectiveness

Regulatory Program Outcomes:

1. **No further or reduced rate of encroachment into coastal resource areas** indicated by no new or fewer new shoreline structures or shoreline stabilizations on the beach and dune system, eroding bluff, coastal hazard areas, coastal floodplain, or immediate shoreline.
2. **No further or reduced rate of hardening of the undeveloped beachfront through shoreline stabilizations.**
3. **Controlled shoreline accessways.**
4. **Healthy and maintained intact natural habitat areas along the coast.**

Survey methods for measuring outcomes starting with a baseline followed by time series:
(a) aerial photography interpretation;
(b) permit data for: 1) setbacks, control line areas, shoreline permit programs; 2) linear miles of shoreline stabilizations permitted by type of stabilization; 3) area and linear miles of permitted activities by type of activity (new residence, seawall, etc.) located in specific resource areas (beaches, dunes, etc.) within the state's coastal control zones and restrictive conditions attached which show minimization of adverse impacts (size, location, design other conditions); 4) demolitions or landward relocation of beachfront/bluff-front structures; 5) shoreline boardwalks, dune crossover, and other structural accessways permitted with specific resource areas (beach, dune, bluff, rocky shore); and/or 6) for habitat areas showing no activities permitted in designated areas which would adversely affect the natural values being protected;
(c) periodic physical surveys of the condition of selected/designated coastal resources protection areas;
(d) shoreline maps of controlled accessways; maps delineating shoreline acres and miles where pedestrian and/or vehicular access is restricted; maps delineating habitat protection areas.

Adopted Plan Outcomes:

1. **Achievement of Plan Objectives through implementation and monitoring**-- such as protection of designated "coastal resource areas" or "natural habitat areas", dune restoration; inlet management to place dredged sand on downdrift beaches; keeping development away from designated coastal hazard areas; etc.

Survey methods for measuring outcomes starting with a baseline followed by time series:
(a) aerial photography interpretation;
(b) periodic physical surveys of areas protected or managed under enforceable plans;
(c) state and local permit data on activities permitted within approved plan areas, area and linear miles affected, and consistency with plan objectives;
(d) direct state or local actions undertaken-- such as miles/acres of dunes revegetation, cubic yards of sand transferred due to installation of inlet sand transfer plant, etc.

State Coastal Land Management and Acquisition Outcomes:

1. **Extent of state coastal land holdings in parks and preserves** containing beaches, dunes, bluffs or rocky shores.
2. **Active public natural resources stewardship of coastal land holdings**
3. **Coastal lands acquired**

Survey methods for measuring outcomes starting with a baseline and periodic updates:
(a) coastline acres and linear shoreline miles in public/ state ownership with resources present;
(b) number of accessways, marked trails, boardwalks, dune crossovers and demonstrated public use;
(c) dune restoration projects, acres, miles of shoreline involved, state funds;
(d) acres or shoreline miles in state coastal lands designated as conservation, preservation or protection areas;
(e) aerial photography interpretation or periodic physical surveys to verify condition of resources;
(f) miles and acres and type coastal shoreline resource areas acquired by the state, the state expenditures for coastal versus inland of properties, and the CZM program funds used.

Source: State Coastal Management Effectiveness In Protecting Beaches, Dunes, Bluffs and Rocky Shores: A National Overview. Final March 1998

Table 16 identifies the availability of selected outcome data. It shows the number of states with some outcome data for selected management tools employed. Although 20 of the 29 states have computerized permit tracking systems, only 14 states have any data on habitable structures permitted. Fifteen (15) states have data on shoreline stabilizations permitted. The numbers drop off when looking at data on access and habitat permit restrictions. Although 15 of the 18 states with local plans track the number of approved plans, only 2 states have any outcome data on local plan implementation. Data is likewise sparse regarding SAMP and other plan outcomes. Looking at stewardship of state coastal lands, more states keep data on physical activities such as beach and dune restoration projects undertaken. But in almost all cases data is too scant to determine on-the-ground results of such actions.

Appendix C contains a summary of all the **available *outcome data*** associated with state regulation through permits for shoreline construction and shoreline stabilizations, restricting access, and protecting habitat. Appendix C also contains summary tables with outcome data associated with state ownership and management and coastal land acquisitions. These tables cover the tools utilized by state CZM programs and available outcome data on program implementation to protect beaches, dunes, bluffs and rocky shores. Findings regarding *outcome indicators* of effectiveness for state CZM tools employed to protect ***beaches, dunes, bluffs and rocky shores*** are presented on the following pages.

Table 16: Availability of Selected Outcome Data

Type of Outcome Data	States Using Mgt. Tool	States With Some Outcome Data
State Coastal Permits:		
Computerized Permit Tracking System	20	See Below
Habitable Structures Permits	29	14
Shoreline Stabilizations Permits	29	15
Pedestrian Access Permits	23	4
Vehicular Access Permits	23	3
Protected Areas Permits	27	9
Local Coastal Permits	20	1
Local Plans:		
Approved	18	15
Implementation Data	18	2
Other Plans:		
Special Area Mgt. Plans	12	3
State Land Management Plans	14	3
Stewardship of State Coastal Lands:		
Inventory coastal lands	29	17
Boardwalks/Crossovers	14	12
Dune Creation	13	9
Beach Nourishment	17	14
Natural Areas Protection	26	26
Acquisition of Coastal Lands	21	15

Source: State CZM Profiles on Protection of Beaches, Dunes, Bluffs and Rocky Shores.

REGULATORY OUTCOMES

*Although 20 of the 29 coastal states have computerized permit tracking systems (19 for habitable structures and 20 for shoreline stabilizations), none of the states coastal programs keep statewide databases on the linear miles, area, or resources affected by the permits approved for activities along the shoreline. Such information, when available, is contained only in the individual paper permit files. Only 16 states provided any permit data on structures and shoreline stabilizations to these researchers.

* Coastal states restrict the size, location and design of structures and shoreline stabilizations to minimize adverse impacts on natural resources beach and dune systems. Conditions attached to individual permits are sometimes contained in paper files, but never in computer permit tracking systems. Of the 25 states that employ restrictions over activities, such as sand mining and beach nourishment, none routinely collect data on the results of these restrictions. Likewise, coastal states do not collect and analyse statewide data on changes in shoreline development or changes to conditions of natural resources from aerial photography or from permitted activities.

* Regulatory program jurisdictions vary but tend to extend from mean high water (MHW) inland a certain number of feet, a distance based on erosion rates, or to the inland extent of a natural or manmade feature. Within this permit jurisdiction, several or no significant natural resources may be affected by any given permitted activity. No statewide data is available on specific resources affected by CZM-approved permits. This data may not even be contained in individual paper permit files. Trend data on changes in number of coastal permits issued and number of violations sited is also insufficient to use in assessing regulatory program effectiveness. Although some states keep data on numbers of coastal permits issued and violations corrected, the critical information missing is a break-down on type of activity permitted, length of project and area of coast and resources affected. Although some states issue permits for demolition or relocation landward of beachfront structures, multi-year data in not readily available. Only Upton-Jones data was available from FEMA. (See **Appendix A**) For states that delegate coastal permitting to local governments, no state maintains a multi-year database on local permit decisions.

* 23 states restrict pedestrian and/or vehicular access. Several coastal states issue permits for boardwalks and dunes crossovers, but states with large number of boardwalks permits (such as Florida) do not have permit data available. A few states set guidelines but do not require permits if such structures comply with the guidelines, so there are no records on construction of these accessways. Only 4 state provided data on access permits and 3 states on vehicular access permits. Michigan data shows 200-250 public access projects approved between 1989-1995 and vehicular access restrictions along 23% of the coastline. New Jersey data shows 2 permits for boardwalks between 1994-1996 but no data on local level restrictions of vehicular access. Oregon data shows 12 boardwalks permitted between 1967-1995 and vehicular restriction along 70% of the coastline. South Carolina allows, without permit, small walkways over dunes if guidelines are met. Larger projects require permits. Data shows 12 boardwalks permits and 13 emergency vehicular access permits were issued between 1988-1995.

* 27 states protect areas such as endangered species habitat by restricting activities and development in these areas. Only 9 states provided data on protection areas and even this data was scant and lacked information on the type of resources within protected acreage or condition of resource area. For several states, protection occurs only on state-held lands. Examples of state data collected:
AL- 3 miles of sea turtle nesting; 40 acres of beach mouse habitat; 25 acres of tern nesting habitat.
AK- 49,000 acres of Bald Eagle nesting habitat.
MI- 300 miles of critical dunes; 250 miles of natural preserves; 310 miles of high risk erosion areas.
NJ- 15 miles of bird nesting habitat
NY- 50 miles of beachfront bird nesting sites; 200 designated fish/wildlife habitat areas.
NC- 100 miles of undisturbed areas.
SC- 181 miles beachfront restricted during sea turtle nesting season.
VI- 13 recreational beaches; 9 sea turtle nesting beaches; 13 CRBA areas.
VA- 6 miles of sea turtle nesting sites protected.

Example of outcome data collected:

The Rhode Island Coastal Resources Management Program (RICRMP) *has had a computerized coastal permit tracking program in place since 1987. This system was upgraded and paper permit files dating back to 1971 are now in the computer system. Unfortunately this permit tracking system is of minimal value in assessing program outcomes in the area of resource protection at this time. The CRMP tracks permit data by activity type but not by location such as beaches, bluffs, rocky shores) So one cannot identify extent of permitted activity by resource area. (See* ***Table 17-A)*** *Likewise, the permit database does not reflect setback or pedestrian access or vehicular access restrictions. On a positive note, CRMP policies prohibit new development on undeveloped and moderately developed barrier beaches, and data show that at least 65% of the barrier beaches have had no new permitted development since 1971. (See* ***Table 17-B)*** *Likewise no new shoreline stabilzaitions were permitted on undeveloped and moderately developed barrier beaches since 1971. Permit data in Tables 15-A and 15-B do not reflect setback requirements which act to place development away from shoreline, erosion areas, and valuable habitat areas.* ***Table 17-C*** *indicates no outcome data on pedestrian or vehicular access restrictions.* ***Table 17-D*** *shows several special regulation areas covering setbacks from resource features, erosion setbacks, setbacks from dunes, and areas restricted from development based on adjacency to state waters classified as type 1 and 2.*

Table 17-A: State Permit Actions- RI

REGULATORY ACTION	CRM Council Permit	CRM Council Permit (Assents)
YEARS	1971-1977	1971-July 1996
Upland Jurisdiction	CRMC Juris(b)	CRMC Regulatory Jurisdction (b)
Permit Applications	~600 (a)	unknown
Permits Approved	~ 97% (a)	14,762-- 95% in Tier 1
Subdivisions		312 (2%)
Dwelling Units		3950 (27%)(c)
Commercial/Indust Dev.		539 (4%)
Maintenance R/C/I		762
Accessory Blds.		1073
Recreation-Pools		208
Dredge/Fill		359
Roads		467
Marina Activities		778
Docks		2504 (17%)
Dock Maintenance		389
Discharge/Waste Fac.		477
Energy facilities		200
Demolitions		30
ISDS*		559
Landscaping		149
Federal Consistency		119
Other (d)		572
Shoreline Stabilizations		1066 (7%) (e)
Nonstructural Shore Proj		238 (1.6%) (f)
Violations Cited		no data
Habitable Structures		
destroyed by storms		no data
permitted to rebuild		no data
denied to rebuild		no data
relocated		3 Claims Approved under Upton Jones for demolition or relocation

Key: *ISDS- Individual Sewage Disposal Systems
(a) 125 approved in FY1977 only (FEIS, p. iv). Approved after modifications suggested by council/staff to minimize adverse environmental effects. (b) Tier 1 -200 ft. inland of coastal features including beaches, dunes, bluffs, rocky shores and other shoreline feature areas such as wetlands. Tier 2- the inland extent of 7 types of activities. (c) 1715 new, 1703 alterations to DU. (d) Other includes buffer alterations (74), wetlands determinations (38), mosquito Ditches (18), ROW (10), and other (e) Shoreline Stabilization Structures: groins, bulkheads, rip rap, seawalls, retaining walls, and repairs. (f) Cover beach nourishment/conservation restoration activities (224) and non-structural shoreline protection/vegetation (14) Sources: Computer printout, Application Statistics by CRMC Project types, provided by Jeff Willis, August 29, 1996. Also Mark Crowell, Upton-Jones Data Base.

Table 17-B New Development & Shoreline Stabilization Permits by Barrier Beach Designations- RI

Barrier Type	% of Beach Shore	New Development Permits 1971-1996	
Undeveloped	65%	Prohibited	None(a)
Moderately Developed	(part of 35%)	Prohibited	None(b)
Developed	35%	Allowed	Unknown
Barrier Type	% of Beach Shore	New SS	Permits 1971-1996
Undeveloped	65%	Prohibited	None (c)
Moderately Developed	(part of 35%)	Prohibited	None (c)
Developed	35%	Allowed	Unknown

Note: Total Beach Shore is 27.3 miles

Key: New Development- residential, commercial, industrial development

SS- structural shoreline stabilizations

(a) neither public nor private development since 1954.

(b) no new development allowed.

(c) no new structural shoreline stabilizations allowed

Sources: 309 Assessment, Jeff Willis

Table 17-C: Pedestrian and Vehicular Access Restriction On Private Lands Protecting Habitat Areas- RI

REGULATORY ACTION
Beachfront Boardwalk Permits 1971-1995: Unknown, no permit required if meet state guidelines. **Vehicular Traffic Restriction Areas** as of 1995: Many, no data base. A. Coastal Beaches and Dunes (210.1): - vehicles prohibited on dunes except on tails marked expressly for vehicular use. - vehicular use of beaches (where not otherwise prohibited by private/public management programs) required DEM Use Permit through DEM Division of Enforcement. Vehicles shall not be operated across protected (lifeguard) swimming beaches during protection period. B. Barrier Beaches (210.2)- Prohibit: - vehicle access across back barrier flat to access Salt Ponds - vehicles in vegetated areas anywhere on barrier C. Dunes (1995 Addendum- New Section 210.7- Dunes)-Prohibit: 1. vehicles on dunes within 75 ft. of dune crest except on marked trails. 2. alteration of foredune zone adjacent to Type 1 and 2 waters, except for protection/restoration, no hard structures. **Habitat Protection Areas** as of 1995: Many, no data base. Source: Jeff Willis, RICRMP Regulations.

Table 17-D Regulated Areas- type of regulated area, acres, shoreline miles, resources protected- RI

TYPE OF AREA	Acres/Shoreline Miles/Resources Protected or Benefit
A. Coastal Setback	acres-nd Mile- 100% All 700 miles of tidal & 311 miles of coastline setback at least 50 feet and up to 200 feet inland in some areas to protect coastal features.
B. Critical Erosion Areas	Acres-nd Miles-nd No data on percent of total 311 mile of coastline designated critical erosion areas. Areas designated and mapped based on 30 yr. erosion rate setback for residential and 60 yr. erosion rate setback for commercial/industrial. Table of required setback depths based on erosion category A, B, C, D.
C. Dunes Construction Setback	Acres-nd Miles-nd No data on miles of beachfront covered. setback based on edge of existing development as measured by utility lines and landlord walls: Misquamicut Beach- #miles-nd Coast Guard Beach- # miles-nd Sand Hill Cove- # miles-nd
D. State Waters Classification	Type I (Conservation) and Type 2 (Low Intensity) Acres- 3300 Miles- covers 70%-75% of the shoreline and development regulated along this entire shoreline area.
Sources: FEIS, RICRMP Regulations	

ADOPTED PLAN OUTCOMES

* Most states with approved local comprehensive, land use, or coastal area plans provided information on the number of local plans the state has approved. Otherwise, no statewide data was available on the results of local plan implementation such as natural resource protection areas, local setbacks, land use designations, and changes to land use or zoning. Connecticut CZM illustates this outcome data deficiency. (See Below)

* For the states with adopted SAMP or other specialized plans, none of the following outcome measures are available: 1) aerial photo interpretation of on-the-ground changes since plan adoption; 2) periodic physical surveys of areas protected or managed under enforceable plans; 3) state and local permit data on activities permitted within approved plan areas, area and linear miles affected by approved permits and consistency of permitted activities with plan objectives. For public-held lands, there is some limited data on actions taken such as dune revegetation, but no data on results from such actions. (See under State Coastal Land Management and Acquisition section below) Only 2 of the 13 states with adopted SAMPs provided outcome data- Guam and California. (See page 43 for the Guam *Recreational Water Use Management Plan)*

The California Malibu/Santa Monica Mountain (SMM) Transfer of Development Credit (TDC) Program is summarized below. In 1979, Coastal Conservancy and CCC developed TDC program requiring, as a permit condition, that proposed subdividers or builders of multifamily housing units extinguish or retire the development potential of comparable existing undeveloped parcels prior to the creation of new parcels or additional units in density. The purpose was to eliminate small undeveloped and poorly sited parcels that, if built, would increase erosion, runoff, and landslides. OUTCOME: By 1989, over 700 parcels of land were placed under open space easements or offers to dedicate open space easements in the SMM area. (Assessment, p.55)

* Only 3 of the 14 states with adopted plans affecting state lands provided outcome data. This include: OR- Territorial Sea Management Plan with Rocky Shore Strategy; PA- 8 approved local plans under Bluff Recession and Setback Act with setbacks covering 50 miles or 94% of bluff-front. FL- 500 miles of beach under state erosion plan; 100 miles of beaches restored. Other states provide data on number of plans and areas covered but no results. For example, NY data shows 2 erosion management plans approved covering 25 miles or 20% of beaches.

Examples of outcome data collected:

*As indicated in **Table 18-A**, most (35 out of 41) of coastal towns and boroughs in Connecticut have adopted Municipal Coastal Program (MCPs) consistent with the CCMA policies and use guidelines. They contain long-range land use plans for coastal development and conservation, as well as implementing local zoning and subdivision regulations. Most have established setbacks from sensitive coastal resources and the high tide line. Through Municipal Coastal Site Plan Review (CSPR), municipalities regulate development between MHW and coastal boundary. There are no statewide data on local land use plans or local zoning and subdivision regulations or results of local implementation in Connecticut*

Table 18-A: Local Comprehensive Land Use Plans and Regulations, & Other Special Area Management Plans- CT

YEAR	1995	1995
COASTAL GOVERNMENT	MUNICIPALITIES (Towns and Burroughs)	
1. Number in CZ	41	(36/4)
2. Number with Approved Plans (Municipal Coastal Programs)	35*	
3. Number with Setback Regulations (Setbacks from beaches/dunes)	ND (a)	
4. Number with Dune Management Plans Acres Protected/Restricted Use	ND (b)	

KEY:
NA- Not applicable
ND no statewide data.
* Local participation is voluntary. Of 6 not participating, three located along Long Island Sound: Madison, Greenwich, and East Haven
(a) Most towns have setbacks from sensitive coastal resources (such as wetlands) and the high tide line required by zoning and/or subdivision regulations. But few have setbacks from the beach.
(b) CZM has provided assistance the locals for development of dunes restoration plans
Sources: 309 Assessment p. 16. Mary-Beth Hart, CZM staff.

The **State of California** utilizes state goals, policies and guidelines with both state and local implementation. Local implementation is through adoption of Local Coastal Land Use Plans which 83% of the localities have adopted. All require either setbacks or case-by-case construction standards. However, no statewide database to determine effectiveness.

Table 18-B: Local Comprehensive Land Use Plans/Regulations, Other Special Area Management Plans- CA

YEAR	1995	1995
COASTAL GOVERNMENT	CITIES/ COUNTIES/Total	LCP Segments(a)
1. Number in CZ	58 15 73	126
2. Number with Certified Local Coastal Land Use Plans (LUPs)		105 (83%)
3. Number with Certified Implementation Plans		88 (70%)
4. LCPs Certified and Issuing Permits		82 (65%)
5. Geographic Area Covered by Certified LCPs		1,387,129 acres (86% of CZ)
6. LCP Amendments Reviewed		738
7. Areas of Deferred Certification		42
8. Number with Beachfront Regulations		All with beaches*
9. Number with Bluff Regulations		All with bluffs*
10.. Number with Dune Management Plans Acres Protected/Restricted Use		unknown*
11.. Number of SAMPs Acres Protected/Shoreline Miles		unknown*
12. Number of Environmentally Sensitive Areas Resource Protection Areas in beaches/dunes/bluffs/rocky shores Acres protected/Shoreline Miles		unknown*

13. Malibu/Santa Monica Mountain Transfer of Development Credit Program
Results- +700 parcels placed on Open Space Easement (as of 1989) avoiding erosion, landslides on these small undeveloped and poorly sited lots.
KEY:
unknown- no statewide database.
(a) The 73 coastal jurisdictions are divided into 126 segments for purposes of LCP planning.
* All cities/counties with certified plans have provisions which meet state goals, policies and guidelines regarding beaches, dunes and bluffs and significant resource areas. However, some require setbacks, other have case-by-case siting/construction standards. No statewide database.
Sources: Local Coastal Planning Program Annual report FY 1994-1995, p.16

Guam has a single layer of government. All plans are island-wide. There is insufficient data in **Table 18-C** to make a determination of effectiveness of the State land Use Plan or State Seashore Protection Plan or the Territorial Parks System. Guam has, however, adopted a Recreational and Water Use Management Plan for which data indicates that a 6 miles is protected and competing use conflicts managed.

Table 18-C: *State* Comprehensive Land Use Plans and Other Special Area Management Plans- Guam

Planning Tool	% of Coastline Covered (excluding federal lands)	% Guam Total Acreage/land Area (Guam CZ)
1. State Land-Use Plan	100%	100%
(a) Conservation Districts	nd	nd
(b) Habitat Protection Areas	nd	28,197 acres (21%land area)*
2. State Seashore Protection Plan	100%	10 fathom contour-10 meters inland
3. SAMPs		
(a) Flood Hazard Zones	nd	nd
(b) Recreational and Water Use Mgt. Plan **		
4. Territorial Parks System		
(a) Natural Preserves	nd	nd
(b) Conservation Reserves	nd	nd

KEY:
nd- no statewide data.
* Island wide- includes upland areas, not just shoreline also includes both Guam Government and federal lands.
** A 6 miles stretch along coast and in water which addresses users conflicts along beach and in waters. Bird nesting areas identified and protected, Manahac fish-runs protected. Cannot operate jet ski except in management plan areas. Plan adopted as part of GCMP in 1990/91. Provides for "use zones" for certain water activities in planned areas, required buoyed areas for jet ski type vehicles and mechanized vehicular closure during predictable Manahac runs. Minimum operating age of 16 years for all mechanized water vehicles. Jet skis can only be operated in planned areas– two such areas adopted, third area finalizing plan. In first area planned, Agana Bay to Piti, encompasses 6 linear miles of coast to a distance varying from two hundred yards to half a mile. The second area, Cocos Lagoon, is a triangular shaped lagoon 3 miles long on the land side, extending 2 miles seaward. The third area is Apra Harbor, which is Guam's commercial port, the Navy port and Guam's Harbor of Refuge.
Sources: Michael L. Ham.

STATE COASTAL LAND MANAGEMENT AND ACQUISITION OUTCOMES

* All 29 coastal states own state parks along the shoreline that encompass one or more beach, dune, bluff or rocky shore. Only 17 states have inventory data on their state coastal land holdings such as number of shoreline miles in state parks or percent of shoreline in public ownership. Five (5) states do not have information on the total number of beach miles. Five (5) states do not known the number of state coastal parks. Ten (10) states do not know the number of beachfront coastal parks they own. Twelve (12) states do not have information on the miles of state coastal park lands they own. Eleven (11) states do not know the number of miles in state coastal lands.

* Several states are active stewards of their public coastal land holdings. Stewardship outcome data is scarce regarding: 1) number of accessways, marked trails, boardwalks, and dune crossovers; 2) dune restoration projects measured in acres, miles of shoreline involved, state funds; 3) beaches restored or renourished as measured in cubic yards, beachfront miles, state funds; 4) number of shoreline stabilizations installed with acres and shoreline miles affected as a counter-indication to stewardship; and 5) acres, shoreline miles in state coastal lands designated as conservation, preservation or protection areas and aerial photo interpretation, periodic physical surveys to verify condition of resources.

* Of the 14 states which use boardwalks or dunes crossovers within their state coastal parks to guide pedestrian traffic over fragile beach and dune resources, 12 have provided limited data on the number accessways installed (See **Table 14**). However, this data is of limited use without additional data which correlates access provided within each state park against length of shoreline or unmet access needs.

* Of the 13 coastal states which employ dunes creation on state beachfront parks to repair and enhance the natural functions of their state-owned beach and dune systems, 9 have provided limited data on the number of projects and/or miles of beachfront covered. (See **Table 14**). This information is of limited use in determining effectiveness, since there is no data which correlates need for dune restoration against projects completed or project results.

* Of the 17 coastal states which have used beach nourishment or renourishment as a management tool, 14 state have very limited data on the number of projects and/or miles of beachfront renourished. There is almost no state data on cubic yards of sand involved, costs, or long-term results of these projects. However, 15 states involve beach nourishment projects sponsored by the USACE and there is some data on federally-funded beach nourishment projects (**See Appendix A, National Context Factors).**

* Eleven (11) coastal states have chosen to armor or to repair existing armoring structures in high erosion areas. 15 state have had federal USACE shoreline protection projects built along their coastlines. As with beach nourishment projects, data is very scarce. (See **Table 14**) However, the fact that over 1/3 of the coastal states employ armoring on state-held lands indicates the policy priority preference for protecting upland structures and infrastructure in such areas.

* Of the 26 coastal states which have designated natural resource protection areas, all have some limited data on the number of areas protected, the type of species protected, the type of resource area protected, and/or the number of acres protected. (See**Table 14**). There is a need, however, for data on the value or condition of the habitat protected and the results of the protection activities in order to assess program effectiveness.

* Of the 21 coastal states which are utilizing acquisition to purchase additional valuable coastal resources, 15 states provided some data on the number of properties and acres acquired. Most are coastwide or statewide acquisition data. (See **Table 13**) For states with multiple coastline resources, data are not broken-down by beaches, bluffs or rocky shores. Very few states provided data on amount of money spent. There is need for data which can be used correlate acquisition of coastal lands versus all state lands acquired and to determine the relative priority of coastal land acquisition in the state's overall land acquisition program.

Example of outcome data collected:

*The **Massachusetts CZM Program** illustrates the limitations on outcome data available to assess program effectiveness. About 25% of the Massachusettes coastline is in public ownership with only 5% being in state-ownership (See **Table19-A**). There are 18 coastal parks covering 63 linear miles or 33,064 feet. Five coastal park management plans are in progress covering 5,000 acres. (See **Table 19-B**). There are no outcome data on pedestrian access restrictions. There has been one federal/state sponsored beach nourishment project covering 2-3 miles, and dunes have been restored. (See **Tables 19-B** and **19-C**). The Rivers and Harbors Program funds dune restoration, beach restoration, and armoring projects-- no data were available, however, on projects funded or project results (See **Table 19-D**). The state has 14 designated Areas of Critical Environmental Concern covering 75,000 acres, but no data were provided on types of resources protected. Outcome indicator data show that 2,250 acres were acquired by state agencies (See **Table 19-E**).*

Table 19-A. State Coastline Ownership and Direct Land Management- MA

OWNERSHIP	LINEAR SHORELINE MILES
Total coastal miles	1,500
Public-Owned	~25%
State-Owned	~5%
Total Beachfront miles	222 miles of barrier beaches
Public-Owned	ND
State-Owned	ND
Total Rocky-Shore	ND
Public-Owned	ND
State-Owned	ND
Total Bluffs	ND

Key: ND- no data Source: Deirdre Buckley

Table 19-B: State Coastline Ownership and Direct Land Management of State Parks- MA

MANAGEMENT	COASTAL NATURAL RESOURCE AREA
Activity	COASTAL FRONTAGE
# Parks	18
# MILES	63.46 miles
# FEET	335,064 feet
# Boardwalks	ND
# Park Plans	5 coastal park mgt. plans completed = 4,673 acres
	5 coastal park beach plans in progress = 5,000 acres
# Dunes Restored	Yes- ND
# Beaches Renourished	2 - 3 MILES
# Protection Areas/Acres	14 ACECs = 75,000 acres

Key: ND- no data ACE'Cs- Areas of Critical Erosion Concern
Source: Deirdre Buckley

Table 19-C: Beaches Restored/Nourished/Renourished - MA

YEAR	PROJECT	MILES OF BEACH	CUBIC YARDS
1970 - 1996	Revere Beach	2 - 3 miles	ND

Note: USACE sponsored. There are several private projects and sand/material placement on beaches.- Jim O'Connell
Key: ND-no data
Source: Deirdre Buckley

Table 19-D: Dunes Restored and Shoreline Armored- MA

YEAR	PROJECT	MILES OF BEACH	CUBIC YARDS
1970 - 1996			
Dunes restored	Yes under Rivers and Harbors Program- No data		
Shoreline Armored	Yes under Rivers and Harbors Program- No data		

Source: Deirdre Buckley

Table 19-E: Coastal Lands Acquired- MA

Coastal Acquisitions: Open Space Bond Bill	
Year:	1978 - 1996
DEM	
Acquisitions:	
Acres/Linear Miles	2,100 acres/ no data on miles
Resource Area	coastal frontage
Acquisition Tool	Bond issue
Expenditures	36 million/
	awarded $70 million more through
	Open Space Bond Bill in 1987 and 1996
DFWELE	
Acquisitions	
Acres/Linear Miles 150 acres	
Resource Area	coastal frontage - habitat protection
Acquisition tool	Bond Issue
Expenditures	3 million

MDC
plans to restore Boston Beaches ; 5 year revitalization project , $30 million

DCS
provides grants to municipalities to protect open space through Self-Help and Urban Self-Help Programs. Also DCS administers federal Land and Water Conservation /fund grants to targeted municipalities. To date only 273 acres of coastal frontage has been acquired through 17 acquisition project in over 20 years by local municipalities. Only 16 cities and towns have received grants - mostly in the Cape Cod/Islands region.
Source: Deirdre Buckley

7 CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Prior to enactment of the federal CZMA, state efforts to address protection of natural shoreline features such as beaches, dunes, bluffs and rocky shores were highly variable. State coastal management programs (CMPs) developed since passage of the CZMA were designed specifically to balance resource protection and development. State coastal programs have resulted in more attention to issues such as erosion, sea level rise, and cumulative adverse impacts resulting from development on receding beach and bluff shorelines and sensitive natural habitat areas. State CMPs have been at the forefront in addressing shoreline use conflicts such as the demand for shoreline armoring to protect existing upland structures to the detriment and loss of natural beach systems. Beach nourishment has been promoted by some coastal states as an alternative to continued loss of developed recreational beaches through shoreline hardening. Likewise, some coastal states have funded research into sand loss from inlet dredging and have demanded that beach quality sand from inlet dredging be placed on down-drift beaches. Whereas excavation of sand for coastal development was a common practice in the past, state CMPs prohibit such practices today and wage educational campaigns on the importance of protecting stabilized dune systems.

State CMPs serve as the institutional focus for addressing ongoing competing public and private demands for the use of our limited and sometimes fragile coastline resources. Our understanding of natural shoreline processes and the impacts of human development on these processes has grown. Today, we are no longer building as close to the shoreline. The development that does occur is better built to withstand coastal storm events. Efforts are made to guide access across fragile vegetated dunes. We are becoming better stewards of our natural coastal heritage through state CMP efforts. Balancing private property rights with natural resource protection goals remains a challenge.

The national objective of protecting coastal resources is being achieved through implementation of federally-approved state coastal management programs. State CMP efforts are effective overall in addressing protection of beaches, dunes, bluffs, and rocky shores, given that the CZMA requires states to balance competing needs and demands such as protection of properties from hazard risks and promotion of recreational use of the shoreline. Determination of CMP effectiveness has been based on process indicators and case examples. Process indicators such as state regulatory setbacks to keep development away from the immediate shoreline were used to determine program effectiveness. Throughout this report and in the appendices are 31 case examples which illustrate and document ways state CMPs are effectively protecting natural shoreline resources.

Coastal states are utilizing 26 widely varying tools to achieve resource protection including regulatory setbacks and controls over shoreline development in combination with planning, stewardship of state lands, coastal land acquisition, and research and public education about shoreline processes and human interaction. All but three coastal states identified protection of natural resources and/or minimization of loss of life and property from coastal hazards as a high priority management issue. Although all coastal states own coastal properties, only three use state ownership and land management as the primary tool. Of the twenty-five tools identified with beach and dune protection, the fewest tools used by a state is eleven and the most is twenty-three. Of the thirteen tools related to bluff and rocky shore protection, the fewest tools used by any state is five and the most is eleven.

Regulatory controls are the most significant tools employed nationwide to protect shoreline resources, since the majority of the oceanfront shoreline is in private ownership, migrating and subject to development pressures. Protection is achieved through setbacks; regulation of shoreline development and shoreline stabilizations; restrictions on pedestrian and vehicular access; habitat protection; and permit compliance/permit tracking systems. Setbacks are particularly effective-- acting as natural buffer areas and reducing hazard risks. Planning tools, when combined with regulatory, improve natural resource protection by offering either long-range vision or site-specific goals for the protection and

development of selected coastal areas. Stewardship of coastal lands, through state land management and acquisition, is also an important component of all state coastal programs. All coastal states own state parks along the shoreline, and most have natural protection areas and guided accessways. Many states have also acquired additional coastal land holdings.

States are upgrading their CZM programs. Coastal zone management is a growing and changing process meeting changing needs. As state CMPs recognize problems or management gaps, they take corrective action. States have made hundreds of significant changes to their programs. This study has documented over 60 significant changes in the way coastal states protect their natural shoreline resources. Most of these program changes involve alteration of the state CMP regulatory or planning tools, such as more stringent shoreline development setbacks and limitations on the use of shoreline stabilizations. States are giving greater consideration to natural shoreline processes, even when addressing other concerns such as the need to protect developed eroding shoreline using structural measures. Although changes complicate assessment of program effectiveness, a review of these changes could serve as an alternative methodology for assessing CMP effectiveness.

More systematic resource protection is occurring through regulatory reviews. State coastal management programs are providing more systematic, extensive and intensive planning and regulatory review of projects along the shoreline. This regulatory review is minimizing adverse impacts of improper development and erosion on natural systems and adjacent properties and structures. Greater attention is being given to cumulative effects of individual permit decisions. More states are measuring erosion rates and establishing construction setbacks. Concerns about the adverse long-term effects of shoreline armoring on natural beach sand transport are being addressed and opportunities are being taken to employ nonstructural solutions to coastal erosion. As a result, less inappropriate development is occurring in hazardous areas such as migrating beaches and eroding bluffs.

There is insufficient nationally compatible outcome data to determine on-the-ground effectiveness. Due to the scarcity of outcome data, it is not possible to determine the on-the-ground effectiveness of state CMP regulatory, planning, land management and acquisition programs. Regarding regulatory data, most coastal states have computerized permit tracking systems. However, no state maintains a statewide database on the miles affected, the area affected, or the resources affected by state or local coastal permits; or the results of pedestrian access and vehicular access restrictions and protected habitat areas. States with local plans tend to have information on the number of plans approved. However, the data stops there. Only some states have inventories of their coastal land holdings-- such as number of shoreline miles in state parks or percent of shoreline in public ownership. Even states that are active stewards of their public coastal land holdings, do not routinely document accessways installed, dunes restored, beaches restored, and other protection results. Coastal states which utilize acquisition have some data on the number of parcels acquired or acres of coastal lands acquired. However, for most states, these data are not categorized by type of resource area acquired, and very few states have data on amount of money spent or acquisition priorities. Therefore, determining "effectiveness" of state coastal programs in protecting natural coastline resources based on *on-the-ground outcome indicators* is elusive. Determining the "effectiveness" of state coastal programs in protecting natural coastline resources based on *process indicators* and case examples is more possible, but still difficult. Case examples can be effective in illustrating how a management tool has been implemented in a certain geographic area and the results of such implementation.

Competing demands for the use of the shoreline and competing government policies continue to require balance, so the dilemma remains. State CMPs continue to face decisions regarding competing demands for recreation and tourist development, protection of existing threatened properties and the rights of private property owners versus public health and safety. Shrinking federal and state dollars for state CMP administration, coupled with increased demand and expectations for CMP services, are long-term concerns for coastal programs. Several federal agencies, state CMPs, local coastal governments, and other non-profit organizations play a role in managing our nation's coastline resources. Inconsistencies between certain federal agency programs and state CMP objectives are ongoing concerns. For example, the FEMA flood insurance program and the federally-funded shoreline

protection projects of the USACE achieve objectives which undermine some state CMP natural resource protection objectives. The unique role of state coastal zone management programs has been and continues to be to focus attention and resources on improving the state and local land use controls and other tools to minimize the adverse impacts on natural resources.

Recommendations

Develop a computerized CZM database - NOAA should seek funding from Congress to establish a computerized monitoring and tracking program for state and federal agency CZM activities, the results of which should be published in a biennial state-of-the-coast report to Congress. This should include a computerized coding system and an information tracking and recovery system for all information submitted by coastal states. NOAA should prepare up-datable state CZM program summary files for each coastal state with information about the state program, periodic changes to the program, program activities, CZM projects undertaken, results and reports produced.

Share Information Through the Internet - NOAA should create a home page on the Internet and a CD-ROM of the National CZM Effectiveness Study and other CZM databases.

Incentives for Coastal States to Refine and Expand their Process and Outcome Data Collection and Record Keeping - NOAA should seek funding from Congress to form a coastal states task force with the objective to change the coastal states reporting requirements under 306, 309, and 312 to better address results of state CZM activities and their effectiveness in meeting state and national CZM objectives. This should include accepted methods for organizing, collecting, storing, and reporting accurate and precise data on program activities and results which include trend data usable in future assessments of CZM effectiveness.

NOAA/OCRM should also encourage coastal states to: a) improve their daily record keeping and yearly reporting to NOAA/OCRM on program implementation and results; b) develop and refine computerized permit tracking systems regarding permitted activities and refine the individual permit entries to include data on type of project, area and resources affected, length of shoreline affected, size of project, permit restrictions/conditions and other data which, when analyzed yearly, could assess the individual and cumulative impacts of projects permitted along the coast; c) monitor, collect and report on local implementation and results for states that delegate implementation to local governments; d) explore the use of in-depth case studies as a way to provide more meaningful explanations of how CZM works and the on-the-ground results, rather than relying on case examples and success stories; and e) explore the use of aerial photo interpretation for measuring long-term changes in develop and resources along the coast.

Utilize 309 Assessment Process to address issues associated with shoreline change. OCRM and the Coastal States should continue to utilize the section 309 Assessment process to address substantive issues associated with the protection of natural coastal systems. Significant changes to state coastal programs such changes in activities exempt, shoreline armoring allowed and the landward extent of regulatory jurisdiction should be carefully scrutinized for their long-term effects on natural coastal systems.

Federal agencies should monitor changes to the coastal environment and report on changes every 5 years. Congress should fund activities to monitor changes along our nation's coastlines including: 1) federal level aerial surveillance and photo interpretations of shoreline development and changes in development patterns; 2) USACE to conduct follow-up national shoreline studies at least every ten years on erosion, shoreline armoring, beach nourishment, and public ownership of the coast; 3) USDOI to compile data on coastal endangered species and habitat loss/protection changes and role of federal and state agencies in this effort; 4) NOAA to compile data from U.S. Bureau of the Census on population changes in coastal counties; 5) USDOI to compile data on private development occurring on designated CBRAs and federal/state agency actions affecting CBRA designations and implementation success.

Indicators of effectiveness. To evaluate state CZM program effectiveness in protecting beaches, dunes, bluffs and rocky shores, the following "*indicators of effectiveness*" and "survey methods" should be used:

Regulatory Program Outcomes:

1. No further or reduced rate of encroachment into coastal resource areas.
2. No further or reduced rate of hardening of undeveloped beachfronts through shoreline stabilizations.
3. Controlled shoreline accessways.
4. Healthy and maintained intact natural habitat areas along the coast

Adopted Plan Outcomes:

1. Achievement of Plan Objectives through implementation and monitoring

State Coastal Land Management and Acquisition Outcomes:

1. Extent of state land holdings in parks/preserves containing beach, dune, bluff or rocky shores.
2. Active public natural resources stewardship of coastal land holdings
3. Coastal lands acquired

Survey Methods- for collecting data and measuring outcomes starting with a baseline followed by time series or periodic updates:

(a) aerial photography interpretation;

(b) computerized permit data collection and analysis -- showing trends in permitted shoreline structures or shoreline stabilizations on the beach and dune system, eroding bluff, coastal hazard areas, coastal floodplain, or immediate shoreline.

(c) periodic physical surveys of the condition of coastal resources protection areas;

(d) shoreline mapping of controlled accessways; delineating shoreline acres and miles where pedestrian and/or vehicular access is restricted; delineating habitat protection areas.

(e) state and local permit data on activities permitted within approved plan areas, area and linear miles affected, and consistency with plan objectives -- such as protection of designated "coastal resource areas" or "natural habitat areas", dune restoration; inlet management to place dredged sand on downdrift beaches, and designated coastal hazard areas where development is prohibited.

(f) documentation of direct state or local actions undertaken-- such as miles/acres of dunes revegetation; cubic yards of sand transferred due to installation of inlet sand transfer plant; coastline acres and linear shoreline miles in state ownership with resources present; number of accessways, marked trails, boardwalks, dune crossovers and demonstrated public use; acres or shoreline miles in state coastal lands designated as conservation, preservation or protection areas; miles and acres and type coastal shoreline resource areas acquired by the state.

APPENDICES

APPENDIX A: NATIONAL AND STATE CONTEXT FACTORS

APPENDIX B: METHODOLOGY & SURVEY INSTRUMENT
B-1 Methodology
B-2 Survey Instrument

APPENDIX C: SUMMARY TABLES

APPENDIX D: CASE EXAMPLES

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APPENDIX A: NATIONAL AND STATE CONTEXT FACTORS

Factors affecting protection of coastal beaches, dunes, bluffs, rocky shores

State CZM programs for protecting beaches, dunes, bluffs and rocky shores are influenced by a variety of physical, social and economic context factors including: (a) the type and extent of the resource in a given state; (b) coastline erosion processes and storm events; (c) coastline ownership and development; (d) human interference with natural processes; (e) competing demands placed on natural coastal resources and state priorities for balancing these demands; (f) shared coastal management responsibilities between states, federal agencies and non-governmental organizations; and (g) the unique role of the CZM program in the state.

Type and Extent of Beach and Dune, Bluff and Rocky Shore Resources

Beach resources are present along portions of all coastal state shorelines, though the length and character of such beaches vary considerably. Sandy beaches can be categoried into three distinct types: barrier beaches, mainland beaches, and pocket beaches.The Gulf of Mexico and Atlantic Coast is characterized by a system of *barrier beaches* and a relatively wide continental shelf, as is much of Alaska. Barrier beaches are part of a complex integrated system of beaches, marshes, bays, tidal flats, and inlets. These beaches are constantly migrating, eroding and building in response to natural processes and human activities. *Mainland* beaches stretch unbroken for many miles, some low standing and prone to flooding, others backed by steep headlands. They received sediment from nearby rivers and eroding bluffs. Examples include Long Island, northern New Jersey and southern California. *Pocket beaches* form in small bays surrounded by rocky cliffs or headlands. The headlands protect the sandy alcoves from erosion by winter storms and strong currents. Pocket beaches are common in Maine and the Pacific Northwest. Other coastline variations are based on plate tectonics or type of wave forces. Difference and variations in beach and dune coastline systems within a state, between states and within regions are factors affect states enactment and implementation of certain beachfront management tools. [1]

Headland/rocky shorelines and bluffs/cliffs are present along the West Coast, the North East Coast, the Great Lakes Coast, and Territorial shores. These features are absent along the low elevation Southern and South Atlantic coastlines. The underlying geology of active tectonics, faulting and earthquakes or glaciers, ice gouging and rafting, or ice and strong wind determine shore stability and erosion factors which effect state management responses. [2] Eroding bluffs and cliffs of the Great Lakes states, creating beaches and dunes, are subject to highwater levels which, when driven by storm winds and waves cause flooding and lakefront deterioration.[3]

Table 1 provides the length of the US coastline, using NOAA, U.S. Department of Commerce data, that includes two measures, one of direct oceanfront miles where they cross bays and sounds and the other tidal shoreline miles which extend inland to the head of tidewaters or to a point where tidal waters narrow to a width of 100 feet. The national shoreline, as measured by the US Army Corps of Engineers, to the head of tidewaters, or to the point where tidal waters narrow to 100 feet is also shown. Percent of direct ocean coastline in beaches, rocky shores and bluffs is also indicated from state CZM program estimates. For 8 of the 29 coastal states, their entire ocean coastlines are sandy beaches with no rocky shores or bluffs. All other 21 coastal states have other beaches and rocky shores, backed by bluffs or sand dunes.

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[1]Beatley, Timothy, David J. Brower, and Anna k. Schwab. 1994. An Introduction to Coastal Zone Management

[2]Ibid.

[3]National Committee on Property Insurance. 1998. America's Vanishing Coastlines: A New Concern for the Voluntary and Residual Property Insurance Markets. p,23

Coastline Ownership

State jurisdictional ownership of beaches usually begins at mean high water and extends seaward. This leaves extensive dry sanding beach and dune systems in private ownership, except where governments have acquired beachfronts for recreation or preservation. Seventy percent of our nation's shoreline is in private ownership (excluding Alaska where 99% is publicly owned). As of 1970, three-fifths of the shoreline was undeveloped (excluding Alaska).[4] Development pressures vary depending on geography and climate issues. Inaccessible and hard to develop shorelines, such as rocky shores, are less prone to development than accessible sandy beach areas. A state's beach and dune management varies depending on the extent of public ownership. For the 20 coastal states (not including the islands or the Great Lake States), public owneship ranges from a high of 99% for Alaska to a low of 3% for Maine. For 11 of the 20 states, over 1/4 of the shoreline is in public ownership. (see **Table 1**).

Coastline Development, Population Growth, and Economic Pressures on Shoreline Properties

As early as the late 1800s, recreational tourism began along our nation's beaches. With the advent of the automobile, seasonal seaside resorts evolved. The summer homes and fishing villages of the 1940s and 1950s were transformed by the 1970s into "cities on the beach."[5] Today, due to population and economic pressures, over half of our nation's population lives within 50 miles of the coast and our nation's coastal zone is over four times more densely populated than the national average.[6] In addition to the retirees who migrated to the coast and other year round residents, tourists and conventioneers are demanding beachfront coastal resorts. This is most pronounced along our coastal barriers at high risk due to coastal flooding, hurricanes and erosion. Billions of dollars in private development and pubic recreation and infrastructure is invested on these unstable coastal barriers.[7] The demand for coastal waterfront property has lead to increased residential development pressures along our nation's coastal bluffs and rocky shores.

The persistent development along our nation's coastline had lead to destruction of coastal dunes systems and placement of structures in jeopardy from both short and long-term erosion. Shoreline development prior to the 1970s were frequently armored with seawalls, revetments, bulkheads or other shoreline stabilization structure to protect upland private and public investments from erosion. Such stabilization structures accelerated the loss of sandy beaches.[8] **Table 1** shows coastal county population change between 1970 and 1990. For 17 of the 29 CZM states, population growth was over 30% (major impact); for 4 population growth was between 10 and 29% (moderate impact); and for 8 population growth was 0% to 9% (minimal impact.)

The cost of purchasing oceanfront and waterfront properties along our nation's shorelines are considerably higher than for non-waterfront properties. Likewise, the value of such properties have increased at a faster rate. The seasonal beachfront cottages of yesterday have given way to much larger and more expensive developments, often high-rise multi-family condominiums. The result is intensive, extensive and expensive investments in known coastal high hazard areas. Barrier islands have become a magnet for retirees and vacation homes.[9] About half of all residential and non-

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[4]Ibid.

[5]Platt, Rutherford H. et al. 1987. Cities on the Beaches: Management Issues of Developed Coastal Islands.

[6]U.S. Department of Commerce, NOAA. 1990. 50 Years of Population Change along the Nation's Coasts: 1960-2010.

[7]Platt, Rutherford, et al. 1992. Coastal Erosion: Has Retreat Sounded?, p.12.

[8]Ibid., p.8

[9]U.S. Department of Commerce, NOAA, NOS. 1992. Building Along America's Coasts: 20 Years of Building Permits, 1970-1989. p.5

residential construction in the U.S. between 1970 and 1989 occurred in coastal areas. The most dramatic growth has occurred in the Florida and California.[10] Despite the environmental degradation associated with population growth, these shoreline areas remain in strong demand for commercial, residential, tourism and recreation.

Coastline Erosion

Coastal erosion, the landward displacement of the shoreline, is a normal process that has been going on for many years along most of our nation's sandy beaches. Gradual long-term erosion from normal wave action (of 1-3 feet per year) is accelerated by severe storm events during hurricanes and winter storms, sea level rise, the greenhouse effect; and man-made shoreline stabilizations. [11]

The only nationwide survey of shoreline erosion, published by the U.S. Army Corps of Engineers in 1971, estimates that at least 7% of our nation's coastline is critically eroding where properties are in imminent danger of collapse and 25% is experiencing significant erosion. [12] In addition to long-term erosion, many coastal states have experienced shoreline loss and property destruction through periodic storm events. Bluff recession is also a problem along the Great Lakes States.

The average rate of erosion is determined locally through historical shoreline records or shoreline modeling. A few examples of documented shoreline retreat dramatize the management urgency of coastal erosion. Cape Shoalwater, Washington has been eroding at the rate of more than 100 feet a year since the turn of the century. it's sparsely settled sand dunes have retreated an outstanding 12,000 feet, or more than 2 miles since 1910. [13] Most of the barrier islands along the east and gulf coasts are retreating landward by 1 to 10 feet per year--rates of up to 20 feet are not uncommon for specific locations.[14] Every coastal state is affected by shoreline change and erosion.[15] **Table 2** shows, by state, the amount of coastal shoreline threatened by erosion.

Sea level rise and land subsidence, as a contributer to shoreline erosion, are recognized problems along portions of our nations' coastline. If accurate, the long-term costs to protect existing development, shoreline stabilizations, and infrastructure would be staggering[16]

Coastal Storm Events

Coastal storms and hurricanes exacerbate long-term erosion, shifting the position of beaches and sand dunes and splintering and collapsing erodable bluffs. Rapid shoreline erosion caused by high storm surge and wave heights overtop dunes and damage beachfront buildings in harms way. Wave attack at the base of steep slopes, undercut and collapse overhanging banks and topple properties perched on such bluffs. Large tsunamis waves with speed and height have inflicted great damaged to California and Hawaii coastal areas. Between 1980 and 1995, 11 separate billion-dollar weather disasters struck coastal areas of the US: 9 hurricanes, 1 Nor'easter and 1 tropical storm resulted in over $46 billion in damages.[17]

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[10]Ibid

[11]Kaufmam, W., and O.H. Pilkey, Jr. 1983. The Beaches are Moving.

[12]U.S. Army Corps of Engineers. 1971. National Shoreline Study.

[13]National Committee on Property Insurance. 1988.

[14]Ibid

[15]U.S. Army Corps of Engineers. 1971.

[16]S.D. Lyles, L.E. Hickman., and H.A. Debaugh.1988. Sea Level Variations for the United States. 1855-1986: US Department of Commerce, National Oceanic and Atrmospheric Administration, Rockville, Maryland.

[17]U.S. Department of Commerce, NOAA, NCDC. Home Page http://ncdc.noaa.gov/publications/billionz.html

Human-Interference with Natural Processes

Beach systems, and sandy beaches in particular, are dynamic. They advance and retreat, but over several cycles maintain state of equilibrium. Beginning as early as the 1890s, a variety of human modifications to the physical shoreline have been undertaken to achieve objectives that run counter to the protection and dynamic equilibrium of natural beach/dune systems. This host of human interferences have adversely affected the natural sand transport system, destroyed or caused dune instability, and increased erosion. These include the damming of coastal rivers; dredged navigational channels with jetties for shipping and dredged tidal inlets for commercial fishing and recreational boating; the placement of dredged spoil and beach quality sand offshore beyond the littoral sand transfer system; shoreline armoring; sand-trapping structures such as groins and breakwaters; sand mining for development; and sand scraping practices. Efforts to recreate natural beach/dune systems include sand fencing and dune revegetation, beach nourishment, and inlet sand transfer.[18]

The *damming of coastal rivers,* to protect urban areas downstream from flooding and provide hydro-electric power, has trapped sediment that would normally feed coastal beaches. Sediment starved beaches occur most on the west coast, but some east coast beaches are also affected by river diversions. *Inlet dredging* to maintain established boating and shipping access through coastal barrier passes that open and close with storm events has, until recently involved disposal of dredge material offshore beyond the littoral sand transfer system. The loss of this sand to the nearby beaches has increased erosion. For major navigational channels, the installation of *jetties* to stabilize the such inlets results in trapping sand on the updrift side of the inlet and staving the downdrift beaches. *Offshore breakwaters* used primarily to stop wave action and create a quiet water area for safe boat moorings obstruct the free flow of sand along the coast and starve downstream beaches.

Shoreline armoring through placement of seawalls, revetments, bulkheads, or riprap to protect private oceanfront structures and public infrastructure from erosion has occurred at the expense of lost recreational beaches. These wave-resistant walls may withstand wave action and protect upland properties but rapidly remove sand from the beach and eventually fail or require more substantial armoring.[19] *Groins,* structures extending into the water to interrupt and accumulate sand on the updrift shore, also starves downdrift adjacent beaches. Most of our nation's urban oceanfronts have been armored, although the percent of our nation's beachfront/oceanfronts that has been armored is unknown.

Sand mining, the removal of sand from beaches, dunes, adjacent areas, or riverbeds near was common practice in many states for road construction and development fill. This resulted in a loss of sand and protective dune areas, making such areas vulnerable to coastal flooding from storm events and accelerating erosion. *Sand scraping,* the practice of moving sand accumulated at one portion of the beach to another to build back a dune or the practice of leveling sand in front of a beachfront development to provide visual access to the water, has been allowed in many states. The negative effects include unstable dunes and low-lying dune areas vulnerable to breaching in storms.

Three activities have been used to try to recreate the natural beach/dune system. Dune restoration through *Sand fences and dune revegetation* has been used to stabilize and re-build dune areas. This helps limit breaching and creation of new inlets during major storms. *Beach renourishment and period nourishment* has become a popular alternative to armoring, in attempting to artificially create or recreate a beach area through the importing of compatible sand and pumping/placing it on the eroded beach area. The flattened beach profile and wider beach width mitigates erosion

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[18] US Army Corps of Engineers. 1971 and Platt. 1992.

[19] U.S. Army Corps of Engineers. 1971. Shore Protection Guidelines. pp32-33

losses and storm-induced inundation. In certain high erosion areas, however, sand is rapidly washed away. Finding suitable sand source borrow areas also poses challenges. *Sand transfer facilities* which pump sand from updrift accumulation areas to downdrift beaches has ameliorated this problem. In Florida, for example, over 80% of the beach erosion on the state's Atlantic coast is estimated to be caused by 19 maintained inlets, most stabilized with jetties.

Balancing Competing Demands for Protection of Natural Resources with Protection of Private Oceanfront Properties and Supporting Public Infrastructure

Sandy beaches backed by dunes or bluffs, rocky shores and wetlands constitute the three types of natural shoreline features along our nation's coastline. The natural resource protection values of these features are often in conflict with social and economic values as reflected in shoreline use and development. State CZM programs were created, in part, to provide institutional mechanisms and management tools to balance the competing demands paced on these shoreline features.

The natural resource protection values of beaches and dunes commonly identified by state coastal programs include the first line of defense and protection of upland properties from storms and high tides; and wildlife habitat for marine life such as sea turtle nesting areas, bird nesting and staging areas, and endangered species habitat. Key use values of beaches and dunes are recreation, tourism and access to coastal waters. On the flip side of the coin, social and economic demands have also made oceanfront properties highly desired places for second-homes, resorts and year-round residences. Beachfront and bluff-front development built too close to the edge and now in jeopardy has led to shoreline armoring which has destroyed the natural beach/dune systems which attracted people to the coast in the first place. In addition, cutting and maintaining of inlets for recreational and commercial navigation has permanently disrupted the natural transport of sand along the beachfront, accelerating the loss of recreational beaches.

Coastal bluffs, sitting behind extensive or minimal beaches, have been thought of as excellent features for providing coastline vistas. In a few states, select bluff areas have been acquired and managed as natural resource protection areas or scenic vista areas. Most are managed as high erosion areas where development and other activities are regulated to minimize erosion risks rather than protect valuable natural resource features. The social and economic pressures for ocean vista developments have resulted in the siting of development along bluff recession areas in harms way.

Rocky shores, located within the inter-tidal zone, are recognized as high energy environments and valuable marine habitat. The inter-tidal areas are under state ownership an management. Although public access and recreational enjoyment of these areas has not been restricted, states are beginning to limit public access to avoid over-utilization and destruction of tide pool areas. Rocky shoreland areas have for the most part been resistant to erosion and therefore not managed as high hazard areas. Likewise, they have not been considered developable, though development often occurs immediately landward of these features.

Balancing such competing demands has become a key role of state CZM programs (see below). As our understanding of the impact (both individual and cumulative) of human activities on natural systems grows, coastal managers are looking for alternative management approaches to allow activities but minimize their negative impacts on resources of known public benefit. The U.S. is based on strong private property rights laws. The private property takings issue in the regulation of coastal land and water uses is of paramount importance in the development and implementation of coastal management tools. Over the years, states priorities in balancing resource protection and development have varied and altered. Today, coastal programs are required to justify their management decisions basing complex technical data sets. Refinements to shoreline setbacks, based on historical erosion rates, demands sophisticated and complex computer modeling programs.

Government has invested billions in public infrastructure along our nation's coastlines from highways and bridges to water and sewer systems to support mainly private development and some public facilities including military facilities, coast guard stations, hospitals schools and recreation facilities. Beginning in the 1980s, in recognition of the hazardous nature of barrier islands, federal and state agencies have begun to limit their public investments in such areas.

Shared Coastal Management

Several federal agencies have a long history of involvement with our nation's coastlines, all pre-dating the Federal CZM Act of 1972. Key federal players involved in activities affecting beaches, dunes, bluffs and rocky shores include the U.S Army Corps of Engineers, the Federal Emergency Management Agency, the U.S. Department of Interior/National Park Service/US Fish and Wildlife Service. Staring in 1972, the U.S. Department of Commerce/Office of Ocean and Coastal Resource Management became responsible for administering the Federal CZM Act.

The Army Corps of Engineers (COE) administers the 1) federal shoreline protection program through research, planning, design, construction management, federal cost-sharing; 2) authorized navigation channel dredging; and 3) federal permits for dredge and fill involving any construction or other activity which affects navigable waters including federal guidelines for beach nourishment and shoreline stabilizations. The COE Published the National Shoreline Study in 1971, and is working on analysis of Federal shore protection program for Congress.

The COE shoreline protection program covers construction projects for hurricane and storm damage reduction, beach erosion control, navigation, mitigation and recreation. Since 1930, Congress has authorized 137 projects or studies involving 19 of the 29 CZMA states plus 4 coastal states not in the CZM program. A total of 82 Federally-sponsored shore protection projects were constructed between 1950 and 1993 in areas of concentrated development experiencing severe erosion and/or property damage from storms. The projects protect 226 miles or less than 0.3 % of the 84,240 mile of tidal shoreline of the U.S. and only 8% of the 2,700 miles of COE identified "critical-erosion" coastline.[20] Of the 82 projects, 56 were large projects costing $1,177.3 million in 1993 dollars. The cost-sharing was 60% federal and 40% non-federal (state, locals, and private) sponsors.[21] These projects involve one or more of the following: 1) initial beach restoration, sometimes with dune filling; 2) periodic beach nourishment; 3)shoreline structures-groins, seawalls, revetments, breakwaters, bulkheads, or sand transfer plants; 4) emergency measures to repairs storm damaged projects. The significant shift from reliance on fixed structures in the 1950s to beach restoration and periodic nourishment in the 1970s by the COE, is based on a realization that fixed structures protect upland property but destroy recreational beaches. Artificial beaches as a primary means of shore protection has become a major component of the COE program. the concept of replicating the protective characteristics of natural beach and dune systems. However, beach renourishment is not without its critics. In 1983, 1 million square yards of sand placed on the beaches of Ocean City, New Jersey at a cost of $5.5 million. Within a few years, storms removed and redistributed much of the sand. [22] In 1993, the COE initiated an investigation and analysis of the benefits, environmental effects, and the existence of induced development resulting from Federal shore protection program. [23]The small percent of our nation's coastal erosion problem covered by the COE, leaves state CZM program with major responsibilities to cope with and address appropriate erosion responses. See **Table 3** for shoreline protection projects by state between 1950-1993.

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[20] U.S. Army Corps of Engineers. 1971.

[21] U.S. Army Corps of Engineers. 1994. Shoreline Protection and Beach Erosion Control Study: Phase I: Cost Comparison of Shoreline Protection Projects of the U.S. Army Corps of Engineers.

[22] Nordstrom, Pilkey et al. 1986. Living with the New Jersey Shore. Durham, N.C. Duke University Press.

[23] U.S. Army Corps of Engineers. 1995. Shore Protection and Beach Erosion Control Study: Economic Effects of Induced Development in Corps-Protected Beachfront Communities.

The COE navigation channel dredging program began with the Harbors Act of 1890. Since then Congress has authorized 830 navigation projects for channels for shipping, commerical fishing and recreational boating involving every coastal state, territory and commonwealth.[24]

The COE permit program for dredge and fill projects in navigable waters is subject to federal consistency provisions. Only one coastal state, Alaska, relies on the minimum standards contained in the COE regulations for placement of shoreline stabilizations. All other coastal states have their own state regulatory programs covering shoreline stabilizations and other activities over coastal waters.

The Federal Emergency Management Agency (FEMA) administers the Federal Flood Insurance Program that produces rate insurance maps and insures properties within the 100-year flood zone for local community participating in the program. Insured coastal structures, when damaged or destroyed, receive insurance claim payments to repair or rebuild. Critics have argued that, despite local code requirements, the NFIP promotes subsidized inappropriate development in coastal high hazard areas, impeding state management efforts to restrict new development and redevelopment in these areas.

In 1994, Congress required FEMA tro conduct an evaluation of the economic impact of mapping coastal erosion areas and then denying flood insurance for existing and new stuctures in such areas, establishing actuarial rates, and changes in the tax base of communities.[25] As of 1992, there were over 66,000 NFIP policies in effect covering structures in the hazard zone (V-Zone) .

Under the Upton/Jones Program 1988-1995, FEMA allowed for payment of flood insurance claims to demolish or relocate buildings imminently threatened by erosion. A total of 434 claims have been approved under this program. 73% for demolition. (See **Table 4** for claims by state). FEMA is currently conducting an evaluation of economic impact of mapping erosion hazard areas for Congress.

U.S. Department of Interior (DOI), National Parks Service (NPS) created and manages 10 National Seashores covering 592,627 acres and 4 National Lakeshores covering 228,716 acres **The DOI U.S. Fish an Wildlife Service (USFWS)** enforces federal wildlife and endangered species laws and maintains system of national wildlife refuges. In cooperation with states and local communities, USFWS identifies and protects beach and dune areas which provide nesting sites for endangered sea turtles and birds through limitations on sand fencing and beach nourishment during nesting season. Rocky shores, habitat for the Stella Sea Lion and other endangered mammals. There are several National Wildlife Refuges along our nation's coastline. These national wildlife refuges are managed by USFWS to preserve the natural beach/dune systems.

DOI/USFWS also administers the Coastal Barrier Resources Act of 1982 and Coastal Barrier Improvement Act of 1990. The purpose of the Act is to minimize loss of human life, wasteful Federal expenditures, and damage to fish, wildlife and associated natural resources. The Act restricts federal expenditures and financial assistance that have the effect of encouraging development on designated coastal barriers along the Atlantic, Gulf and Great Lakes shorelines. This includes prohibitions on National Flood Insurance, HUD assistance, public infrastructure, and other financial assistance. The system includes 582 units, comprising over 1.3 million acres and 1,276 miles of shoreline that are not publicly owned or otherwise protected. An addition 173 units of otherwise protected areas are covered under the 1990 Act which includes public barrier holdings in federal, state and local ownership. These areas include national wildlife refuges, national parks and seashores, state and local parks and conservation lands. (See **Table 5**)

The U.S. Department of Defense owns coastal properties within military bases, some significant tracts along the eroding coastline. The closing of certain bases and disposal of coastal properties will pose choices between sale for development or transfer for public preservation. [26]

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[24]U.S. Army Corps of Engineers, Institute of Water Resources, Table D, Unpublished Report.

[25] FEMA. Undated. "Section 577 of the National Flood Insurance Reform Act of 1994--"Evaluation of Erosion Hazards": Overview of Study Plan." (provided by Mark Crowell, FEMA)

[26]Platt. 1992.

Nonprofit conservation organizations have played a significant role in preserving certain coastal barrier lands. **The Nature Conservancy, the National Audubon Society and the Trust for Public Lands** and their partners have selectively acquired parcels for protection. Just over half of the shoreline of coastal barriers on the Atlantic and gulf of Mexico are protected through public or quasi-pubic ownership.[27]

Unique Role of States CZM Programs

All coastal states are involved with the protection of their natural resources through a variety of state and local management controls. 29 of the 35 coastal states, territories and commonwealths have federally-approved CZM programs. The management tools these states utilize to protect beaches, dunes, bluffs and rocky shore include regulatory, planning, direct land management, acquisition and other techniques. These tools are discussed in detail in this study. In most states, local governments participate through local land use controls. The unique role of state CZM programs has been the creation of unified state programs which articulates the conflicts among competing uses, the policies of the state and the balance or method used to resolve conflicts; and utilizes land use controls, both state and local, to manage shoreline uses.

State CZM programs have become increasingly involved in identifying the problems of eroding beach/dune systems and developing coordinated responses through statewide beach management and erosion control plans. States concern about adverse affects on downdrift beaches from federal dredging of navigation channels, offshore disposal of dredged materials, and loss of recreational beaches from shoreline armoring, has lead states CZM programs to take a proactive role in shaping state and federal policies and programs. In recognition of the adverse effects on recreational beaches from shoreline armoring. For example, the South Carolina CZM Program pushed for Congressional recognition that COE dredging of Charleston Harbor was causing severe beach erosion on the sand-starved downdrift beaches and led to the Folly Beach renourishment mitigation project.[28] The State of Florida passed legislation requiring that suitable beach quality sand from be inlet and navigational channel dredging be placed on the down-drift beaches and used federal consistency and state-funds to negotiate with the COE to place 1.4 million cubic yards of sand from St. Mary's inlet dredging on the down-drift beaches rather than losing the sand to the offshore system.[29] Several states have passed legislation limiting the use of new shoreline stabilizations, in an effort to protect beach and dune systems at the expense of private upland properties.

The inappropriate siting of structures on coastal barriers, in coastal flood zones and on erodable bluffs is a problem which state CZM programs inherited. Thus when the state CZM programs began in the 1970s, certain portions of our nation's coastline were already committed to intense development and other areas already zoned and platted for development. Shoreline erosion was a recognized problem, but land use controls were not well developed. State CZM programs would provide the testing grounds for land and water management to balance competing demands along our shoreline and minimize adverse impacts on valued natural coastal resources. State CZM programs would be at the forefront of the "quiet revolution in land use controls" and "integrated coastal management."

All states with significant beaches, dunes, bluff and rocky shore resources rank protection of these resources as a high priority. Most focus on the coastal hazard.

This project explores the CZM management tools developed, refined and employed to protect beaches, dunes, bluffs and rocky shores and the effectiveness of the management tools in

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[27]Ibid.

[28]U.S. Army Corps of Engineers. Water Resources Development in South Carolina. 1993. p.44

[29]State of Florida. Florida Castal Management Program. Best Projects Report. 1988. p.19

achieving national objectives. Included will be documentation of regulatory controls such as setbacks from beaches/bluffs, controls over shoreline stabilizations and the policy shift towards beach nourishment and shoreline retreat. Also include will be direct land management of beachfront parks, acquisition of beaches and coastal resource areas, and the use of planning and research tools such as beachfront management plans.

Financial Support

Federal CZM funds for State CZM Program implementation between 1974 and 1992 have amounted to $858, 849,000 for all program activities including Section 305-program development, Section 306-program implementation, Section 308-interstate grants, and Section 309-enhancement grants. CZM Section 306 Program Implementation Grants to individual states in 1995 ranged from a low of $600,000 to a high of $2.5 million for a given coastal state. [30] State spending of CZM funds for natural resource protection has varied depending on competing state priorities.[31]

Tables of National and State Context Factors

Table 1: Length of US Coastline, Population Change, Resources Present, Public Ownership
Table 2: Coastal Shoreline Erosion - Percent Eroding by State
Table 3: US Army Corps of Engineers Major Shoreline Protection Projects in CZM States 1950 - 1993
Table 4: Upton-Jones Coastal Claims Summary
Table 5: DOI- Coastal Barrier Resource System

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[30]Bill Millhouser, phone interview. U.S. Department of Commerce, Office of Ocean and Coastal Resource Management.

[31]Natural Coastal Resources Research and Development Institute.1990. Valuing Coastal Zone Management. p.11

Table 1: Length of US Coastline, Population Change, Resources Present, Public Ownership

State	Open Ocean Coastline miles (1)	Tidal Shoreline Miles (2)	National Shoreline Miles and % Critically Eroding (3)		% State Land Area % State Population in Coastal Zone (4)		Coast Pop. density 1990 (4) person per sq. mile	% Coast Pop Chg 1970-90 (5)	Presence of Natural Coastal Resources and Beach and Rocky Shore a Percent of the State's Open Ocean Coastline Beach, Bluff and Rocky Shore as Percent of Non-Open Ocean (CT & Great Lakes States) Shoreline (6)				% Open Coast Public (7)
	Miles	Miles	Miles	% CE	Area	Pop.		%	Beaches	Dunes	Bluffs	Rocky Shores	
AL	46*	607	352	9	6	12	171	27%	y-100%	n	n	n	5%
AK	6640	33904	47300	>1	67	85	1	89%	y-nd	?	y	y	99%
AS	126	126	nd	nd	100	100	607	72%	y-nd	n	y	y-nd	9%
CA	840	3427	1827	4	24	73	605	39%	y-nd	y	y	y-nd	47%
CT	0 (a)	618	270	9	47	62	887	8%	y-31%	Y-rare	y-25%	y-14%	20%(a)
DE	25*	381	226	12	100	100	338	22%	y-100%	y	n	n	75%
FL	1266*	8426	6266	5	100	100	228	90%	y-65%	y	n	n	nd
GU	108*	110	nd	3	100	100	637	57%	y-37%	n	y	y-63%	nd
HI	750	1052	nd	2	100	100	174	44%	y-25%	y	y-nd	y-nd	nd
LA	149*	7721	1943	2	37	49	171	16%	y-50%	y	n	n	20%
ME	228	3478	2500	>1	39	72	72	29%	y-10%	y	y	y-90%	5%
MD	32*	3190	1939	9	66	70	507	12%	y-100%	y	n	n	nd
MA	192	1519	1200	11	45	75	1272	5%	y-??	y	y	y-nd	nd
MI	0	3224	nd	nd	55	50	154	-5%	y-nd	y	y-nd	y-nd	30%
MS	44*	359	247	15	4	12	192	30%	y-41%	n	n	n	30%
NH	18*	131	40	5	12	32	331	67%	y-70%	y	n	y-30%	78%
NJ	125*	1792	469	26	76	90	1219	6%	y-100%	y	n	n	74%
NY	125* (b)	1850	638	47	37	84	858	-3%	y-100%*	y	y	y	nd (b)
NC	320*	2625	3661	15	19	11	75	39%	y-100%	y	n	n	nd
NM	184*	206	nd	nd	100	100	236	255%	y-nd	n	y	y-nd	nd
OR	362*	1410	500	13	20	38	82	46%	y-72%	y	y	y-28%	58%
PA	0	140	nd	nd	4	25	1701	-9%	y-19%	n	y-81%	n	20%
PR	311	700	nd	nd	12	100	856	30%	y-50%	y	y	y-nd	nd
RI	40	384	340	7	100	100	950	6%	y-68%	y	y	y	nd
SC	181*	2876	3063	2	26	24	114	57%	y-100%	y	n	n	42%
VI	nd	175	nd	nd	100	100	771	63%	y-nd	?	y	y-nd	nd
VA	200*	3315	993	26	22	62	423	40%	y-100%	y	n	n	nd
WA	171	3026	2337	>1	31	70	172	46%	y-35%	y	y	y-65%	nd
WI	0	820	nd	nd	19	39	177	0%	y-10%	y	y-72%	y-8%	nd
Total	nd	85770	31513***	nd	nd	44	nd	nd	y-29	y21 n8	y18 n11	y17 n12	nd

KEY and SOURCES:

* denotes where state coastline miles data differs from General Coastline miles data in US DOC,NOAA 1975. The Coastline of the United States

** New York- Atlantic Ocean only covered under this study *** Does not include the Great Lakes States or the Island Territories and Commonwealths.

(a) CT has no open ocean coastline. Data covers Long Island Sound (b) New York data covers open ocean coastline only. Great Lakes shoreline not included here.

nd- no data available ?- unknown

(1) Individual State CZM Profiles on Protection of Beaches, Dunes, Bluffs and Rocky Shores

(2) US DOC, NOAA. 1975. *The Coastline of the United States.*

(3) USACE. 1970. *National Shoreline Study.*

(4) Coastal Ocean Policy Roundtable, The 1992 Coastal Status report: A Pilot Study of the US Coastal Zone and its Resources, Tables 2 and 3.

(5) US DOC, NOAA, NOS. *50 Years of Population Change Along Our Nation's Coasts 1960-2010.*

(6) Individual State CZM Profiles on Protection of Beaches, Dunes, Bluffs and Rocky Shores

(7) Individual State CZM Profiles on Protection of Beaches, Dunes, Bluffs and Rocky Shores

Table 2: Coastal Shoreline Erosion - Percent Eroding By State

State	National Shoreline	% Critically Eroding Eroding Miles	Significantly Eroding Miles
Alabama	352	9%	41%
Alaska	47300	>1%	11%
Am. Samoa	---	---	---
California	1827	4%	85%
C.N. Marianas	---	---	---
Connecticut	270	9%	89%
Delaware	226	12%	26%
Florida	6265	5%	16%
Guam	---	---	---
Hawaii	930	3%	12%
Louisiana	1943	2%	82%
Maine	2500	>1%	99%
Maryland	1939	9%	86%
Massachusetts	1200	11%	97%
Michigan	---	---	---
Mississippi	247	15%	43%
New Hampshire	40	5%	95%
New Jersey	469	26%	49%
New York	638	47%	100%
North Carolina	3661	15%	35%
Oregon	500	13%	33%
Pennsylvania	---	---	---
Puerto Rico	---	---	---
Rhode Island	340	7%	98%
South Carolina	3063	2%	8%
Virgin Islands	---	---	---
Virginia	993	26%	56%
Washington	2337	>1%	4%
Wisconsin	---	---	---
Great Lakes	3680	6%	34%

Sources: U.S. Army Corps of Engineers. 1971. The National Shoreline Study.
Notes:
Critically Eroding Areas- areas where action to halt erosion may be jusitfied based on rate of erosion and presence/level of threatened development.
Significantly Erosion Area- areas where erosion occuring but development not threatened
Study did not cover Island Territories and Commonwealths or Great Lakes States.

Table 3: US Army Corps of Engineers Major Shoreline Protection Projects in CZM States 1950-1993

	Initial Beach Renourishment		Periodic Beach Nourishment		Structures		Emergency Projects		Total
	# Projects/Est.CuYds/Act.Exp.		# Projects/Est.CuYds/Act.Exp.		#Projects/Act. Exp.		#Projects/Act. Exp.		Projects
CA	5	14448 $ 23942	2	5600 $36813	5	$ 6144	1	$ 473	13
CT	3	1435 $ 1882	3	889 $ (1)	2	$ 169	0	$ 0	8
DE	1	0* $ 0	1	700 $ 813	1	$ 1876	1	$ 88	4
FL	15	34804 $147764	11	14731 $68273	6	$ 9797	1	$3217	33
LA	1	2540 $ 10534	1	1520 $ 7571	1	$ 284	1	$4688	4
MD	1	3825 $ 23290	1	184* $ 685	1	$ 5919	1	$2335	4
MA	3	1325 $ 4664	2	285 $ (1)	2	$ 745	0	$ 0	7
MS	1	5700 $ 856	1	3350* $ (1)(a)	1	$ 736	0	$ 0	3
NH	2	540 $ 956	1	931 $ (1)	2	$ 190	0	$ 0	5
NJ	4	9131 $ 36781	4	1842 $ 4561	4	$24860	0	$ 0	12
NY	3	37995 $ 29875	3	5585 $53386	3	$ 6642	1	$1750	10
NY-GL	1	244 $ 1178	1	70 $ 0	1	$ 1200	0	$ 0	3
NC	3	4651 $ 1606	3	6653 $22351	2	$ 948	2	$2529	10
PA	1	4400 $ 5692	1	4017 $24637	1	$19723	0	$ 0	3
RI	0	0 $ 0	0	0 $ 0	1	$ 1361	0	$ 0	1
SC	1	2500 $ 7184	0	0 $ 0	1	$ 1609	0	$ 0	2
VA	0	0 $ 0	1	1875 $12800	0	$ 0	1	$ 560	2
Total	45		36		34		9		124

Source: U.S. Army Corps of Engineers, Shoreline Protection and Beach Erosion Control Study: Phase 1: Cost Comparison of Shoreline Protection Projects of the U.S. Army Corps of Engineers. (Adapted from Tables 13, 14, 16, 18, 19 and Appendix D)

KEY: Est. Cu. Yds- Estimated Cubic Yards of Sand Placed on Beach(000 cu.yd.) Act. Exp.- Actual Expenditures for Projects ($000's Federal/Non-Federal)

(1) Actual Costs for project not available. Estimated Costs of projects for CT- $889; MA-Not Available; NH-$931

(1)(a) All non-federal costs and no record kept by COE. * Actual Cubic Yards

Note regarding COE involvement with Coastal States, Territories, Commonwealths

16 CZM-Approved States with COE Shoreline Protection Projects (Listed Above)

8 CZM States with Continuing Authorized Projects for Beach Erosion Control: CA, CT(3), DE, MD, VA, HI, AS, WA

2 CZM-Approved States with other COE Erosion Control Projects: AK-Under construction; Puerto Rico-Deauthorized project

23 CZM-Approved States with COE Dredging Projects 90-93

25 CZM-Approved States with one or more COE Projects (protection, dredging, etc).

4 CZM-Approved States with No COE Projects: ME, Guam, CNMI, UV.

Table 4: Upton-Jones Coastal Claims Summary (as of 2/20/96)

Coastal State	Claims Filed	Claims Approved	Claims Denied	Total Amount of Approved Settlement
Approved CZM Programs				
CA	2	1	0	$ 58,900
DE	4	3	0	$ 35,605
FL	19	10	3	$ 690,958
LA	5	3	1	$ 37,618
MA	51	32	15	$ 2,361,667
MD	2	2	0	$ 142,128
MI*	47	32	9	$ 1,084,727
MS	1	1	0	$ 44,678
NC*	356	262	21	$14,715,911
NJ*	1	0	1	$ 0
NY	24	10	10	$ 748,939
PA*	36	23	3	$ 1,193,114
RI	4	3	0	$ 89,220
SC*	15	9	2	$ 1,612,638
VA	16	8	3	$ 695,011
WA	20	12	5	$ 181,687
Subtotal	603	411	73	$23,692,801
Not In CZM Program				
IN	1	0	0	$ 0
MN	1	1	0	$ 20,714
OH	22	17	4	$ 813,605
TX	17	5	10	$ 125,765
Subtotal	44	23	16	$ 960,084
TOTAL	644	434	87	$24,652,885

Coastal Claims Approved	434
Demolition - 73%	
Relocation - 27%	
Coastal Claims Denied	87
In Erosion Zone, Not Condemned	43
Not in Erosion Zone, Condemned	4
Not in Erosion Zone, Not Condemned	24
No Coverage	16
Coastal Claims Withdrawn	34
Coastal Claims Pending	87
Total	645

* The 5 states with state certification authority from FEMA under this program.
For all other states, claim applicants submit directly to FEMA.
Source: Mark Crowell, FEMA, Upton-Jones Data Base. 500 C Street, Room 444, Washington DC 20472 phone: 202-646-3432

Table 5: DOI- Coastal Barrier Resource System

State	# Units		Total Acreage	Shoreline Length(miles)
	Private	O. Protected*	Not Including Otherwise Protected Units	
Maine	26	5	4,812	23.4
Massachusetts	61	10	67,410	122.3
Rhode Island	21	5	11,116	33.0
Connecticut	25	3	9,180	22.7
New York	80	10	64,731	104.0
New Jersey	9	7	8,096	10.4
Delaware	4	4	6,945	17.5
Maryland	36	12	7,163	28.0
Virginia	50	12	47,930	77.0
North Carolina	9	7	35,229	43.0
South Carolina	15	6	98,184	60.2
Georgia	6	5	64,407	19.9
Florida	67	39	285,146	189.3
Alabama	4	4	11,381	19.6
Mississippi	6	1	5,981	12.8
Louisiana	17	4	351,738	178.0
Texas	17	6	195,992	175.9
Puerto Rico	41	22	20,196	51.1
Virgin Islands	24	11	3,793	14.6
Ohio	10	0	4,792	8.1
Michigan	46	0	18,689	55.2
Wisconsin	7	0	1,958	7.6
Minnesota	1	0	940	3.0
Totals	582	173	1,325,809	1,276.6

* Otherwise Protected Areas in Public Ownership
Source: US Fish and Wildlife Service, Adapted from Table December 22, 1992.

APPENDIX B: METHODOLOGY & SURVEY INSTRUMENT

APPENDIX B-1: METHODOLOGY

RESEARCH QUESTION

The basic research question utilized is "how effective overall have the individual and collective state CZM program efforts been in addressing protection of beaches, dunes, bluffs and rocky shores?"

What is Covered and What is not Covered: This section covers oceanfront beaches, dunes, bluffs and rocky shores. It also covers the same resources along the shoreline of the Great Lakes. It is limited to the twenty-nine coastal states, territories and commonwealths with approved coastal programs as of 1995.

What is not Covered: *"Barrier islands"* and *"coral reefs"* were not studied as distinct natural coastal features, although, some states employ management tools to specifically address their protection. Likewise *"coastal hazard areas"* and management tools employed exclusively to minimize hazard risks were not addressed in this study including state participation in the NFIP; hurricane preparedness, evaluation, mitigation and post-disaster redevelopment tools. However, because state protection of beaches and dunes and eroding bluff areas is often tied to coastal hazard risks, several tools which overlap these issue areas were part of this study. They include regulatory tools for structures and shoreline stabilizations; beach, dune, and bluff erosion management plans; dune restoration, beach nourishment; armoring repair programs; public investment restrictions and incentives for beach and dune protection. States participation in Upton-Jones portion of the NFIP is referenced, since it involves the removal or relocation of structures rather than building standards within beach/dune areas. Many states regulate coastline development and stabilizations based on public access and visual access considerations. This study only covers state CZM regulations which limit public access in order to protect natural resources. Likewise, *"dredging and dredged material disposal"* policies and management tools are not covered except when such material is disposed on beaches as nourishment. Federal consistency and intergovernmental coordination tools are also not expressly part of this study. In addition, the New York CZM program in the Great Lakes was not addressed.

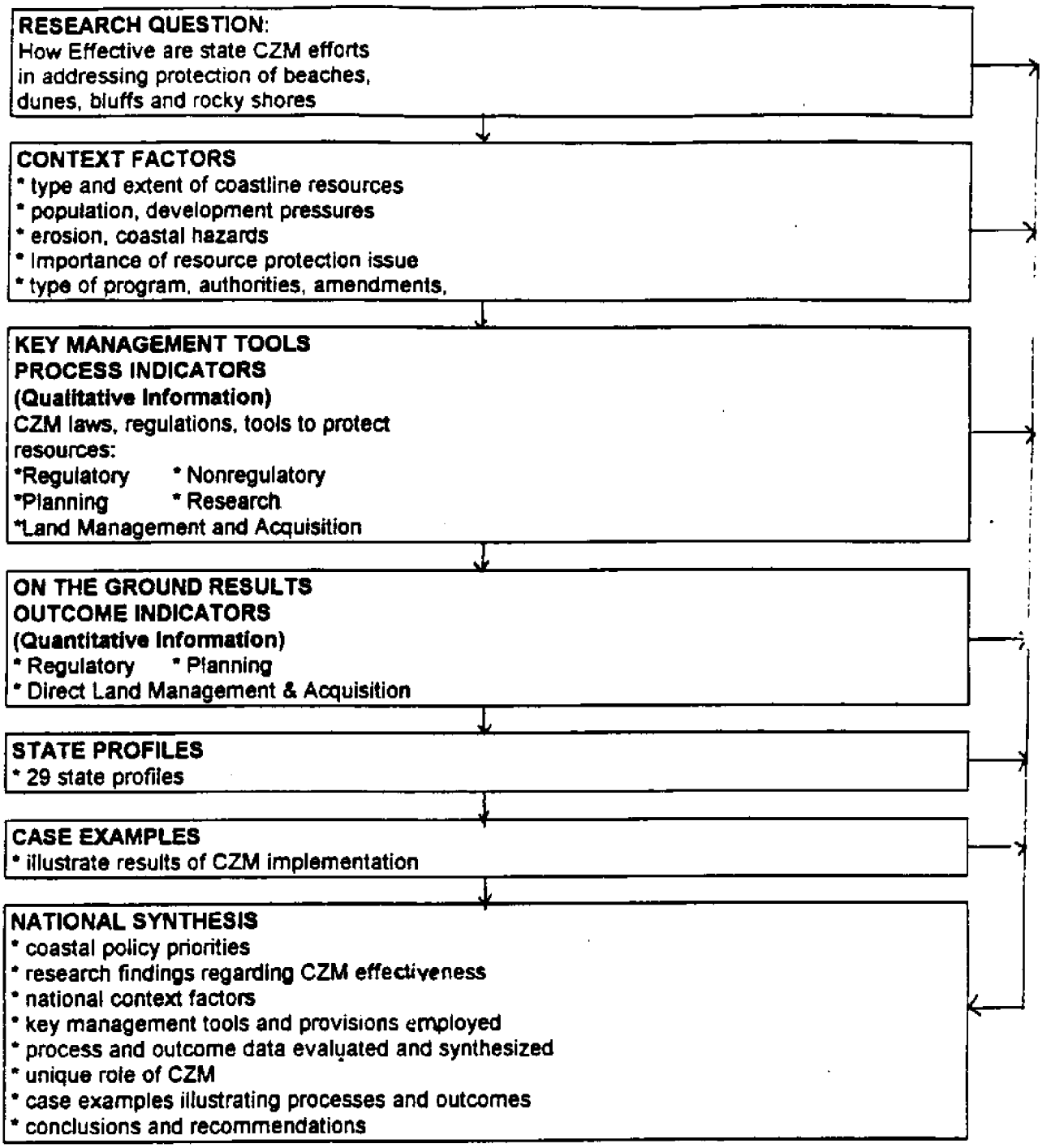
RESEARCH OBJECTIVES

1. Describe the management tools developed, refined and employ to protect beaches, dunes, bluffs, rocky shores;
2. Describe the on-the-ground outcome after implementation of the CZM tools;
3. Determine the effectiveness of state CZM programs in achieving the national policy objective to protect beaches, dunes, bluffs and rocky shores by linking tools and outcomes.
4. Identify the role of federal and state CZM programs in achieving the outcomes; and
5. Identify and recommend improvements related to monitoring guidelines, performance measures, technical or information services.

RESEARCH DESIGN

A. Model for Evaluating Effectiveness. The overall research framework is described in the introduction to the entire study. However, a model of the method used to evaluate the effectiveness of state CZM programs in addressing protection of beaches and dunes, bluffs and rocky shores is shown in Figure 1.

Figure 1: Method used for evaluating effectiveness of state CZM programs in addressing protection of beaches and dunes, bluffs and rocky shores



B. Data Collection: A specific survey instrument was developed for collecting information on tools employed (process data) and on-the-ground results of program implementation (outcome indicator data) on the protection of beaches, dunes, bluffs and rocky shores. This survey instrument was mailed, faxed or emailed to all twenty-nine CZM states. In addition, the instrument was used in completing phone interviews with state contacts. It also served as the basis for completion of individual state CZM profiles. (See **Appendix B-2** for a copy of the Survey Instrument)

In addition, the authors reviewed and selected information from state CZM documents including Final Environmental Impact Statements (FEIS); 309 Assessment and Strategy Reports; and state laws and regulations pertaining to resource protection. Where provided by OCRM or the coastal state, the authors reviewed documents related to beach and dune protection, state coastal parks, land acquisitions, and selected state CZM progress reports, annual reports, and 312 evaluation reports.

Follow-up phone interviews and data requests were made to each coastal state, usually to multiple state agency or bureau staff. It was typical to contact more than one staff in the state CZM program office, the state land management agency, a state environmental regulatory agency, the state land acquisition agency, and the state wildlife protection agencies.

The information collected for each of the 29 coastal states was placed in the individual state CZM Profiles on Protection of Beaches, Dunes, Bluffs and Rocky Shores. This draft profile was sent to each state for review, and sometimes to OCRM regional staff for review, and then finalized.

C. Definitions

"Process Indicators" are the specific management programs, tools or techniques that states have developed to address coastal problems. Examples include key provisions of regulatory programs such as coastal setbacks from primary dunes or control zones which protect natural functions of resources; plans with enforceable policies that address beach renourishment, inlet management, dune restoration or special area resource protection; state land management of coastal parks which guide access or protect unique habitat areas; and acquisition programs to purchase beaches, dunes, bluffs or rocky shore areas.

"Outcome Indicators" are the specific on-the-ground effects that result from implementation of CZM programs, tools, and techniques. Examples include linear and/or area data on permits issued reflected in miles of beachfront shoreline developed or armored through permitting; area restricted from vehicular access through access plan and regulations; miles of coastal shoreline and acres in state land management or protection status; miles of beaches restored or dunes revegetated; miles and/or acres of coastal shoreline acquired for resource protection.

"CZM Program Effectiveness" means the special role of CZM in using process tools to affect outcomes sought under the CZMA, namely the protection of natural beaches, dunes, bluffs and rocky shores. Effectiveness is measured by: 1) process indicators (tools) and outcome indicators (results) and their linkage within each of the 29 state programs; 2) state CZM program implementation through case examples where no statewide data is available; and 3) the unique role of CZM as only one of many government and non-government agencies involved in coastal management.

"Natural Resources of the Coastal Zone" means watersheds, lakes and rivers, associated floodplains and wetlands, estuaries, beaches and dunes, barrier beaches, offshore coral reefs, and the wildlife, fish and other aquatic life that depends on these environments are part of a larger, integrated coastal nearshore ecosystem.

"Natural Resources" under this section means beaches, dunes, bluffs and rocky shores. State definitions for these resources, however, vary particularly with regard to the inland extent of the resource jurisdiction.

"Resource Protection Values" means the priority natural values a state gives to a certain resource. For example, some states establish conservation or preservation zones within which natural resources are afforded more protection than within a recreation or development zone. Likewise, some states identify certain species or habitat as having high protection value such as threatened or endangered species habitat areas.

"Management Tools Employed" means the processes, tools and techniques which a state CZM program has identified in their FEIS document and OCRM has approved as part of the state's CZM program that affect protection of beaches, dunes, bluffs and rocky shores.

An example of a management tool is the "setback law". This study looks at the key provisions and their long-term effects. State setback laws require new structures to be built at a specified distance from the mean high water line, a dune line or some other definable point. The setback distance is usually defined as either an *"arbitrary distance"* in feet (e.g., 50 feet, 100 feet) or a distance in feet determined by the average annual *"erosion rate"* multiplied by a specific number of years (e.g., average annual erosion rate at 2 feet x 30 years = 60 foot setback). The arbitrary distance method creates a need to reestablish the mean high tide line, or other measurement point frequently. The erosion rate method is intended to allow normal erosion and avoid erosion threats to a structure during its usable lifetime. However, state laws define the normal useful life of a frame dwelling structure as 30 years, where in reality it is closer to 70 years and, in some coastal areas, the current annual erosion rate exceeds the long-term historical rate placing structures in harms way even sooner. Along our nation's high erosion areas, beaches and shorelines are washing away and the long-term effects, using either setback method, are homes toppling into the ocean or armored shorelines.

D. Grouping of State Management Tools for Beach, Dune, Bluff and Rocky Shore Protection.

An initial analysis of the 29 coastal states/territories and their legal authorities to protect beach, dune, bluff and rocky shore resources demonstrated a great diversity in approaches. Each state's particular physical, social and economic environment is reflected in that state's priorities, laws, regulations and other implementing management tools. This makes it difficult to compare diverse state approaches and the effectiveness of their management tools.

To facilitate comparisons for this research, common state management approaches to protecting beach and dune resources, bluffs and rocky shores are grouped together. This grouping makes it possible to analyze similar state management tools and to develop a national perspective on the utilization of major management tool in addressing beach and dune, bluff and rocky shore protection.

State **coastal management tools** utilized for the protection of ***beaches and dunes*** are grouped and analyzed within the following six major categories: 1) Regulatory Tools; 2) Planning Tools; 3) Direct Land Management Tools; 4) Acquisition Tools; 5) Nonregulatory Tools; and 6) Research Tools.

Each of these categories have sub-groupings of more precisely delineated management tools and **key provisions**. This was necessary, again, in order to identify and compare similar management approaches and tools among state programs. The following is a list of the tool categories and subtools employed:

* Regulatory Tools:
1.1. Distance inland regulations apply
1.2. Activities regulated and exceptions
1.3. Restrict new construction and rebuilding through a) setback, b) controls zones, c)exceptions
1.4. Restrict new and repair/rebuilding of shoreline stabilization structures and exceptions
1.5. Restrict pedestrian access
1.6. Restrict vehicular access/traffic

1.7. Protect beach/dune habitat of value to marine life
1.8. Other restrictions or conditions affecting dune creation, revegetation, sand fencing, sand scraping, dune reshaping, near shore mining, etc.
1.9. Local delegation of permit responsibilities
1.10. Permit compliance and computerized permit tracking system

* Planning Tools
2.1. Local planning and/or regulation
2.2. Special Area Management Plans
2.3. Other adopted plans- such as erosion control, inlet management, land and water use plans

* Direct Land Management, Restoration and Acquisition Tools
3.1. Shoreline in state park management
3.2. Natural areas protected
3.3. Boardwalks, dune cross-overs & access restrictions
3.4. Dunes creation or restoration program
3.5. Beach renourishment program
3.6. Shoreline armoring and repair program
3.7. Coastal lands acquisition program

* Nonregulatory Tools
4.1. Public investment restrictions
4.2. Public investment incentives
4.3. Coastal property disclosure
4.4. Education, outreach and technical assistance
4.5. Financial assistance

* Research Tools
5.1. Methodologies for establishing setbacks, control zones
5.2. Beach profiles
5.3. Natural areas inventories
5.4. Technical reports
5.5. Aerial photography
5.6. Sea level rise considerations

Existing **state management tools** utilized to protect ***bluff*** resources and likewise ***rocky shore*** resources have been identified, grouped and analyzed within six major categories: 1) Regulatory Tools; 1) Planning Tools; 3) Direct Land Management Tools; 4) Acquisition Tools; 5) Nonregulatory Tools; and 6) Research Tools.

For ***bluffs*** and ***rocky shores***, these six categories have sub-groupings of management tools to facilitate comparative analysis, as follows:

* Resource Present
1. Bluffs
2. Rocky Shores

* Regulatory Tools
1.1. Restrict construction
1.2. Other regulatory controls

* Planning Tools
2.1. Local
2.2. State
2.3. Special area management
2.4. Other

* Direct Land Management Tools
3.1. State owns and manages
3.2. natural areas protected

* Acquisition Tools
4.1. Lands acquired

* Nonregulatory Tools
5.1. Public investment restrictions
5.2. Coastal property disclosure
5.3. Education, outreach and technical assistance
5.4. Financial assistance

* Research Tools
6.1. Inventories/designate protection areas
6.2. Technical reports

Due to the paucity of on-the-ground outcome data, indicators of program effectiveness were developed using the tools states employ and key provisions which are assumed to ensure greatest protection of resources. See below.

E. Analysis and Linkage of Process and Outcome Indicators and Determination of Effectiveness in Protecting Beach, Dune, Bluff and Rocky Shore Resources.

The author has expressed certain underlying ***assumptions*** and developed certain ***process*** and ***outcome indicators or measures of effectiveness*** for management tools employed to protect beaches, dunes, bluffs, and rocky shores. These are summarized as follows:

Regulatory Programs

Assumption: *Regulatory programs*, depending on their purpose and design, can provide on-the-ground protection of beach and dune systems. The level of protection they provide varies depending on the jurisdictional area covered, the types of prohibitions and limitations placed on activities within the jurisdiction, exception/variances allowed, level of enforcement and penalties for violations. coastal laws with setbacks from beach and dune systems offer significant protection, provided there are no major exceptions such as single family homes seaward of the jurisdiction. Coastal laws with control zones within which activities are regulated tend to allow but try to minimize negative impacts on beach and dune resources. Most types of shoreline armoring impede natural sand migration, cause erosion and result in the loss of natural beach. States which restrict the use of shoreline armoring structures protect natural beaches, dunes and bluffs. Coastal laws which require and regulate beach access, dune cross-overs, pedestrian and vehicular access, protect beach and dune vegetation/stability. Coastal laws which identify, designate and protect wildlife habitat through permit restrictions protect those specific sections of beach/dune; however such regulated areas tend to be small areas and restrictions are seasonal for bird or turtle nesting sites.

Effectiveness: For regulatory tools employed by states to protect beach, dune, bluff and rocky shore areas:

1) "process indicators of effectiveness" include:

(a) mandatory setbacks for development and redevelopment from beaches, dunes, bluffs, rocky shorelines; the farther setback the more effective and the fewer exceptions allowed within the setbacks, the more effective.

(b) control zones along the shoreline which restrict construction on the beach and dunes, steep slope bluffs, erodable bluffs, rocky shores; the more restrictive, the more effective.
(c) restrictions on shoreline stabilization structures; the more restrictive, the more effective.
(c) restrictions on pedestrian and vehicular access.
(d) restriction on the use of habitat areas.
(e) permit tracking system.
(f) enforcement program.

2) "outcome indicators of effectiveness" include:

(a) no new permits for shoreline structures or shoreline stabilizations on the beach/dune system.
(b) decreases in the number of permits issued or violations cited for shoreline structures and shoreline stabilizations over time.
(c) permits issued for demolition and/or landward relocation of beachfront structures.
(d) permit restrictions on size, location, design of structure or stabilization to minimize adverse impacts on natural beach/dune system.
(e) permits issued for beachfront boardwalks/dunes cross-overs.
(f) areas/acres/shoreline miles restricted from pedestrian or vehicular access.
(g) areas/acres/shoreline miles designated protected areas as endangered species habitat, etc. where development restrictions apply.

Planning Programs

Assumption: *Planning programs*, when combined with implementation through local land use regulations, zoning and subdivision ordinances and other actions, can provide on-the-ground protection of beach and dune resources. The level of protection the planning programs provide varies depending on the extent of the resource covered by the plan; the type of protection policies, standards and provisions; and specified exemptions and variances.

Effectiveness: For planning tools employed, states to protect beach, dune, bluff and rocky shore areas:

1) "process indicators of effectiveness" include:
(a) number of approved plans: state beach/dune, rocky shore, bluff management plans; local coastal land use plans; SAMPS, etc. that protect resources.

2) "outcome indicators of effectiveness" include:
(a) areas/acres/shoreline miles designated by enforceable state or local plans, SAMPs, or other designations as protection/conservation/limited use areas which are enforced through zoning or other protective ordinances/regulations.

State Ownership and Direct Land Management

Assumption: *State ownership and management* of state-held lands along the coast can afford a high level of natural resource protection, depending on competing use demands placed on such lands. State lands developed for recreational use, such as beachfront parks, can also protect natural resources if management plans are adopted and implemented which restrict pedestrian and vehicular access, set aside fragile habitat from human use, and employ other methods to maintain the natural landforms. Protection also varies depending on priority uses given to such state holdings. Those lands with wildlife preserves or conservation areas generally affording more restrictions on uses than state parks and recreation areas.

The installation of boardwalks and dune cross-overs serve to protect natural dunes through vegetation stabilization and breach avoidance. Dune creation and restoration through sand fencing and dune revegetation serves to stabilize and rebuild dune areas, limit breaching during coastal storms, and recreate natural dune systems. Beach renourishment has become popular as a tool to artificially create or recreate a beach area through the importing of compatible sand.

The position of NOAA is that "...while beach nourishment may indeed, under certain circumstances, be a technically viable alternative, there are many other considerations that must be deliberated prior to supporting this approach to erosion management...include(ing) the role of beach nourishment in inducing development in high hazard areas, ...other erosion management approaches, whether beach nourishment is economically justified, appropriate cost-sharing, and the environmental issues..." (MEMO March 19, 1996. NOAA Position on the National Academy of Sciences' Report "Beach Nourishment and Protection." For this study, if a state employs beach nourishment, it is considered a positive impact on protecting natural beach/dune systems. However, the author agrees that unconditioned use of beach nourishment may indeed adversely affect natural systems and may not be the most suitable management approach to protect natural beach/dune areas.

Armoring and armoring repair through construction of shoreline stabilization structures acts to accelerate the loss of sandy beaches. (Platt. Coastal Erosion: Has Retreat Sounded). For this study, if a state employs armoring on state beaches, it is considered a negative impact on natural beach/dune systems.

The identification, designation and protection of natural resource areas within beach/dune systems functions to sustain the natural habitat conditions and values present and provide long-term protection. However, to the extent that such protection is seasonal, such as temporary turtle or bird nesting site fencing, pedestrian access over such areas at other times of year may destroy the habitat values long-term.

Effectiveness: For direct land management tools employed by states to protect beach, dune, bluff, and rocky shore:

1) "process indicators of effectiveness include:
(a) number of state beachfront parks
(b) number of park management plans
(c) policies prohibiting use of shoreline stabilizations
(d) number of natural areas protected

2) "outcome indicators of effectiveness" include:
(a) presence of state parks/coastline holdings that contain beaches and dunes, bluffs and rocky shores as measured by acres, linear shoreline miles covered, coastline in public ownership/state ownership; the more coastline in state parks the more effective.
(b) number of boardwalks/dune cross-overs installed on state park lands.
(c) dune revegetation projects, acres and shoreline miles involved, state funds.
(d) beaches restored/renourished measured in cubic yards, beachfront miles, state funds.
(e) natural resource protection areas as measured by number, acres, coastline acres/miles within these state parks for sea turtle nesting sites, sea bird or shorebird nesting sites, other protected species, or restricted from pedestrian and vehicular public access through limitations on use or fencing, vehicular access restrictions, etc.

Acquisition

Assumption: *Acquisition programs* place private lands into public holdings. Along the coast, these acquisitions tend to serve both recreational use demands, as well as some resource protection goals. Acquisition of large resource systems or acquisition of lands adjacent to existing holdings can afford improve natural resource protection opportunities.

Effectiveness: For state land acquisition tools employed by states to protect beach, dune, bluff and rocky shore areas:

1) "process indicators of effectiveness" include:
(a) state acquisition program which includes coastal land acquisition component.
(b) multiple acquisition tools employed- fees, trades, etc.
(c) acquisition expenditures.

2) "outcome indicators of effectiveness" include:
(a) amount of land on coastline acquired, acreage, beachfront and coastline miles; the more land acquired for natural resource protection, the more effective.
(b) increase in amount and percent of coastline in state ownership.

Nonregulatory Tools and Research Tools

Assumption: Nonregulatory and research tools support the four management tools discussed above. For example, education and technical assistance to local governments functions to improve local coastal planning and regulation. Likewise, research such as shoreline erosion rates functions to improve state regulatory controls over development in erosion prone areas.

Effectiveness: No attempt was made to collect outcome indicator data for these two types of management tools employed.

F. Suite of Tools Employed and Competing Policy Priorities

States with the following suite of regulatory, planning, direct land management and acquisition provisions are presumed to have effective oceanfront resource protection programs:

Regulatory Programs
(a) **Coastal Setbacks** for development and redevelopment from beach, dune, bluffs, or rocky shores natural features, with the farther setback the more effective; the fewer exceptions allowed within the setback, the more effective.
(b) **Coastal Construction Controls Zones** along the shoreline with regulations governing activities affecting beach, dune, steep slope bluffs, erodable bluffs, and rocky shores and limits on size, type, design or location of permitted construction to minimize adverse impacts on beach/dune/bluff systems; controls over new significant activities with few exceptions, control over additions/repairs/rebuilding; the more restrictive, the more effective.
(c) **Shoreline Stabilization Regulations** which place limitations on the use of shoreline stabilization structures in favor of nonstructural solutions.
(d) **Access Restrictions** with requirements for boardwalks or dune crossovers to minimize adverse impacts on dune; and areas designated where pedestrian and/or vehicular access is restricted to protect resources.
(e) **Habitat Protection and Other Controls** over critical habitat areas where uses are restricted to protect habitat protection values.
(f) **Permit Tracking and Enforcement Provisions** which are used to monitor permits and violations.

Planning
(a) **Adopted Plans** for areas containing enforceable policies that address resource protection, beach nourishment, inlet management, dunes restoration, or special area resource protection or conservation; the larger the resource area covered, the more of the shoreline included, and the more restrictive the enforceable policies, the more effective.

State Coastal Land Management and Acquisition
(a) **State Coastal Land Holdings** including inventory of the number, acres, shoreline miles of state lands in state oceanfront parks and preserves.
(b) **State Coastal Land Management and Stewardship** including park management plans; boardwalks, dune cross-crossovers or other guided pedestrian access; dune restoration and beach nourishment where appropriate; enforceable policies restricting the use of shoreline stabilization structures; and designated natural resource habitat protection areas.
(c) **State Coastal Land Acquisition Program** with coastal land acquisition as a priority

Balancing Competing Policy Priorities
The CZMA and state programs are multi-objective, attempting to accommodate diverse uses competing for limited space along our nation's shorelines. The CZMA requires states to balance competing needs and demands such as protection of properties from hazard risks and promotion of recreational use of the shoreline, as well as protection of natural shoreline resources. As a result, natural resource protection policies are tempered by policies which meet other state and national objectives. Context factors are important, such as development pressures, inappropriate shoreline development and commitment to coastline development which preceded CZM, presence of valued natural resources, natural threats such as erosion, hurricanes, landslides, etc. The suite of tools and key provisions listed above are indicative of states which have developed effective resource programs.

G. Unique role of CZM Programs among several CZM agencies.

A national and state context report was prepared which identifies key federal laws and agencies with coastal management responsibilities and the unique role of the national CZM program in this context. See **Appendix A**

H. National Synthesis

The national synthesis provides a summary of tools states employ, key provisions and relevant outcome data demonstrating protection of beaches, dunes, bluffs and rocky shores. Effectiveness is based on a assessment of coastal policy priorities, context factors, management tools employed, the strength of the key provisions, outcomes linked to tools employed, case examples, and the unique role of CZM in protection of resources and utilization of particular management tools. The cross-state utilization and overall effectiveness of certain tools is discussed, such as setback or control zones. No attempt is made, however, to weight and rank the effectiveness of each coastal state according to the CZM tools it employs and the outcome data it provided.

RECOMMENDATIONS

The fourth objective of this study is to identify and recommend improvements related to monitoring guidelines, performance measures, technical or information services. Recommendations follow directly from lessons learned in conducting this research projects.

RESEARCH LIMITATIONS

Limitations to the research include:

* diversity among state CZM programs in geography, sociology, development pressures, organization and policy priorities.

* plethora of management agencies involved in coastal area with separate management mandates and lack of coordination.

* lack of database at OCRM on state CZM program tools, activities, outcomes.

* lack of documentation, bibliographies and dissemination of CZM technical reports and program results, coupled with reliance on case examples and success stories in the absence of statewide data on CZM outcomes.

* lack of standardized and consolidated reporting in performance evaluations, grants, annual reports which is reflected in an inadequate reporting process between the coastal states and OCRM.

* Inadequate computerized permit tracking data regarding miles, acres, resources, areas affected, length of projects permitted, and assessment of cumulative impacts of multiple permits.

* lack of federal standards for measuring state CZM performance coupled with lack of measurable data provided by OCRM and the coastal states.

* significant changes to state CZM programs over the years which are not documented by OCRM.

* turn-over among state CZM staff and the lack of institutional memory about CZM activities and results.

* compounding factors which influence and shape state coastal policies and programs and affect CZM results including economic development, environmental pressures, political and social factors.

* legal interpretations and decisions affecting coastal management tool implementation.

APPENDIX B: METHODOLOGY & SURVEY INSTRUMENT

B-2 SURVEY INSTRUMENT

STATE---Beaches. Dunes. Bluffs. Rocky Shores Protection (1/10/95)

BACKGROUND AND CONTEXT

ISSUE IN THE STATE
At time of program approval.
Evolution of the Issue:
State Ranking of Issue:

CONTEXT FACTORS

Tidal Shoreline Mileage:
Open Coastline Mileage:
Sandy Beaches Coastline:
Dunes-Backed Beaches: Bluff-Backed Beaches:
Rocky Shores Coastline:
Bluff Coastline w/minimal Beach:
Offshore Rocks and Islands:
Description:
Changes in Resources/Use Patterns:
Coastline Ownership: % Public
Coastline Development: % Developed % Undeveloped (% public/private)
Coastal Population Growth 1980-1990: % (Major. Moderate. Minimal Impact)(See National Table)
Economic Pressures:
Coastal Erosion Factors:
Critical Coastal Erosion Areas as measured by Miles of Beachfront with annual erosion>1ft per year:
Critical Coastal Erosion Areas as measured by Miles of Bluff-Front with annual recession rates>? per year:
Tidal Inlets:
Inlets with jetties:
Inlets with maintained channels:
Inlet Dredging Projects: (See National Table)
Beachfront Shoreline Armored (miles/% of coast) 19__: 1995:
Bluff Fronts Armored (miles/%):
Beachfronts Renourished: If yes, (See National Table of COE projects)
Major Coastal Storm Events: (See National Table)

KEY MANAGEMENT AUTHORITIES AFFECTING PROTECTION OF BEACHES, DUNES ROCKY SHORES, AND BLUFFS

MAJOR AMENDMENTS AFFECTING BEACHES AND DUNES, BLUFFS ROCKY SHORES

KEY DEFINITIONS

CZM PROGRAM POLICIES THAT ADDRESS BEACH AND DUNE PROTECTION

TOOLS EMPLOYED TO PROTECT BEACHES AND DUNES

A. REGULATORY TOOLS EMPLOYED

A-1 Regulatory Program to Restrict Construction on the Beach/Dune Systems

Local Regulation Delegation

A-1 Outcome Indicators for Restricting Development on Beaches and Dunes
Number of state permits for habitable structures in permit jurisdiction 19 -1995:
(Seaward of setback, within permit control zone, etc)
Number of beachfront structures damaged and
- permitted to be replaced/rebuilt 19 -1995:
- not allowed to be rebuilt 19 -1995:
- relocated Landward 19 -1995:
- demolished 19 -1995:

A-2 Regulatory Program to Restrict Shoreline Stabilization Structures

* Permit *new* shoreline stabilization structures * Exceptions
* Restriction on *reconstruction* of shoreline stabilization structures/shoreline protection devices:
* Exceptions:
* Provisions for "emergency repairs" of shoreline stabilizations

A-2 Outcome Indicators for Restricting Shoreline Stabilization Structures
Number of state permits issued for seawalls, rip rap, other armoring devices between 19 and 1995:
Number of seawalls, rip rap, and other shoreline stabilization structures damaged and
- allowed to be repaired/rebuilt 19 -1995:
- not allowed to be repaired between 19 -1995:
- emergency permits issued 199 -1995:
Number of groins/groin fields permitted : 19 - 1995:
Number of jetties and offshore breakwaters constructed 19 -1995:

A-3 Regulatory Program to Restrict Pedestrian Access and Vehicular Traffic

* Construction of beachfront boardwalks/elevated walkways over dunes regulated:
* Restrictions on vehicular traffic

A-3 Outcome Indicators for Restricting Pedestrian and Vehicular Traffic on Beaches and Dunes
Number of Beachfront Boardwalks Permitted 19 - 1995:
Areas where access/vehicular traffic has been prohibited/restricted in area and shoreline miles:

A-4 Other Regulatory Permit Restrictions/Conditions Affecting Beach/Dune Protection
* Beach/Dune Habitat for Marine Life Regs:
* Dunes Creation/Revegetation Regs/Sand Fencing:
* Sand Scraping/Dune Reshaping Regs:
* Near Shore Sand Mining Regs:
* Other:

A-4 Outcome Indicators for Other Restrictions Resulting in Beach/Dune Protection
Number of Areas/Beachfront Miles protected as Turtle Nesting Habitat:
Number of Areas/Beachfront Miles protected as Bird Nesting Habitat:

A-5 Permit Compliance and Permit Tracking System

* Permit compliance tools include.
* Permit tracking system

A-5 Outcome Indicators--Violation Corrections
Number of violations cited and corrected 19 -1995:

B. MANAGEMENT PLANS EMPLOYED TO PROTECT BEACHES AND DUNES

B-1 State Coastal Zone Management Plan
B-2 State Comprehensive Plan or State Comprehensive Planning Process Requirements
B-3 Local Beach/Dune Resource Mgt. Plans
(State guidelines and approval/certification or Voluntary/advisory only; Beach/Dune Resource Protection plans; Local Comprehensive Plan component:; Land use regulations (ordinances, zoning, subdivision regulations, etc.; Inventory of Resources: other)

B-3 Outcome Indicators for Local Beach/Dune Resource Mgt. Plan Results
Number of local governments with state certified plans/ regulations to protect beach/dune systems and areas/acres covered by local protection plans/regulations and results:

B-4 State Beachfront Management Plans/Erosion Control Plans

B-4 Outcome Indicators for State Beachfont Management Plan Results
- area/acres/beachfront covered and protection results:
- Number of COE Sponsored beach restoration projects where state negotiated placement of beach quality sand on down-drift beaches 19__-1995:

B-5 Inlet Management Plans

B-5 Outcome Indicators for Inlet Management Plan Results
- area covered and protection results:

B-6 Special Area Management Plans

B-6 Outcome Indicators for State Special Area Management Plan Results
-area/acres/beachfront covered and protection results:

B-7 Post Disaster Redevelopment Plans

B-7 Outcome Indicators for Post Disaster Redevelopment Plans
- area covered and protection results:

B-8 Other Management Plans for Beach and Dune Protection

B-8 Outcome Indicators for Other Management Plans for Beach and Dunes Protection
- Other on the ground indicators of management plan results:

C. DIRECT LAND MANAGEMENT/RESTORATION TOOLS EMPLOYED FOR BEACHES AND DUNES

C-1 State Beachfront/Oceanfront Park Management
C-1 Outcome Indicators for State Beachfront Parks with Management Plans that designate and protect beach/dune systems
- percent of beachfront in state beachfront parks:
- areas/acres/beachfront protected:
- public boardwalks installed:

C-2 Natural Resource Areas Protection Program for Public Lands

C-2 Outcome Indicators for Designated Natural Resource Protection Areas Under CZMP Management.
Number of areas/acres of publicly-owned beach/dune areas restricted from public access and damages and designated natural preserve areas/ habitat protection areas: 19__: 1995:

C-3 Dune Creation/Restoration Program
C-3 Outcome Indicators for Dunes Revegetated
Number of areas/beachfront miles 19 -1995:

C-4 Beach Renourishment Funding Program
C-4 Outcome Indicators for Beaches Restored/Nourished/Renourished
Number of beachfront miles replenished and cubic yards sand placed
19__ and 1995:

C-5 Armoring Repair Program
C-5 Outcome Indicators for State Funding of Beach Erosion Control
(a) armoring 19__-1995:
(b) nourishment 19__-1995:

D. ACQUISITION TOOLS EMPLOYED FOR BEACHES AND DUNES

D-1 Acquisition Program for Purchase of Beaches/Dunes/Coastal Hazard Areas
D. Outcome Indicators for Acquisition of Beaches and Dunes
D-1 Number of areas/acres of coastal beaches/dunes acquired for public use/natural resource protection (If acquired in partnership specify with whom) between 19__ and 1995:

E. RESEARCH FOR BEACHES AND DUNES PROTECTION

E-1 Methodologies for Designating Setback or Regulatory Zone
E-2 Beach Profiles:
E-3 Natural Resource Areas Inventories:
E-4 Technical Reports as Base for Mgt:
E-5 Aerial Photography:
E-6 Sea Level Rise Considerations:

F. OTHER KEY MANAGEMENT TOOLS EMPLOYED TO PROTECT BEACHES AND DUNES

F-1 Public Investment Restrictions:
F-2 Coastal Property Disclosure:
F-3 Technical Assistance:
F-4 Financial Assistance to Local Governments/Land Owners:

TOOLS EMPLOYED TO PROTECT BLUFFS

A. REGULATORY TOOLS EMPLOYED FOR BLUFF MANAGEMENT

A-1 Regulatory Program to Restrict Development on Bluffs

A-1 Outcome Indicators for Restricting Development on Bluffs

Number of structures permitted & required to be setback from bluffs: 19__-1995:
Number of Cliff/Bluff-front Structures Damaged and
- allowed to be repaired/rebuilt 19__-1995:
- not allowed to be rebuilt 19__-1995:
- relocated Landward 19__-1995:
- demolished 19__-1995:

A-2 Regulatory Program to Restrict Shoreline Stabilization Structures Used in Bluff Protection

A-2 Outcome Indicators for Restricting Shoreline Stabilization Structures That Protect Bluffs (See IV.A-2)

A-3 Bluff Erosion Control Regulations

* Engineering Standards * Geotechnical Studies * Siting Standards: * Revegetation Regs:
* Ground Water Controls

A-3 Outcome Indicators for Bluff Erosion Control
- areas covered and results:

A-4 Pedestrian and Vehicular Traffic, Shoreline Stairs & Access Controls

A-4 Outcome Indicators for Restrictions on Pedestrian and Vehicular Traffic, Shoreline Stairs, and Access to Shoreline
- Number of permits issued for stairs and other shoreline access:
- Areas where vehicular traffic is restricted/prohibited:

A-5 Permit Compliance and Permit Tracking Program

* Permit Compliance Program includes
* Permit Tracking Program

A-5 Outcome Indicators --Violation Corrections
Number of violations cited and corrected 19 -1995:

B. MANAGEMENT PLANS EMPLOYED FOR BLUFF PROTECTION

B-1 Bluff Management Plans

B-2 Special Area Management Plans

B-1 and B-2 Outcome Indicators for Bluff Management Plan/Special Area Management Plan Results
Bluffs areas protected in acres/shorefront miles:

B-3 Local Bluff Protection Plans/Regulations as part of state CZMP

B-3 Outcome Indicators for Local Bluff Protection Plans/Regulations
Number of local governments with state certified plans/ regulations to protect bluffs and areas/acres protected:

C. DIRECT LAND MANAGEMENT/RESTORATION TOOLS EMPLOYED FOR BLUFF MANAGEMENT

C-1 Public Owns Bluffs:

C-1 Outcome Indicators for Public Ownership of Bluffs- % public

C-2 Bluff Park Management:

C-2 Outcome Indicators for Bluff Park Management
Number of bluff state parks:

C-3 Natural Areas Protection of Bluffs in Public Ownership:
C-3 Outcome Indicators for Designated Natural Resource Protection Areas Under CZMP Management:
Number of areas/acres of publicly-owned bluffs restricted from public access and damages and designated natural preserve areas/ habitat protection areas: 19__: 1995:

D. ACQUISITION TOOLS EMPLOYED FOR BLUFF PROTECTION
D-1 Acquisition Program or other Acquisition Techniques for Bluffs
D-1 Outcome Indicators for Acquisition of Bluffs
-Number of areas/acres of coastal shoreline bluffs acquired for public use/natural resource protection (If acquired in partnership specify with whom) between 19__ and 1995:

E. RESEARCH FOR BLUFF MANAGEMENT
E-1 Inventories of Bluff Resources:
E-2 Designation of Bluff Protection Areas:
E-3 Technical Reports as Base for Bluff Mgt:
E-4 Other:

F. OTHER KEY MANAGEMENT TOOLS EMPLOYED FOR BLUFF MANAGEMENT:
F-1 Public Investment Restrictions:
F-2 Coastal Property Disclosure:
F-3 Technical Assistance:
F-4 Financial Assistance to Local Governments/Property Owners:

TOOLS EMPLOYED TO PROTECT ROCKY SHORES

A. REGULATORY PROGRAMS EMPLOYED FOR ROCKY SHORES PROTECTION

A-1 Regulatory Program to Restrict Development on Rocky Shores
A-1 Outcome Indicators for Restricting Development on Rocky Shores
Number of structures permitted & required to be setback from rocky shores 19__-1995:
Number of rocky shore front structures damaged and
- allowed to be repaired/rebuilt 19__-1995:
- not allowed to be rebuilt 19__-1995:
- relocated Landward 19__-1995:
- demolished:

A-2 Regulatory Condition To Protect Rocky Shores
*Engineering Standards * Geotechnical Studies * Siting Standards * Utilities Controls
A-2 - No Outcome Indicators

A-3 Pedestrian Access Controls
A-3 Outcome Indicators for Pedestrian Access Control Results

A-4 Permit Compliance and Permit Tracking System
* Permit Compliance Program includes
* Permit Tracking Program
A-4 Outcome Indicators--Permit Violations Cited 19 -1995:

B. MANAGEMENT PLANS EMPLOYED FOR ROCKY SHORES PROTECTION:

B-1 State Rocky Shore Management Plans:
B-2 Special Area Management Plans:
B-1 and B-2 Outcome Indicators for State Rocky Shore Management Plan/ Special Area Management Plans
- areas protected in acres/shorefront miles:

B-3 Local Rocky Shores Protection Plans as part of state CZMP:
B-3 Outcome Indicators for Local Rocky Shore Protection Plans
Number of local governments with state certified plans/ regulations to protect rocky shores and acre/acres protected:

C. DIRECT LAND MANAGEMENT/RESTORATION TOOLS EMPLOYED FOR ROCKY SHORES:

C-1 Public Owns Rocky Shores:
C-1 Outcome Indicators for Rocky Shores in Public Ownership: %

C-2 Rocky Shore Park Management:
C-2 Outcome Indicators for Rocky Shore Parks
Number of rocky shore state parks:

C-3 Natural Areas Protection of Rocky Shores in Public Ownership:
C-3 Outcome Indicators for Designated Natural Resource Protection Areas Under CZMP Management:
Number of areas/acres of publicly-owned rocky shores restricted from public access and damages and designated natural preserve areas/ habitat protection areas: 19__: 1995:

D. ACQUISITION TOOLS EMPLOYED FOR ROCKY SHORES:

D-1 Acquisition Program or other Acquisition Techniques for Rocky Shores:
D-1. Outcome Indicator for Acquisition
- Number of areas/acres of coastal rocky shores acquired for public use/natural resource protection (If acquired in partnership specify with whom) between 19__ and 1995:

E. RESEARCH FOR ROCKY SHORES PROTECTION
E-1 Inventories of Resources:
E-2 Designation of Protection Areas:
E-3 Technical Reports as Base for Mgt:
E-4 Other

F. OTHER KEY MANAGEMENT TOOLS EMPLOYED FOR ROCKY SHORES PROTECTION:
F-1 Public investment restrictions:
F-2 Coastal property disclosure:
F-3 Technical Assistance:
F-4 Financial Assistance:
F-5 Other:

CASE EXAMPLES (Examples that illustrate paerticularly important and effective management tool in protecting resources or example that shows complexity/conpeting demands of difficulty in protecting)

STATE CONTACTS FOR BEACHES/DUNES/BLUFFS/ROCKY SHORES

STATE REFERENCES FOR BEACHES, DUNES, BLUFFS, ROCKY SHORES

State of

_____. 309 Assessment.
_____. 309 Strategy.

U.S. Department of Commerce. National Oceanic and Atmospheric Administration, Office of Coastal Zone Management. Coastal Zone Management Program and Final Environmental Impact Statement.

APPENDIX C: SUMMARY TABLES

1: National Context Factors Affecting State Protection of Beaches, Dunes, Bluffs and Rocky Shores

2: Summary of State CZM Programs--year CZM plans approved, year plans amended, management techniques used under CZMA, and primary authorities and tools employed to control land and water uses and protect natural resources (beaches and dunes, bluffs and rocky shores)

3: Summary of State CZM Tools Employed to Protect ***Beach/Dune Systems***

4: Summary of State Tools Employed to Protect ***Bluffs*** and ***Rocky Shores***

5: Regulatory and Planning Tools and Outcome Data Associated with Regulating Construction & Shoreline Stabilization Structures on Beaches, Dunes, Bluffs, and Rocky Shoreline

6: Direct Land Management and Acquisition Tools and Outcomes Associated with State Management of ***Beaches, Dunes, Bluffs and Rocky Shores*** and Acquiring Additional Areas.

Table 1: National Context Factors Affecting State Protection of Beaches, Dunes, Bluffs, and Rocky Shores

State	Open Ocean Coastline miles (1)	Tidal Shoreline Miles (2)	National Shoreline Miles and % Critically Eroding (3)		% State Land Area % State Population in Coastal Zone (4)		Coast Pop. density 1990 (4) person per sq. mile	% Coast Pop Chg 1970-90 (5)	Presence of Natural Coastal Resources and Beach and Rocky Shore a Percent of the State's Open Ocean Coastline Beach, Bluff and Rocky Shore as Percent of Non-Open Ocean (CT & Great Lakes States) Shoreline (6)				Major Barrier Islands Number/ Miles (7)	CRBA Units-length in Miles (8)	USACE Major Shoreline Protect Projects 1950-93 (9)	FEMA Upton-Jones Claims (10)	Resource Protection-Importance of Issue: H M L (1)
	Miles	Miles	Miles	% CE	Area	Pop		%	Beaches	Dunes	Bluffs	Rocky Shores	Miles	Miles			
AL	46*	607	352	9	6	12	171	27%	y-100%	n	n	n	--	20	-	-	H
AK	6640	33904	47300	>1	67	85	1	89%	y-nd	?	y	y	nd	0	-	-	H
AS	126	126	nd	nd	100	100	607	72%	y-nd	n	y	y-nd	nd	0	-	-	H
CA	840	3427	1827	4	24	73	605	39%	y-nd	y	y	y-nd	--	0	13	1	H
CT	0	618	270	9	47	62	887	8%	y-31%	Y-rare	y-25%	y-14%	--	23	8	-	M
DE	25*	381	226	12	100	100	338	22%	y-100%	y	n	n	1- 6 mi	18	4	3	H
FL	1266*	8426	6266	5	100	100	228	90%	y-65%	y	n	n	49-560m	189	33	10	H
GU	108*	110	nd	3	100	100	637	57%	y-37%	n	y	y-63%	nd	0	-	-	H
HI	750	1052	nd	2	100	100	174	44%	y-25%	y	y-nd	y-nd	nd	0	-	-	H
LA	149*	7721	1943	2	37	49	171	16%	y-50%	y	n	n	--	178	4	3	L
ME	228	3478	2500	>1	39	72	72	29%	y-10%	y	y	y-90%	--	23	-	-	H
MD	32*	3190	1939	9	66	70	507	12%	y-100%	y	n	n	2- 31 mi	28	4	2	H
MA	192	1519	1200	11	45	75	1272	5%	y-??	y	y	y-nd	2- 18 mi	122	7	32	H
MI	0	3224	nd	nd	55	50	154	-5%	y-nd	y	y-nd	y-nd	--	55	-	32	H
MS	44*	359	247	15	4	12	192	30%	y-41%	n	n	n	--	13	3	1	H
NH	18*	131	40	5	12	32	331	67%	y-70%	y	n	y-30%	--	0	5	-	H
NJ	125*	1792	469	26	76	90	1219	6%	y-100%	y	n	n	10-100m	10	12	-	H
NY	125*	1850	638	47	37	84	858	-3%	y-100%**	y	y	y	4- 93 mi	104	13	10	H
NC	320*	2625	3661	15	19	11	75	39%	y-100%	y	n	n	20-285m	43	10	262	H
NM	184*	206	nd	nd	100	100	236	255%	y-nd	n	y	y-nd	nd	0	-	-	H
OR	362*	1410	500	13	20	38	82	46%	y-72%	y	y	y-28%	--	0	-	-	H
PA	0	140	nd	nd	4	25	1701	-9%	y-19%	n	y-81%	n	--	0	3	23	H
PR	311	700	nd	nd	12	100	856	30%	y-50%	y	y	y-nd	nd	51	-	-	H
RI	40	384	340	7	100	100	950	6%	y-66%	y	y	y	--	33	1	3	H
SC	181*	2876	3063	2	26	24	114	57%	y-100%	y	n	n	18- 96 m	60	2	9	H
VI	nd	175	nd	nd	100	100	771	63%	y-nd	?	y	y-nd	nd	15	-	-	H
VA	200*	3315	993	26	22	62	423	40%	y-100%	y	n	n	9- 67 mi	77	2	8	H
WA	171	3026	2337	>1	31	70	172	46%	y-35%	y	y	y-65%	--	0	-	12	H
WI	0	820	nd	nd	19	39	177	0%	y-10%	y	y-72%	y-8%	--	8	-	-	M
Total	nd	85770	31513***	nd	nd	44	nd	nd	y-29	y21 n8	y18 n11	y17 n12	nd	1070	124	411	26H 2M 1L

KEY and SOURCES:

* denotes where state coastline miles data differs from General Coastline miles data in US DOC,NOAA 1975. The Coastline of the United States

** New York- Atlantic Ocean only covered under this study. *** Does not include the Great Lakes States or the Island Territories and Commonwealths.

(1) Individual State CZM Profiles.

(2) US DOC, NOAA. 1975. *The Coastline of the United States.*

(3) USACE. 1970. *National Shoreline Study.*

(4) Coastal Ocean Policy Roundtable, The 1992 Coastal Status report: A Pilot Study of the US Coastal Zone and its Resources, Tables 2 and 3.

(5) US DOC, NOAA, NOS. OCRM. *Table 2: Coastal County Percent Population Per Decade and Percent Population Change Per Decade.* (unpublished in-house data)

(6) Individual State CZM Profiles on Protection of Beaches, Dunes, Bluffs and Rocky Shores

(7) Ringold, Paul and John Clark. 1980. *The Coastal Almanac,* Table 8.

(8) US DOI, US FWS, Adapted from CBRA Table December 22, 1992.

(9) USACE, *Shoreline Protection and Beach Erosion Control Study: Phase 1.*

(10) FEMA, Mar[illegible]rowell, Upton-Jones Database.

Table 2 SUMMARY OF STATE CZM PROGRAMS----
YEAR CZM PLANS APPROVED, YEAR PLANS AMENDED, MANAGEMENT TECHNIQUES USED UNDER CZMA, AND PRIMARY AUTHORITIES AND TOOLS EMPLOYED TO CONTROL LAND AND WATER USES AND PROTECT NATURAL RESOURCES (BEACHES AND DUNES, BLUFFS AND ROCKY SHORES)

State	Year Approved	Program Changes affecting Natural Resources	Technique for control of land and water uses (A, B, C)	Primary Authorities and Tools Employed under state CZMP that affects protection of beaches, dunes, bluffs, rocky shores * State Coastal Regulatory/Permit Program(s) along the open ocean coastline * Voluntary or Mandatory Local Coastal Planning and Regulatory in the coastal zone * State ownership and management of coastline properties with natural resources
AL	1979	1994	A, B	Combination of a direct state CCCL regulatory program and voluntary local planning/ zoning consistent with ACMP.
AK	1979	1981 1983-1993	A, B	Combination of state coastal policies and mandatory District Control Zone plan/regulatory implementation. Also 99% in public ownership with direct state and federal management of coastline property.
AS	1980	1994	B	Direct Territory regulatory program with Land Use Permits and Project Notification and Review System in coastal zone.
CA	1978	1983-92, 1993	A, B	Combination of a direct state regulatory program with Coastal Development Permits and voluntary local planning/regulation/ and permit delegation program.
CT	1980	1987-88, 1992	A, B	Combination of direct state regulation of shoreline stabilizations and state policy/use guidelines and mandatory Municipal Site Plan Review and voluntary local planning.
DE	1979	1984	A, B	Direct state regulatory program with coastal permits along oceanfront.
FL	1981	1985, 1986 1994	A, B	Network of state regulatory programs. State CCCL permit program. However, beginning in 1994, mandatory local planning and regulations based on state standards and approval added to program.
GU	1979	1993	B	Network of direct Territorial planning and zoning regulatory program through Seashore Protection Permits and Territory Land Use Commission Permits.
HI	1978	1979-80, 1986-87 1989, 1994-5	A, B	Combination of a network of direct state land use and regulatory programs and mandatory County Special Management Area and Shoreline Setback Variance regulation programs.
LA	1980	1990, 1991 1993	A, B	Combination of a direct state regulatory program with Coastal Use Permits in coastal zone and a local planning and regulation program.
ME	1978	1989, 1993 1995	A, B	Combination of a network of direct state regulatory programs with Sand Dune and Shoreline Permits and mandatory Municipal Shoreland Zoning Regulations and beginning in 1988 mandatory local comprehensive plans.
MD	1978	No	A, B	Combination of a direct state regulatory program with Beach Erosion Control Districts and sand dune permits and County zoning to implement state setbacks.
MA	1978	1990, 1996	A, B	Combination of a direct state regulatory program with state permit in tidal and coastline area and a voluntary local planning and Local Conservation District regulation program.
MI	1978	1974, 1989 1990, 1994	A, B, C	Combination of a network of direct state regulatory programs with sand dune permits, bluff permits and earth change permits along the coast, State model zoning plan, and option local planning/ zoning.
MS	1980	1994	B	Direct state regulatory program, but only for shoreline stabilizations. All beaches are artificial and no state regulation above MHW since all artificial beaches are public and construction prohibited.
NH	1982/88	1991, 1995	B	Combination of a network of direct state regulatory programs along coast for Tidal Buffer Zone and Shoreland Development Permits, and optional local planning/zoning, and local planning. Mandatory local shorelands ordinances and setbacks based on state standards beginning in 1995, but not part of approved control techniques.

Table 2: SUMMARY OF STATE CZM PROGRAMS-----
YEAR CZM PLANS APPROVED, YEAR PLANS AMENDED, MANAGEMENT TECHNIQUES USED UNDER CZMA, AND PRIMARY AUTHORITIES AND TOOLS EMPLOYED TO CONTROL LAND AND WATER USES AND PROTECT NATURAL RESOURCES (BEACHES AND DUNES, BLUFFS AND ROCKY SHORES)

State	Year Approved	Program Changes affecting Natural Resources	Technique for control of land and water uses (A, B, C)	Primary Authority Employed under state CZMP- affecting protection of beaches, dunes, bluffs, rocky shores * State Coastal Regulatory/Permit Program(s) along the open ocean coastline * Voluntary or Mandatory Local Coastal Planning and Regulatory in the coastal zone * State ownership and management of coastline properties with natural resources
NJ	1978/80	1981-83, 1992-94	B	Combination of network of direct state regulatory programs for activities in the coastal zone, erosion hazard areas, and barrier islands Voluntary local land use plans, but not part of approve control technique.
NY	1982	1988	A, B	Combination of a direct state regulatory program with Coastal Erosion Hazard Area Permits and voluntary local Erosion management planning/ regulation.
NC	1978	1979, 1981 1985	A, B	Combination of a direct state regulatory program with permits in Areas of Environmental Concern (AECs) along the coast and mandatory local planning and minor development permits in AECs.
NM	1980	1983, 1991	B	Direct Commonwealth regulatory program with coastal permits in Shoreline APCs.
OR	1977	1980-86, 1994	A, B	Combination of state policy plan and guidelines, network of direct state regulatory programs with Ocean Improvement Permit (OIP), and Removal-Fill Permit, and mandatory Local Comprehensive Plans, land use controls and regulations local planning and regulation program.
PA	1980	1984	A, B	Combination of a direct state regulatory program for shoreline stabilization structures and mandatory local Bluff Setback ordinances Also, only major beach area in State ownership, so no state regulations for beaches and dunes.
PR	1978	1983, 1988 1992	B	Direct Commonwealth regulatory programs with permits along shoreline, Flood Area Permits, and Maritime Control Zone Authorization/Concessions
RI	1978	1979, 1986 1988, 1990-93	B	Direct state regulatory program with CRMC permit (Assent) along coastal and barrier islands.
SC	1979	1988, 1990	B	Direct state regulatory program with SCCC Permit along coast. Beginning in 1990, local beachfront management plans required, but only for beach access and beach nourishment decisions and not a control technique change.
VI	1979	1987, 1992 1994	B	Direct Territory regulatory program with Coastal Zone Permit along coast and network of regulatory programs inland.
VA	1986	1993	A, B	Combination of a direct state regulatory program with permits on Coastal Primary Sand Dunes and Beaches and designated counties/cities may adopt local dune ordinances and issue permits.
WA	1976	1992	A, B	Combination of a state policy plan, direct state regulatory program for shoreline stabilizations and delegated mandatory Shoreline Master Program (SMPs) and coastal permitting.
WI	1978	NO	A, B	Combination of a direct state regulatory program for shoreline stabilizations and mandatory local shoreland zoning ordinances with setbacks and delegated permitting.
Total	1976-1988	Changes 27 yes 2 no	18 A, B 10 B 1 A, B, C	17 Combination of direct state and local planning/regulatory programs based on state standards, guidelines, model ordinances : AL, AK, CA, CT, HI, LA, ME, MD, MA, MI, NY, NC, OR, PA, VA, WA, WI. 12 Direct state regulatory program(s): AS, DE, FL, GU, MS, NH, NJ, NM, PR, RI, SC, VI 3 States where ownership and management of beach/dune resources a primary tool: AK, MS, PA

KEY: Techniques means the techniques used by a CMP for control of coastal uses. Under CZMA Section 306(d)(11); 15 CRF, Section 923.42-.44
Technique A- State establishment of criteria and standards for local implementation
Technique B- Direct State land and water use planning and regulation
Technique C- State review on a case-by-case basis of actions affecting land and water uses subject to the management Program

Sources CZM Profiles, OCRM Review of Approval Findings and Amendments, FEIS Documents

Table 3: **Summary of State CZM Tools Employed to Protect *Beaches and Dunes***

TOOLS	AL	AK	AS	CA	CT	DE	FL	GU	HI	LA	ME	MD	MA	MI	MS	NH	NJ	NY	NC	NM	OR	PA	PR	RI	SC	VI	VA	WA	WI	Total Yes
REGULATORY & PLANNING TOOLS																														**29**
Restrict Construction	y	y	y	y	y	y	y	y	y	y	y	y	y	y	n	y	y	y	y	y	y	n	y	y	y	y	y	y	y	27
Setbacks	y	n	y	y	n	y	y	y	y	n	y	y	n	y	*	y	y	y	y	y	y	*	y	y	y	y	y	y	y	23
Control Areas	y	y	y	y	y	y	y	y	y	y	y	y	y	y	*	y	y	y	y	y	y	*	y	y	y	y	y	y	y	27
Restrict Shoreline Stabilizations	y	n	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	28
Restrict Pedestrian or Vehicular Access	y	y	n	y	y	y	y	y	y	n	y	y	y	y	y	n	y	y	y	y	y	n	n	y	y	n	y	y	y	23
Protect Habitat, Other Restrictions	n	y	y	y	y	y	y	y	y	n	y	y	y	y	y	y	y	y	y	n	y	n	y	y	y	y	y	y	y	25
Permit Compliance Program	y	y	y	y	y	y	y	y	y	y	y	y	y	y	n	y	y	y	y	y	y	y	y	y	y	y	y	y	y	28
Local Plan and/or Regulate	y	y	n	y	y	n	y	y	y	y	y	y	y	y	y	y	y	y	y	n	y	n	n	n	y	n	y	y	y	22
Special Area Management Plans	n	y	n	y	n	n	n	y	y	n	y	n	y	n	n	n	n	n	n	y	n	n	y	y	n	y	y	n	y	12
Other Adopted Plans	n	n	y	y	n	n	y	n	n	y	n	y	y	y	n	y	n	y	y	y	y	y	n	n	y	n	y	n	y	16
DIRECT LAND MGT, RESTORATION AND ACQUISITION TOOLS																														**29**
Shoreline in State Parks Management	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	29
Natural Areas Protected	y	y	n	y	y	y	y	y	y	n	y	y	y	y	n	y	y	y	y	y	y	n	y	y	y	y	y	y	y	25
Dunes Revegetated	y	n	n	y	y	y	y	n	n	y	y	y	y	n	n	y	n	n	y	n	n	n	n	n	n	y	n	y	n	13
Beaches Nourished or Renourished	n	n	n	y	y	y	y	n	n	y	y	y	y	n	y	y	y	y	y	n	y	y	n	n	y	n	y	n	n	17
Shoreline Armoring & Repairs	n	n	n	y	y	n	y	n	y	y	n	y	y	n	n	y	y	n	n	n	n	y	n	n	y	n	n	n	n	11
Coastal Lands Acquired	n	n	n	y	y	y	y	y	y	n	y	y	y	y	n	y	n	y	y	n	y	y	y	y	y	n	y	y	y	21
NON-REGULATORY TOOLS																														**29**
Public Investment Restrictions	n	n	n	y	y	y	y	n	n	n	y	y	y	y	n	n	n	y	y	n	n	n	y	y	n	y	n	n	n	13
Public Investment Incentives	n	n	n	n	n	y	y	n	n	n	n	y	y	n	n	n	n	n	n	n	n	n	n	n	y	n	n	n	n	4
Coastal Property Disclosure	n	n	n	n	n	n	y	n	n	y	n	y	n	n	y	n	n	n	n	n	y	n	n	n	y	n	n	n	n	6
Education/Outreach/Technical Assist.	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	n	y	y	y	y	y	y	y	28
Financial Assistance	y	y	y	n	y	n	y	y	y	y	y	n	n	y	y	y	y	y	y	n	y	y	n	n	y	n	y	y	n	20
RESEARCH TOOLS																														**29**
Methodologies for Shore Setbacks/Zones	y	n	n	y	y	y	y	y	y	n	y	y	n	y	y	y	y	y	y	n	y	n	y	n	y	n	n	n	y	19
Beach Profiles	y	n	n	y	y	y	y	y	y	y	y	y	n	y	y	y	y	y	y	y	y	n	y	y	y	n	y	n	y	23
Natural Areas Inventory	y	y	y	y	y	y	y	y	y	n	y	y	y	y	y	y	y	y	y	y	y	n	y	y	y	y	y	y	y	27
Technical Reports	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	29
Aerial Photos	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	29
Sea Level Rise Considerations	n	n	y	y	y	y	y	n	y	y	y	y	y	n	y	y	y	y	y	y	y	y	y	y	y	y	y	y	y	25
Total Tools Employed – 25																														

KEY: Y- Yes, Management Tool employed by state N- No, Management Tool not employed by state

* For MS, all beaches are artificial and open to the public. There is no regulation above MHW.

* For PA, the only major beach is in public ownership and under state land management. All bluffs are regulated by setbacks and control zones.

Total Tools Employed out of 25: Al-15, AK-13, AS-12, CA-22, CT-21, DE-19, FL-24, GM-17, HI-19, LA-16, ME-21, MD-23, MA-20, MI-18, MS-15, NH-20, NJ-18, NY-20, NC-21, NM-14, OR-20, PA-11, PR-16, RI-16, SC-23, VI-13-, VA-20, WA-15, WI-18.

Source: Individual CZM Profiles Version 2/10/98

Table 4: Summary of State CZM Tools Employed to Protect ***Bluffs*** and ***Rocky Shores***

STATES	AK	AS	CA	CT	GU	HI	ME	MA	MI	NH	NM	OR	PA	PR	RI	VI	WA	WI	Total YES
RESOURCE PRESENT																			
Bluffs/ Rocky Shores	y y	y y	y y	y y	y y	y y	y y	y y	y y	n y	y y	y y	y n	y y	y y	y y	y y	y y	17 17
REGULATORY TOOLS																			
Restrict Construction Bluffs/ Rocky Shores	y y	y y	y y	y y	y y	y y	y y	y y	y n	- y	y y	y y	y -	y y	y y	y y	y ?	y y	17 15
Other Regulatory Controls Bluffs/ Rocky Shores	n n	y y	y y	y y	n n	y y	y y	y y	y n	- y	? ?	y y	y -	n n	y y	y y	y ?	y y	13 11
PLANNING TOOLS																			
Local, state, or special area	y y	y y	y y	y y	y y	y y	y y	? ?	n n	- y	n n	y y	y -	y y	y y	y y	y y	n n	13 13
DIRECT LAND MGT																			
State Owns and Manages Bluffs/ Rocky Shores	y y	n n	y y	y ?	y y	y y	y y	? y	y ?	- y	? ?	y y	y -	y y	y y	? y	y y	y y	13 13
Natural Areas Protection Bluffs/ Rocky Shores	y y	n n	y y	y ?	y n	y y	y y	? y	y ?	- y	? ?	y y	n -	y y	y y	? y	y y	y y	11 12
ACQUISITION TOOL																			
Lands Acquired Bluffs/Rocky Shores	n n	n n	y y	? ?	n n	y y	y y	? ?	y ?	- y	n n	n y	y -	n n	? ?	n n	y y	y y	7 7
NONREGULATORY TOOLS																			
Public Investment Restriction	n n	n n	y n	y n	n n	n n	n n	? ?	y ?	- n	n n	n n	n -	y y	n n	y y	n n	n n	5 2
Coastal Property Disclosure	n n	n n	n n	n n	n n	n n	n n	n n	n n	- n	n n	y y	n -	n n	n n	n n	n n	n n	1 1
Education/Outreach/ TA	y n	y y	n n	y y	n n	y y	n n	y y	y ?	- y	n n	y y	y -	n n	y y	y y	y n	y y	12 9
Financial Assistance	y y	y y	n n	y y	n n	y y	n n	n n	y ?	- y	n n	n y	y -	n n	n n	n n	y y	n n	7 7
RESEARCH TOOLS																			
Inventories/ Designate protection area	y y	y y	n n	y y	y y	y y	y y	y y	y ?	- y	n n	y y	y -	? y	n y	y y	y n	y y	13 13
Technical Reports	y y	y y	y y	y y	n n	y y	y y	y y	y ?	- y	n n	y y	y -	y y	y y	? ?	y n	y y	14 12
Total Tools Employed--13	9 8	8 8	9 8	11 8	6 5	11 11	9 9	6 8	11 ?	- 11	2 2	10 12	10 -	7 8	8 8	7 8	11 6	9 9	

Key:
y- YES, Management Tool employed by state
n- NO, Management Tool not employed by state
- not applicable
? unknown, not state data or insufficient data to determine answer

Resource Presence Summary:
17 States with Bluffs: AK, AS, CA, CT, GU, HI, ME, MA, MI, PA, NM, OR, PR, RI, VI, WA, WI
17 States with Rocky Shores: AK, AS, CA, CT, GU, HI, ME, MA, MI, NH, NM, OR, PR, RI, VI, WA, WI

13 States with No Coastal Bluffs: AL, DE, FL, LA, MD, MA, MS, NH, NJ, NY ocean coast only, NC, SC, VA
12 States with No Coastal Rocky Shores: AL, DE, FL, LA, MD, MS, NJ, NY ocean coast only, NC, PA, SC, VA

Source: CZM profiles Version 12/1/96

Table 5: Regulatory and Planning Tools and Outcome Data Associated with Regulating Construction & Shoreline Stabilization Structures on Beaches, Dunes, Bluffs and Rocky Shorelines

	TYPE OF REGULATION					SUMMARY OF TOOLS EMPLOYED Key provisions: setbacks; distance inland regulated/location; activities regulated; exceptions; shoreline stabilization regulations; regulation of access; habitats regulated; other regulations. Local delegation of permit responsibilities, voluntary or mandatory local plans required, other enforceable plans.	OUTCOME DATA & SUFFICIENCY Database, Permit Outcome Data and Plan Outcome Data
State	SB	CZ	SS	PA VA H O	LD LP S OP	**SB- Setback** **CZ-Control Zone** **SS- Shoreline Stabilization Structures** **PA-Pedestrian Access** **LD- Local Permit Delegation** **VA- Vehicular Access** **LP- Local Planning** **H-Habitat Areas Protected** **O-Other** **S- Special Area Management Plan (SAMP)** **OP- Other Plan**	**HS**- Habitable Structures **SS**- Shoreline Stabilizations **(S)** Sufficient Data **LP**- Local Plans Case Example **SAMPs**
AL	y FT	y	y	y y y n	n* y n n	**Beachfront** **SB**-Seaward of 40 ft. crestline (120-450 feet landward of MHWL). Exceptions- Single Family 1200 sq. ft. or less if bought before CCL and no room to build, repairs if <50% damaged. **CZ**- state ADEM CCCL regulates construction 40 ft. inland from crestline to the 10-ft elevation line. Repairs allowed if <50% damaged. Both a setback and control zone. **SS**-No SS allowed on gulf-front. Exceptions-case-by case if structure built prior to regulation and threatened by erosion. **PA**-regulates boardwalks but no permit for dune cross-overs. **VA**-only cleanup or law enforcement vehicles allowed on beach **H**- 3 miles sea turtle nesting; 40 acres beach mouse; 25 acres tern nesting habitat protected. *LD/LP- Voluntary local planning and zoning ordinances consistent with state CCCL provisions. State retains CCCL permitting	DATABASE Computerized permit tracking: YES Permit Outcome Data: HS/SS no data provided by state HS-no permit data SS-no permit data Local Permits- no data **LP**- 1 approved plan. 3 locals with zoning ordinances. No linear/area data
AK	n	y	n	y y y y	y y y n	**Shoreline** **CZ**-Regulates construction through district control zone. Regulates new activities in hazardous and erosion hazard areas though District land use, zoning and subdivision regulations based on statewide guidelines and Council approval. Covers flood, storm surge, littoral process areas. Distance inland/area covered unknown. No restrictions on repairs. State policies to minimize property damage and loss of life and to manage rocky islands and seacliffs to avoid harassment of wildlife, destruction of important habitat and the introduction of competing/destructive species/predators. Lack data on landward boundary of AK CZ regulatory program. **SS**-No regulation of SS- relies on USACE **PA**- trails regulated **VA**- transportation route inland from beach/shoreline unless WD or no alternative. **H**- 49,000 acres of Bald Eagle habitat (also see 990,335 acres in marine parks-under Direct Land Management) **O**- neashore sand and mining regulated. **LD/LP**- Mandatory District land use planning, control zones and regulations based on statewide guidelines and Council approval.- Need more data. **SAMP**- Areas designated which merit special attention. No data. Need more information on state policies/District guidelines.	DATABASE Computerized permit tracking: YES Permit Outcome Data: HS- data too limited SS-na **LP**- 33 approved. No data on area covered or outcomes. **SAMPS**- No data on areas designated. No linear or area data
AS	y FT	y-3	y	n n y n	n n n y	**Shoreline** **SB**-from OHWL 25ft for residential and 50 ft for commercial. No exceptions. **CZ**- (1)Territory regulates activities through Territory-wide zoning and land use permit within 200 ft MHW. Permit denied if subject to shoreline erosion, diminish physical/visual access, degrade coastal resources. Exceptions-public purpose recreation, water-dependent, no better alternative site, and SF w/in existing residential areas. (2) Also building permits for coastal hazard areas and (3) permits for grading, excavation, fill, steep slopes Variances- for use changes such as commercial or industrial. Conservation Zone on all but Pago Pago Harbor & Industrial Park. **SS**- Regulated, allowed to protect property from erosion, uses USACE standards. **H**- case-by-case review of permits to protect habitat. **Steep Slopes/Land Slide Areas** Soil Erosion/Slope Erosion Policy to control road building and construction to minimize soil erosion and avoid clearing, grading, construction on slopes >40%. Use Landslide Mitigation Maps to identify steep slope hazard areas to avoid. Engineering Plans required in high/medium slope areas. Most land in agriculture or open space. **OP**- Territory-wide zoning serves as a land use plan.	DATABASE Computerize permit tracking: YES for Land Use Permits since 1984 Permit Outcome Data: HS: Island-wide, no linear data or by geographic/resource area SS- 20 in 11 yrs, no linear data No data on Territory-wide zones and variances for use changes.

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State	SB	CZ	SS	PA VA H O	LD LP S OP	**SB- Setback** **CZ-Control Zone** **SS- Shoreline Stabilization Structures** **PA-Pedestrian Access** **LD- Local Permit Delegation** **VA- Vehicular Access** **LP- Local Planning** **H-Habitat Areas Protected** **O-Other** **S- Special Area Management Plan (SAMP)** **OP- Other Plan**	HS- Habitable Structures SS- Shoreline Stabilizations (S) Sufficient Data LP- Local Plans Case Example **SAMPs**
CA	y	y	y	y y y y	y y y y	**Shoreline** **SB**-no state coastal setback. Some Local Coastal Programs require setbacks. e.g.: LA Co. 15 ft. from MHW; Malibu 10 ft. from MHW. **CZ**-State Coastal Development Permit for activities from MHT to 1st public road, or 300 ft. from beach/bluff or MHT if no beach. Covers beaches/dunes, rocky shores and within 300 feet of top of a coastal bluff and any development in a locally-designated sensitive coastal resource areas. Regulations based on State CC Act policies and interpretive Guidelines. Exceptions- improvements to SF and repair/replacement, SF in designated urban areas, replacement. Coastal Permit based on enforceable policies in California Coastal Act which serves as both a planning and regulatory tool at state level, and plan adoption, implementation guidance at local level. **SS**-Regulates SS, allowed if WD uses or to protect existing structures or eroding public beaches. Rebuild ok without permit. Regional variations. **PA/VA**-boardwalks, elevated walkways regulated and some restrictions on vehicular traffic. But both promoted, except where inconsistent with protection of fragile coastal resources. Case-by-case review. **H**-Locally designated environmentally sensitive coastal resources/habitat areas **O**-land form alteration policies; nearshore sand mining regulated but allowed for beach nourishment. **LD/LP**-Local Coastal Programs required with land use plans & zoning ordinances. Must implement statewide coastal policies in CCAct. Covers land use activities, coastal resource protection areas, environmentally sensitive habitat areas, geologic hazard areas, flood hazard areas, bluff and cliff areas. Certified LCPs vary widely. Some have setbacks but vary and no statewide database. State retains permit jurisdiction over tidelands, submerged lands, public trust lands, and other activities for which no local permit required. Also acts on local permit appeals **SAMPs**- a) LCP designation of coastal resource areas/environmentally sensitive areas considered **SAMPS**- b) Regional coastal erosion plans. Coastal Erosion Management Plan for Santa Barbara and Ventura Counties. c) Malibu/Santa Monica Mountain (SMM) TDC Program to eliminate small undeveloped lots to avoid erosion, runoff, landslides. +700 parcels placed in Open Space Easements (as of 1989) avoiding erosion, runoff, landslides on small undeveloped and poorly sited parcels **Bluffs** **OP**- Local Bluff Protection Plans adopted as part of LCPs consistent with CCC Interpretive Guidelines for Geologic Stability of Bluff tops Development. Must minimize alteration of cliffs and blufftops, faces or bases. Cliff retaining walls only to stabilize slope or seawalls at toe of seacliffs to check marine erosion if no alternative or to protect public infrastructure or existing development. Geologic investigation and report required in unstable areas. Commission may require waiver of all claims against public for future liability/damage resulting from permission to build in geologic hazard area. Allows rebuilding w/o permit if built in same location as original site; does not include public works. LCPs vary. 24 coastal jurisdictions recognize coastal geologic hazards through designation as special zones, geologic hazard ordinances, or comparable techniques. 18 jurisdictions use liability releases for projects proposed in hazardous areas. Regarding bluff-top development, some local jurisdictions use predetermined, fixed setbacks that vary from 10 to 320 feet. Others employ a cliff retreat rate, most commonly over a 50-year period. Most communities compromise safe setback considerations in "infilling" areas. LCP/SAMP- designation of environmentally sensitive areas with overlay zones, special use permits. But no statewide data on LCPs. **Rocky Shores** -No Regulations or Plans Specific to Rocky Shores- Below MHT rocky shore habitat areas. Above MHT, RS and bluffs in State Parks/Recreation.	DATABASE Computerized permit tracking: NO, developing electronic logging system. Permit Outcome Data: HS/SS: No, coast-wide only, no break-down by type or resource or sub-area. HS-coastwide SS- no data Case Examples LP- 126 LCP segments, 105 (83%) certified LUPs, 88 (70%) certified Implementation Plans. Cover 86% of CZ. All locals with beaches/bluffs have plans/regulations for these areas. No statewide data on outcomes. Case Examples **SAMPS**-a) and b) No statewide data on area designated, No linear/area data. c) +700 parcels (S) **OP**- no statewide data on outcomes.

Table 5: Regulatory and Planning Tools and Outcome Data Associated with Regulating Construction & Shoreline Stabilization Structures on Beaches, Dunes, Bluffs and Rocky Shorelines

	TYPE OF REGULATION					SUMMARY OF TOOLS EMPLOYED Key provisions: setbacks; distance inland regulated/location; activities regulated; exceptions; shoreline stabilization regulations; regulation of access; habitats regulated; other regulations. Local delegation of permit responsibilities, voluntary or mandatory local plans required, other enforceable plans.	OUTCOME DATA & SUFFICIENCY Database, Permit Outcome Data and Planning Outcome Data
State	SB	CZ	SS	PA VA H O	LD LP S OP	**SB- Setback** **CZ-Control Zone** **SS- Shoreline Stabilization Structures** **PA-Pedestrian Access** **LD- Local Permit Delegation** **VA- Vehicular Access** **LP- Local Planning** **H-Habitat Areas Protected** **O-Other** **S- Special Area Management Plan (SAMP)** **OP- Other Plan**	**HS**- Habitable Structures **SS**- Shoreline Stabilizations **(S)** Sufficient Data **LP**- Local Plans Case Example **SAMPs**
CT	n	y	y	y n y y	y y n n	**Shoreline** **CZ-Yes- see under Local Delegation (LD)- MHW inland to 1000 feet. State Coastal policies/Use Guidelines to preserve natural beach system, protect coastal bluffs from erosion, maintain healthy intertidal community, and regulate uses to minimize adverse impacts.** **SS-State permit for SS seaward of MHW, landward controlled by LD. Filling allowed for beach nourishment/erosion control. Groins/jetties allowed where nonstructural infeasible or to protect infrastructure, water-dependent uses, existing inhabited structures in existence prior to 1986 and if mitigated. Seawalls, revetments, bulkheads allowed for same reasons as above and if minimal, and do not increase erosion. Also allowed on bluffs if slope of protective structure no steeper than 3:1 when bluff/escarpment to be protected is fronted by beach system.** **H-regulate activities in mapped bird nesting habitat areas and case-by-case review.** **PA- pedestrian traffic corridors allowed along B/D, BL if vegetation/habitat protected. VA- no, not an issue.** **O-Dune reshaping allowed only as part of beach renourishment or filling** **LD- Municipal Coastal Site Plan (MSPR) reviews required and covered under regulatory tools -local regulation delegation. 2 Tier regulatory zones. 1) All activities regulated above MHW inland to 1000 feet or 100 feet from inland boundary of state regulated tidal wetlands, or 100 year flood zone through Municipal Site Plan Reviews(MSPR). 2) Certain major state/federal activities reviewed for consistency within the boundaries of the coastal municipalities. Exceptions- gardening, agriculture, conforming SF if 100 feet landward of beach/dune/bluff/escarpment/tidal wetland, minor additions/modifications to existing bldg, pools/walks/drive ways/docks/fences/utilities, conservation/preservation activities. Local regulations based on state General Use Guidelines. No provisions for relocation of damaged structures outside erosion-prone areas.** **DATABASE-HS- No statewide database for municipal site plan review (MSPR) decisions. Data in performance reports of each municipality and not broken-down by resource areas, permit data aggregated for all activities within coastal boundaries. CT CZM now trying to identify resources that may be impacted (including beaches, etc.).** **LP-State coastal policies and use guidelines adopted as part of CCMP to guide state decisions and local planning and regulations. Voluntary Municipal Coastal Programs (MCPs) adopted with long-range land use plans and zoning consistent with CCMA coastal policies and use guidelines.** General Use Guidelines for: **Beachfronts/Bluffs/Rocky Shores- preserve natural beach systems/bluff vegetation/rocky shore slope/composition and natural features; setback; protect habitat; siting to preserve littoral system; prohibit excavation of beach; construction to minimize adverse impacts; public access; siting to avoid visual/aesthetic impacts.**	DATABASE Computerized permit tracking: NO for HS, YES for SS HS- No statewide data base for local MSPR. SS- state database since 1988, by activities on or adjacent to specific resource areas. But no linear data. Permit Outcome Data: HS- 3,229 MSPR permits issued for activities with 1000 feet over 5 1/2 years (1/86-6/91) Permits not broken-down by resource area. SS- 93 State DEP permits approved in 9 years (1988-1996) in or adjacent to B/D, BL, RS areas. No linear data LP- 35 of 41 Towns/Burroughs have approved plans. No statewide data. Most approved plans have established setbacks from sensitive coastal resources/HTL. Case Examples
DE	y FT	y	y	y y y y	n n n n	**Beachfront** **SB-100 feet landward of seaward most 7-foot elevation above National Geodetic Vertical Datum. Re-establish line if storm changes seaward contours. Exceptions- may build within 100 feet of MHW if not sufficient land, but permit required.** **CZ- Building landward of setback, letter of approval needed for building landward of the setback along a strip which runs down the Delaware Bay and around to the Atlantic. Extends inland 100 yards North of Wilmington to ~12 miles in the south-eastern part of the state. Post-storm reconstruction prohibited after complete destruction (75% or more of structure or 50% or more foundation). Exception- inadequate space landward of line for reconstruction.** **SS- permits new and repair of shoreline stabilizations.** **PA- Letter of approval required for dune-crossovers. VA- only 4-wheel drive vehicles allowed.** **H- bird nesting sites, however, on state park lands only.** **O- nearshore sand mining, sand fencing, dunes alteration regulations.** **LD/LP- soil Conservation Districts implement Erosion and Sediment control Act, but not along ocean. State has comprehensive plan and counties have growth management plans, but not part of CZMP.**	DATABASE Computerized permit tracking: YES Permit Outcome Data: 18 years (1973-1995) HS: 1550 Letters of approval (landward of setback) HS: 108 permits (seaward of setback) No linear data SS: 59 (2 years- 1993-1995). No linear data . Some Setback Replacement, Relocation data.

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FL	y E	y	y	y y y n	y y n y	**Beachfront** **SB-**30-year erosion zone setback for major structures. Zone determined on permit-by-permit basis from SHWL w/in 30 year after permit. Exception-Single Family on parcels platted prior to 1985. Can repair/rebuild but not seaward of zone. **CZ-** permits for activities w/in CCCL Measured from SHW to landward extent of 100-year floodplain. Line ranges from a few feet to several hundred feet. **SS-** state allows new and repair of SS by permit. Anti-armoring policy for areas with no armoring repealed in 1992. **PA-** Boardwalks, dunes crossovers regulated by permit. **VA-**5 counties allow driving on beach to facilitate beach parking needs. **H-** sea turtle nesting areas. **LD-** State could delegate CCCL and 30-Year erosion zone permits to local governments--None delegated at this time. **LP-** In 1994, mandatory local comprehensive plans and implementing regulations added to CZMP. Must meet state requirements including beach/dune management. Prior to 1994, relied on network program at state level. **op-** a) Florida Beach Erosion Control Assistance Program identifies/plans erosion control and funds beach management projects. b) Inlet Management Plans- state funds inlet management plans for sand transfer to address adverse effects of channel dredging on littoral drift and beaches.	DATABASE Computerized permit tracking: YES Permit Outcome Data: HS/SS: NO data provided by state Boardwalks- Thousands **LP-** 170 cities/35 counties with approved plans. Beach Management Plans cover 58.8 miles (10.8% of beachfront). No statewide data on outcomes. **Other-** a) all ~500 miles of beach under state erosion plan- ~100 miles of beaches restored/dunes restored. See under Direct Land Management. **(S)** b) 29 inlet mgt.plans. No data on results
GU	y-2 FT	y-2	y	y y y y	y n y n	**Shoreline** **SB-** (1) Ocean Shore Public Access Zone right between MLW and 25 feet inland from 2 foot contour line of Geodedic Survey. (2) Zoning Setback of 35 feet from MHW bounding beach. No higher than 20 feet within 75 feet of MHW. Exception-Beach does not include shoreline if cliff/bluff higher than 25 feet nor village lots >100 sq. meters in residential areas before WWII. Cannot restore nonconforming buildings if destroyed >50% value of building unless conform to regulations for new buildings. Variances- recreation, aesthetic, commercial value and not interfere surrounding property and public access to beach. **CZ-** Territory-Wide Land-Use Plan, Zoned Districts, Policies and Guidelines. Requires state agencies act consistent. (1) Territory permits required for activities in Seashore Reserve seaward to 10 fathom contour, all islands, and inland from MHW to 10 meters or inland edge of public right of way. Exception- repair/improve Single Family at $7500 or less and maintenance dredging. (2) Flood hazard area building permit for new and expanded activities. No permit required for repairs. **SS-** TSPA and submerged lands permit would be required. Relies on USACE permit programs. **PA-**boardwalks regulated through TSPA. **VA-** vehicles restricted on public beaches. **H-** conservation/preserve areas. All protected habitat areas under public ownership, so covered under Direct Land management **O-**sand mining prohibited on beaches and taking of coral and live rock prohibited. **LD-** Local building official issues building permit unless outside organized villages, then issued by Territorial Land Use Commission. **SAMPs-** a) Guam Seashore Reserve Plan and b) Flood Hazard Areas as APCs- see under CZ above. c) Recreation and Water Use Management Plans- plan for 6 mile stretch designates jet skis area, bird nesting protection areas, Manahac fish run protection areas. d) Erosion Control Plans to get clearing/grading permit. Development limited in areas 15% or greater slope by erosion/sediment requirements. Development on bluffs and slopes >15% discouraged, not restricted. No regulations/plans for rocky shores. Public owns below MHW (Submerged lands are 2/3 territory and 1/3 federal). About 1/3 coastline is federal and contains rocky shores and cliffline areas.	DATABASE Computerized permit tracking: NO Permit Outcome Data: HS: Island-wide 357 requests, 86% approved. No data by resource area, no linear data. SS: none permitted since 1970s.**(S)** H- 3,000 acres-public. **Use Districts-** 100% of Guam CZ covered. 21% of land area in Habitat Protection Areas. No data on % conservation districts, type habitat protected. **SAMP** -a) covers seashore inland 10 meters.-inf. under regulatory tools. b) no data c) 6 lineal miles. 3 Jet skis use zones/ planning areas area/distance defined for each. 2 Adopted 1990-91, 1 pending. **(S)**

Table 5: Regulatory and Planning Tools and Outcome Data Associated with Regulating Construction & Shoreline Stabilization Structures on Beaches, Dunes, Bluffs and Rocky Shorelines

	TYPE OF REGULATION					SUMMARY OF TOOLS EMPLOYED Key provisions: setbacks; distance inland regulated/location; activities regulated; exceptions; shoreline stabilization regulations; regulation of access; habitats regulated; other regulations. Local delegation of permit responsibilities, voluntary or mandatory local plans required, other enforceable plans.	OUTCOME DATA & SUFFICIENCY Database, Permit Outcome Data and Planning Outcome Data
State	SB PA VA H	CZ	SS	LD LP S O	OP	**SB- Setback** **CZ-Control Zone** **SS- Shoreline Stabilization Structures** **PA-Pedestrian Access** **LD- Local Permit Delegation** **VA- Vehicular Access** **LP- Local Planning** **H-Habitat Areas Protected** **O-Other** **S- Special Area Management Plan (SAMP)** **OP- Other Plan**	**HS**- Habitable Structures **SS**- Shoreline Stabilizations **(S)** Sufficient Data **LP**- Local Plans Case Example **SAMPs**
HI	y FT y y y	y-3	y	y y y y	y y y n	**Shoreline** **SB**- Shoreline setback of 40 feet along most shorelines. Counties establish setback based on state guidelines and may establish greater setback distance. Prohibits new structures seaward of setback. Shoreline defined as the upper reaches of the wash of the waves, other than storm and seismic waves, at high tide during the season of the year in which the highest wash of the waves occurs, usually evidenced by the edge of vegetation growth, or the upper limit of debris left by the wash of the waves. Variances-20-ft for small lots, shoreline stabilization if in public interest or hardship; protection of existing structures at risk from shoreline erosion; new or repair/minor expansion of boating, Maritime, or water-sport recreation facilities; public agency/utilities; private facilities clearly in public interest; private facilities/improvements if not adversely affect beach processes, nor artificially fix shoreline if hardship demonstrated; private facilities/improvements that artificially fix shoreline if shoreline erosion likely to cause hardship but only if in public interest; moving of sand from one location to another if not adversely affect beach processes, size of beach, erosion; cultivation of crops; aquaculture; landscaping; drainage. **CZ**- a) Special Management Areas (SMAs) must extend 100 yards inland from shoreline, so extend several miles inland to cover resources or set boundary at inland coastal road. Permits required for development (land uses w/market value >$25,000 or significant adverse effect on environment/ecology. Exemptions: Single-family residences; land use <$25,000; subdivisions prior to 12/1/75. Major permits >$125,000 or adverse environmental or ecological impact, otherwise minor permits. b) Land Use Commission Land Use Boundary Amendments to reclassify land use from agriculture or conservation, rural to urban; c) Dept. of Land and Natural Resources Conservation District use Permits. **SS**- Allowed but require a Shoreline Setback variance. No public hearing requirement for stabilization of shoreline erosion by the moving of sand entirely on public lands. Variance requires demonstration of public interest or hardship. **PA**- HCZMP policies to provide pedestrian access but restricted in areas where natural resources may be adversely affected on case-by-case basis. No boardwalks. **VA**- Vehicular access restricted. Most roads have barriers limiting access to shoreline, except for government vehicles. **H**- Endangered plant/animal species on case-by-case review. Natural Area Reserves, Wildlife Sanctuaries on state lands. **O**- Prohibit taking/mining sand, dead coral, coral rubble, rocks, soil or beach w/in in shoreline setback area or within 100-ft seaward from shoreline. **LD**- Counties administer both Shoreline Setback Variances and Special management Area (SMA) Permits- see above. **LP**-County Master Plans, zoning and subdivision regulations required. Zoning based on state-mandated setbacks/guidelines. **S**- Natural Areas Reserves, Wildlife Sanctuaries, and Marine Life Conservation Districts.	DATABASE Computerized permit tracking: YES, updated in 1994 Permit Outcome Data: 1993-1995-Permits Issued 4 Counties Total SMA Major Permits: 153 SMA Minor Permits: 730 Shoreline Setback Variances: 27 DLNR-CDUA Permits: 53 LUC District Boundary Amendments: 23 Total CZMP regulatory Permits: 1342 No data on resource areas affected, type of activity regulated. **SAMP**- See data under Direct Land Management
LA	n n y y	y	y	n n y y	y y n y	**Beachfront** **CZ**- Coastal Use Permit required in CZ. Inland boundary based on intracoastal waterway, highways, natural ridges and parish boundaries. Exemption- Single-family and no restriction on repair or rebuilding. Uses of state concern include dredging, use of submerge lands; mineral, oil and gas, and energy activities; uses of local concern that may affect the region/state/nation. Uses of Local concern include: shoreline modifications such as jetties/breakwaters/bulkheads, piers; dredging/fill not intersecting more than one waterbody; maintenance dredging; private water control projects >$15,000. **SS**- Coastal Use Permit required. Exemption-No restriction on repair/rebuilding damaged shoreline structures and no permit needed if rebuild same structure and no dredge/fill required. **H**- Bird nesting sites protected. **O**- Sand scraping, dune reshaping require Coastal Use Permit. **LD/LP**- Local coastal use permits allowed, but not required, for Uses of Local Concern. 8 parishes with local plans/regulation. based on state guidelines/certification. Few land use/ restrictive zoning ordinances. **OP**-a) Water and Marsh Management Plan includes erosion prevention. b) Beneficial Use of Dredged Materials Policy- If USCOE dredges > 500,000 cu yd, must work with state to determine beneficial use. Note: Beach Management Plan with guidelines for beach renourishment, but not incorporated into CZMP.	DATABASE Computerized permit tracking: NO Permit Outcome Data: HS/SS: No data H: bird nesting sites on Chandelier Island. No linear data **LP**- 8 parishes have certified plans. No data on linear/area resources protected. **OP**- a) no data b) no data

Table 5: Regulatory and Planning Tools and Outcome Data Associated with Regulating Construction & Shoreline Stabilization Structures on Beaches, Dunes, Bluffs and Rocky Shorelines

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State	SB	CZ	SS	PA VA H O	LD LP S OP	**SB- Setback** **CZ-Control Zone** **SS- Shoreline Stabilization Structures** **PA-Pedestrian Access** **LD- Local Permit Delegation** **VA- Vehicular Access** **LP- Local Planning** **H-Habitat Areas Protected** **O-Other** **S- Special Area Management Plan (SAMP)** **OP- Other Plan**	**HS**- Habitable Structures **SS**- Shoreline Stabilizations (S) Sufficient Data **LP**- Local Plans Case Example **SAMPs**
ME	y-2 R FT	y-3	y	y y y y	y y y n	**Beachfront/Dunes and Shoreline** **SB-** (1) In Frontal dunes (V-Zone) no new structures, shore stabilizations. de facto setback. Dune encroachment is setback behind 100-year floodplain (v-zone) and sea level rise area. No setbacks in back dunes. Prohibits reconstruction of structures damaged >50% unless all new building standards met-i.e., minimal-damage to dunes, lot restrictions, bird habitat protection, revegetation of disturbed areas. After 1/89 may not expand floor area/volume by >30% of existing structures. (2) Under MSLZ, setback from residential district is 75 feet; general development/commercial- 25 feet. Existing development-follow existing pattern. In Resource Protection Areas setback is 250 feet from NHWL. **CZ-** (1) State NRPA/BEP permit for any activity on coastal sand dunes. Regulates activities on coastal frontal and back dunes. Dunes mapped by states. Frontal dunes extend inland 125-175 feet from MHW or seaward edge of sand dune. Setbacks (see above). In Back Dunes, size limits max. 2,500 sq. ft and must be moveable structure or elevated 3" above sea level rise. Multi-Family elevations higher. Exceptions- maintenance/repair/additions to existing structures, temporary structures, walkways, open decks >200 sq. ft; underground storage tanks outside v-zone. (2) NRPA permit also for activities in "protected natural resource areas" which include 100-year flood zone, moderate/high value wetlands, steep slopes >20%. Setback 250 feet (see above). Exception- Single-Family under certain conditions. (3) Under LURL same restrictions as MSZA, but for unorganized areas. **SS-** prohibits new rip-rap, seawalls, groins, other SS in/on any sand dune system. Exempt-existing seawalls may be repaired/maintained unless building behind SS damaged >50%. Effective 1995, existing seawalls can be fortified, built bigger and deeper if undermined. Property owner without permit may place protective materials (riprap, sand bags, etc.) or Strengthen SS. **PA-** State standards- private 4 ft. wide, public 10 ft. wide allowed without permit if sand transport and dunes not affected. Maintenance/repair of existing accessways to residential does not require a permit, if conditions met. However, Notice to state required. **VA-** no new roads, driveways, parking in V-zone. No other specific restrictions on beach/dune. **H-** shore bird nesting areas, essential wildlife habitat areas protected. **O-** sand fencing, beach nourishment, sand scraping and removal regulations. **LD-** Municipal shoreland zoning regulations (MSZA) required for activities within 250 feet of NHW line. Six districts **LP-** State Comprehensive Planning and Land Use Regulation Act (CPLURA) of 1988 established 10 coastal area goals and mandates planning to address growth. More comprehensive than Municipal Shorelands Zoning Act since covers watersheds and addresses growth/infrastructure issues. Incorporates 250 ft. set-back from resource protection areas in MSZA. Local must adopt ordinances which meet or exceed state standards in MSZA. Land Use Regulation Law (LURL) requires planning in unorganized areas (5%) of Maine coastline- mostly rocky shores and 306 (10%) of Maine's islands. At time of program approval, locals required to adopt/enforce minimum shorelands zoning regulations. With passage of CPLURA in 1988, local comprehensive plans required and shoreland zoning as method to implement. **SAMP-** Locals required to designate "Resource Protection Zones" within 250 ft. of NHWL (including beaches, floodplains, steep slopes) under MSZA. Same shoreline regulations cover bluffs or rocky shores.	DATABASE Computerized permit tracking: YES Permit Outcome Data: NRPA/BEP Permits 1988-1995 HS: 304 SS: 110 Other: 214 NRPA/BEP Permit by Rule 1988-1995 HS: 9 SS:82 Other:12 LURC Permits 1972-1995 HS: 187 SS: 4 Other: 434 Local MSZA Permits HS/SS: no data Note: no linear data, no location data for state/local permits Case Example **LP-** 56 of 144 coastal communities have approved plans. The MSZA, all have setbacks- see under Regulatory Tools. **SAMP-** 36, 250 acres and 10% of shoreline protected as "Essential Wildlife Habitat" under all planning and regulatory tools combined MSZA, LURL, NRPA, ESA. However, % zoned as "resource Protection districts" is unknown. No statewide database. Varies by type and extent of resource present. Case Example

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State	SB	CZ	SS	PA VA H O	LD LP S OP	**SB- Setback** **CZ-Control Zone** **SS- Shoreline Stabilization Structures** **PA-Pedestrian Access** **LD- Local Permit Delegation** **VA- Vehicular Access** **LP- Local Planning** **H-Habitat Areas Protected** **O-Other** **S- Special Area Management Plan (SAMP)** **OP- Other Plan**	**HS**- Habitable Structures **SS**- Shoreline Stabilizations **(S)** Sufficient Data **LP**- Local Plans Case Example **SAMPs**
MD	y FT	y-2	y	y y y y	y y n y	**Beachfront** **SB**- Beach Erosion Control District. Setback 75 feet from NHW. Building setback runs along landward west edge of board-walk in Ocean City and behind dunes of Assateaque island. No construction seaward except fences and boardwalk when extends ~26 city blocks. **CZ**- a) State BEP permits for any activity on coastal Sand dunes. b) State permit for Multi-Family and other development within shoreland zone of 250 feet from NHW. **SS**- New and repair/rebuild allowed by permit. Nonstructural stabilizations encouraged. **PA**- boardwalks, elevated dune crossovers regulated. **VA**- vehicle traffic prohibited on beach. **H**- bird nesting sites seasonally restricted. **O**- sand mining, erosion control, beach replenishment, **LD**- county zoning implements requirements of model ordinance with 75 feet setback. **LP**- Requires county comprehensive plans/zoning to implement state Beach Erosion Control District Act standards. **OP**- a) Beach Erosion Control District Plan--provides beach maintenance funds for shore erosion structures. Dunes restored, beaches renourished, erosion control projects-- see under Direct Land Management.	DATABASE Computerized permit tracking: YES, joint state and USACE Permit Outcome Data: HS: No data provided SS: 4238 permits (9 yrs-1986-1995) 367 planting/sand fill However, No linear data LP- 1 county/1 city (100% oceanfront) approved plans with setbacks and dune mgt. plans. No outcome data on results
MA	n	y	y	y y y y	y y y y	**Shoreline** **CZ**- State Waterway Permit for any new construction/fill on tide-flowed tidelands and filled tidal flats between waterway and first public way, or 250 feet from water. State performance standards of resource areas including coastal beaches, dunes, barrier beaches, banks. No restriction on private rebuilding, but priority to relocating willing sellers. May impose permit conditions if project found to have significant impact on storm damage prevention. Exemptions- rebuilding, demolition, relocation. **SS**- State DEP permit required. Allowed if necessary for stabilization of shore, rehabilitation existing structure, if minimize encroachment in waterway. Seawalls, bulkheads, revetments locate landward of MHW, except tieback, slope stability and abutting below MHW. Encourages nonstructural alternative where feasible. **PA**- boardwalks, cross-overs regulated. **VA**- Local Beach Management Plan required if locals permit ORV activity on beach. **H**- natural heritage and endangered species habitat areas. **O**- Sand scraping and sand mining regulated. **LD**-Local Conservation Commission permits projects within 100 feet of the 100-year floodplain or 100 feet of bank of beach, dune, flat, marsh, meadow or swamp. State performance standards for resource areas including coastal beaches, dunes, barrier beaches, banks. **LP**- Local comprehensive plans/land use plans voluntary. Cape Cod Commission requires local comprehensive plan for all activities (traffic, buildings) not just CZM. **SAMP** - Areas of Critical Environmental Concern (ACECs) delineated and designated by state cover 75,000 acres. **OP**- Local Beach Management Plans encouraged and required if ORV allowed on beach. MCZMP Barrier Beach Management Guidelines as technical assistance to local planning to help communities develop plans for all locally-owned beaches. To qualify for funding through DCS, municipalities must have developed an open space and recreation plan for the area.	DATABASE Computerized permit tracking: YES Permit Outcome Data: HS/SS: No data provided by state Case Example **SAMP** -14 coastal ACEs designated/adopted. 75,000 acres of resources protected. No linear data. No results data. **Other**- 8 local barrier beach mgt. plans approved. No linear/area data. No results data.

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MI	y-2 FT /R E	y-3	y	y y y y	y n n y	**Sand Dunes/Bluffs/Shoreline** **SB-** (1) Sand Dunes Setback of 100 feet landward from the crest of the first landward ridge that is not a foredune. (2) Bluffs High Risk Erosion Area Setback landward of 30-year erosion projection along receding bluff-line. In 1992, 15 feet added to setbacks to address severe short-term erosion events. Also expanded to cover non-bluff areas. Small structures (>3,500 sq. ft. foundation and >5 units) must be moveable if built between setback and 2 times setback distance. Larger structures-setback doubled. Exceptions- site too narrow/steep for movable structures. Exceptions- construction on parcels/substandard lot prior to designation if moveable, waste system landward, landward as possible, meets engineering standards, etc. Also additions to nonconforming structures if moveable or foot print d/n exceed 25% of foundation. **CZ-** (1) Sand Dunes- Permits required within designated critical dune areas. Covers land lying w/in 2 miles of Great Lakes OHWM. Also may regulate land w/in 250 feet of critical dune area. Regulates development, silvaculture and recreation affecting dune areas/contour change. State requirements: cannot build on slope 25-33% w/o registered plans, >33% w/o special exception; silvaculture prohibited; 100 foot setback; if structure w/in 100 feet of dune crest, standards to ensure dune stability; special use projects regulated (Commercial, Industrial, Multi-Family>3 acres, density> 4 units per acre). Variances- rebuilding of nonconforming structure w/in critical dune area if build prior to act and destroyed by fire/non-erosion forces. Also nonconforming lot prior to Acre; made nonconforming due to erosion. (2) Bluffs- Permit required w/in High Risk Erosion Area which extend landward from OHWM as far as 1,000 feet inland from recession and covers all areas w/erosion of 1 foot or greater per year over past 15 years. Setback requirements. (see above) Allows reconstruction of substantially (non-erosion) damaged structures if moveable, not in zone of imminent danger. If completely damaged, new requirements apply. (3) Earth change permit for changes to natural cover or topography within 500 feet of a land or stream including the Great Lakes **SS-** must be designed to meet/exceed 20-year storm event for small structures; 50 year storm event for large structures. Must be constructed at least 30 feet from erosion zone and landward of zone of imminent danger. Escrow required for maintenance of erosion control device in front of large structures. Exception to minimum setback based on engineering. **PA-** regulates beachfront stairs, boardwalks, trails. **VA-** restrict vehicles along 23% of the coast. **H-**designated natural preserves, critical dune areas, high erosion areas **O-** nearshore mining, sand scraping and dune reshaping regulated. **LD-**authorized to zone within 100 feet of OHWM of Great lakes. Optional Local Sand Dune Protection Ordinances based on Model Zoning Plan/State requirements for critical dune areas. **OP-** a) Sand Dune Protection and Management Act & b) Shorelands Protection and Management Act, both essentially regulatory programs with local zoning including designated critical dune areas, high erosion areas that meet state requirements. c) Soil Erosion and Sedimentation Control Act both a planning and regulatory tool. Plans/educates on need for soil erosion control, local implementation. Rock Shore Management- Need information.	DATABASE Computerized permit tracking: YES Permit Outcome Data: HS: 705 homes (6 years- 1989-1995) SS: 1688 (6 years 1989-1995) PA 200-250 projects VA- prohibited along 23% of coast H- 300 miles critical dunes; 250 miles natural preserves; 310 miles high risk erosion area. For HS/SS, no linear data Some relocation data. Case Example OP-a) and b) see above (c) no data
MS	n	n	y	y y y y	n y n n	**Beachfront** Note: All beaches are artificial and open to the public. No regulation of beaches/dune above MHW. (Coastal Wetlands regulations, but no permit required for Single Family) **SS-** permit or consistency certification required for SS. Repair/rebuilding allowed. **PA-** boardwalk to only beach park. **VA-** no vehicles allowed on the beach. **H-** bird nesting sites **O-** sand scraping and sand mining for beach nourishment regulated. **LP-** One voluntary local coastal land use plan adopted,. Voluntary beach/dune management plans are utilized in two counties on public beaches.	DATABASE Computerized permit tracking: NO Permit Outcome Data: 1980-1995 HS: none on beach SS: 12 permits No linear or Area Data LP- no linear/area outcome data

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NH	y-3 FT	y	y	y n y y	y y n y	**Shoreline** **SB-**(1) Tidal Buffer Zone extends inland 100 feet from HOTL bordering tidal waters. No structures on beach/dune unless in public good. Effective 1993, allows building on relic dunes. Exception- rebuilding existing structures, activities in public benefit, building on relic dunes. (2) Shoreland development setback of 5 feet from MHW for primary structures; (3) 75 feet setback from coastal waters for septic tanks. **CZ-** (1) Tidal Buffer Zone extends inland 100 feet from HOTL bordering tidal waters. All dredge and fill in wetlands regulated. Covers beaches and dune areas. Regulates in-filling of back dunes and building on relic dunes. (2) Shoreland Development Permits required from OHTL landward 250 feet. Standards for cutting veg., septic & building setbacks, lot sizes and disturbance of terrain. Exceptions- agriculture, forestry, state port authority, special local urbanized area on petition. (3) DES Subsurface disposal permits statewide with setbacks from water bodies. **SS-** state permit for SS. No restriction on reconstruction. SS considered in public interest and generally allowed for protection of upland structures. Major project if in dune, tidal wetland or w/in 100 feet of HOTL. Minor project is beach replenishment <10 cu yd or removal rock, gravel, sand <20 cu yd. Minimal impact projects-repair retaining walls,. **PA-** construction of boardwalks and accessways regulated. **VA-** no **H-** condition of dune and value of habitat a permit consideration. Natural Sites protected but all public. **O-** mining of sand and gravel regulated. **LD-** Local Shorelands ordinances based on state standards. No local delegation of wetlands permits. **LP-**LCPs voluntary and not part of CZMP. Effective 1991, Comprehensive Shorelands Protection Act requires local protection ordinances with setbacks based on state standards- See under Regulatory tools. **OP-**a) Hampton Harbor Inlet Management Plan for placement of dredged material on Hampton Beach. See under Direct Land Management Tools. b) Seabrook Beach/Dune Plan- See Under Direct Land Management Tools. RS-same regulations as SB and CZ above.	DATABASE Computerized permit tracking: YES, new in 1995. No data entrees yet Permit Outcome Data: HS/SS: No (6 months from paper files) OP- a) and b) See under Direct Land Management Tools
NJ	y-3 E FT	y-2	y	y y y y	n y n n	**Beachfront** **SB-** (1) V-zone Setback: residential prohibited. Exception- some beach-related commercial permitted (2)) Erosion Hazard Areas setback along Atlantic based on 30 year erosion rate for 1-4 dwelling units, and 60 yr. for larger structures. Baseline for setback varies by site (crest of coastal bluff, dune crest, first line of vegetation, landward edge of 8-ft. elevation). Erosion rate calculated on case-by-case basis. Within EHAs, new development prohibited. Exceptions- Single-Family and duplex infill and shore protection. (3) All permanent structures must be setback 25 feet from shore protection structures. **CZ-** (1) state DEP permit for all facilities (Commercial, Industrial, Housing >24 units) within CZ. (need data on inland boundary of CZ). In 1994, Single Family added as a regulated activity. In 1988/1990, expanded regulation to include activities from MHW landward 500 feet. Covers Single Family, Commerical, Shoreline Stablizations. (2) Erosion Hazard Areas covers erosion rate areas and uses setbacks (see above). (3) DEP rule limit development permits based on growth, environment, development potential and divided into 14 areas. Barrier island designated "extension region." For "barrier island corridors" new/expanded development allowed and no restrictions on repair, rebuilding, relocation of damaged structures. However, DEP rule prohibits development on dunes, overwash areas, beaches and coastal bluffs except where no prudent/feasible alternative. **SS-** allowed by permit in areas where most new development prohibited based on 7 conditions such as water-dependent, public use, protect existing structures/infrastructure in developed urban shoreline areas. Nonstructural solutions preferred. **PA-** boardwalks, crossovers regulated. **VA-** local level restriction. **H-** 15 miles restricted for bird nesting **O-** Dune creation, sand scraping and sand mining regulated.	DATABASE Computerized permit tracking: YES Permit Outcome Data: HS: No data provided SS: ~40 (25 years 1970-1995) 30 Emergency (11 yr 1984-95) Boardwalks: 2 (1994-1996) No linear or area data No resource impacted data

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NJ	y-3 E FT	y-2	y	y y y y	n y n n	**Beachfront (Continued)** **LD- state retains permit jurisdiction.** **LP-** Local plans are voluntary under NJCZMP. However, if adopt Local Coastal Land Use Plan or Beach Management Plan must meet state standards, requirements, approval. Some local plans and construction line ordinances seaward of which construction is prohibited OP- a) Coastal Erosion Hazard Management Plan under development. Will coordinate state and coastal municipalities beach erosion control efforts. b) In 1992, State Development and Redevelopment Plan (SDRP) adopted. Original State Comprehensive Plans excluded coastal areas. Exclusion removed as part of CAFRA Amendments in 1992. NJCMP and State Planning Commission working together to adopt new rules/regulations for SDRP for coastal counties and municipalities. State's coastal policies will be revised to incorporate the planning policies and land use criteria in SDRP to provide for statewide planning for the coast. Goal of SDRP is to channel development to preserve important natural resources, encourage development where there is existing infrastructure, and minimize adverse impacts of development.	**LP-** 151 local Coastal Land Use Plans and Beach/Dune management Plans approved. . No linear or Area Data
NY	y R/ E	y	y	y y y y	y n n y	**Oceanfront Shoreline** **SB-** Within EHAs, prohibits nonmoveable structures and major additions. **CZ-** Coastal Erosion Hazard Area (EHA) permit required for any activity in a designated erosion hazard area (EHA) and natural protective feature area based on state standards. Covers Atlantic Ocean, Long Island Sound and lands adjoining the shores of Lake Erie and Ontario. EHA defined as portion of the coastline that is 1) a natural protective feature (beach, dune, shoal, bar, spit, barrier island, bluff, wetlands and assoc. natural veg) or 2) structural hazard area (40-year erosion areas). Within EHAs, prohibits nonmoveable structures and major additions. Exceptions- Moveable structures permitted if reasonable/necessary, will not increase erosion. Permits also required to relocate structures and relocation required if structure w/in 10 feet of receding edge. **SS-** permits dredging, sand by- pass, beach nourishment, new docks and SS. Allows repair/reconstruction without a permit. However, any change or modification (bigger or longer) subject to CEHA regulations. **PA-** permits commercial boardwalks. No permit required for walkways/stairs for individual property owner use. **VA-** local permits generally required. Must drive seaward of upper debris line or toe of primary dune, not on vegetation. **H-** 50 miles of beachfront bird nesting sites; 200 designated fish/wildlife habitat areas. **O-** Dune creation, sand scraping, sand mining regulated. **LD-** Local Erosion Management Plans and regulations cover 20% of beachfront. **OP-** a) Local Waterfront Revitalization Plans - very broad, deals with all aspects of coastal community. b) Local Coastal Erosion Management Plans- Locals regulation erosion based on state standards. **Bluff-front** - No data collected on Great Lakes Shoreline of New York.	DATABASE Computerized permit tracking: YES Permit Outcome Data: HS: no permit data SS: no permit data (local data on % in riprap and seawalls for 5 Long Island Sound counties) **OP-** a) 115 plans approved. No results data. b) 2 Erosion Management Plans approved. Management area covers 25 miles (20%) of beaches.

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NC	y E R	y	y	y y y y	y y n y	**Beachfront** **SB-** In Ocean Erodable AECs-Erosion rate setback based on size of structure. >5,000 sq ft setback farthest of: 1) 30 year annual erosion rate; 2) behind the crest of the primary dune; 3) behind landward toe of the frontal dune; 4) 60 feet landward from the first line of stable vegetation. Exception-for lots platted before June 1, 1979 if they cannot meet the 30 times setback; they must be back as far as possible and in no case closer than 60 feet landward of first line of vegetation). For structures greater than 5,000 sq. feet, setback 60 year annual erosion rate or 120 feet from mean vegetation lines. **CZ-** CAMA permit program in designated areas of environmental concern (AECs). State permit for major developments (.20 acres/ 60,000 sq. ft.) w/in AECs. Local permits for minor developments (SF) within AECs. Development must conform with state standards for each category of AEC and local land use plans for each AEC. Also General permits for routine major development projects such as private piers, etc. Ocean hazard areas on barrier islands, beaches, frontal dunes, and inlet lands vulnerable to erosion consist of 4 types of AECs: 1) ocean erodible area, 2) high-hazard flood area, 3) inlet hazard area and 4) unvegetated beach area. Ocean erodible AEC areas extend from mean low water line to a variable distance inland depending on erosion in the vicinity varying from 145 feet to 700 feet. Within this area, all development must be located landward of an erosion setback line based on the size of the structure. (see above) **SS-** Effective 1985, no new erosion control devices designed to harden/stabilize beach allowed. Temporary sand bags and Beach nourishment allowed. Repairs to existing SS do not require permits, however replacement requires CAMA permit. Exceptions- emergency DOT SS to protect historic sites, groin at N. end of pea island to protect bridge foundation across Oregon Inlet-the only road access to the barrier island. CRC policy preference for beach nourishment and relocation of structures. **PA-** structural accessways require permits. **VA-** local level restrictions. **H-** 100 miles of undisturbed areas. **O-** Dune creation, sand scraping, dune reshaping regulated. **LD-** Mandatory local planning in 20 coastal counties/70 municipalities. Local permits are needed for minor developments within AECs. (see above) Effective 1993, all coastal counties required to have hazard mitigation element of land use plan with enforceable policies on post-storm rebuilding. **LP** - Mandatory local land use plans with hazard mitigation element required effective. 1983. **OP** - a) State Beach Management/Shoreline Erosion Response Plan with policies, designate ocean and inlet hazard areas- implemented through regulation- See under Regulatory Tools. b) Inlet Management Plans- same as above	DATABASE Computerized permit tracking: Yes Permit and GPS/GIS Systems Permit Outcome Data: Oceanfront Permits 1979-1995 Major: 2489 General: 11,222 Minor 2,405 HS demolished: 174 HS relocated: 76 SS: 3 Violations: 193 (1986-1996) No linear data, no data by resource area (beach, dune), not data by type of activity **LP**- 70 municipalities/20 counties with approved land use plans. No results data. **OP**- See under Regulatory Tools
NM	y-3 FT	y-3	y	n n y y	n n y n	**Shoreline SB-** Setbacks within Shoreline APC. 0-35 feet no construction; 35-75 feet no structures that obstruct visual openness; 75-100 feet SF structures only. **CZ-** coastal permit program. Activities regulated w/in 4 APCs (shoreline, lagoons reef, wetlands/mangroves, ports/industrial) and major sitings w/in commonwealth. Shoreline APC extends 150 feet inland of MHW mark. - Covers ocean shoreline beaches and rocky headlands, not top of seacliffs. Setbacks (see above) . Permit standards. Permit criteria: water-dependent, compatible uses, SF w/in existing residential area, safe location/resources protected, erosion controlled. Priority uses- public recreation of beaches, compatible water-dependent uses, preservation. Moderate priority-agriculture; Low priority- Commerical, Multi-Family, mining/taking sand. Unacceptable- new Commercial, Industrial non-recreational, Single-Family, waste disposal. Executive Order 15 established Territory-wide goals, policies, and priority land uses implemented through regulation. Lagoon and Reef APC extends from MHW seaward to outer slope of barrier or reef fringe. High priority uses include prevention of beach erosion, conservation, public recreation, habitat preservation, WD projects. Lowest priority-dredging/filling. Unacceptable include taking of corals, etc. Exemptions- only outside APCs. Variances- if public, regional, national interest, emergency repairs, mitigation. (2) Earth moving permit island-wide for erosion/sediment prevention. (3) Submerged Lands license/Lease **SS-** Allowed, but require CRM permit. Also covered under submerged land license/lease for petroleum/mineral extraction. **H-** no development in critical habitat areas- beaches, pristine marine areas. Offshore islands designated as wildlife sanctuaries-turtle nesting sites. **O-** onshore and near shore sand mining regulated. Prohibits removal from public beaches. **SAMP-** Siapan Lagoon Use Management Plan.	DATABASE Computerized permit tracking: No. Computer database being developed. Permit Outcome Data: No data provided by CNMI **(I)** **SAMP**- no data **(I)**

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OR	y-2 R	y-3	y-3	y y y y	y y n y	**Beachfront** **SB**- (1) Under OIP interpretation, no new buildings in "beach zone." (2) LUPA Beach/Dune Goal 18- prohibits R, C, I buildings on beaches, active foredunes, other conditionally stable foredunes subject to ocean undercutting and wave overtopping, and intertidal areas(deflation plains) subject to ocean flooding. (V-zone). Exceptions- in-filling developed areas where protection provided. On older-stabilized dunes, development allowed w/ vegetation retention and stabilization standards. **CZ**- (1) OIP permit for any improvement w/in ocean shore recreation area- land lying between extreme low tide and line of vegetation. No new buildings (de facto setback). Permits for stairs, pipelines, sand alteration, armoring. (2) DSL Removal-Fill permit for >50 cu yds w/in area seaward of highest measured tide/vegetation line. Covers mainly riprap/seawalls. Exemptions- no permit required for revegetation/landscaping since considered beneficial use. (3) Oregon Land Use Planning Act sets enforceable statewide planning goals and guidelines which require federal/state/local consistency. Includes coastal goals. to protect beaches and dunes. (see Goal 18 under setback above). Goals 5 and 19 require resource protection. Goal 7 requires safeguards before development in known hazard areas. Goal 17 Coastal Shorelands applies at least 100 feet landward of ocean shore and further in to cover significant coastal resources/hazard areas. Goals apply to both state and local permits. **SS**- (1) OIP permit and (2) DSL Removal-Fill permit and 3) Land Use planning Act goals for new beach erosion control devices. (see above). Must build as far landward as possible above MSL to prevent encroachment. All construction, maintenance and reconstruction of SS. Prohibits erosion repair on lots where no physical improvements (i.e., buildings, roads, water lines and sewer lines) on oceanfront lots platted before 1977. Allows emergency permit for a new improvement, dike, revetment, or for repair, replacement or restoration of an existing, or authorized improvement where property or property boundaries are in imminent peril of being destroyed or damaged by actions of the Pacific Ocean or the waters of any bay. Goal 17 promotes nonstructural solutions to erosion problems and calls for erosion stabilization structures to be designed to minimize adverse impacts. **PA/VA**- .Construction of beachfront boardwalks or elevated walkways over dunes requirements and access sidewalks, structures regulated through OIP permit. Restricted on certain beaches/dunes based on bird/endangered species habitat. **H**- bird/endangered species habitat. Vehicles prohibited on 70% of coastline. **O**-Sand grading allowed but regulated and dune management pans required. **LD**- mandatory Local comprehensive Plans, land use controls and zoning ordinances implement statewide goals. All development landward of state jurisdiction requires a local permit. Covers several private stabilized dune areas. **LP**- Local Comprehensive Plans required with state acknowledgment. Includes land use controls and zoning to address beach/dune/rocky shore/bluff management. Must be consistent with State Planning Goals and Guidelines. **OP**- Territorial Sea Management Plan adopted 1994 includes a Rocky Shore Strategy. **Bluffs**- No statewide setbacks, but siting, design and landscaping guidelines fir construction under Goal 7 Areas Subject to Natural Disasters and Hazards. Under Goal 17, areas within 100 feet of ocean and areas of geologic instability and coastal headlands subject to management. Under Goal 18, only priorities developed before 1977 are eligible for shoreline stabilization. **Rocky Shores**- most under state ownership and subject to Territorial Sea Management Plan and Rocky Shore Strategy.	DATABASE Beachfront Computerized permit tracking: YES Permit Outcome Data: PDR OIP Permits (1967-1995) HS: 1 SS: 202 Other: 64 Boardwalk: 12 DSL R/F Permits (1977-1995) HS: 0 SS: 238 Other: 27 LUPA Local Permits- no data on local permits No linear data, no data on resources affected **LP**- no statewide data on results **OP**- 10 habitat refuges (4% of rocky shore; 7 research reserves (7%); 8 marine gardens (10%); 29 marine shores (79%) **(S)** Case Examples Bluffs: Case Example Rocky Shores: Case Example and see above OP.

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PA	n-B y-BL	n-B y-BL	y	n n y n	y y y n	**Beachfront(B)** No regulatory Program and no Local Plans for beaches/Dunes. Only major beach is in public ownership. Presque Isle Peninsula State Park- See under Direct Land Management Tools **Bluff-front(BL)** **SB** - Under Bluff Recession and Setback Act, setback based on rate of recession times the life span of the structures which for residential is 50% years, commercial is 75 years and industrial is 100 years. Variances for new development on lots subdivided prior to 1980 if inadequate depth to setback. Substantial improvements prohibited. **CZ** - Local government planning and zoning applies within and landward of setback. **SS**- New SS allowed by permit from MHW lakeward. Submerged lands lease agreement required. Groins allowed 50 feet from water's edge. Program protects bluff from recession/erosion rather than minimizing beach erosion. No regulation over SS built above MHW line. **H** - 3.5 miles of bluff-front as David N. Roderick Wildlife Reserve. **LD** - State delegates administration of Bluff Recession and Setback Act. **LP** - Bluff Recession and Setback Act sets state regulations along bluffs and requires local implementation through plans and ordinances. Bluff recession hazard areas designated by state. Minimum setback of 50 feet. Setback distance based on type of use times life span of structure. **S** - Presque Isle State Park	DATABASE **Beachfront** Computerized permit tracking. NA Permit Outcome Data. NA No regulatory program for beaches/dunes. State park covers 7 miles-See under Direct Land Management. **Bluff-front** **LP**- 8 approved plans with setbacks covers 50 miles (94% of bluff-front) **(S)**
PR	y-3 FT	y-3	y	y y y y	n n y n	**Shoreline** **SB**- (1) 6 meter public ROW on which no structures can be built ((Spanish Water Law); (2) 20 meter public accessway Separation Zone setback for construction and subdivision and no permanent structures w/in 30 meters of separation zone results in 50 meter setback from Territorial Maritime Zone; (3) 2.5 times height of building setback for all structures erected w/in 400 meters of TMZ to prevent shadows on beach. Exemptions- urban zone lots approved prior to regulation, if structures on one or both sides setback less, if WD. **CZ**- Commonwealth-Wide Land Use Policies and Zoning Districts. (1) Permits from RPA based on PB regulations for activities 1000 meters inland from shoreline or farther to include important natural resources. Also includes all offshore islands. 14 Zoning Districts. In District CR (Conservation of Resources) and District CRR (Conservation and Restoration of Resources), and District PR (Resource Preservation), no subdivisions. Exceptions in CR District for tourist-related recreation if in public interest/natural environment not affected. In District PP-Public beaches, subdivision and developed allowed for hotel/vacation facilities, tourist villas, restaurants, recreation, wharves/docks, etc. (2) Flood Areas Permits from RPA based on PB regulations for activities in Floodprone zones. In Zone 1 (floodways) development, major renovations prohibited. Exception-existing structures cannot be expanded unless protected. Zone 1M(v-Zone) and Zone 2 (low areas) allows new development and modifications to existing subject to design/building requirements. Also relocation program in coastal high hazard flood areas. (3) In 1992, Maritime Control Zone and DNR Authorizations and Concessions over nonconforming uses in the maritime zone-which includes territorial waters, submerged lands, inland to reaches of low lands beneath by ebb/flow of tides and mapped by DNR. **SS**-DNR permit required for SS. Few permitted. No policies. Relies on USACE standards. **PA**- No permits for boardwalks. But restriction on public access in some Zoning Districts. Also permits for uses in recreational areas and fees for use of recreational areas/facilities. Includes foot paths, trails, observation/watch towers. e.g., in Districts CCR and PR, access controlled to protect natural resources. **VA**- No cross-country vehicles in or adjacent to bathing beaches. Vehicular restrictions in some Zoning Districts. **H**- Natural Reserves and Special Planning areas, endangered species habitat protected, beaches on certain islands protected. **O**- sand, gravel and stone extraction regulated, and removal of sand from sand dunes requires permit approval. **SAMP**- a) Natural Reserves; b) Special Planning Areas; c) Island of Culebra Plan	DATABASE Computerized permit tracking: NO, developing GIS database. Permit Outcome Data: 1 Year (July 1995-June 1996) HS: see below Resid.-120 Tourist- 24 Public 47 Rec- 41 Comm 34 Activity in Maritime Zone- 82 Marine Sports Event- 143 Total- 491 SS: unknown No linear data. No data by resource type Coastal Flood Hazard relocation-1300 families relocated. **SP**- no data on zones, acres, etc. **SAMPS** a) 20 NRs designated- see under DLM b) 7 SPAs designated- see under DLM c) no outcome data

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RI	y-4 FT E R	y	y	y y y y	n n y n	**Shoreline- Beaches, Dunes, Bluffs, Rocky Shores** **SB-** (1) 50 feet from inland boundary of coastal feature or 25 feet inland of edge of Coastal Buffer Zone up to 200 feet. Exceptions: Water Dependent activities; minor modifications or restoration of structures conforming to standards. (2) Critical Erosion Area Setback in areas receding >2 ft. per year, 30 X annual erosion rate >4 units; 60 x annual erosion for Commercial, Industrial, DU>4 units. Setback measured from landward edge of foredune zone defined as 25 feet landward of dune crest. (3) Dunes construction setback line on 3 barrier beaches. No building seaward of line based on utilities/wall of existing development. Amended 1995- see above. (4) Construction Prohibition Areas- No new construction on sand dunes; beach face; undeveloped barrier beaches. Exception- beach/dune stabilization, public access, sanitary or recreation facilities, protect public welfare. **CZ-** State CRMC permit (Assent) for activities inland 200 feet from a "coastal feature" which includes a) beaches/dunes; b) barrier beaches; c) coastal wetlands; d) coastal bluffs, cliffs, banks; e) rocky shores; f) manmade shoreline. Also regulates 7 categories of activities inland of shoreline features: 1) power-generating plants; 2) petroleum storage; 3) chemical/petroleum processing; 4) mineral extraction; 5) sewage treatment; 6) solid waste disposal; 7) desalination plants. CRMC permits tied to 1) Zoning of Uses adjacent to State Water Classification Areas; 2) Coastal Shoreline Features protection and 3) regulated activities. For Coastal Beaches and Dunes, construction on beaches adjacent to Type 1 and 2 waters and undeveloped dunes is prohibited. Exception- beach protection, restoration, renourishment, some SS. On Dunes, setbacks (see above). Alteration of foredunes adjacent to type 1 and 2 waters prohibited except non-structural protection/restoration, accessways to beach. Alteration adjacent to type 3-6 waters permitted if designated priority use, alternative considered, etc. For *all* Barrier Beaches, new infrastructure prohibited. for *undeveloped* barrier beaches, construction/alteration prohibited. Only nourishment, dune stabilization, natural features protection. On *developed* barrier islands, new construction prohibited on barriers on which only roads, utility lines, infrastructure present as of 1985. On *moderately* developed barrier beaches, new development prohibited. Exceptions- restoration/preservation; existing infrastructure; and existing recreation may be maintained/expanded/rebuilt if destroyed. **SS-** regulated. Nonstructural measures preferred. If SS proposed, must exhaust alternatives including relocation of structure and nonstructural measures. Prohibit new SS on all barriers in type 1 waters. Limit use of riprap to protect septic systems/ancillary structures. If SS permitted, must demonstrate that erosion hazard exists and SS will control; nonstructural SS does not work; no reasonable alternatives, will not increase erosion, long-term solution and maintenance program/financial commitment. Repair/reconstruction >50% damaged requires new permit. **PA-** Guidelines for dune walk-over structures. Width 4 feet. May include small deck/view platform limited to 100 sq. ft. No permit required of guidelines met. **VA-** A. Coastal Beaches and Dunes: 1) vehicles prohibited on dunes except on trails marked expressly for vehicular use.; 2) vehicular use of beaches (where not otherwise prohibited by private/public management programs) required DEM Use Permit through DEM Division of Enforcement. Vehicles shall not be operated across protected (lifeguard) swimming beaches during protection period. B. Barrier Beaches- Prohibit: 1) vehicle access across back barrier flat to access Salt Ponds; 2) vehicles in vegetated areas anywhere on barrier. C. Dunes (1995)-Prohibit: 1) vehicles on dunes within 75 ft. of dune crest except on marked trails; 2) alteration of foredune zone adjacent to Type 1 and 2 waters, except for protection/restoration, no hard structures. D. Transportation policy- Section 550.0-2(E)(2)and (3) in reviewing transportation facilities shall address impacts on natural environment and habitat; and impacts on scenic, sensitive, productive and/or unique coastal natural features and areas such as wetlands, beaches, cliffs and bluffs. **SAMP-** a) Salt Pond Regions SAMP: Ninegret to Point Judith Ponds b) Pawcatuck River Estuary and Little Narragansett Bay SAMP OP-a) Harbor Management Plans. 8 Plans, but not yet adopted as part of RICRMP. LP-State Comprehensive Plan adopted in 1994 which requires local planning and regulation, but not part of RICZMP. **H-** Designated APRs protect habitat. Designated Conservation and Management Areas cover 9 barrier beach/dune areas where CRC permits protects areas. DEM Fish and Wildlife review CRC permits for habitat protection areas. **O-** neashore and onshore sand mining, sand dune alterations, dune revegetation regulated.	DATABASE Computerized permit tracking: YES Began in 1987, upgraded and input permit data back to 1971 Permit Outcome Data: Tier 1- 200 ft. landward of C Feature 14 1/2 yrs (1971-1996) HS: See below DU- 3950 C/I: 539 SS: 1066 Nonstructural SS: 238 No linear data No resource area data **SAMP-** 2 Plans adopted affecting beaches/dunes. No data on Results

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SC	y R E	y	y	y y y y	n y n y	**Beachfront** **SB**- Setback from MHW to crest of primary oceanfront sand dune. No new/reconstruction <u>except</u> swimming pools seaward of baseline. **CZ**- SCCMA establishes state coastal policies used in regulatory decisions and Local beach management planning. Regulates new and reconstruction within 40-year erosion zone. Prohibits destruction of beach/dune vegetation <u>Exception</u>- If no feasible alternative. Structures permitted w/in 40-yr zone: 1) structures less than 5000 sq ft heated space; 2) and located as landward as possible; 3) no erosion control as part of building; 4) not built on primary dune. If vegetation damaged, mitigation required. <u>Exceptions</u>- swimming pools, other activities to avoid takings cases. No permits required for: hunting, fishing, research, walkways over sand dunes which follow established guidelines. Sand bags, sand scraping, and minor beach nourishment are also exceptions allowable under "emergency orders" and within established guidelines. Since 1990, restricts repair or rebuilding of beachfront structures destroyed beyond repair >66 2/3% of structure based on point system for building components left intact. Exemptions include habitable structures and pools damaged less than 66 2/3% may be repaired. There are no relocation provisions for structures in erosion-prone areas. Although state policy encourages retreat, no state program. Procedures for requiring property owner to remove structure that is permanently located on the active beach, as a result of erosion and shoreline change. **SS**- Restricts new shoreline stabilization structures since 1988. No new erosion control structure or device allowed along oceanfront beaches and sand dunes in state jurisdictional boundaries, <u>except</u> structure to protect public highways which existed on June 25, 1990. Restricts reconstruction of shoreline stabilization structures since 1990. Between 6/90-6/95 structures damaged> 80% above grade cannot be repaired or rebuilt. Between 6/95 - 6/2005 structures damaged > 66 2/3% above grade cannot be repaired or rebuilt. After 6/2005 structures damaged >50% above grade cannot be repaired or rebuilt. Sand bags, sand scraping, and nourishment are also exceptions allowable within established guidelines under "emergency orders". **PA**- Construction of walkways over sand dunes are allowed as an exception if they follow guidelines under R. 39-13(O) including maximum width of 6 feet and other criteria. Otherwise permit required for handicapped and access wider than guidelines. Beachfront Boardwalk Permits 1988-1995: 12 **VA**- Restrictions for vehicular traffic include emergency vehicle access; construction/repair of drives and parking lots. Emergency Vehicular access permits 1988-1995: 13 **H**- Restrictions on beach nourishment during sea turtle nesting season. Restriction on sand fencing so as not to impede turtle nesting. Restriction on beach nourishment during sea turtle nesting season affect all 181 miles of beach. **O**- regulations covers fences, lighting. Trash receptacles, sidewalks, signs; utility lines; drainage structures; golf courses; new fishing piers, sand scraping, sand bags, **LD**- Since 1990, locals required with strategy for 40-year retreat and setbacks. However, state did not delegate permitting authority. **LP**-Local Beach Management Plans required under 1990 Amendments including regulatory setbacks and 40-year retreat plan. **OP**- in 1992, State Beachfront Management Plan adopted to address erosion, beach nourishment and other management issues. State BMP covers entire beachfront of 181 mile and landward to cover frontal dunes.	DATABASE Computerized permit tracking: YES. beginning in late 1980s Permit Outcome Data: 8 Years (1988-1995) HS: 35 1977-1987 SS: 307 1988-1995 SS: 0- except exempt areas No linear data No data on resources affected Case Example **LP**- 15 of 18 coastal communities with adopted beach Mgt. Plans. No statewide linear or area data. **OP**- no results data Case Example

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	TYPE OF REGULATION					SUMMARY OF TOOLS EMPLOYED Key provisions: setbacks; distance inland regulated/location; activities regulated; exceptions; shoreline stabilization regulations; regulation of access; habitats regulated; other regulations. Local delegation of permit responsibilities, voluntary or mandatory local plans required, other enforceable plans.	OUTCOME DATA & SUFFICIENCY Database, Permit Outcome Data and Planning Outcome Data
State	SB	CZ	SS	PA VA H O	LD LP S OP	**SB- Setback** **CZ-Control Zone** **SS- Shoreline Stabilization Structures** **PA-Pedestrian Access** **LD- Local Permit Delegation** **VA- Vehicular Access** **LP- Local Planning** **H-Habitat Areas Protected** **O-Other** **S- Special Area Management Plan (SAMP)** **OP- Other Plan**	**HS-** Habitable Structures **SS-** Shoreline Stabilizations **(S)** Sufficient Data **LP-** Local Plans Case Example **SAMPs**
VI	y FT R	y-Z	y	n n y y	n n y n	**SB-** Open Shore Act prohibits obstructions w/in 50 feet of MLT, or inland boundary of seaward boundary of natural barrier whichever is shortest. **CZ-** Coastal Land and Water Use Plan- sets Use Districts consistent with policies in VICZM Act. A) Coastal Zone Permit for major and minor permits w/in 1st tier whose landward boundary is mapped and based on features such as roads, landmarks, property lines, USGS contour lines, and uniform distance from MLT. Also covers all offshore islands and cays. Major permits cover activities on offshore islands and the 1st tier. Exception- if landward of MHT and minor activity which include: a) subdivision Single Family, Duplex; 2) improvements >$52,000; c) dev. less than %56,000; d) mineral extraction >$17,000; e) emergency permits; f) maintenance/repair of permitted facility. B) CZ Permit incorporates 5 other state permits in the 1st tier: 1) Earth Change; 2) Submerged lands; 4) Use Permits under Zoning Law; and 5) Building, plumbing and electric permits. 2nd tier landward boundary includes all watersheds, adjacent areas and inland portions of 3 main islands. Permits include 1) earth Moving; and 2) Use Permits under Zoning Law. **SS** CZ Permit required for new SS. Reconstruction of SS allowed w/o permit and emergency repairs. Prohibited w/in 50 ft open shore setback. Siting policies to minimize adverse impacts. **H-** yes, but data limited on areas. 18 APCs designated, 13 cover recreational beaches, 9 cover sea turtle nesting beaches, 13 cover CBRA designated areas, 6 cover shore protection structure areas. **O-** offshore and neashore dredging and sand and gravel mining regulated. **SAMP-** APC Management Plans adopted by Legislature in 1994.	DATABASE Computerized permit tracking: NO Permit Outcome Data: 10/92-3/95 Permits Approved Major: 365 Minor: 374 HS: unk SS: unk No linear data No data on resources affected No statewide data on use districts **SAMP-** 18 APC Mgt. Plans adopted. 13 recreational beaches, 9 sea turtle nesting beaches; 13 CBRA areas; 6 shoreline protection structure areas. No statewide data on outcomes. No linear/area data.
VA	y E	y	y	y y y y	y y y y	**SB-** 30 yr. annual erosion rate or 20 time local recession rate for barrier islands. No permanent development/alteration of coastal primary sand dunes. Exceptions- public interest activities. Restrictions on rebuilding existing structures damaged within 20-year setback. **CZ-** Permits on Coastal Primary Sand Dunes and beaches. Setbacks required effective 1990 (See above). Permit required of certain uses –Need information on activities/uses regulated, and exemptions. **SS-** Effective 1990, new shoreline erosion protection structures prohibited under any circumstances. Prior to 1990, discouraged shoreline modifications in preference to nonstructural solutions. Exception- portions of Virginia Beach where private upland structures in imminent danger from erosion, bulkheads/erosion control devices and normal maintenance allowed. **PA-** no boardwalks, but dune cross-overs and nature trails regulated. **VA-** no vehicles allowed in specific areas of state parks. **H-** 6 miles of sea turtle nesting sites protected. **O-** dune creation/revegetation and sand mining regulated. **LD-** designated counties/cities authorized to adopt coastal primary dune ordinances and issue local permits. **LP-** Voluntary and state provides model ordinances for local adoption/implementation. **SAMP-** Northhampton County Sustainable Development Initiative began in 1991, enforceable policies for habitat protection and eco-tourism. Covers 209 square miles. **OP-**a) Shoreline Erosion Control Act provides TA to property owners, policy on dredge material for beach nourishment, and Board on conservation and development of public beaches. b) Erosion and Sediment Control Plan establishes standards/regulations for local erosion and sediment control regulations. Mandatory, but not part of approved CZMP.	DATABASE Computerized permit tracking: YES but just now incorporating permit data into database. Permit Outcome Data: HS: no linear/area data SS: no linear/area data Less than 10 permits per yr for activities in beach and dune area. **LP-** 3 counties w/approved land use plans, setbacks. No linear or Area Data **SAMP-** No outcome data **OP-** a) no outcome data b) na

Table 5: Regulatory and Planning Tools and Outcome Data Associated with Regulating Construction & Shoreline Stabilization Structures on Beaches, Dunes, Bluffs and Rocky Shorelines

	TYPE OF REGULATION					SUMMARY OF TOOLS EMPLOYED Key provisions: setbacks; distance inland regulated/location; activities regulated; exceptions; shoreline stabilization regulations; regulation of access; habitats regulated; other regulations. Local delegation of permit responsibilities, voluntary or mandatory local plans required, other enforceable plans.	OUTCOME DATA & SUFFICIENCY Database, Permit Outcome Data and Planning Outcome Data
State	SB	CZ	SS	PA VA H O	LD LP S OP	**SB- Setback** **CZ-Control Zone** **SS- Shoreline Stabilization Structures** **PA-Pedestrian Access** **LD- Local Permit Delegation** **VA- Vehicular Access** **LP- Local Planning** **H-Habitat Areas Protected** **O-Other** **S- Special Area Management Plan (SAMP)** **OP- Other Plan**	HS- Habitable Structures SS- Shoreline Stabilizations (S) Sufficient Data LP- Local Plans Case Example **SAMPs**
WA	y	y	y	n y n y	y y n n	**SB-** No state setback, but local regulations may contain setbacks **CZ-** Shoreline substantial development permit w/in 200 feet of shore. See under LD. **SS-** Hydraulic Project Approval required for construction in coastal waters including SS. Groins are no longer allowed and no new jetties have been built since 1985. **VA-** restrictions on beach driving. **O-** primary dune grading prohibited at local level or restricted. Near shore sand mining regulated locally. **LD-** Total local permit delegation subject to state review. Shoreline Master Programs (SMPs) issue permits. Permits required for substantial development (cost>$2500 or interferes w/normal public use of waters/shores of state. Exception- need information. **LP-** Mandatory Local Shoreline Master Program with state certified plans and regulations.	DATABASE Computerized permit tracking: NO for local permits, YES for State Hydraulic Projects Permit Outcome Data: HS: no data SS: No data, database not coded for SS LP- all 5 oceanfront local governments have approved Shoreline Master Programs. No linear or area data
WI	y	y	Y	n y y y	y n y y	**SB-** 75 ft. setback from OMHW for all buildings and structures, except piers, boat hoists, boathouses. **CZ-** State regulates development within 100 feet of OHWM. Setback (see above). **SS-** permit required for SS in navigable waters. **PA-** do not regulate boardwalks, shoreline accessways. **VA-** restricts vehicles w/in navigable waters. **H-** 300 areas statewide **O-** near shore sand mining regulated. **LD-** Locals administer state required setback through shoreland zoning ordinances. **SAMP-** Carol Beach protects unique coastal area dunes, ridges, swales covers both beach and wetland areas. **OP-**3 Year Harbor Plan required for State Harbor Assistance Money	DATABASE Computerized permit tracking: YES for DNR, but no for CZM Federal consistency Permit Outcome Data: HS: No data (local permits) SS: 6422 (1949-1995) No linear or area data **SAMP-** 4.5-5 miles of shoreline. No other outcome data **OP-** No outcome data

Table 5: Regulatory and Planning Tools and Outcome Data Associated with Regulating Construction & Shoreline Stabilization Structures on Beaches, Dunes, Bluffs and Rocky Shorelines

	TYPE OF REGULATION					SUMMARY OF TOOLS EMPLOYED Key provisions: setbacks; distance inland regulated/location; activities regulated; exceptions; shoreline stabilization regulations; regulation of access; habitats regulated; other regulations. Local delegation of permit responsibilities, voluntary or mandatory local plans required, other enforceable plans.	OUTCOME DATA & SUFFICIENCY Database, Permit Outcome Data and Planning Outcome Data
State	SB	CZ	SS	PA VA H O	LD LP S OP	**SB- Setback** **CZ-Control Zone** **SS- Shoreline Stabilization Structures** **PA-Pedestrian Access** **LD- Local Permit Delegation** **VA- Vehicular Access** **LP- Local Planning** **H-Habitat Areas Protected** **O-Other** **S- Special Area Management Plan (SAMP)** **OP- Other Plan**	HS- Habitable Structures SS- Shoreline Stabilizations (S) Sufficient Data LP- Local Plans Case Example **SAMPs**
Total Yes	24	27	28	22 22 28 25	20 18 12 14	**Dominant Features of Regulatory and Planning Tools** **SB- 23** **CZ- 27** **Combo SB/CZ- 23** **SS- 28** **PA- 22** **VA- 22** **H- 28** **O- 25** **LD- 20** **LP- 18** **S- 12** **OP- 14** **Mandatory Delegated Local Permit Program- 20 states**: AK, CA, CT, FL, GU, HI, LA, ME, MD, MA, MI, NH, NY, NC, OR, PA (bluffs only), PR, VA, WA, WI **Mandatory Local Planning- 10 states** - AK, CA, FL, HI, ME, MD, NC, OR, SC, WA **Voluntary Local Planning- 9 states- AL, CT, LA, MA, MS, NH, NJ, VA, PA (bluff only)** **State Beach Management Plan 4 states**: FL, MD, NC, SC **State-Level Inlet Management Plan: 3 states**- FL, NH, NC, RI **SAMPS- 12** **Resource Protection Areas:** AK, ME, MA, NY, NM, OR, PR, VI, VI, HI, RI, WI **Erosion Control Areas:**: CA, LA, MI, VA **Other Plans:** 4 states - Rec. & Water Use Plan (GU); Local Bluff protection plans (CA); Beneficial use of dredging (FL, LA) **Outcome Data**: States with Computerized Permit Tracking System- 20, for: Habitable Structures (y-19) Shoreline Stabilizations (y-20) States with some Permit Outcome Data on: Habitable Structures Permitted (y-14) Shoreline Stabilizations Permitted (15). States requiring Pedestrian Access Permits (23), states with some outcome data (4) States requiring Vehicular Access Permits (23), states with some outcome data (3) States requiring Protected Area Pewrmits (27), states with some outcome data (9) States with local coastal permits (20), states with some outcome data (1)-PA with local setback data. States requiring local plans (18), states with data on number of local plans approved (15), states with some outcome data on plan implementation (2) States with SAMPs or Other Special Area plans (14), states with some outcome data (4). There are only 4 special planning programs with outcome data that includes linear or area data: CA TDC Program; FL Beach/Dune Restoration Program; GU Recreation and Water Use Mgt. Plans; and OR Rocky Shore Strategy.	(See Under "Outcome Data" in adjacent column)

KEY
y- yes, tool employed n- no, tool not employed
SB- Setback required
CZ- Coastal construction control zone, also referred to in some states as coastal construction control line (CCCL) or Coastal Permit Area
LD- Local Delegation
A- Access restricted through regulation of a) pedestrian boardwalk or dunes-crossover; or b) vehicular traffic
H- Habitat area restrictions
SS- shoreline stabilization structures (seawalls, riprap, revetment, groins, etc.)
WD- water dependent activities
SF, MF, C, I - Single Family Residential, Multi-Family, Commercial, Industrial Development
CR- coastal resources
na - not applicable
Case- case example provided which illustrates on-the-ground effectiveness of tool employed.
USACE- United State Army Corps of Engineers
MHW- Mean High Water
MHT- Mean High Tide
MLT- Mean Low Tide
SHW- Seasonal High Water
NHW- Normal High Water
OHWM- Ordinary high Water Mark

TYPES OF PLANS
SP - State Level Plans- Covers State Comprehensive, Land Use, or CZM Policy Plan and all tied to regulatory tools for implementation
LP- Local Plan both land use and implementing zoning, subdivision, other ordinances.
SAMP - Special Area Management Plan
O - Other State Plans which address resource management areas: Beach Erosion Plan; Inlet Management Plan; Harbor Management Plan; Rocky Shore or Bluff Management Plans

OUTCOME DATA AND SUFFICIENCY FOR ANALYSIS
(S) - Sufficient- Tool used and sufficient data to analyze outcomes.
(na) - not applicable, no planning tools employed, or dominated by regulatory controls
Case Example- example provided which illustrates effectiveness in a local area

Note: Regarding Rocky Shores, the submerged lands below HHT are generally in state, commonwealth or territory ownership. Development regulations tend to apply to water-dependent activities such as docks and piers.
KEY
R- Regulatory Tools
P- Planning Tools
L- Direct Land Management Tools
A- Acquisition Tools
na- not applicable
no data- no statewide data, either linear data or acreage data, on program results or outcomes on-the-ground
17 States with Rocky Shores: AK, AS, CA, CT, GU, HI, ME, MA, MI, NH, NM, OR, PR, RI, VI, WA, WI
16 States with Bluffs: AK, AS, CA, CT, GU, HI, ME, MI, PA, NM, OR, PR, RI, VI, WA, WI
12 States with No Coastal Rocky Shores: AL, DE, FL, LA, MD, MS, NJ, NY ocean coast only, NC, PA, SC, VA
13 States with No Coastal Bluffs: AL, DE, FL, LA, MD, MA, MS, NH, NJ, NY ocean coast only, NC, SC, VA

Source: State CZM Profiles Version 3/1/98

Table 6: DIRECT LAND MANAGEMENT AND ACQUISITION TOOLS AND OUTCOMES associated with state management of beaches, dunes, bluffs and rocky shores and acquiring additional areas.

State	Open Coast Miles	Open Coast % Public % State	Beach Miles % Public % State	State C. Parks Mi.Parks Mi.Beach	State C. Parks Acres Pk Acres Bc	State C. # Parks # Beach Parks	Board-Walks/ Dune Cross-Overs	Critical Coastal Erosion Areas	Dunes Reveg. # proj / ft/mile	Beach Nouris. Fed ** # proj. State # & mi	Armor Project Fed. ** State	Natural Protection Areas	Coastal Lands Acquired (acres/miles) B/D Beach/Dune BL Bluff RS Rocky Shore CA Coastal Area
AL	46*	10% 7%	46	3 all beach	6,000 all beach	1 all beach	y-7	2 areas	1 500ft	n n	n n	40 acres for Perdido beach mouse; ~3 mi. sea turtles nesting season; 25 acres for terns	n
AK	6640	99% nd	nd	nd nd	990,335 nd	63 nd	N	nd	n	n n	n n	49,000 acres protected for Bald Eagles	n
AS	126	~9% ~9%	nd	nd nd	nd nd	nd nd	N	20,000 ft	n	n n	n n	n	n
CA	1100*	47% 34%	nd	377 280	145,540 26,838	119 71	y-~20	4%	>19 nd	y-7 y-nd	y-5 y-12	Resource Mgt. Plans designate trails, roads, parking and zone units for reserves, preserves, habitat protection and public use. Endangered species habitat protected (bird nesting sites, etc.	B/D: 26,838 acre BL: yes-nd RS: yes-nd
CT	Long Is Sound 276 *	LIS-20%	85	nd 6.75	nd 3003	nd 6	?-nd	nd	9 nd	y-6 y-1 .25 mi	y-2 y-3	408 acres Natural Area Preserve; 806 acres Coastal Reserve; Nature trail	B/D: 1,439 acre
DE	24.5*	75% >62%	24.5	18	nd	3 all beach	2-bdwk 3-cross	nd	y-nd >18 mi	y-2 y-nd 6 mi.	y-1 n	Endangered species habitat-such as piping plover- case by-case and during nesting season.	B/D: yes- nd
FL	1350	nd nd	825 343 P or 42% P	~500 bch only	~11,500	24	y-many nd	273 mi	100 mi	y-26 y-nd ~94 mi	y-6 y-nd	Sea turtle nesting sites during season.	B/D: parcels. 980 acres 294,968 miles nd
GU	110*	nd nd	40	5.1 13%	nd nd	14 (only beach)	N	No Areas	N	n n	n n	28,197 acres (20.73% Guam total land area) and 15,600 acres submerged lands	yes through trades -nd
HI	750	nd nd	185	nd 16%	14,814 322	24 16	N	nd	n	n n	n n	Natural Reserve Area System- 9 coastal covering 48,102 acres Wildlife Sanctuaries- 11 covering 83,200 shoreline miles Marine Life Conservation Districts- 9 covering 1346 acres	B/d & BL & RS properties. 62 acres
LA	397	~20% <1%	>4 mi d/n inc. barrier island shoreline	unk >1 mi.	unk 345	2	1	100%	y-6 ~20 mi barrier islands	y-2 y-nd ~20 mi	y-1 y-20	N	n
ME	228	5% >4%	23 B/D 20%-S 205 RS	nd 4.6	11090 2380	25 10	3	1%	y-5 4 mi.	n y-6 COE Habor Proj. >1 mi	n n	3 state beachfront parks dunes protection, pedestrian accessways; sea bird nesting sites fenced off during nesting season. 1Rocky Island Sanctuary-access restricted	B/D & BL & RS properties: 8 acres 4828 miles. ~20

Table 6: DIRECT LAND MANAGEMENT AND ACQUISITION TOOLS AND OUTCOMES associated with state management of beaches, dunes, bluffs and rocky shores and acquiring additional areas.

State	Open Coast Miles	Open Coast % Public % State	Beach Miles % Public % State	State Mi Parks Mi Bch P	Coastal Acre Pks Acre Bch	Parks # Parks # Bch Pk	Board-Walks/ Dune Cross-Overs	Critical Coastal Erosion Areas	Dunes Reveg. # proj / ft/mile	Beach Nouris. Fed ** # proj. State # & mi	Armor Project Fed. ** State	Natural Protection Areas (2)	Coastal Lands Acquired (acres/miles) B/D Beach/Dune BL Bluff RS Rocky Shore CA Coastal Area
MD	32*	nd ~50%	32	17	nd all beach	3	1	Assateaq ue Island	y-1 2 mi	y-2 y-2 10 mi	y-1 y-nd	Seasonal restirctions for nesting birds along entire beachfront.	parels 2 acres: nd miles: 2
MA	222*	nd nd	222	64 nd	nd nd	18 nd	nd	S. Nantuck et Island	y-nd	y-5 y-nd 3 mi	y-2 y-nd	5 coastal pk. mgt. plans for 4,673 acres 14 ACECs covering 75,000 acres.	State Acres:2250 miles: nd Local Grants Projects: 17 Acres: 273 miles: nd
MI	Great Lakes 3,288	GL 30% nd	270 50%-S	114 nd	nd nd	29 nd	nd	350 mi high risk areas	n	n n	n n	- 860 miles total ~250 miles natural preserves ~300 miles critical dunes areas ~310 miles high risk erosion areas	136,000 acres statewide coastal: nd
MS	44	30% 17%	18	nd	md	1	1	Jackson Co.	n	y-2 y-1 18 mile	y-1 n	n	n
NH	18*	78% nd	10.2 B/D 100%-p 88%-S 7.8 RS	12.5 10.1	~580 101	16 9	1	7 areas	y-2 nd	y-3 y-5 2 mi	y-2 y-3	Pedestrain access restricted area; 5 acres. piping plover nesting site.	B/D & RS acres: 131 Miles: nd
NJ	125*	74% 9%	125 9% state	12	3192	2	n	nd	n	yes-8 y 27 mi	y-4 y	B/D acres: 2,500 miles: 11.57 Included 100 acre bird sanctuary; 1200 acres beach research/wildlife sanctuary; 1,000 acre beach nature area; 3 other nature areas 1201 acres.	n
NY	125*		125 30%-s	46.5 all beach	11,600 all beach	10 all beach	3	nd	n	y-8 y-nd	y-4 n	7 protection areas covering 566 acres in stte parks. >50 miles beachfront bird nesting areas. 200 fish/wildlife habitat areas.	CA:2000 acres
NY	Great Lakes	no data	Collected	for Great	Lakes	portion of	New York	Coastal	Zone.				see above
NC	320*	nd 3.4%	320 3.4%	nd 11 mi	nd nd	3	2	50%	y-nd	y-6 y-12 5 mi	y-2 n	314 miles, plussome spoil islands. 100 miles undisturbed areas/Reserves; 50 acre nesting colonial birds; 11 miles sea turtle nesting.	7,000 acres beachfront 27,439 beach access sites
NM	184*	nd nd	nd	nd nd	nd nd	nd nd	n	nd	n	n nd	n n	Offshore islands as bird sanctuaries, beacehs as turtle nesting sites	n

Table 6: DIRECT LAND MANAGEMENT AND ACQUISITION TOOLS AND OUTCOMES associated with state management of beaches, dunes, bluffs and rocky shores and acquiring additional areas.

State	Open Coast Miles	Open Coast % Public % State	Beach Miles %Public %State	State Mi Parks Mi Bch P	Coastal Acre Pks Acre Bch	Parks # Parks # Bch Pk	Board-Walks/ Dune Cross-Overs	Critical Coastal Erosion Areas	Dunes Reveg. # proj / ft/mile	Beach Nouris. Fed ** # proj. State # & mi	Armor Project Fed. ** State	Natural Protection Areas (2)	Coastal Lands Acquired (acres/miles) B/D Beach/Dune BL Bluff RS Rocky Shore CA Coastal Area
OR	362*	58% 36%	262 B/D 56%-P 30%-S 100 RS 65%-P 53%-S	129.5 76.3-B/D 53.2-RS	27,107 nd	64 nd	n	13%	n	n y-1 >1 mi	n n	Vehicles prohibited on 70% of coastline. State park mgt. trails, restricted access.	B/D & RS acres: 94 3 miles: .75 B/D only
PA	Great Lakes 120 * Lake Erie 63*	20% nd	Lake Erie 10-B 99%-S 53-BL 11%-P 10%-S	Lake Erie 13.4 9.9 B 3.5 BL	Lake Erie 3110 10 B 3100 BL	Lake Erie 2 1	n	Lake Erie All 10 mi Beach 50 mi bluff (94%)	n	y-2 y- 1 area 6 mi	y-1 y-1	Lake Erie only n- beach, but Presque Isle Peninsula State Park y- D. Roderick Wildlife Refuge	B/D: Spoil Island mile: 25 acres: 10 BL: mile 3 5 acres:3100
PR	311*	nd nd	154	nd nd	nd nd	nd 15	n	nd	n	n n	n n	19 Nature Reserves and 8 Special Planning Areas	n
RI	40	nd nd	27.3 64%-S	nd nd	1501 nd	14 nd	y-1	nd	n	n n	y-1 n	All undeveloped barrier beaches	y-nd
SC	181*	42% 38%	181	68	nd	4	4	26 miles (30% of dev coast)	y-3 58 mi	y-1 y-4 45 mi	y-1 y-nd groins repair	68 miles in parks/wildlife preserves.	y-nd
VI	nd 175 (tidal)*	nd nd	nd	nd nd	nd nd	nd nd	n	nd	n	n n	n n	Salt River Bay	n
VA	200*	nd nd	200 10%-S	6	4700	1	n	2 co.'s 1 city	y	y-1 y-5 nd	n n	6 miles sea turtle nesting at False Cape.	y-nd
WA	171*	nd nd	60 B 111 RS	nd nd	27,000 nd	120 nd	?-nd	yes-varies All Bluffs	n	n n	n n	Many- 7 areas with >6336 acres harbor seals, falcons, eagles and other bird nesting areas.	75,000 acres statewide coastal: >10,748 acres
WI	Great Lakes 820	nd 8%	820 10%-B 72%-BL 8%-RS	nd nd	nd nd	30 nd	y-several nd	30%-mainly bluffs	n	y-4 n	y-n n	~300 natural areas statewide coastal: nd	637 acres: 77 beach/560 dunes
Total	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	Nd	nd	

Key: y- yes n- no nd- no data provided by state unk- unknown by state mi- miles s- state p-public B/D- Beach/Dune BL-Bluff RS-Rocky Shore

Sources:

State CZM Profiles

* CZM Profile coastline miles data differs from General Coastline mile data in U.S. Department of Commerce, NOAA 1975. The Coastline of the United States.

**US Army Corps of Engineers, Shoreline Protection and Beach Erosion Control Study: Phase 1: Cost Comparison of Shoreline Protection Projects of the U.S. Army Corps of Engineers.

OUTCOME L A

States with coastal land holdings: 29
States with an inventory of coastal land holdings: 17

States employing use of boardwalks/cross-overs: 14
State witn some data on boardwalks/cross-overs 12

States using dune creation: 13
States with data on their dune creation activities: 9

States using beach nourishment: 17
States with data on their beach nourishment activities: 14

States using natural areas protection on state lands: 26
States with some data on their natural areas protected: 26

States using coastal land acquisition: 21
States with same data on their coastal land acquisition: 15

APPENDIX D: CASE EXAMPLES

Case examples have been provided for the following 17 states: California, Connecticut, Delaware, Florida, Guam, Maine, Massachusetts, Michigan, New Hampshire, New Jersey, New York, North Carolina, Oregon, Pennsylvania, Puerto Rico, Rhode Island and South Carolina.

LIST BY TITLE OF CASE EXAMPLES

CA 1 ReCAP Santa Cruz County and Monterey Pilot Study
CA 2 Beach Sand Mitigation Fund– In Lieu Mitigation for Impacts of Seawalls on Sand Supply
CA 3 State Coastal Conservancy Projects
CA 4 Local Coastal Program Implementation - Dunes Protection
CA 5 Local Coastal Program Implementation- Bluff Protection
CT 1 Victoria Beach Condominium Project
CT 2 CT-2 Harvey's Beach Acquisition
DE 1 Delaware's Piping Plovers Management Plan
DE 2 Beach Nourishment Project at Dewey Beach
FL 1 State Revises Beach Armoring Policies to Protect Sea Turtles
GU 1 Recreational Water Use Management Plan
ME 1 The Atlantic Condominiums at Old Orchard Beach
ME 2 Sand Dune Rule
ME 3 Cutler Coast Acquisition and Management Plan
ME 4 Coastal Control Zone Regulations
MA 1 Sylvia State Beach and State Highway on Martha's Vineyard
MI 1 Regulatory Controls
NH 1 Public Land Management
NJ 1 CAFRA Amendments
NJ 2 The New Jersey Beach Profile Network Program
NY 1 Westhampton Beach Erosion and Groinfield Chronology
NY 2 Coney Island Beach Nourishment Project
NC 1 Oceanfront Setback Program
OR 1 Oceanfront Improvement Permit Implementation
OR 2 Local Setbacks
OR 3 Sea Cliff Land Slides, Geologic Hazards Management
OR 4 Oregon Territorial Sea Plan and Rocky Shores Strategy
PA 1 Pennsylvania Bluff Recession and Setback Law and Coastal Hazards Area Technical Assistance Program to Lake Erie Property Owners
PR 1 Island Regulations
RI 1 Coastal Construction Control over Coastal Features:
RI 2 The Rhode Island Coastal Program adopted four SAMPS
SC 1 Evolution of the Coastal Retreat Policy
SC 2 Charleston Harbor Jetties and Folly Beach Erosion Problems
SC 3 Simplified Permit Application Process

CASE EXAMPLES

CALIFORNIA

CA-1 ReCAP Santa Cruz County and Monterey Pilot Study

CA-2 Beach Sand Mitigation Fund– In Lieu Mitigation for Impacts of Seawalls on Sand Supply

CA-3 State Coastal Conservancy Projects

CA-4 Local Coastal Program Implementation - Dunes Protection

CA-5 Local Coastal Program Implementation- Bluff Protection

CA-1 ReCAP Santa Cruz County and Monterey Pilot Study

The California Coastal Commission (CCC) undertook at pilot Regional Cumulative Impact Project (ReCAP) to study development impacts along a 83 mile-long coastal stretch covering the two central California coastal counties of Santa Cruz and Monterey. This study provides an in-depth look at the effectiveness of the implementation of the CC Act policies relative to coastal hazards, wetlands protection, and public access.

Regarding hazards, the study looks at policies governing shoreline armoring activities, resource conditions as measured by changes in amount of armoring, and permit activity related to shoreline armoring. This study is relevant to protection of natural beaches, dunes and bluffs, since "Armoring along much of the coast in the ReCAP region has led to cumulative impacts to beach areas and public access opportunities. These impacts occur when shoreline devices are placed directly on the beach and by affecting the sand supply and landward retreat of the beach." (ReCAP: Executive Summary, p.3)

The study data shows increased growth pressures with population increasing 65% from 1970- and 1995 in the two-county area through in-filling and urban expansion. This is reflected in an increase of 43% in urban land uses in the past twenty years. From 1983 to 1993, there were over 3000 coastal development permits approved by the CCC and local governments of which 100 were for shoreline protection permits. Of these, 96 permits were approved for some type of shoreline protective device; 4 for beach nourishment. The armoring permits resulted in more than 2 miles of approved seawall activity and over 65,000 tons of approved riprap tonnage. Most are rip-rap or rock rubble revetments, with only 1.1 miles in timber seawalls without rock. Only 30 of the permits were for *new* revetments or seawalls; 63 for repair/maintenance or expansion of existing shoreline structures. One reasons for the high number of permits involving modifications of existing structures is that riprap revetments require regular additions of rock for the structure to function effectively. In general such devices are concentrated in developed areas with erosive shoreline material and high incidence of storm wave attack. .

A major finding of the study is that the current coastal policies support the use of public shoreline and public resources to protect private property, and if the current situation continues, more and more of the public shoreline will be lost as a public resource. On-the-ground outcome data indicates that, between 1978 and 1993, the percent of the shoreline armored in the ReCAP pilot area increased from 9.6 miles to 12.0 miles. Approximately one-eighth of the shoreline is now armored. This estimate does not include lengths of beaches protected by breakwaters, jetties, or groins, nor do the figures for length reflect maintenance and additions of rock to existing walls. Much of the increase in armoring between 1978 and 1986 is thought to have been constructed in response to storms in the late 1970s and early 1980s. Future demand for shoreline protection will depend on trends in development along the shoreline, erosion potential and storm frequency. Based on private property ownership, land use and physical characteristics, development patterns, and continued implementation of existing policies, it is estimated that 1/3 of the ReCAP coastline, or 27 miles, could be armored in the future.

There is no consistent regional approach to address areas prone to shoreline erosion. In many portions of the ReCAP area, the strategies used to provide shoreline protection differ greatly from one property to the next, in spite of physical similarities of sites. For example, within Live Oak along a 3,000 foot long section of Opal Cliffs, properties have been protected with gunite, vertical walls, rip-rap and concrete cylinders. The piecemeal approach to shoreline protective devices and generally not effective and have the potential to create further problems.

Armoring has led to cumulative impacts to beach areas and access opportunities, affecting sand supply and landward retreat of the beach. Along the ReCAP shoreline, data indicates that protective structures cover ~25 acres of beach. Permits granted since 1978 represent about 20%, or 5 acres of this total. Although shoreline armoring data indicates that armoring and encroachment has slowed under CZM, the impact from such encroachment may still be significant. Many of the armoring projects were approved in the popular recreational areas of Santa Cruz County.

Armoring is often put in place during emergency storm events. However, permits are approved with little or no technical analysis, review of alternatives, or review of mitigation for adverse impacts on resources, and no follow-up permit. Therefore, such projects do not receive full regulatory review or monitoring, and are usually in areas of significant long-term or storm related erosion. As a result impacts from these projects have not been fully assessed or mitigated.

The policies governing shoreline development and building setbacks for much of the shoreline development in urban portions of the ReCAP pilot are often inadequate. CC Act policies are inconsistent. One requires that new development be stable without construction of protective devices to minimize hazards. Another policy allows shoreline armoring to protect existing structures. There is no cutoff date for when a structure can be considered existing. Storm damaged structures are exempt from permits if reconstructed in same footprint thereby precluding more landward redevelopment, risks avoidance, and reduction of dependence on protective devices. Setbacks are a common LCP management approach to avoid armoring. However, most are based on long-term average erosion and do not incorporate episodic events which may exceed setbacks. This leads to structures in harms way and future need for armoring. In the ReCAP region, LCPs generally develop setbacks based on 50-year economic lifetime for new development. Those structures exceeding that lifetime will ultimately require armoring for long-term protection. Development on infill lots are allowed to be as seaward as adjacent existing development, exacerbating erosion risks and the need for armoring.

Current policy does not restrict development in areas of high hazard. Future development is likely to continue with adverse impacts on coastal resources and public costs involved in protecting private development. Regional Plans are recommended to address adverse impacts of shoreline armoring.

Source: ReCAP Pilot Project; Executive Summary and Findings and Recommendations.

CA-2 Beach Sand Mitigation Fund-- In Lieu Mitigation for Impacts of Seawalls on Sand Supply

In 1995, the CCC received requests for one long seawall to protect 12 properties within the same shoreline area along the Encinitas portion of the San Diego County bluff-backed sandy beach coastline. No armoring existed along the shoreline, but structures setback 10 to 30 feet were in danger due to episodic erosion. A few structures has been red-tagged by local governments as non-habitable structures. Since the bluffs contribute 40% of the sand in the littoral system, the CCC was concerned about loss of long-term sand supply from armoring. The result was a permit condition attached to the requests for shoreline armoring which required fees to go into a regional fund to pay for placement of sand on the beach within the same littoral cell area through offshore dredging or sand transport from inland sources.

To implement this permit condition, the California Coastal Commission in 1996 established a Beach Sand Mitigation Fund. Under a MOA, the Fund is administered by the San Diego Association of Governments(SANDAG). Funds are to be used for beach nourishment projects to provide sand to replace sand and beach area that would be lost due to the impact of the proposed shoreline armoring projects. Mitigation fees can be collected by the CCC through its coastal development permit process. Fees address adverse impacts of proposed protective structures on local shoreline sand supply. Three quantifiable impacts from seawalls along shoreline backed by coastal bluffs, such as in Encinitas, are identified and include: 1) halting of natural bluff retreat, preventing a portion of the bluff material from becoming part of the sand supply; 2) halting landward migration of beach and nearshore profiles, preventing formation of beach that would otherwise be available to the public for use over time if the seawall were not constructed; and 3) physically occupying areas, by its encroachment seaward of the toe of the bluff that would otherwise be available for recreational use.

The fee is based on estimates of the loss of beach material and beach area which could occur over the life of the structure and the cost to purchase an equivalent amount of beach quality material and deliver to beaches in the project vicinity. The methodology for determining the in-lieu fee is based on estimates the total quantity of sand necessary to replace: a) the reduction in beach quality material contributed from the seacliff over the life of the armoring; b) the reduction in beach width which will occur when the landward migration of the beach profile is stopped, over the life of the structure; and c) the reduction in beach area which will occur from the seaward encroachment of the seawall.

SANDAG has adopted a Shoreline Preservation Strategy for the San Diego region. Through its Shoreline Erosion Committee, SANDAG monitors large scale projects, both in and out of the

coastal zone, looking for "opportunistic sand projects" that will generate large quantities of beach material suitable for replenishing the region's beaches.

Applicants for shoreline stabilization projects are being required to pay a fee, in-lieu of depositing sand on the beach, because most are small projects and the costs would outweigh the benefits. Instead, the fees go into the fund which is used for a larger renourishment project to provide sand to the region's beaches.

CA- 3 State Coastal Conservancy Projects

Garrapata Beach Site Reservation: In 1979, the Coastal Conservancy acquired 2.24 acre site on Big Sur coast with reefs, tidepools, and sea caves. The parcel is within the designated boundaries of the Garrapata Beach State Park. Conservancy, using tax law incentives, negotiated purchase price of $155,000. Land intended to become part of Department of Parks and Recreation state park. (1980 Annual Report, p.20)

Nipome Dunes Enhancement. In 1990, the Coastal Conservancy acquired 2,500 acres in the heart of the Nipoma Dunes, California's largest and one of it's most spectacular coastal dune regions, bringing the goal of protecting the major part of the 12,000 acres dunelands and 18 mile shoreline a step closer. The property acquired has rare beauty and high biological value, a landscape of sand and wetlands. The $2.6 million acquisition was $425,000 below market value. The Conservancy had earlier, in 1986, acquired 567 acres of fragile dune habitat through a $715,000 grant to the Nature Conservancy. Today, the "Nipomo Dunes Preserve," under Nature Conservancy management, encompasses about 4,000 acres but is expected to expand. The Coastal Conservancy remains active in the Nipomo Dunes, developing projects to protect scenic and biologically valuable coastal resources. (1989-90 Annual Report, p.22)

Furlough Gulch Subdivision Conflict Resolution. Prior to 1972, when coastal subdivisions were relatively unregulated, thousands of lots were created in areas inappropriate for development. Permanent protection of the coast required the Coastal Commission to temporarily deny such development. In the case of Furlough Gulch, a 38-lot subdivision on 22 acres planned for a parcel that flanks Sonoma Coast State Beach, the land was purchased by the Conservancy and resold to the Department of Parks and Recreation. The cost of acquisition was defrayed by transfer of development rights whereby developers on alternative sites paid fees for intensified development and these fees were used to reimburse the Conservancy. This made possible keeping land that should be in open space from being developed. (1982 Annual Report)

Access to the Beach. The Coastal Conservancy has funded stairways, wheel chair ramps, bike paths, gravel paths and other amenities to facilitate access to the beach and from the bluffs to the shoreline. Although accessways have served to open up areas of the coast to human access, they have also served to guide pedestrian traffic over or away from fragile resources to the water's edge; and provide visual access through scenic vistas and coastal trails.

CA-4 Local Coastal Program Implementation- Dunes Protection

In California, local governments' adoption and implementation of Local Coastal Program (LCPs) vary depending, in part, on the type and extent of coastal resources, geologic conditions, hazard risks, and development pressures. Each LCP was required to adopt policies suitable for protecting coastal resources, such as beaches and dunes and natural land formations (bluffs/cliffs) consistent with the policies of the CC Act. Time did not permit completion of case example of dunes protection.

CA-5 Local Coastal Program Implementation- Bluff Protection

There are several examples of local bluff protection: Malibu, Marin County, Oceana Marin. Cayucos. Time did not permit completion of case examples. However some references noted below.

District Interpretive Guidelines- Malibu- Environmentally Sensitive Habitat Areas; Natural Landforms; Natural Hazards Waiver of Public Liability, Landslide Areas, Blufftop Development Shoreline Development - 10 ft setback, Stringline Bulkheads; Wave Hazards Residential Development- Small lot Subdivisions, Slope Intensity Formula

Interpretive Guidelines for Marin County
Bolinas- "Geologic studies indicate the new construction at Bolinas Mesa should have a minimum setback of 150 feet from the bluff."

Oceana Marin. Extreme geologic instability at Oceana Marin, ..as an interim measure, all permit applicants should be required to join the Bodega Bay Preserve and Bodega Bay Club to contribute to erosion prevention measures,..."

Cayucos Guidelines-Oceanfront bluffs in Cayucos subject to erosion. Carefully follow Statewide Interpretive Guidelines on Geologic Stability on Blufftop Development

CONNECTICUT
CT-1 Victoria Beach Condominium Project
CT-2 CT-2 Harvey's Beach Acquisition

CT-1 Victoria Beach Condominium Project

Various components of a proposal for a 40-unit condominium complex at Victoria Beach in East Haven have been reviewed by the municipal zoning board with substantial OLISP involvement since 1984. The original complex was proposed for location on a bluff immediately landward and east of an existing public beach area. This area is very dynamic and has experienced periodic storm-related erosion over the years, and also accretes and erodes sand seasonally. Because the project was proposed and constructed fairly soon after the passage of the Connecticut Coastal Management Act (CCMA), which went into effect on January 1, 1980, OLISP's early involvement was significant and centered on relevant CCMA consistency issues such as the protection of the beach resource through use of non-structural measures, including dunes, for shore stabilization along with the need for adequate building setbacks from the water. OLISP had also indicated during review of the project that since the condominiums at Victoria Beach did not exist as of the effective date of the CCMA, the use of structural solutions to flood and erosion problems, such as a seawall, would be in violation of Section 22a-92(b)(2)(J) of the CCMA which allows structural solutions to flood and erosion problems when necessary and unavoidable for the protection of infrastructural facilities, water-dependent uses, or existing inhabited structures, and where there is no feasible, less environmentally damaging alternative and where all reasonable mitigation measures and techniques have been provided to minimize adverse environmental impacts. OLISP specifically recommended that non-structural alternatives including adequate beach nourishment, dune creation, and building setbacks be incorporated into any project plans for this property to protect against flooding or erosion. When the condo complex was subsequently approved, a dune was incorporated into the project plans while adequate water-side building setbacks were not required. The dune and vegetation planted early on, which has required periodic replenishment and replanting after significant storm events, has been effective for over 10 years in protecting the beach and dwellings in the area. However, pressures have periodically surfaced from residents to build a structural seawall to protect the condos, some of which lie within 10 feet of the top of the dune bluff. In 1996, residents again proposed to build a seawall approximately 260 long and ranging from 20 to 35 feet wide just landward of direct DEP regulatory jurisdiction. Such a structure, if locally approved, would have been inconsistent with the same CCMA policies and standards, and would have been unprecedented in terms of size in this area of Connecticut in recent years. Based on OLISP's historic and on-going coastal management involvement, the Planning and Zoning Commission denied the seawall application in July of 1996, instead recommending redesign, replenishing and replanting of the dune which has effectively protected the beach and condos since the mid 1980's.

CT-2 Harvey's Beach Acquisition
As a result of coastal management issues raised during the coastal site plan review of a proposed development project on Harvey's Beach in Old Saybrook, the town decided to purchase the popular swimming beach and preserve it for public use. "Coastal Management in Connecticut, Beyond the First Decade, p.8"

DELAWARE
DE-1 Delaware's Piping Plovers Management Plan
DE-2 Beach Nourishment Project at Dewey Beach

DE-1 Delaware's Piping Plovers Management Plan
This plan will be a networked plan between the US Fish and Wildlife, Department of Natural Resources and Environmental Control, and the Soil and Water Conservation. The plan will be implemented by the Department of Natural Resources and Environmental Control. The plan will be in effect as long as the species is in need of state management, and the determination will be abased upon status of the species on official State or Federal Listings of threatened or endangered species. The management practice is to identify nests and monitor to determine when eggs are laid. During the nesting period , 'permanent fencing" will be installed perpendicular to the dune, from the dune to the high tide line, on both sides of the piping plover nest. The fencing should be no closer than 300 feet of the nest, and specific location will be determined case by case. The fencing will be installed by the Staff of Soil and Water Conservation. There will be no construction of jetties, groins, bulkheads, or other "hard" coastal protection structures during the nesting period that would have detrimental effects.

DE-2 Beach Nourishment Project at Dewey Beach
In July of 1994, there was a $2.3 million beach replenishment project in progress at Dewey Beach, Delaware. The project added more than a half million cubic yards of sand to Dewey Beach, whose shoreline had been damaged by coastal storms and has suffered tremendous erosion.. Sand was dredged from the ocean at a borrow site 2.5 miles offshore and pumped onto the beach. The state paid half of the 2.3 million dollar cost, and the Town of Dewey Beach paid the other 50%. Over time the town will be reimbursed with a portion of the funds raised by the state's accommodation tax.

FLORIDA
FL-1 State Revises Beach Armoring Policies to Protect Sea Turtles. The Florida Department of Environmental Protection (DEP) is changing its proposed beach armoring rules to protect sea turtles. As a result of the revisions, the Center for Marine Conservation (CMC) and the Caribbean Conservation Corps (CCC) announced today that they have agreed to withdraw their challenge to the rules 15 days after publication of the changes. CMC and CCC filed a challenge to the rules in early June because the State's beach armoring policies failed to adequately protect threatened and endangered sea turtles that nest on Florida beaches.

"We are withdrawing our challenge because the DEP has taken an important first step by prohibiting the construction of harmful sea walls and other beach armoring devices on public lands in the Archie Carr National Wildlife Refuge. However, we will continue to fight to control all armoring within the Refuge that destroys sea turtle nesting sites and public beaches. There should be at least one safe place in Florida for sea turtle nesting," said Tim Eichenberg, Program Counsel for CMC. The Archie Carr Refuge is the most important nesting site for threatened and endangered loggerhead sea turtles in the western hemisphere, and the largest nesting site for endangered green sea turtles in the United States.

DEP also revised its rules to provide that the U.S. Fish and Wildlife Service (USFWS) should review local agency emergency armoring projects under the Endangered Species Act (ESA) to ensure the protection of sea turtles and nesting habitat. "The revisions will at least provide some oversight to ensure that emergency armoring projects do not sidestep the requirements of the ESA.

The changes also mean that the DEP, USFWS and local agencies must be vigilant and, where possible, plan ahead to ensure that nesting beaches are not destroyed," said David Godfrey, Program Director with the Caribbean Conservation Corporation.

CMC and CCC will continue to press the State to honor its pledge to restrict all armoring within the Archie Carr Refuge, and comply with the requirements of the Florida Marine Turtle Protection Act and the ESA. Both laws prohibit the "take" of threatened and endangered sea turtles through "significant habitat modification or degradation" that impair nesting beaches. CMC and CCC were represented by the Sierra Club Legal Defense Fund.

The Center for Marine Conservation has over 120,000 members nationally, and approximately 8,000 in Florida. It is headquartered in Washington D.C., and has regional offices St. Petersburg, California and Virginia. The Center is the nation's leading nonprofit organization dedicated solely to protecting the marine environment. The Caribbean Conservation Corporation is the oldest sea turtle conservation group in the world, founded in 1959 by Dr. Archie Carr for the sole purpose of studying and protecting marine turtles and their habitats. CCC is headquartered in Gainesville; Florida, with field offices in Tortuguero and San Jose, Costa Rica.

CONTACTS: Tim Eichenberg, Center for Marine Conservation (202) 429-5609 or David Godfrey, Caribbean Conservation Corp. (352) 373-6441; FAX:(352)375-2449; Sea Turtle Survival League, Caribbean Conservation Corporation; ccc@cccturtle.org; ** New Web Page! http://www.cccturtle.org; Mailing Address: 4424 NW 13th Street, Ste A-1, Gainesville, FL 32609
June 26, 1996
Publications: Beaches-The Official Journal of Florida's Shore and Beach Preservation Association; and The Coastal Barriers Resource Manual: Federal and State Program Highlights.

GUAM

GU-1 Recreational Water Use Management Plan: The Guam Coastal Management Program developed and adopted the Recreational Water Use Management Plan in 1990-1991. The plan covers a 6 miles stretch along the coast and in the water. It addresses user conflicts along this stretch of beach and water. Bird nesting areas are identified and protected, and Manahac fish-runs protected. The plan prohibits jet skis except in management plan areas. The plan provides for "use zones" for certain water activities in planned areas, and requires buoyed areas for jet-ski-type vehicles and mechanized vehicular closure during predictable Manahac runs. Minimum operating age is 16 years for all mechanized water vehicles. Jet skis can only be operated in planned areas--two such areas have been adopted, and a third area being finalized. The first area planned, Agana Bay to Piti, encompasses 6 linear miles of coast to a distance varying from two hundred yards to half a mile. The second area, Cocos Lagoon, is a triangular shaped lagoon 3 miles long on the land side, extending 2 miles seaward. The third area is Apra Harbor, which is Guam's commercial port, the Navy port and Guam's Harbor of Refuge.

MAINE

ME-1 The Atlantic Condominiums at Old Orchard Beach
ME-2 Sand Dune Rule
ME-3 Cutler Coast Acquisition and Management Plan
ME-4 Coastal Control Zone Regulations

ME-1 The Atlantic Condominiums at Old Orchard Beach

In 1987, the Maine Board of Environmental Protection denied a permit for the construction of the Atlantic Condominiums in Old Orchard Beach, Maine. The project would have contained 96-units, 8 story residential condominium, two 2-story parking garages, and a new frontal dune ridge between the land and the beach. This project was located along a beachfront with no existing seawall. The proposed building would have been about 137 feet from the shoreline. Experts disagreed on the amount of erosion and shoreline retreat the be expected, but consensus was that retreat will occur, and that the project as proposed would be in the intertidal zone in the next 100 years. Additional

grounds for denial were based on applicant's inability to demonstrate that the project would not adversely impact the sand dune system; unreasonably interfere with existing recreational or wildlife use and natural supply or movement of sand; not increase erosion hazard or cause flood hazard to structures built on property or neighboring property. The applicant requested a reconsideration of the project with modifications to a 30 unit structure, no parking garages and located 286 feet from the shoreline and contested the shoreline retreat calculation over the next 100 years by state experts. The Board denied the reconsideration, citing that the applicant's change to the proposal constituted a substantially different project and should be considered as a new application. Market conditions changed and the applicant elected not to submit a new application request.

The debate centered around the calculation of shoreline change and retreat based on sea level rise, absence of a seawall and construction of a sand dune, the natural storage and movement of sand, and other data. Several geologist testified. Credibility over certified state geologists verses non-certified geologist became an issue. This case example illustrates the difficulty coastal states face in implementing setback laws based n shoreline erosion rates, given limited data on historical shoreline change and the effects of shoreline stabilizations and artificial dunes on impeding erosion. The Department of Conservation, Natural Resource Information and Mapping Center (formerly Maine Geological Survey) has been called upon by the DEP to assess natural hazard risks associated with building close to the shoreline. The Maine CZM Program is working on refining methods for determining erosion rates of the shoreline and applying these to the shoreland zoning setbacks.

ME-2 Sand Dune Rule

The Maine Sand Dune Rules are very clear with regard to location of dune system and applicant requirements. There are maps of all beach/dune systems. This has made it very easy for applicants to comply with the requirements.

The Maine Sand Dune rule covers frontal dunes and back dunes and applies to the entire dune system whether developed or not. For example, the York, Maine beachfront is paved and seawalled with the highway running along it. However, it is classified as a "frontal dune" and subject to the same protection as undeveloped/pristine frontal dune areas. Recent State efforts to distinguish between developed and pristine dune areas has met with resistance from citizens opposed to changing the law. The state is facing a few takings cases involving the denial of variances for development on frontal dunes along the developed portion of York Beach. (Dan Prichard 207-287-7826)

ME-3 Cutler Coast Acquisition and Management Plan

In 1989, the Land for Maine's Future Program acquired the 2,174 acre Cutler Coast Unit with 4.5 miles of ocean frontage in the Town of Culter. The property contains step bedrock cliffs jutting into the Atlantic Ocean, with the highest elevation 220 feet above sea level. The property also contains coves, pebble and cobble beaches. Through a 1993 Management Plan, 600 acres or twenty-seven percent of the property has been set-aside as a "special protection area" including 1500 feet from the seaward edge of the cliffs and where they occur pocket beaches from MHW. (Source: Culter Coast Unit Management Plan, 1993)

ME-4 Coastal Control Zone Regulations

The Maine Coastal Program illustrates the complexity of regulating diverse resources- such as beaches, bluffs and rocky shores. Maine uses three coastal construction regulatory programs to protect its beach and dune system and natural resource areas. Under the Natural Resources Protection Act, coastal frontal sand dunes and back sand dunes are mapped and protected. The Maine sand dune rules apply equally to the entire dune system, whether developed or pristine areas. There is a de facto setback from frontal dunes. In back dunes, there is a size limit of 2,500 square feet, the structure must be moveable, and elevated above 3" sea level rise, with multifamily elevated higher. Reconstruction of structures damaged >50% is prohibited unless all new building standards are met, including minimal damage to dunes, lot restrictions, bird habitat protection, and revegetation of disturbed areas. Additions, may not expand floor area or volume by more than 30% of existing structure. Exceptions include maintenance and repair of existing structures, temporary structures, walkways, open decks smaller than 200 square feet, and underground storage tanks

outside the V-zone. State permits are also required for activities within "protected natural resource areas" which include the 100-year flood zone, moderate/high value wetlands, and steep slopes greater than 20%. Development in "protected areas", with the exception of single family residential, must be set back 250 feet from NHWL. Under the Municipal Shoreland Zoning Act, state-mandated and locally-implemented setbacks required. 75-foot setback for residential and 25 ft for general development/commercial.

MASSACHUSETTS

MA 1- Sylvia State Beach and State Highway on Martha's Vineyard

Sylvia State Beach is a ~2.5 mile long barrier beach on the Island of Martha's Vineyard. It is owned by the Department of Environmental Management (DEM) and maintained by the Dukes County Commission. The beach is bordered on the East by Nantucket Sound and to the West by Sengekontacket Pond. There are two fixed inlets into the Ponds. Longshore sediment volume and transport to the state beach may be reduced and interrupted over the years through construction of a variety of coastal engineering structures northeast of the Pond and through channel construction and maintenance.

The controversy at Sylvia State Beach revolves around the beach road, a state highway which runes the entire length of the state beach. Erosion of the beach, particularly immediately downdrift of the last two stone groins, coupled with the Beach Road's low elevation relative to storm surge and waves, has resulted in storm damage and temporary closures after coastal storm events. Both the Massachusetts Highway Department (MHD) who maintains the road and the Towns want to protect the road as a link for emergency and other vehicles between Oak Bluffs and Edgertown.

Since the October Storm of 1991, state agencies have debated how to best protect long-term the road and the barrier beach system consistent with the Wetlands Protection Act and other regulations. In the interim, dune building, planting and beach nourishment efforts by the Friends of Sengekontacket Barrier Beach Task Force and MHD beach nourishment have protected the beach and road from major storm events.

The Massachusetts CZM Program have co-sponsored a series of meetings with other state agencies, local towns and conservation commissions, the county, harbor masters, universities, state legislators, and federal agencies. These meetings have resulted in an Interim Plan, short-term alternative to reduce storm damage to the beach Road. The Plan calls for construction of 1-3 adjustable wooden groins, beach nourishment, and dredging of Sengekontacket Pond to protect the roadway until a long-term erosion control measure and storm damage reduction is implemented.

MICHIGAN

MI-1: Regulatory Controls: The Michigan Coastal Program illustrates a multi-faceted program which has specialized regulatory controls for different types of areas. Under the Shorelands Protection and Management Act (SPMA), three types of areas are regulated: 1) high risk areas--subject to bluffline recession; 2) environmental areas--fish and wildlife habitat ; and 3) flood risk areas--flood-prone areas due to changes in Great Lakes water level. The "high risks erosion areas" have been surveyed and designated. Included are all areas with erosion > 1 foot per year over 15 or more years. This area can extend inland from MHW as far as 1,000 feet from the bluffline. Setbacks are required and based on 30-year bluffline erosion projections. Within the setback area, new permanent structures are prohibited. and lakeward relocation of existing structures is prohibited. Existing structures in front of the setback line cannot be moved lakeward and any addition must be located landward of the setback line. Repairs to deteriorated or damaged structures >60% of building's replacement value must meet new setback standards. If less than 60%, structures can be restored to previous condition. Exceptions to the setback for small lots granted if waste handling system is landward of the structure, the structure is moveable and located as far landward as possible, and the building meets engineering standards. For structures in danger from erosion with access routes too narrow or steep to relocate the structure, shoreline stabilization permits may be granted, but only after all other options are exhausted and sewer and engineering standards are met. Major regulatory amendments in 1992 expand the definition of bluffline to include non-bluff areas subject to erosion. All 'zone of imminent danger"-- area landward of bluffline where erosion anticipated in the next 10 years-- must be designated. An

additional 15 feet was added to the setback to address severe short-term erosion or landslides or high water. Construction requirements were eased. Additions are allowed if existing building and addition are moveable, the addition and the foot-print does not exceed 25% of the building's foundation, and located landward of zone of imminent danger. Reconstruction of substantially damaged structures (60-100% of replacement value) is allowed if damage not caused by erosion and if structure is not reconstructed in zone of imminent danger and is readily moveable. Small structures (3,500 square feet foundation and >5 units) must be moveable if built between setback and 2 times setback distance. For larger structures, the setback is doubled.

The Sand Dunes Protection Act of 1976, strengthened in 1989, protects critical dune areas within 2 miles of the Great Lakes, much farther inland than the 1,000 feet SMPA high risk erosion are jurisdiction. Regulations may extend inland 250 feet from a critical dune area. A 100-foot setback from the crest of the dune is required unless dune stability standards are met. Development, silvaculture and recreation affecting dunes and contour changes is regulated. Building is not allowed on slopes 25-33% without registered plan or slopes >33% without a special exception. Special use projects are regulated including industrial, commercial, multi-family >3 acres or>4 units per acre. Variances can be granted for rebuilding of nonconforming structures within critical dune areas if built prior to act and destroyed by fire or non-erosion forces or made nonconforming due to erosion.

NEW HAMPSHIRE

NH-1: Public Land Management: This example illustrates the diversity of public land management activities that occur in a coastal state with a small shoreline which is mainly in state ownership. New Hampshire has 9 state beachfront parks covering ~9 beachfront miles, and 7 rocky shore state park and other holdings along the Atlantic Ocean. In addition, there are several local beachfront parks covering over 2 beachfront miles. About 78% of the 18 mile long shoreline is in public ownership. The state has completed several state coastal park management plans including studies of archeological, historical, recreational, and natural resources. 20 natural resource inventories funded by CZM provide baseline data on habitat areas for permitting by Wetlands Board and are used for public education.

The 53 acres of the Seabrook Back Dunes were acquired by the Town of Seabrook with partial funding ($100,000) from the CZM Program. The area was acquired for conservation and passive recreation and constituted the only major undeveloped back dunes remaining along the New Hampshire coast. CZM funded an Education Brochure Trail Guide to the Seabrook Dunes Area (1985), Coastal Endangered Plant Inventory on Seabrook Dunes (1983), Seabrook Dune Management Plan (1985), Dunes Valuation Analysis and Acquisition Report 1984, and Final Appraisal (1986). A Fish and Game easement on a 4-5 acre dune spit at the mouth of Hampton River was also acquired as an endangered piping plover nesting site. If nesting occurs, the land may be fenced and foot traffic restricted during nesting season. The state also acquired lands adjacent to Odiorne Point State Park, as well as other parcels, to expand their coastal land holdings for recreation and conservation. CZM funds were used to develop an Odiorne State Park Management Plan.

New Hampshire has completed a multi-year Seabrook Foredunes Restoration Project on a 15 acre system on town-owned Seabrook Beach. The project involved restoring badly eroded dunes, the planting of American beach grass to stabilize the dunes, and the construction of walkways from the street to the beach to direct access and minimize adverse impacts on dunes. Signs along walkways inform the public about dunes restoration work and the importance of using walkways.

The coast is almost fully developed. Route 1-A borders the ocean along most of the coastline. The state periodically repairs and maintains protective seawalls running between the beach and the road, as well as seawalls protecting state beachfront parking lots.. Two USACE- built harbor jetties are maintained. Periodic harbor channel dredging and placement of sand on beaches occurs. The jetty at Hampton Harbor Inlet is periodically repaired. Hampton Harbor is periodically dredged by the state and beach-quality sand placed on Hampton Beach. The USACE also periodically dredges the Hampton Harbor entrance channel, but the sand is not always used for beach nourishment

NEW JERSEY
NJ-1- CAFRA Amendments
NJ-2- The New Jersey Beach Profile Network Program

NJ-1- CAFRA Amendments
In 1970, New Jersey passed the Coastal Area Facility Review Act (CAFRA) which required that certain large facilities be subject to state review and permits. Only coastal area facilities with 25 or more housing units and commercial development with 300 or more parking spaces were required to obtain a development permits from the State DEP. AS a result of this loophole, an estimated 50% of the development in the coastal zone was taking place without State or NJCZMP review. In July 1993, New Jersey passed amendments to the CAFRA, closing a major loophole in the act. Now permits are required for any development on a beach or dune, or any residential development with 3 or more dwelling units within the CAFRA boundary. This amendment is intended to improve state oversight of development within the coastal zone. It will address coastal hazard management requirements and cumulative and secondary impacts of numerous small developments along the coast.

NJ-2- The New Jersey Beach Profile Network Program
Coastal damage along the New Jersey coast shore by a March 1984 northeast storm and the 1985 Hurricane Gloria brought to attention the lack of survey data needed to substantiate the severity of storm losses on state and municipal beaches and episodic verse long-term erosion. FEMA recommended an updated mapping program every five years or after severe storm events, complemented by a seasonal or annual beach-dune profiling program. In response, the New Jersey Beach Profile Network (NJBPN) was established in 1986 to collect and analyze data on shoreline and beach face conditions and erosion trends. The Stockton State College Research Center has received almost $118,000 in CZM funds to create beach profile stations and annually monitor and map changes to beach-dune profiles. Data collected under this program continues to aid the regulatory and planning components of N.J.'s Coastal Management Program in determining areas of potential erosion problems, implementing policies and discussing permits to protect beaches, dunes, overwash fans and erosion hazard areas, as well as reducing development risks in high hazard areas, and improving coordination with FEMA after storm events.

NEW YORK
NY-1: Westhampton Beach Erosion and Groinfield Chronology
NY-2: Coney Island Beach Nourishment Project

NY-1: Westhampton Beach Erosion and Groinfield Chronology
During a 1938 hurricane, Shinnecock Inlet opened increasing the erosion rate west of the inlet to over 6 feet per year in some locations. Emergency dune repair by State and local governments cost about $180,000. In 1951, sand fill and beach grass was used to close a small inlet formed during a nor'easter. In the 1950's, the US Army Corps of Engineers (USACE) developed a protection plan calling for beach nourishment only. Local concerns resulted in plan modification to allow immediate construction of groins. In 1958, the Westhampton dune was nourishment with 380,000 cubic yards of sand. In 1960, the Federal Rivers and Harbors Act authorized the Atlantic Coast of long Island, Fire Island Inlet to Montauk Point Beach Erosion Control and Hurricane Protection Project which was subsequently amended by 1974, 1986, and 1992 Water Resources Development Act. A March 1962 nor'easter caused severe erosion; a new inlet was formed which was closed with emergency placement of sand at a cost of around $970,000. In 1963 the USACE and the NYS Superintendent of Public Works and the County agreed to construct a beach erosion control and hurricane protection project for the reach with 23 groins and fill placement. In 1965, eleven groins were built 480 feet long and 1200 feet apart with an elevation of 16 feet above MSL at the landward end and 2 feet above MSL at the seaward ends. No beach nourishment was provided. In 1969, an additional four groins were built in response to rapid erosion and 1.9 million cubic yards of sand was dredged from the bay and placed with the groins. The total cost for the 15

groins was about $6 million. In 1973, property owners along Dune Road west of the groin field a class action suit against the U.S., State of NY and Suffolk County which is still pending.

In 1977, an interim project was proposed by the USACE at the Westhampton Beach. The project would add 4 million cubic yards of fill to existing groin compartments and 4 million cubic yards to nourish beach west of the groins, at a cost of $50-%75 million to be cost shared 70% federal, 21% state, and 9% county. Additional beach and dune nourishment for the remainder of the island and 8 groins was also proposed at $55-80 million. Nor'easters caused severe erosion in 1978, 1984, and 1992. In 1983 sand was bulldozed to reopen Dune Road. In 1984 Dune Road was rebuilt and 125,000 cubic yards of sand was used create artificial dunes costing $900,000. Litigation against Suffolk County claimed damages over $70 million affecting 300 property owners as a result of the nuisance caused by the groins. The County in turn sued the US (USACE) and the State of New York.

In 1987 the NYS Department of States proposed an alternate project plan to address problems raised by the groin fields-- taper the existing groins and nourish the beach downdrift of the groins at a cost of $25-50 million. A 1992 storm created two new inlets. In 1993, USACE rejected the NYS alternate project plan in favor of a 3-5 year study, but later agrees to proceed with NYS plan. USACE closes the new inlet for $8 million. The cumulative impact of the groins, storms, and inlet migration resulted in the loss of about 200 private structures.

In 1994, affected area becomes Village of Westhampton Dunes and in 1995 lawsuit settled with Suffolk County paying Westhampton Dunes $2 million in damages and up to $2 million in legal fees. NYS-DEC places about 8,000 cubic yards of sand to maintain the inlet closure for $54,400. In 1996, the USACE proceeds to implement the "modified state plan" to taper groin fields, adding fill to groin area and placing sand downdrift of groins. Estimated cost is $30 million, plus $7 million every 3 years for renourishment for 30 years. Project is ongoing at this time.
Source: NY Coastal Management Program -staff file.

NY-2: Coney Island Beach Nourishment Project

New York's Coney Island beach has received beach nourishment, beginning in 1923. In the 1970s, the US Army Corps of Engineers (USACE) developed a beach erosion control and hurricane protection plan for the area involving beach restoration and terminal groins. Due to lack of support from non-federal participants, the large project proposed by the USACE was scaled back, but the 1986 Water Resources Development Act authorized federal participation in the larger beach restoration plan for Coney island. After further reanalysis, a Final General Design Memorandum was approved and funds appropriated in 1992. The project cost $9.5 million with the New York State Department of Environmental Conservation (NYSDEC) paying 25%, the City of New York paying 10%, and the federal government paying 65%.
Source: Emmett, Brian. K., Larry J. Cocchieri, and John R. Lesnik. "Coney Island Storm Damage Reduction Plan." *Shore and Beach*. Vol. 63, No. 4, October 1995, pps.5-10

NORTH CAROLINA

NC 1: Oceanfront Setback Program: The North Carolina Coastal Area Management Act is an example of a strong oceanfront setback law which uses erosion rate based setbacks which vary by type/size of structure. Areas of Environmental Concern (AECs) are designated and regulated based on state standards. "Major development" -drilling or activity occupying >60,000 square feet of land--requires a state permit. Smaller projects require local permits. Within the "Ocean hazard AEC"-- sand dunes, ocean beaches, and other areas exhibiting substantial possibility of excessive erosion-- coastal goals include: 1) minimize loss of life and property from storms and long-term erosion; 2) prevent encroachment of permanent structures on public beaches; and 3) reduce public costs resulting from inappropriate coastal development. Regulations cover 3 areas: 1) ocean erodible areas, 2) high hazard flood areas; and 3) inlet hazard areas. A statewide oceanfront setback is required within the ocean hazard areas based on average annual erosion rates, natural site features, and the nature of the proposed development. The setback is measured from the first line of stable natural vegetation or aerial photos/ground survey where no stable vegetation. New structures smaller than 5,000 square feet and fewer than 5 residential units must be set back the farthest landward of the following: 1) a distance equal to 30 times the long-term annual erosion rate; 2) the crest of the primary dune; 3) the landward toe of the frontal dune, or; 4)

60 feet landward of the vegetation line. Larger structures must be set back 60 times the average annual erosion rate or 120 feet landward of the vegetation line. Where erosion rates exceed 3.5 feet per year, the setback line for larger structures is set at 30 times the erosion rate plus 105 feet. The law was passed in 1974, made part of the coastal program in 1978, and amended in 1981 to allow single-family residences on pre-existing lots not deep enough to meet the erosion setback requirements, as long as they are set back at least 60 feet. The coastal program has focus attention on studying erosion rates used in determining setbacks.

OREGON
OR-1 Oceanfront Improvement Permit Implementation
OR-2 Local Setbacks
OR-3 Sea Cliff Land Slides, Geologic Hazards Management
OR-4 Oregon Territorial Sea Plan and Rocky Shores Strategy

OR-1 Oceanfront Improvement Permit Implementation

The Oregon Department of Parks and Recreation (OPRD) regulates new shoreline stabilization structures within "ocean shore recreation area" under Oceanfront Improvement Act. All beachfront erosion control devices must be built as far landward as possible to prevent encroachment on the public beach. State Goal 18 prohibits erosion repair permits on lots where there were no physical improvements (i.e., buildings, roads, water lines and sewer lines) existed on oceanfront lots platted before January 1, 1977. State Goal 17 promotes nonstructural solutions to erosion problems and calls for erosion stabilization structures to be designed to minimize adverse impacts on water currents, erosion and accretion patterns. The law allows emergency permit for a new improvement, dike, revetment, or for repair, replacement or restoration of an existing, or authorized improvement where property or property boundaries are in imminent peril of being destroyed or damaged by actions of the Pacific Ocean or the waters of any bay.

The ground for denial of permits are very comprehensive and cover project need, public rights, public laws and compliance with state goals (scenic/visual impacts; beach access, impacts on adjacent properties and safety concerns, long-term public costs; and other resource concerns); project modification options; and public and agency comments.

A 1993 application to construct a 100 foot-long riprap revetment on the ocean shore in Lincoln County was denied by the OPRD . The grounds for denial included: 1) no habitable structure on the property; 2) property buildable without a beach protection structure; 3) inadequate documentation by the applicant of active erosion or cause of erosion on the site or impacts on adjacent properties; 4) public rights would be eliminated without justification on 800 square feet of public beach easement; 5) although local government defers to state regulations and state goals, Lincoln county code requires that "shoreline stabilizations ..be confined to ..areas where active erosion is occurring which threatens existing uses of structures" and "permitted only where a higher priority method is not feasible" and "designed and located so as to minimize impacts on aquatic life and habitat, circulation and flushing characteristics and patterns of erosion and accretion;" 6) nonstructural alternatives to the proposed revetment were not considered; 7) proposed revetment does not comply with county plan or state goals 17 and 18; and 8)adverse impacts and cumulative effects have not been considered.

The permit denial contained several nonstructural alternatives to avoid erosion hazards through site design and building setbacks; relocation of septic system which may be contributing to shoreline instability by saturating soil; shoreline reconfiguration and vegetative stabilizations; or use of dynamic or soft structures. The denial also noted that reduction on size of structural alternative or modified toe protection which would offer equivalent erosion protection and no encroach west of beach zone line.

This application was resubmitted and approved after the following amendments and new information was submitted: size of structure reduced; analysis of the effectiveness of alternative methods presented; analysis of possible adverse impacts to adjoining properties.
(Source: Application BA-352-92, SP 3357 - Riprap Revetment NW Willa St. in Yachats, Oregon)

OR-2 Local Setbacks

Tillamook County, predominantly sandy beaches and dunes, has a construction setback in oceanfront and geologic hazard areas. The oceanfront setback line (OSL) is a line landward of the crest of the active foredune and approximately parallel to the State's BZL. Variances to the setback may be granted, but the setback must be at least 10 feet from the OSL. The oceanfront setback is based on existing structures and type of zone. In zones suitable for development, or already developed area, setback is determined by distance from dune crest possible to obtain ocean view from ground floor of proposed structure, the lot size, and the location of the seaward location of the nearest buildings within 250 feet of the proposed project.. If there are not pre-existing structures in area zoned for development, oceanfront setback based on geological stability of site, landward crest of the foredune, and ability to achieve ocean view. In areas of active erosion or flood zone, the setback may be increased based on a site investigation and a geologic hazard report. In permitting shoreline stabilizations, in addition to demonstrated need, county priorities are: 1) maintenance of riparian vegetation; 2) vegetated riprap; 3) non-vegetated riprap; 4) groins, bulkheads, other structural devices.

Lincoln County, characterized by sandy beaches backed by sedimentary cliffs located between rocky headlands, uses setback requirements based on the erosion rate and the height of the bank at a given site. (The setback ranges from 1 ft setback per 1 ft of bank height to 2.75 ft setback per 1 ft of bank height.) Geotechnical reports and design modifications in areas of known hazards may also be required if the applicant proposes modifications to the setback requirements. This commonly occurs, since existing lots subdivided prior to the county setback law are too small to meet the setbacks. In permitting shoreline stabilizations, preference is given to 1) vegetative/nonstructural measures; 2) vegetated riprap; 3) unvegetated riprap; and 4) seawalls/bulkheads.

In Curry County, characterized by sea cliffs and rocky headlands with beaches, development decisions are on a case-by-case basis with a required geologic/engineering analysis. The diversity of the terrain precludes uniform requirements. The county allows shoreline protective structures if a property is threatened and there is a demonstrated need.

The City of Newport, like Lincoln County, requires setbacks based on coastal recession rates and bank heights for ocean bluff developments. Newport has setback regulations for geological hazard areas which increases the setback based on three erosion categories which increase with erosion rates ranging from 1 ft to 2.75 ft. per year. The City of Gearhart has mapped a Dune Hazard Line based on rate of erosion and anticipated life of the structure. The City of Florence prohibits buildings within 100 feet of the leading edge of the foredune and no grading or breaching of a foredune. Shoreline stabilizations are allowed under a conditional use permit or by administrative review. In Waldport, if oceanfront and bayfront setbacks cannot be met, a geotechnical site report is required before a building permit can be issued.

OR-3 Jump-Off Joe Sea Cliff Land Slide- Geologic Hazards Management

The erosion of sea cliffs is a significant problem along many of the world's coastlines, including Oregon. However, few studies document the processes and patterns of sea cliff retreat due to the complexity of multiple casual factors. Research confirms that sea-cliff erosion is highly variable along the Oregon coast. Landsliding has been a problem at some locations, particularly where development has occurred along bluffs composed of small remnants of marine terraces which are muddy and particularly susceptible to landsliding.

In 1942, a large landslide developed in the bluff at Newport carrying more than a dozen homes to their destruction. In 1982 a condominium was built on a small remnant of the bluff adjacent to the major slide, despite continued slumping in the area. Within three years, slope retreat had caused the foundation to fail and the unfinished structure had to be destroyed by the City of Newport. The City had allowed the condominium to be built on this known hazard area because a registered geologist, hired by the developer, submitted a geotechnical report attesting to the safety of the project.

Homes and condominiums are being built atop cliffs overlooking the ocean, as close to cliff edges as geologist evaluations will allow. Local governments in Oregon lack technical ability to evaluate geotechnical reports and have adopted few site evaluation standards which would ensure hazards avoidance from erosion or landslides. As a result, individual development in hazard areas

are routinely approved. The erosion of sea cliffs along the Oregon coast has increased in prominence as a management issue. The Oregon Coastal Program is now focusing attention on improving state technical assistance and local government regulations in this area through development of hazard mitigation requirements, construction setback methodology, and area-wide hazard management plans.

OR-4 Oregon Territorial Sea Plan and Rocky Shores Strategy

In 1992 the Oregon Ocean Plan was adopted. This was followed in 1994 with adoption of the Territorial Sea Management Plan which covers rocky shores, intertidal areas and ocean resources in an ecosystem management process. The Plan provides an ocean policy framework with management standards to be used in managing the marine resources in Oregon's territorial seas.

The Plan includes a Rocky Shores Strategy to protect Oregon's rocky marine habitats while providing people the opportunity to use them. Under the strategy, four classifications of rocky shores are designated to guide agency programs on the ground: They include: 10 "habitat refuges" along 4% of the rocky shore where access is limited; 7 "research reserves" along 7% of the rocky shore where access is discouraged and harvest is limited; 8 "marine gardens" along 10% of the rocky shore which encourage visitors to highly popular areas; and 29 "marine shores" along 79% of the rocky shore which are small areas which are open to public but not heavily used. In addition, 9 areas have been identified but not yet designated and 7 priority offshore rocks/reefs identified for future study.

A key aspect is local site management plans for rocky shore sites with mandatory polices to address complex site conditions, biological resources, human uses, and agency management concerns. Due to multi-agency management, the strategy provides clear policies for all agencies to follow and a process for intergovernmental coordination. Education and public awareness through communications and interpretive programs is a crucial part of the strategy to manage growing usage and impacts on rocky-shore areas. The strategy is based on sound research and monitoring. An extensive inventory and analysis of rocky shore sites along the coast was conducted in 1993-1994. This inventory provides the coastwide ecosystem context for site-by-site management. The detailed inventory of the Oregon rocky shores was conducted using aerial photos registered on the 7.5' base map. This data showed 161 miles of rocky shore and 395 miles of ocean coastline. Even these figures do not account for the vertical zone of certain large rocks, such as haystack rock which has a vertical zone of 10 feet or greater around the base circumference and therefore a large intertidal surface area. In contrast, more generalized and straight-line state parks shoreline data shows 100.1 miles or 28% of the 361.9 mile-long coastline in rocky shores. (Peter Bond and Nan Evans, Oregon State Parks and Recreation Department, Table on Ocean Shoreline Ownership.)

The plan covers all rocky shores defined as shoreline features of rocky cliffs, rocky intertidal areas with associated rocks; and offshore features of rocks, islands, and submerged reefs within Oregon's Territorial Sea (ocean and seafloor area from mean low water seaward three nautical miles). This extremely comprehensive and ambitious plan covers marine fish and shellfish, invertebrates, marine plants, threatened and endangered species, migratory species, marine mammals, and all human uses (both recreational and commercial) associated with marine life and their habitat.

Illustrations of on-the-ground results of site management plans: 1) Four Marine Gardens have been closed to taking of marine invertebrates, clams (except razor clams at cape Perpetua), and mussel (except single mussels for bait). 2) Pyramid Rock in Rogue Reef, a critical habitat site for Steller sea lions and under increased fishery use, under the plan is closed within 1,000 feet to all fishing activity from May-August. Permit or management conditions have been placed on all rocky shore sites to protect the natural resource values of these areas.

PENNSYLVANIA

PA 1: Pennsylvania Bluff Recession and Setback Law and Coastal Hazards Area Technical Assistance Program to Lake Erie Property Owners:

Pennsylvania's Bluff Recession and Setback Act provides a long-term, regulatory approach to reducing property losses from bluff recession along Lake Erie. The act requires municipalities in bluff recession hazard areas to develop, adopt and administer bluff setback ordinances. The ordinances restrict new development from bluff areas and limit improvements to existing structures within the minimum bluff setback distance. Setback distance is based on the rate of erosion (feet per year) multiplied by the life span of the structure. Life span for residential development is 50 years; commercial is 75 years; and industrial is 100 years; or at least 50 feet from the crest of the bluff. Currently, the act restricts development only from the bluff crest landward. CZM wants to strengthen the law by including the regulation of structures placed landward of the bluff crest in a high hazard area known as the bluff face. CZM is also working to improve its bluff recession monitoring techniques. The major effective of this program has been to keep new development a safe distance from bluff recession hazard areas.

Since 1981, CZM has provided free site analysis and recommendation service to Lake Erie property owners affected by shoreline erosion and bluff recession. The service consists of on-site inspections and recommendations on surface and groundwater control, bluff stabilization and the role of vegetation to stabilize loose soil conditions. In the first seven years of the service (1981-1988), approximately 3/4 of the surveyed property owners followed CZM's recommendations, resulting in an estimated property damage savings and property value enhancement of $5.2 million. Pennsylvania is the only Great Lakes state to offer this service.

PUERTO RICO

PR 1: sland Regulations: The Puerto Rico Coastal Program is characteristic of state CZM programs adopted by the island states, territories and commonwealths where regulations are island-wide. Puerto Rico regulates development through island-wide land use policies and zoning districts In addition to three shoreline setback areas, permits are required for activities within 1000 meters of the shoreline or farther inland to include important natural resources, as well as all offshore islands. There are 14 zoning districts within which specific activities are allowed. For example, no subdivisions are allowed in the following three Districts: Conservation of Resources District (CR); Conservation and Restoration of Resources District (CRR); and Resource Preservation District(PR). Exceptions granted in CR District for tourist-related recreation if the public interest and natural environment not adversely affected. In the Public Beaches District (PP), subdivisions and development allowed for hotel/vacation facilities, tourist villas, restaurants, recreation, wharves, docks and other water-dependent or water-related activities. Puerto Rico also required Flood Areas permits for activities in Floodprone zones. In Zone 1 (floodways) development and major renovations are prohibited. Exception-existing structures cannot be expanded unless protected. Zone 1M(v-Zone) and Zone 2 (low areas) allows new development and modifications to existing subject to design/building requirements. There is also a relocation program in coastal high hazard flood areas. Effective beginning in 1992, there is a Maritime Control Zone and required state Authorizations and Concessions for nonconforming uses in the maritime zone- mapped territorial waters, submerged lands, inland to reaches of low lands beneath by ebb/flow of tides.

RHODE ISLAND

RI-1 Coastal Construction Control over Coastal Features:
RI-2 The Rhode Island Coastal Program adopted four SAMPS

<u>RI-1 Coastal Construction Control over Coastal Features.</u> The Rhode Island Coastal Program is an example of a strong regulatory program with defined criteria addressing identified resources, activities, and management issue areas. The Coastal Resource Management Council regulates activities within and 200 feet landward of defined coastal features---coastal beaches and dunes, barrier beaches, bluffs, cliffs and banks, rocky shores, and manmade shoreline. Complex

coastal zoning designates what types of activities are permissible on shoreline features, tied to 6 state water classifications. About 75% of the shoreline is adjacent to Type I Waters (Conservation) or Type 2 Waters (Low Intensity Use Areas) where alteration or construction or shoreline features and undeveloped barrier beaches is prohibited. In addition, activities are regulated by different setbacks from beaches and dunes, critical erosion areas, and coastal buffer zones. There are also regulations for specific types of activities (such as dredging, filling, new residential structures) as well as 17 designated coastal hazard areas and 18 identified erosion-prone areas. On barrier beaches, all residential and non-water dependent structures on dunes destroyed >50% may not be reconstructed regardless of insurance carrier coverage. Additions are allowed only to structures designated priority permissible uses.

RI-2 The Rhode Island Coastal Program adopted four SAMPS, as a supplement to the regulatory program for specific areas: Two SAMPS cover oceanfront areas. The main focus of SAMP planning in Rhode Island has been on cumulative and secondary impacts of development in, and adjacent to, poorly flushed estuaries, nonpoint source pollution, groundwater contamination, and on-site sewage disposal systems.
The Salt Pond Regions SAMP: Ninigret to Point Judith Ponds covers 32 square miles. Just over 11% was in public ownership and 50% undeveloped as of 1984. The shoreline miles and miles in beaches and rocky shores are unknown, but the Rhode Island Coastal Resources Management Program is developing a GIS data base and will be able to provide this data in future. The SAMP expands the inland boundary to include a watershed; establishes coordinated permit review procedure; amends policies for dredging in Ninigret and Green Hill Ponds to allow dredging in Type 2 waters; and changes water use designations for Port of Galilee to allow port expansion. It also specifies dredging of navigational channels and restoration of overwash channels, and requires disposal of sand dredged materials to replenish the following adjacent beaches: Sand Hill Cove, East Mantunuck; Charlestown Beach; Quonochontaug barrier beach. It prohibits, for beach restoration, mechanical removal or redistribution of sand from the intertidal zone of the beach to increase the profile of the beach scarp or to construct artificial dune since they destabilize beaches, increase erosion along beaches and sedimentation in ponds. It specifies how beach sand shall be placed on beach. It identifies priority areas for acquisition. The SAMP plan sets density limitations for "self-sustaining lands" and "lands of critical concern." Subdivisions in these areas cannot exceed more than 1 residential unit per two acres and sewers are prohibited. The goal is to keep residential development low. The percent of area and shoreline miles covered under these two classifications is not available, but RICRMP is developing a GIS system that should be able to provide this information in the future. Also, the plan is under revision. (Source: RI Salt Pond Region SAMP, 1984, and 1993 Addendum and phone interview with Jeff Willis, RI Coastal Program Manager)

SOUTH CAROLINA
SC-1 Evolution of the Coastal Retreat Policy
SC-2 Charleston Harbor Jetties and Folly Beach Erosion Problems
SC-3 Simplified Permit Application Process

SC-1 Evolution of the Coastal Retreat Policy

Until 1987, the SCCC routinely issued permits for erosion control structures on the beach. Construction allowed by the regulations resulted in a proliferation of sea walls and resultant acceleration of erosion of the beach by lowering of the beach face in front of the walls. Damages from the 1986 winter storms caused the Council to toughen its standards concerning permits for erosion control structures. The 1988 Beachfront Management Act and the 1990 Amendments established an erosion retreat program which requires the SCCC to develop setback lines derived from expected beach erosion over 40 years.

To build public awareness and education about the beachfront coastal erosion problems, the SCCC produced "Who Owns the Beach?, a 90 minute film on beach and hazard management issues which was aired in 1989. The SCCC has used mass media to communicate/respond to heightened public awareness of SCCC events such as the Lucas property taking case that received national press coverage as it made its way to the US Supreme Court.

State-of-the art scientific and technical expertise has been and continues to be used to refine the methodologies on which the state bases its shoreline construction retreat policy. This includes methodologies to protect structures from shoreline erosion and damage from storms.

Beachfront development prior to 1977 (the year that the State CZM statute was enacted) and from 1977 to 1988 (the year that the State Beachfront Management Act was enacted) resulted in a steadily increasing loss of the State's public beach resources. No better example of this trend exists than the development of the Garden City areas in Horry County. This unincorporated beachfront community in Horry County developed from 1977 till 1985 from single family beach cottages to high rise hotels and condominiums at the water's edge. In each case, the buildings and swimming pools occupy the entire square footage of the beachfront lots behind seawalls and revetments that leave little or no dry sand beach for much of the day. This development has taken place since the State CZM program was enacted in 1977. This law provided little consideration for the protection and conservation of the public beach or for the dynamics of the changing beachface from erosion and storms. The proliferation of hard erosion control structures in this area has significantly narrowed the beach and flattened the beach profile resulting in a much less appealing tourist destination when compared to other areas with healthier beaches. The storm hazard potential has also been greatly heightened. The policy of retreat established in the 1988 legislation will require decades to correct this problem while repeated, expensive attempts at beach renourishment will be required in the short run to rebuild public beach. (Source: Chris Brooks)

SC-2 Charleston Harbor Jetties and Folly Beach Erosion Problems

Jetties constructed in the 1890s leading to Charleston Harbor and maintained by the US Army Corps of Engineers (COE) have a long recorded history of causing beach erosion on Folly Beach. Between 1988 and 1992, the SCCC worked with its Congressional Delegation to negotiate a management response with the COE to address this problem. The SCCC was successful in getting the Section 111 Study which documented the contribution of COE maintained jetties and the inlet to the Folly erosion problem. The COE has subsequently nourished Folly beach, paying for 85% of the cost with the state paying 15% at $2.3 million.

SC-3 Simplified Permit Application Process . South Carolina DHEC in 1995 produced a brochure on "General Guide to Environmental Permitting in South Carolina". In cases where a 401 water quality certification and a direct state permit and coastal zone management consistency certification are required, the three are combined into a "state certification" or "state permit." The state certification is issued by EQC; however, all EQC and OCRM requirements for certification must be met (p.65). This constitutes a simplified joint permitting program between EPA and two state agencies.

APPENDIX E: BIBLIOGRAPHY

BIBLIOGRAPHY FOR BEACHES AND DUNES, BLUFFS AND ROCKY SHORES

In 1995, the National Oceanic and Atmospheric Administration Offices of Sea Grant and Ocean and Coastal Resources Management selected a team from the University of Washington, University of Rhode Island, Oregon State University, and Coastal Consultants to conduct the National Coastal Zone Management (CZM)

Effectiveness Study. The purpose of the study is to determine the effectiveness of the national CZM program, as developed and implemented by the states, in addressing certain core objectives of the CZMA. One of these core objectives for state programs is the *"protection of natural beaches, dunes, bluffs and rocky shores.*

The National CZM Effectiveness Study is unique among CZM evaluations at the national level in that it seeks to determine on-the-ground outcomes of state CZM policy implementation. In the process of addressing estuary and coastal wetland protection issues and outcomes in the states, the investigators gathered a great deal of information, some published and others in the "gray literature."

As an independent task, OCRM has asked the investigators to compile a comprehensive bibliography of materials collected in the study at the national level and for each state. This bibliography is that product.

This bibliography is based on materials collected by members of the project research team consisting of Tina Bernd-Cohen, coastal consultant in Helena, Montana and Melissa Gordon, Ph.D. Student at Louisiana State University.

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Effectiveness of State Coastal Management Programs in Providing Public Access to the Shore: A National Overview

by

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"The use of the world is finally a personal matter, and the world can be preserved in health only by the forbearance and care of a multitude of persons."

---Wendall Berry
"The Unsettling of America"

Executive Summary

Context and Purpose

The purpose of the National Coastal Zone Management Effectiveness Study is to assess how well the national Coastal Zone Management (CZM) program, as developed and implemented by individual states, addresses the fundamental objectives of the Coastal Zone Management Act (CZMA). Five core objectives were addressed: providing public access to the coast; protecting wetlands, and estuaries; protecting beaches, rocky shores, bluffs, and dunes; promoting waterfront revitalization; and developing seaports. This report deals with public access to the coast.

Americans have traditionally displayed a passion for access to coastal waters. Yet, no federal legislation had ever mandated the preservation, enhancement, and provision of public access until the CZMA was passed in 1972. The Act states that "Congress finds and declares that it is the national policy ... to encourage and assist the states to exercise effectively their responsibilities in the coastal zone through the development and implementation of management programs ... which programs should at least provide for ... public access to the coasts for recreational purposes ..." (PL 92-583).

In order to build a constituency for the integrated balance of coastal uses, the public must have the means to access and experience all that the coast has to offer. Access to the coast for swimming, fishing, sailing, or wandering the urban or beach shorefront improves quality of life, provides the opportunity to appreciate the beauty of coastal habitats, offers the chance to observe a working waterfront and port area, and enables one to appreciate the need for an equitable balance of uses. Constituencies are needed to support the CZM efforts to manage the coastline nationally, state-by-state, and locally, to support as many of these uses as possible while also considering the protection of coastal resources.

The Study Approach

The first stage of the study was a state-by-state assessment of action taken by CZM programs since 1972 to provide for public access to the nation's coasts. A five-state pilot inquiry was undertaken based on program literature and phone interviews with key state officials and coastal program managers from Oregon, Louisiana, Pennsylvania, Rhode Island, and South Carolina. Based on the pilot exercise, a standard questionnaire was designed, and sent to all coastal states and territories. From this survey, 29 state profiles were developed that characterize the approach of each coastal management program to providing public. The information gleened from the individual states was synthesized, assessed and summarized in this report.

Conclusions

Coastal States and Territories Are Actively Working to Provide Public Access to the Shore - Coastal access has been given significant attention by coastal states and territories and all 29 coastal programs are active in using tools and programs in the acquisition of access sites, providing future access, and fostering public education about the importance of safeguarding public access to the coast.

State CZM Programs Are Adaptive - The CZMA encourages each coastal state and territory to fulfill the Act's mandate using whatever tools and approaches are best suited to their own political and institutional setting. This is an advantage that might not have achieved had a centralized federal approach been taken.

Technical Assistance and Public Outreach Are Key Activities - Traditionally, acquisition and regulatory tools and programs provided the greatest amount and most effective means of public coastal access. Since funding to purchase coastal sites has dramatically decreased, emphasis has shifted to using technical assistance and public outreach.

Accurate Monitoring Data Are Needed – It is extremely difficult to assess quantitatively whether or not coastal states and territories are effectively meeting the mandate of the CZMA. Regular monitoring of quantitative indicators, assembled annually in a national database, would be valuable.

Resource Protection Is Balanced with Public Access - Coastal states are inventive and resourceful in providing coastal access in ways that also protect natural resources. Dunes are being preserved through the use of dune walkovers, wetlands are protected by catwalks, and sensitive habitats and wildlife are spared by enforcing regulations that limit public access.

Networking is Critical - Networked CZM states may be more successful in achieving the public access objectives of the national CZMA, since networking promotes partnerships and leverages funding—key elements for public access in a time of dwindling resources.

The Public Trust Doctrine is Important - The Public Trust Doctrine has had varying judicial success rates throughout the state coastal programs; however it remains an important tool for providing public access.

Recommendations

Develop Accurate Databases – and conduct needs assessments in order to determine the effectiveness of the CZMA and each of the federally approved state coastal management programs, accurate data must be regularly collected, reported, and recorded. The types of tools and programs used to acquire public access should also be documented. NOAA's Office of Ocean and Coastal Resource Management (OCRM), together with the coastal states and territories, should revise, simplify, and combine the coastal states reporting requirements under Sections 306, 309, and 312. Once databases have been developed and an accurate baseline has been established, needs assessments should be conducted. Needs assessments are required to best determine how to meet the growing future demand for public access, and to target future public access sites effectively.

Establish a Clearinghouse of Innovative Tools and Programs - There is a need to establish a public access clearinghouse, one central location where states can readily provide, as well as obtain, information about successful tools and innovations used by other coastal programs around the country.

Document CZM Public Access Successes - NOAA needs to make stronger efforts at communicating the specific public access successes of state CZM programs. The many ways in which CZM has provided public coastal access in creative, cost-effective, and opportunistic ways should be documented and shared for future successful collaborations with potential partners, such as private foundations, local government, non-CZM states, academia, and the private and commercial sector.

Fund State CZM Programs to Provide Public Access – Increased funding for the CZMA and coastal programs for public access is essential as coastal populations and need for access increase.

1.0 INTRODUCTION

1.1 The Purpose of the Study

The purpose of the National Coastal Zone Management Effectiveness Study is to determine how well the national Coastal Zone Management (CZM) program, as developed and implemented by individual coastal states, addresses certain core objectives of the Coastal Zone Management Act (CZMA). Four core CZMA objectives were chosen for scrutiny: natural resource protection, public access, coastal-dependent development, and waterfront revitalization. Analysis of each objective included a study of management processes, or tools, used in state programs, and a statement of the program results or outcomes flowing from the application of the tools. Additionally, case studies were included to illustrate particularly innovative ways in which core objectives were met in real-life practice. The study concludes with suggestions to improve the effectiveness of the national CZM program.

This report, one of five national summaries produced during the CZM study, deals specifically with the provision of public access to the coast. The other reports address protection of wetlands and estuaries; protection of beaches, rocky shores, bluffs, and dunes; promoting waterfront revitalization; and seaport development. While all these reports are important in assessing the overall effectiveness of the CZMA, this particular topic, coastal access, provides the public with the opportunity to experience the shore—whether that be an urban waterfront, coastal fishing pier or an open space—for a multitude of uses. It is essential that the public have personal experience with the coast in order to foster the stewardship necessary to balance uses and protect critical habitat for sustainable development of the coast.

1.2 National Policy Objectives

Providing public access to the coast is a fundamental goal of national coastal zone management legislation and a priority of individual state and territory programs that were developed in response to the CZMA.

In 1972, Congress passed the first CZMA and declared:

> "it is the national policy ... to encourage and assist the states to exercise effectively their responsibilities in the coastal zone through the development and implementation of management programs ... which programs should at least provide for ... *public access to the coasts for recreational purposes* ..." (PL 92-583)." [1]

The Act required coastal and Great Lakes states and territories (hereafter "states") to define a planning process for protecting and providing access to "... public coastal areas of

[1] Coastal Zone Management Act of 1972.

environmental, recreational, historical, aesthetic, ecological, or cultural value" (16USC §11454(b)(7)).

Although initial legislation strongly encouraged the planning for preservation and provision of public access by state coastal programs by 1980, it became apparent that limited budgets in many CZM state programs prevented adequate implementation of the national objective for coastal access. As a result, the CZMA was amended in 1980 (Section 306A) (16USC §1451) to allow Section 306 funding to be used for 306A purposes. This included expanding existing public access through construction of low-cost improvements to public access areas, rehabilitating deteriorated urban waterfronts, and acquiring coastal property for new sites.

In 1990, Congress again amended the CZMA to include Coastal Zone Enhancement grants (Section 309) which may be awarded to a state for the adoption of procedures and enforceable policies to improve the effectiveness of a state program in eight key areas, one of which is the provision of public access.

As a result of these two CZMA amendments, public access to the nation's coastal areas has been significantly increased.

2.0 THE BACKGROUND AND CONTEXT OF PUBLIC ACCESS

Historically, the public has accessed the nation's extensive shoreline through national, state, and local parks as well as streets, boat ramps, public piers, and boardwalks. Coastal management permits have also opened to the public valuable view corridors, rights-of-way, and redeveloped urban waterfronts. Yet, in spite of this progress, commercial, residential, and industrial use of the coastal zone often continues to limit or eliminate public access. Private ownership of the nation's coastal uplands prevents the public from reaching intertidal zones and shorelines.

2.1 Insufficient Quantity and Quality of Coastal Access

Prior to implementation of the CZMA, the decline in coastal public access could best be characterized in two ways: a limited number of public access sites, areas and facilities; and a degraded quality of those sites. The first issue, decline in the number of public access sites, was a result of the rapid privatization of the shoreline as coastal properties were purchased for residential, commercial, and industrial developments. There were great social and economic changes between 1931 and 1964, due to the wartime boom and postwar growth. Construction of large sewer and water treatment facilities, power plants, freeways, urban ports, and oil and gas processing facilities combined with residential development restricted physical and visual access to the shore. The result was a coast overcrowded with competing industrial, commercial, residential, and recreational uses.

From the early 1900s until the 1970s, coastal access was provided primarily through the National Park Service and the Bureau of Outdoor Recreation, both of the Department of Interior. The

National Park Service provided staff for the park areas and constructed park facilities. A substantial portion of its budget was used to construct, reconstruct, improve, and repair roads, bridges, and trails in the national parks.

In 1962, the Bureau of Outdoor Recreation was created and given the authority to coordinate federal plans and activities relating to outdoor recreation, conduct research, provide technical assistance, perform surveys to determine recreational demand, and review possible effects of transportation projects upon parks, recreation areas, and wildlife and waterfowl refuges. Most of the bureau's power lies in administering a grants-in-aid program that assists federal, state, and local agencies in acquiring and developing outdoor recreation areas and facilities. Revenues from entrance and user fees, taxes on fuel for motorboats, oil and gas revenues from the outer continental shelf, and funds received from the sale of surplus federal property were allocated to the fund. The Land and Water Conservation Fund financed the acquisition of land for outdoor public recreational areas and the preservation of water frontage and open space, and the development of public outdoor park and recreational areas, and their support facilities.

Between 1972 and 1984, the amount of public recreation lands in coastal and estuarine areas increased only 27 percent. Local need for coastal parks and facilities outstripped the amount of available coastal sites to meet these recreational needs. Federal and state parks experienced a dramatic increase in attendance over mid-1960 levels. Visitor data from federal parks and nature refuges along the coast show substantial increases in attendance. A new problem of decaying quality emerged. Not only were there not enough coastal public recreational areas and facilities for the dramatically increasing numbers of visitors, but the quality of what existed was in rapid decline, many of the sites were in disrepair, and in sites close to urban areas, the once pristine coastal environment and surrounding habitat was becoming degraded.

Although federal funding provided for the acquisition of coastal property for public use, there were insufficient allocations for the maintenance or operation of the property once acquired by a state or local entity. Sites were falling into rapid decay due to vandalism, litter, overgrowth, and neglect. There was no clear line of management responsibility for the sites, nor was there funding provided for site upkeep and improvement. In the same vein, sites were not improved to meet new needs for parking availability, handicapped access, or adequate signage to alert the public of site locations. Some states that aggressively pursued innovative funding sources to acquire access sites were confronted with the problem of not being able to allow the public on the property until some entity accepted the responsibilities of site maintenance, improvement, and legal liability.

2.2 Rising Demand for Public Access

California was one of the first states to recognize and protect coastal resources for the public's use and enjoyment. By the late 1960s, the growing public sentiment for protection expanded. Public access was spurred by the creation of the San Francisco Bay Conservation and Development Commission (BCDC). Since 1965, BCDC has required nearly every shoreline developer to reserve the immediate shoreline of the property for public access, provide a property

restriction to guarantee the public the permanent right to use the area, and improve the accessway with pathways, benches, landscaping, trash cans or signs, and most importantly, remain liable for the access area. During the mid 1960s there were only four miles of shoreline that were accessible to the public within San Francisco Bay. Since then, approximately 150 miles have been opened to the public through the connection of individual access segments, sidewalks along streets, shoulders on roads or on new dedicated pathways.[2]

At the same time, many environmental groups joined together to assert rights to the use and enjoyment of the coast by the general public. Condominium towers blocked views of the shoreline, private developments barred people from access to the beach and publicly owned tidelands, and two years in a row, powerful landowner interests stopped environmental legislation that would protect coastal resources. So the people of California took control of the situation.[3]

In 1970, over 1,100 environmental bills were introduced in the California Legislature. The most important result of these efforts was the creation of the Coastal Alliance in 1971, which became a vigorous force that eventually spearheaded the effort for Proposition 20. Proposition 20, approved by the California voters in 1972, had three principal aims: (1) to establish a state policy of coastal protection; (2) to create commissions to exercise interim controls through a permit system; and (3) to provide for the study of coastal zone needs. Public approval of Proposition 20 by a substantial majority was truly a landmark event, and subsequently created a strong system of state and regional commissions with full planning and land use control powers in the coastal zone. California became the model by which other coastal states attempted to address coastal resource protection issues, including public access to the shore.

Today, nearly half of the nation's total population lives in coastal counties; approximately 110 million people crowd into a thin coastal region that encompasses only 11 percent of the nation's land area (excluding Alaska and the territories).[4] These coastal areas are among the most densely populated and rapidly growing counties in the nation. It is projected that the nation's coastal population will increase 60 percent by 2010 (Figure 1). This indicates an enormous need for providing more public access for increasing numbers of coastal residents as well as for seasonal tourists.

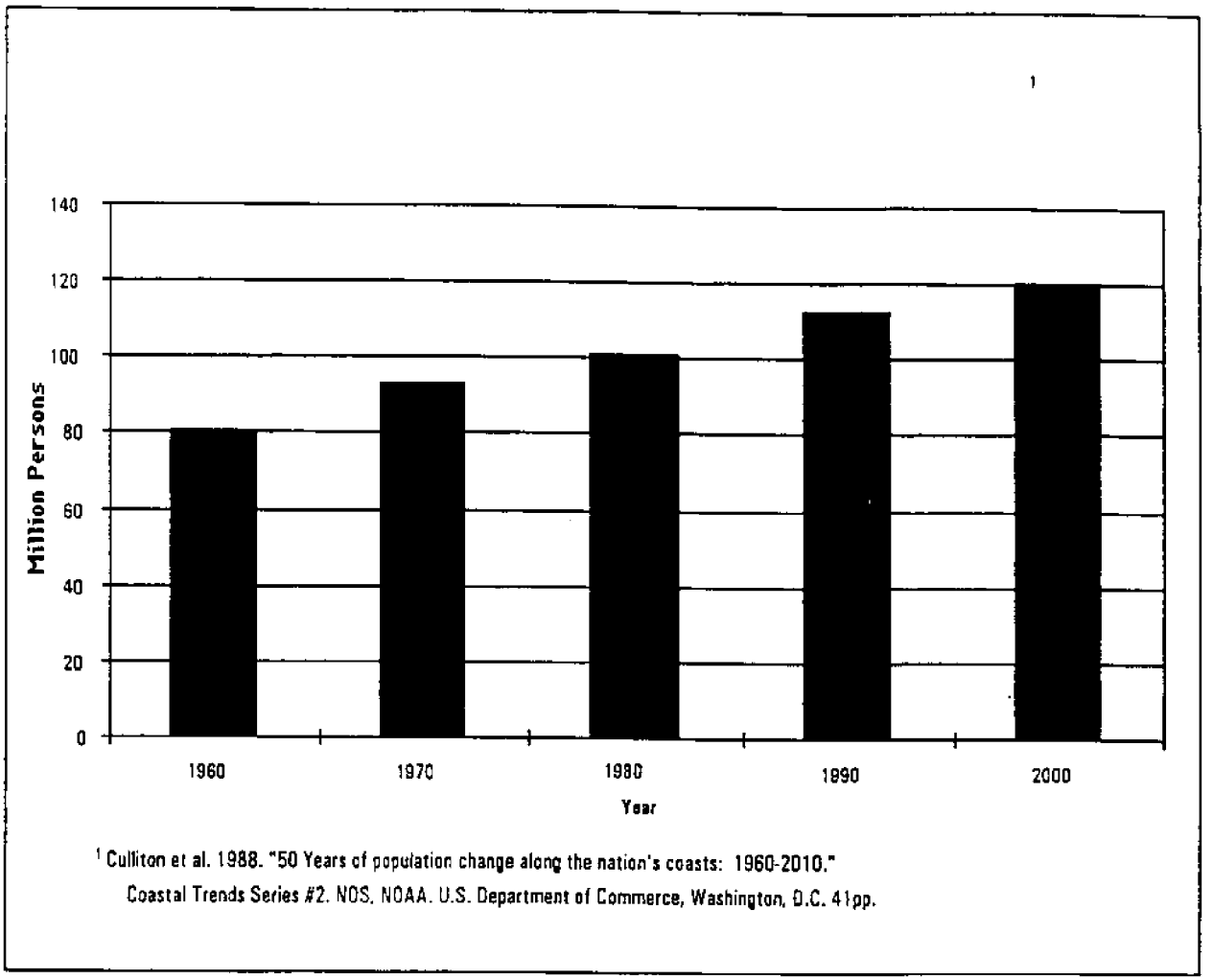
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[2] Travis, Will. Pers. Comm., 1998.

[3] Fischer, Michael. Pers. Comm., 1998.

[4] Culliton et al. 1988.

Figure 1. U.S. Coastal Population Change, 1960-2000.



[1] Culliton et al. 1988. "50 Years of population change along the nation's coasts: 1960-2010." Coastal Trends Series #2. NOS. NOAA. U.S. Department of Commerce, Washington, D.C. 41pp.

The northeast coast (Maine to Virginia) is the most densely populated in the country, with more than 750 people per square mile of coastal county. From New Hampshire to New Jersey, there are at least 2,500 coastal county residents for every mile of shoreline (Table 1). This implies a huge demand for coastal access. By 2010, coastal county population density is expected to be five times greater than that of inland counties in the northeast, and 10 times that of the national average. Most of the increase will occur at the urban edges around Boston, New York City, Philadelphia, Baltimore, and Washington, D.C.

The Pacific coast is the second most densely populated region, with 27 million people living in coastal counties, mostly in southern California. The Pacific states are projected to have another 6 million more people in coastal counties by 2010, the largest increase in the nation. In addition to southern California (Los Angeles and San Diego counties), hot spots of growth will be the areas of San Francisco Bay and Puget Sound.

Table 1. Context Factors For Public Access

State	Year Approved	CZMP Program Type[3]	Coastline Miles[2]	% Public Land	# of Sites	Coastal Population[1]	Coastal Density per mile[1]
AL	1979	MLB	607	22	75	484,000	800
AS	1980	FN	126	-99	UNK	32,000	607[2]
AK	1979	FN	3,904	87	335	466,000	13
CA	1978	CCL	3,427	60	850	23,091,000	6,551
CNMI	1980	FN	189	100	74	55,000	236[2]
CT	1980	MLB	618	36	261	2,030,000	3,235
DE	1979	MLB	321	25	215	666,000	1,733
FL	1981	FN	8,436	23	1,692	12,357,000	1,815
GU	1979	FN	2,344	75	285	3,260	637[2]
HI	1978	FN	1,052	26	802	1,108,000	1,044
LA	1980	CCL	7,721	UNK	22	2,045	171
MA	1978	FN	362.7	78	671	1,272,000	2,907
MD	1978	FN	3,190	UNK	725	3,339,000	1,027
ME	1978	FN	3,500	7	350	250,000	250
MI	1978	FN	3,224	30	1,494	4,641,000	1,579
MS	1980	FN	44	UNK	UNK	344,000	192
NC	1978	CCL	3,375	UNK	211	711,000	202
NH	1982/88	FN	18	78	157	2,553,000	2,553
NJ	1978/80	FN	1,792	UNK	UNK	6,979,000	3,898
NY	1982	MLB	2,625	41	298	15,026,000	6,738
OR	1977	FN	1,410	56	1150	1,086,000	1,140
PA	1980	FN	120	UNK	46	2,921	18,151
PR	1978	MLB	700	UNK	204	3,008,000	856[2]
RI	1978	CCL	420	UNK	530	1,002	2,585
SC	1979	CCL	2,876	UNK	274	834,000	303
USVI	1979	MLB	175	UNK	30	1,845,800	771[2]
VA	1986	FN	3,315	1	388	3,861,000	1,133
WA	1976	MLB	2,421	25	700	3,389,000	1,163
WI	1978	CCL	820	UNK	268	1,908,000	2,285

Key: CCL - Comprehensive Coastal Legislation
MLB -Mixed Legislative Basis
UNK - Unknown
FN - Fully Networked

[1]Culliton et al., 1988.
[2]COPR, 1992.
[3]Bernd-Cohen et al., 1995.

The coastal counties along the Great Lakes are the third most populous, containing 19 million people in 1988, and have the highest density per shoreline mile—nearly 4,000 people per mile. Future growth in the region, however, is expected to be slow.

The Gulf of Mexico—the fourth most populous coastal region—is home to 14 million people. Between 1970 and 1980, coastal population increased by 33 percent, and is projected to increase another 22 percent by 2010. In this region, Western Florida and the Texas coast will continue to have the most growth and associated demand for access to the coast.

The Southeast, until now, has had the smallest coastal population (237 people per square mile of coastal county), with most of the people living in eastern Florida (402 people per square mile). However, the Southeast is projected to experience the highest rate of growth (27 percent) by 2010. This will result in a regional average of 940 residents per shoreline mile. Coastal counties in Florida are expected to increase at the fastest rate and have the highest coastal population density in the region.

Demand for Multiple Coastal Uses

When the coastal management program was enacted in 1972, coastal lands were 11 percent federally owned, 12 percent non-federally owned (state, county or local government), and 67 percent privately owned. Ten percent of the coast was under uncertain ownership. The Atlantic coast from Virginia to Maine was 87 percent privately owned.[5]

In the decades since, rapid coastal development for competing private uses has grown faster than area dedicated to public recreation. NOAA data indicate that in the 1990s, 46 percent of new residential construction and 40 percent of new commercial and industrial building occurred in the coastal zone.[6] Large tracts of "gated communities" were developed along the coast, and homes sold at steep prices based on the water views and exclusion of the public. As local governments approved these types of subdivisions throughout the 1970s and particularly during the building boom of the 1980s, miles of coastline are purchased for exclusive private use.

In addition to residential development, recreation and tourism are an increasingly important part of the coastal economy. Recreational boat sales are one indication: they have risen dramatically from $1 million in 1955, to $3.5 million in 1970, to $47 million in 1980, to over $17 billion in 1995. The U.S. Coast Guard reports there were 11,734,710 boats registered in the United States and its territories in 1995.[7] Sports fishing and recreational boating require a physical means of getting to the coast to fish, including parking, boat docks, piers, and ramps and marinas. However, marina expansion and construction may conflict with public access to the coast when marina owners exclude general public traffic from their property. Successful tourism depends upon a healthy, clean environment, but also may require supporting facilities such as hotels, resorts, and infrastructure.

Providing public access may, in turn, adversely affect other goals of the CZMA such as

[5]U.S. Army Corps of Engineers, 1971.
[6]COPR, 1992.
[7]Soundings, 1997.

protecting critical habitats. An increased use in boating may impair water quality, beach-going may cause damage to the dune habitat and coastal development of public access facilities can negatively affect coastal sediment processes necessary for healthy beach habitat.

2.3 The Changing Context of the National CZM Legislation and Funding for Public Access

The original CZMA, enacted in 1972, funded the development of coastal management policies, procedures, program administration and planning processes. Within several years, it was evident that planning activities were not sufficient to achieve the desired results of providing more coastal access for the public.

Section 306A Amendments to CZMA

Congress amended Section 306 of the CZMA (implementation of state coastal programs) in 1980 to provide states with a moderate amount of funds to provide public access to the coast for recreational purposes. Eligible projects were specified: the redevelopment of deteriorating and under-utilized urban waterfronts, the preservation or restoration of areas as specified within a state coastal program, and the provision of access to public beaches and other public coastal sites and waters. Funding categories for 306A projects were acquisition, low-cost construction, rehabilitation of urban waterfront areas, engineering designs, and appropriate educational, interpretive and management costs. States decided what, if any, portion of a core Section 306 implementation award they would spend on 306A projects. As federal dollars available for 306/306A implementation dropped from $35 million in 1985 (the first year states were allowed to spend on 306A) to $31 million (adjusted to 1985 dollars) in FY 88, states shifted to core program implementation rather than to provision of new, improved access.

Section 309 Coastal Zone Enhancement Grants

In 1990, in response to mounting public concern for the well-being of the nation's coastal resources, Congress created a new program under Section 309 of the CZMA to encourage all coastal states and territories to address coastal issues of national significance. The §309 program promotes new and continued efforts in planning as a means to accomplish CZMA objectives and goals, using funding as the means to get coastal programs to target specific issue areas using specified planning methods. One of these priority issues was public access. Under section 309(a)(3), the legislative objective for public access was to:

> Attain increased opportunities for public access, taking into account current and future public access needs to coastal areas of recreational, aesthetic, ecological or cultural value.

Section 309 of the 1990 amendments to the CZMA required coastal states with federally approved programs to evaluate and complete an assessment on how public access was being addressed in their state and its coastal management program by characterizing its nature, describing and evaluating the adequacy of programmatic efforts to address the area and reflect upon its relative importance.

Section 309 established a new, voluntary coastal zone enhancement grants program beginning in FY 91. The first phase of the program required each state to complete an assessment, using a format developed by OCRM, to analyze CMP performance in meeting their state coastal zone management program goals and the national public access objectives. The Act encouraged each coastal state with a federally approved coastal management program to devise multi-year enhancement strategies with the intention to lead "program changes" in the form of strengthened laws, regulations or other enforceable mechanisms to implement the strategies and provide greater protection for coastal resources. More specifically, states and territories could improve public access within their coastal management programs through the following methods:

- Regulatory, statutory, and legal systems such as local ordinances, implementation of federal consistency, and legal strategies based on the public trust doctrine
- Acquisition, improvement, and maintenance of public access sites
- Public access management plans that update site location and/or availability and studies that assess current and future demand for access
- Protection measures that minimize the potentially adverse impacts of public access on coastal resources and private property rights

3.0 METHODOLOGY

3.1 The Research Question

The basic research question addressed in this component of the national CZM effectiveness assessment is: "How effective, overall, have the individual and collective state CZM program efforts been in providing public access to the shore for the people of this nation?" Specifically:

1. How important is the issue of public access for each coastal state?
2. What types of management policies, programs, processes, and tools are used by states for providing and maintaining public access?
3. Based on on-the-ground outcomes, supplemented by process indicators, what types of policies, processes, and tools employed by states are most effective for providing public access?

"Effectiveness" is regarded as the impact of state CZM programs in addressing public access, a core objective of the federal CZMA, as measured by outcome measures and processes given the importance of public access as an issue within that state.

3.2 Process Indicators

"Process indicators" are intermediate measures of state coastal management program accomplishments relative to CZMA objectives. Process indicators after the objective of providing public access to the coast are classified in five categories:

1. Acquisition - purchase of coastal property for public access through public and/or private funding, or achieving public access to the coast through dedicated easements, the transfer of development rights or through legal action under the public trust doctrine
2. Planning Tools - public access inventory, coastal access sites mapped, or the completion of public management plans
3. Regulatory Tools - tax or liability breaks that might then provide a financial or legal incentive for private property owners to provide easements across their property to the shore, zoning overlays that place restrictions such as limiting building height or location on development projects in order to preserve public access viewsheds or implement permit conditions requiring the developer to either provide or improve public access
4. Technical Assistance - availability of engineering expertise to local government in public access site design, and/or site development and maintenance, or providing legal expertise to assist in legal research needs
5. Public Outreach - public awareness of the availability of public access within their state through access guides, signs, and interpretive display programs, and/or the knowledge of the relevant public access issues through the availability of public workshops, publications, and fact sheets

Coastal states are using different types of processes to both preserve public access and provide more access to the shore including acquisition, planning, regulatory, technical assistance, and public outreach tools. Section 4.2 discusses the different types of process indicators implemented by each of the 29 coastal states and territories to provide, improve and protect public access.

3.3 Outcome Indicators

"Outcome Indicators" are quantitative, on-the-ground measures of CZM program accomplishments relative to CZMA goals. On-the-ground outcomes for public access are the results of CZM policy implementation decisions expressed as area (square miles, acres, feet, etc.), points (site numbers) or lines (linear miles or feet of shoreline frontage). Table 1 lists context factors such as the coastal population, number of coastline miles and coastal density; and outcome indicators such as the number of public access sites and percentage of public coastal land in the state.

3.4 The Research Design

The public access assessment, like the other components of the national study, incorporated three major phases. During phase one, the study team clarified the purposes and objectives of the study, refined the research design, and identified research questions to assess the tools and techniques used by CZM programs to address core objectives. Together with OCRM and advisors, the team identified potential process and outcome indicators for assessing effectiveness of the state programs in meeting core objectives of the CZMA. The research design was verified in five test states: Oregon, South Carolina, Louisiana, Pennsylvania and Rhode Island.

Based on the results of this pilot test, a specific survey instrument was developed for collecting process and outcome data on how states provide public access to the shore. The survey was sent to all 29 CZM states and territories. In addition, it was used in completing phone interviews with state contacts, and served as the basis for completion of individual state CZM profiles. (Appendix A is an example sate profile (Rhode Island), Appendix B is a copy of the survey instrument and Appendix C contains the profiles for each coastal state and territory, except Massachusetts and Wisconsin).

Next, a profile was prepared for each coastal state and territory that described: 1) coastal zone environmental and social setting; 2) CZM program authorities, management tools and evaluation; 3) resource and issues; and 4) process and outcome indicators (state profiles are available from OCRM). Analytical techniques were developed and applied to the data to evaluate outcomes and processes. Outstanding case examples of addressing the CZMA core objective of provided coastal access were identified and described. Primary methods included collection and summation of information on public access available from OCRM/NOAA and from each state. Documents, agency records, surveys, interviews and direct agency contacts were primary sources of information. A draft of each profile was faxed to each respective sate or territory for review and comment prior to inclusion in this report. This phase includes Steps 5 to 8 of Figure 2.

In the final phase (Steps 9 and 10 of Figure 2), the team synthesized state-level profiles into a National CZM Program Evaluation. State-level data was analyzed, compared, and combined. The results of the use of CZM processes and tools were identified, and outstanding case examples were integrated into the report. Follow-up phone interviews and data requests were made to each coastal state–usually to multiple state agency or bureau staff.

Interim summary presentations of the national assessment were given at the Coastal States Organization meeting, December 1995, the Coastal Program Managers meeting, March 1995, and the Coastal Society Conference, July 1996 and Coastal Zone '97, July 1997. Final drafts of the national assessment were sent to OCRM for review in January 1997. Comments were incorporated into this final national report.

3.5 Lack of Reliable, Comparable, Outcome Data

No National Database

The greatest limitation of this study with respect to meeting the objective of determining CZM effectiveness nationally was the lack of baseline information. There were no quantitative data, from every sate and territory depicting what public access existed prior to the enactment of the CZMA, making it nearly impossible to document over time how much access is being provided as a result of CZMA activity. There was no central agency assigned the responsibility of providing, securing, or tracking information about public access. The Department of the Interior National Park Service does document recreational access through its annual State Comprehensive Outdoor Recreational Planning process (SCORP). The SCORP plans consist of detailed state inventories dating back prior to the 1960s, however, the inventories make no distinction between coastal and inland public recreation areas, and include everything from baseball diamonds and

tennis courts to public swimming pools and coastal parks. Separating out coastal recreational areas would have been a monumental task, far beyond the scope and resources of this project.

Figure 2. Overall Research Process for the National CZM Effectiveness Study

Step 1. Clarify the purpose and utilization of the research (with OCRM and advisors).

Step 2. Identify key research questions for each core objective.

Step 3. Identify CZM processes states use to address core objectives and expected outcomes of implementing those processes (with test states, DE, PA, OR, RI and LA).

Step 4. Identify social and environmental context factors, process and outcome indicators, and associated data needs (with test states).

Step 5. Develop data collection procedures and preliminary analysis plan (based on test state results).

Step 6. Collect available data, reports and documents, and fill out draft state profiles(for review by 29 approved state and territory CZM programs).

Step 7. Revise state data analysis procedures based on the type and quality of data available from states.

Step 8. Analyze data and summarize in a profile for each state using state-level analysis procedures.

Step 9. Develop national evaluation synthesis procedures and present preliminary results at national conferences.

Step 10. Synthesize evaluation results at the national level.

It is a reasonable expectation that determining the effectiveness of achieving the national public access objectives would be fairly straightforward, an exercise in counting up access points and categorizing various management tools, programs, and policies. Unfortunately, this was not the case. In addition to the lack of a national database of pre-existing and/or existing coastal public access sites, none of the states had compiled an accurate statewide inventory of public sites prior to the enactment of their state coastal management programs nor do they regularly monitor and report number or quality of access sites acquired or improved in the years since the CZMA. This situation was not surprising as no standardized, on-the-ground outcome monitoring protocol exists for assessing state coastal management program performance relative to national CZMA objectives. Outcome data were scarce, and when data were available, they lacked comparability across state or regional efforts. Most importantly, the study was unable to link CZM program processes with quantitative information on outcomes in order to measure CZM program effectiveness.

Institutional Memory

Another impediment was the heavy dependence on state and territory staff to complete the surveys and interviews (primarily because a national database did not exist). Many state programs are now 15 to 20 years old, and original senior staff and program managers have retired or moved on to other positions. As a consequence, the institutional memory of program activities that occurred even as recently as a decade ago has been lost. If there were files

containing a history of the coastal program achievements, in many cases these files were inaccessible or lost. Many states could not answer some of the most basic questions concerning where pre-existing or even existing public access points are, or how much public access they have in terms of linear miles, points, or even acreage since program approval.

Agency Staff Loads

Because many state coastal programs have suffered staff and budget cuts in the last several years; fewer staff are available to carry out the same or expanded workloads. This project placed enormous demands on staff time in terms of completing surveys, locating data, providing other points of contact, and reviewing drafts of our state profiles to determine inaccuracies or expand the text to include examples of creative approaches to providing coastal access. Unfortunately, the demands of this study, in many cases, overwhelmed the staff's capacity to respond in a timely fashion, if at all. Several never responded to the survey, letters, e-mails, or phone calls.

4.0 RESEARCH FINDINGS

4.1 Public Access is an Important Issue

With scarce resources and a multitude of conflicting uses to address, each state coastal zone program must set priorities among several core issues. Therefore, an important precondition for effectively providing public access is determining whether or not public access is considered a priority. Table 2 is a summary of the importance that states and territories attribute to public access. This ranking was required by the Coastal Zone Enhancement Grants amendment (Section 309) to the CZMA in 1990. A comparison of Table 1 with Table 2 indicate that those states with dense coastal populations usually consider public access to be a high priority.

The assessment of the data is complicated, however, by the fact that a few states, such as Oregon, addressed the issue of public access to their coast before the enactment of the CZMA and the creation of their state CZM program. Because they had been dealing with the public access issue for so long and had been so effective, it is no longer a priority compared to issues, such as ocean resources, coastal hazards and cumulative impacts, which is now at the forefront for Oregon. Similarly, Louisiana had not ranked public access as a priority issue because the physical character of the coast did not lend itself to typical coastal activities such as beach-going. Wetlands, marsh, and swamps dominate the Louisiana coastline and make access difficult, so issues such as the protection of natural resources (e.g., wetlands) were a priority instead. Knowledge of the local context is important for interpretation of the effectiveness of each state in achieving this core goal of the CZMA. The context and the activities of each state and territory are described in more detail in the state profiles, (Appendix C).

4.1.1 Public Access Given National and State Priority

Section 309 of the 1990 amendments to the CZMA made public access a priority for both the national CZ program office (OCRM) and coastal states and territories. It required coastal states

with federally approved programs to evaluate and complete an assessment of how public access was being addressed in the context of each state coastal management program by reflecting upon the relative importance of access as an issue and by describing and evaluating the adequacy of programmatic efforts to address the issue.

OCRM and the state coastal management programs invested considerable time and energy in the Section 309 program. Only 20 years earlier, public access issues were not even addressed by any other federal entity, let alone by 29 coastal states. Access improvements included the implementation of new planning methods, an increase in site acquisition, mandatory provision of public access as a precondition for permit approval for coastal development, and land use controls that preserve public access (as a few examples).

Table 2. How coastal states ranked public access as a priority in 1992 and 1996.

	Rank '92	Funded	Rank '96
AL	H		H
AK	L		H/L
AS	L		L
CA	H	Y	H
CT	H	Y	H
DE	L		L
FL	M	Y	M
GU	H	Y	M
HI	H	Y	H
LA	L		L
ME	M		M
MD	H	N	H
MA	L	Y	H
MI	M		M
MS	L		H
NH	L		L
NJ	M		M
NY	H	Y	H
NC	L		L
NMI	M		M
OR	L		L
PA	H	Y	M
PR	H	N	H
RI	H	Y	M
SC	H	Y	H
VI	H	Y	M
VA	H	N	H
WA	M		M
WI	var		var

During the 1992 §309 assessment period, 16 states and territories identified public access as a priority enhancement area and applied to OCRM to fund a variety of innovative ways to improve public access. The types of program changes that were implemented by the 16 states included revised regulations, new legislation, executive orders, memorandum of agreements (MOAs) and local plan adoptions. Yet, in spite of the increased demand for public access, in fiscal years 1992 and 1993, federal funding for public access initiatives was a modest $625,800.[8]

In the fall of 1996, coastal states repeated the §309 assessment process, this time addressing the coastal management program's progress on and/or changing status of the issue area within the state/territory since the first assessment. Each issue area was ranked again, and new strategies were developed. Results from the 1992 Assessments were compared against the 1996 Assessments to determine progress made in meeting the national public access objectives through the implementation of the §309 program and subsequent priority changes in issue area rankings. Thirteen CMPs ranked public access as a "high" priority in their 1992 assessments', of those, nine actually conducted one or more access-related projects under section 309. Of the four CMPs that ranked access as a high priority but then did not fund 309 work, one addressed access through section 306 and 306A, two performed 306A projects only, and one did nothing. However, four other CMPs that ranked access as a medium or low priority did perform at least one access-related 309 project each. Finally, seven of the coastal management programs that ranked access as medium or low performed access work using Section 306 and/or 306A, suggesting that access was something of a priority, just not for §309 funding.

4.2 Coastal States Use A Variety of Tools and Processes to Provide Public Access

Coastal states use a wide variety of institutional structures, types of management plans and partnership arrangements in myriad creative ways to provide public access. Table 3 summarizes the suite of tools that are used most often and are considered to be most effective.

4.2.1 Acquisition of Waterfront Land Is the Most Commonly Used Tool for Public Access

Acquisition, for the purposes of this study, is defined as the purchase of all legal rights to a property. A public entity may acquire ownership by purchasing the land outright or by exercising the power of eminent domain. Ownership of waterfront land by a public entity is the most effective way to secure public access along the coast. All 29 coastal states have used acquisition tools to provide public access. In doing so, they have employed at least 89 different types of acquisition programs or tools.

The Benefits of Acquisition

Acquiring land outright is the most effective means of securing long-term provision of public coastal access because the public ownership is clear and private incursions can be prohibited. It is also a way to secure perpendicular coastal access to the shore. Public ownership of coastal

[8] Bernd-Cohen, T., et al. 1995.

TABLE 3
PROCESS INDICATORS: COASTAL STATE PUBLIC ACCESS TOOLS AND PROGRAMS

INDICATORS		STATE	AL	AK	AS	CA	CNMI	CT	DE	FL	GU	HI	LA	MA	MD	ME	MI	MS	NC	NH	NJ	NY	OR	PA	PR	RI	SC	USVI	VA	WA	WI	TOTALS ND	N	U
	Acquisition Program	Public Funding	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	27	2	0
		Private Funding	✓	✓		✓	✓	✓	✓	✓				✓	✓	✓	✓	✓	✓		✓	✓		✓	ND	✓	✓	✓	✓	✓	✓	22	6	1
		Conservation Easements	✓	✓		✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	ND		✓	✓	✓	✓	✓	25	3	1
		Transfer of Development Rights	✓			✓	✓	✓							✓		✓	✓							✓	✓		ND	✓			10	18	1
		Public Trust Doctrine	✓	✓		✓	✓	✓	✓	✓			✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓	✓		ND	✓	✓		21	7	1
	Planning Tools	Inventory of Coastal Public Access Sites	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	ND	✓	✓	✓	✓	✓	✓	✓	✓	✓	27	1	1
		Mapping of Coastal Public Access Sites	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	ND	✓	✓	ND	✓	✓		✓	✓	✓	25	2	2
		Public Access Managment Plans	✓	✓		✓		✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	25	4	0
	Regulatory Tools	Tax Breaks				✓				✓		✓					✓	✓	✓		✓	✓			ND			✓	✓	✓	✓	12	16	1
		Liability Conditions	✓			✓		✓		✓		✓		✓	✓		✓	✓			✓	✓		✓	ND	✓		✓	✓	✓		16	12	1
		Permit Condtions			✓	✓	✓	✓	✓	✓	✓	✓		✓			✓	✓	✓	✓	✓	✓		✓	✓	✓		✓	✓	✓		21	8	0
		Limits)				✓		✓		✓	✓	✓		✓		✓	✓					✓		✓	✓			✓	✓	✓		14	15	0
	Technical Assistance	Site Design	✓	✓	ND	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	27	1	1
		Site Development/Maintenance	✓	✓		✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		26	3	0
		Legal Research/Support	✓			✓								✓		✓		✓			✓	✓		✓		✓				✓		10	19	0
	Public Outreach	Interpretive Display Program	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	ND	✓	✓	ND		✓	✓	✓	✓	✓	24	3	2
		Signage Program	✓	✓		✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	ND	✓	✓	ND	✓	✓	✓	✓	✓	✓	25	2	2
		Access Guide	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓		✓	✓		✓	ND	✓	✓		✓	✓		✓	✓	✓	23	5	1
		Workshops	✓	✓	✓	✓	✓	✓		✓		✓		✓		✓				✓		✓				✓				✓		14	15	0
		TOTALS	16	13	3	19	14	17	13	17	9	15	6	17	14	14	16	17	14	10	16	13	11	17	9	14	13	13	17	18	11			

KEY: ✓ - State has a program/tool in place
Blank - State does not have a program/tool in place
ND - No Determination

property not only increases the number of accessible sites but also the quality of the access. If state or local government owns the sites and sufficient funding is allotted, restrooms, lighting, trash receptacles, handicapped access, or any other facilities can be readily constructed to make the site attractive and safe for a wide variety of public uses.

The Limitations of Acquisition

The cost of coastal property is exorbitantly high. Federal, state and local budgets rarely have sufficient funding to purchase many sites. Moreover there is a scarcity of sites for sale. Most of the coastline is developed and/or is privately owned residential property. So, although demand for public access sites continues to increase, the ability of governments to acquire the land to create these access sites becomes even more constrained.

Acquisition with Public Funds

Public funding refers to the provision of federal, state and/or local funding for the purpose of acquiring coastal property for public access to the shore. These include federal initiatives such as the Section 306A program, Section 309 Coastal Enhancement Grants program, and other non-CZM initiatives such as the Land and Water Conservation Fund, the Department of Interior's Wallop/Breaux Act funding, and U.S. Fish and Wildlife Service's Dingle/Johnson Act funds. Each of these federal programs requires a match of nonfederal dollars. CZM programs have partnered with other state and local agencies to provide additional coastal access to the shore. Therefore, federal funding of the CZMA leverages other federal dollars and local private dollars for acquiring and improving public access.

Twenty-seven coastal states employed a public funding program (Table 3). Many of these states had public referenda to purchase larger tracts of coastal property. They leveraged available funding with other federal non-CZM programs and took advantage of the 306A funding available for coastal property acquisition. The federal acquisition funds are useful in leveraging state funds and help to maintain the ecological integrity, cultural heritage and public accessibility of coastal areas.

Public Funding–North Carolina

Most of North Carolina's 306A acquisition funds were used to purchase two ecologically significant areas: Permuda Island and portions of Buxton Woods. The state matched $987,066 in federal 306A funds with $756,581 in state funds to purchase Permuda Island in Stump Sound, North Carolina. This 50-acre island is in the middle of pristine wetlands and prime oystering grounds. When a major development was planned for the island, local citizens lobbied the state to protect the island. Local, state and federal entities worked together to protect this environmentally and archeologically important coastal resource, and helped to maintain the cultural heritage of the local fishing community.

The other major North Carolina 306A acquisition was the partial purchase of the 3,000-acre ecologically significant Buxton Woods Maritime Forest on Cape Hatteras. Buxton Woods, important as a unique coastal habitat, storm buffer, recreational area and fresh water acquifer for the island, is under intense

development pressure. North Carolina initially used $1,021,127 in federal funds and $578,000 in state funds to purchase 337 acres. The state purchased another 145 acres with $800,000 in federal 306A funds and $500,000 in state funds. In addition, Congress awarded North Carolina $1.5 million in special FY 90 306A funds for the Buxton Woods acquisition. To expend these funds, the state will have to provide another $1.5 million in matching funds for a total of $3 million to purchase 600 more acres. It is this combination of both federal CZM and non-CZM funds that have made these access sites a reality for North Carolina.

Public Funding–Maine

Administered by the Department of Economic and Community Development/Office of Comprehensive Planning, the Land and Water Conservation Fund has played a major role in funding acquisition for public access along the state's coast. Revenues for the fund come from fees paid by offshore oil well leases to the federal government. The National Park Service dispenses the funds to the state annually. Maine's annual share has declined from a high of $3.2 million to $165,000 more recently.

Established in 1988 with a voter-approved $35 million dollar bond issue, the Land For Maine's Future Program has acquired over 3,553 acres of coastal property with more than 16 miles of combined shore frontage. The Land for Maine's Future Program is administered by the Natural Resource Policy Division of the State Planning Office.

Maine recently took its acquisition program one step further using a very innovative approach. The state developed an affinity credit card that will deposit a percentage of the amounts purchased by cardholders into the Land for Maine's Future Fund. The credit card is expected to generate between $100,000 to $200,000 for the fund.

Acquisition Through Private/Public Alliances

The purchase of coastal land by private entities such as The Nature Conservancy, Audubon Society, local land trusts, or other nongovernmental organizations is another important means of providing public access. Private funding is often provided as a match for state and federal grants. Although public access must be a condition of the purchase, recreation within these parcels is commonly passive in nature. This, in turn, tends to limit the number of people using the site. Therefore, where environmentally fragile habitats exist, private acquisition is a particularly effective tool for balancing habitat protection with providing public access to the coast.

At least 22 states leverage private funding as an important acquisition tool (Table 3).

Private/Public Alliances–California

The lack of new state or federal funding initiatives has prompted some local nonprofit land trusts and other nonprofit organizations to take on the responsibility of acquiring and managing shoreline access.

The California Coastal Conservancy is working to preserve, improve, and restore public access and natural resources along the coast of California. It builds trails and walkways, purchases threatened coastal land from willing sellers, enhances and restores wetlands and watersheds, protects open space and farmland, supports commercial fishing, helps cities develop and improve waterfronts, and crafts innovative solutions to land-use conflicts. The Conservancy undertakes projects in partnership with nonprofit organizations, landowners, local governments and other public agencies. It is funded primarily by bonds authorized by California voters.

The nonprofit, all-volunteer Moat Creek Management Agency now operates a creekside trail and trail head parking lot, which provides access to one of the best surfing and abalone diving spots in southern Mendocino County. The Conservancy helped this land trust to get started and is backing it up with a guarantee that if it goes out of existence or somehow defaults, the Conservancy will assume responsibility for accessibility. For years, surfers, abalone divers and others had used this trail, paying a small fee to a rancher to cross his land. Then, in 1981, the Coastal Conservancy bought the property to protect it against an unsuitable development that had been approved before the passage of the California Coastal Act.

Local residents offered to improve and maintain the trails under the Surfriders Foundation. In 1989, the Conservancy signed a contract and provided $48,000 to Surfrider to improve the Moat Creek access, and to protect and restore riparian habitat that had been destroyed by vehicles driving off the trail. A small group of volunteers put up vehicle barriers, erected signs, and restored vegetation along the creek. Ever since, the Moat Creek Trail has been maintained and monitored with the help of students who pick up litter through the Adopt-a-Beach program. The Moat Creek organization signed a new contract with the Conservancy, joined the Land Trust Alliance and, through the Alliance, reduced their insurance costs.

Through the initial purchase by the Coastal Conservancy, a small group of concerned local citizens became stewards of a critical piece of coastal property and organized and partnered with other nonprofits. They have now become the new guardians of their local coastal area.

Acquisition by Conservation Easement

Property easements, such as conservation easements, secure a limited legal right to utilize some aspect(s) of a piece of land. Easements may be acquired through the same means as those used in fee simple acquisition. An easement may be obtained through eminent domain, agreed purchase, or dedication.

A property owner may offer a conservation easement on their land to a public or nonprofit entity in exchange for the assurance that the land will only be utilized in a specific manner, such as for

farming or grazing livestock. The conservation easement may be for the entire parcel of land or for a portion of it. If it is specified that the land be utilized for public access or recreation, this type of easement could be as valuable as fee simple ownership.

Twenty-five coastal states are using some type of an easement program in order to gain access across private property to the coast (Table 3).

Easements–Virginia

The Virginia Conservation Easement Act of 1988 increases the ability of certain charitable corporations, associations, or trusts to acquire and hold conservation easements for the protection of historic, open space, and recreational value. The Virginia CZM program partnered with nonprofit organizations, federal and state agencies, and private entities (The Nature Conservancy, Division of Natural Heritage, local and county governments) to purchase a parcel of environmentally sensitive land located in Matthews County, Virginia. The piece is comprised mostly of wetlands, and fronts the Chesapeake Bay.

The Nature Conservancy owned the land but wanted the state to maintain the property. In order for the state to assume the responsibility for maintaining the property, there had to be a guarantee of public access to the parcel. Two 306A grants were awarded to the Virginia CZM program, first to purchase an easement to the land that provided the public with access across a portion of the parcel, and then to develop a boardwalk over the wetlands and fragile habitat. As a consequence, valuable coastal open space was protected, and most importantly, the public was provided access across the land to coastal waters in a manner that protected fragile habitat.

Easements– Wisconsin

Easements have been used to link parcels to form a linear lakefront walkway along Lake Michigan in downtown Green Bay and Milwaukee. The lower lake, from Milwaukee around to Michigan, is one of the most heavily industrialized regions in the nation. The Wisconsin Coastal Zone Management Program used Section 306A funding to purchase easements over private property to connect with the remaining linear lake-front walkway.

Acquisition by Transfer of Development Rights

The transfer of development rights (TDRs) separates the right to develop land from the property rights associated with land ownership. Property owners in sending zones transfer their development rights to land parcels in receiving zones, usually for money. The property in the sending zone is then limited in its future development depending upon which rights attached to it have been transferred. The amount of development is then increased on the receiving parcel and the rights to develop are therefore decreased on the sending parcel of land (typically the lot to be preserved). The benefits of TDRs are that they promote development and conservation in desirable locations, they provide economic relief to property owners affected by land use regulations, and they preserve land at low cost to the public. When implemented, TDRs can

influence where development can occur and can be a successful tool for preserving open space, fragile economic resources, and historic landmarks.

Ten coastal states employ TDR as a means of acquiring public access.

Purchase Development Rights– Michigan

Residents of Michigan's Old Mission Peninsula recently voted to approve the implementation of a Purchase of Development Rights (PDR) program in an effort to preserve high quality agricultural lands and coastal views. Peninsula Township will use revenues gained from a $1.25 million property tax increase over the next 15 years to purchase development rights from participating farmers. Residential development pressures in this scenic area have threatened to put local cherry growers and other fruit producers out of business. Under the PDR proposal, property taxes that are assessed on a property's development potential would be reduced for participating farmers. Using Section 309 grants, the Michigan Coastal Management Program assisted the township in developing the PDR program and related educational materials. Peninsula Township's program will be the first of its kind in the Midwest.

Conclusion on the Use of Acquisition as a Means for Providing Public Access

The ability of state and federal governments to purchase large tracts of coastal land for the purpose of providing large amounts of coastal public access is becoming less feasible with shrinking budgets and rising coastal property values. Although relatively large parcels of land were acquired during the 1970s and 1980s through federal and state funding programs, this will probably not be the trend in the years ahead. Federal, state and local governments appear to be looking to other alternatives. Rather than purchasing land fee simple, more CZM programs are acquiring the rights to use coastal land with the objective of providing public access across private property to get to the shore. Coastal states provide incentives such as tax deferrals or abatements and liability waivers to encourage private property owners to grant easements across their property. In most cases, this has provided a "win-win" situation: the private land owner is satisfied with greatly reduced property taxes and/or a waiver of liability for the public use of a proportion of his property, and the public wins by gaining the perpendicular access needed to get to the shore.

As funding for the acquisition of larger tracts of coastal property has decreased, federal, state, and local agencies are have been smaller tracts of coastal property. Acquisition of smaller parcels provides many benefits. First, the purchase cost is significantly less. Second, developing and maintaining these sites is significantly cheaper. Finally, smaller coastal parks diffuse the adverse impacts of the public on the surrounding habitat because these sites are smaller in size and typically offer less facilities in terms of parking or restrooms, therefore attracting fewer people.

The transfer, or purchase, of development rights has been a very effective means of protecting fragile environmental habitats as well as providing passive public access to the shore. Examples of TDRs and conservation easements illustrate the successful way in which CZM is meeting the

difficult challenge to balance the right of the public to get to the shore with the protection and preservation of coastal resources.

4.2.2 Regulatory Programs: Effective Tools Where Development or Redevelopment Is Occurring

Public access to the coast can be provided by regulatory means including statutes enacted by state legislation; executive orders, regulations, county and municipal ordinances; and the application and implementation of the Public Trust Doctrine.

The Benefits of Regulatory Programs

Regulatory programs, depending on their purpose and design, can provide on-the-ground protection of existing public access and, in some instances, can provide additional public access to the shore. The level of success that regulations meet with depends upon the jurisdictional area covered, the types of prohibitions and limitations placed on activities within that area, the number and extent of exceptions and variances permitted, and the level of enforcement and penalties levied for violations. State laws that require public access as a condition of permit approval offer significant opportunity for the provision of public access to the shore.

Other benefits to the public include the incentives that states can offer to private landowners for providing easements across their property. These incentives take the form of tax deferrals and liability waivers to landowners granting easements to the public to cross their property to get to the shore. Tax and liability incentives are particularly important in areas of the country where much of the waterfront is privately held, and especially where coastal property is prohibitively expensive.

Zoning waterfront areas also enhances public access by requiring sufficient public parking and limiting building heights and locations to preserve visual access to the shore. Many urban areas mandate that developers provide public access as a condition of permit approval. Often they also require developers to enhance existing public access by including small parks, boardwalks, lighting, and benches as part of their waterfront development.

The Limitations of Regulatory Programs

The most common limitation on the effectiveness of regulation as a means for providing public access to the shore is the lack of enforcement. There are two primary reasons for this lack budget cuts and the property rights issue related to "takings."

The Fifth Amendment in the Bill of Rights promises that government may not take private land for public purposes without paying for it or "taking" it. "The general rule is that while property can be regulated to a certain extent, if the regulation goes too far, it will be recognized as a taking." (U.S. Supreme Court Justice Oliver Wendell Holmes, 1922.) However, no one has the absolute right to use their property in a manner that may harm the public health or welfare, or damage the interests of neighboring landowners or the community as a whole. Therefore, there is a need to establish a fair balance between public need for land use restrictions and private economic interests. Local government, in particular, can often be intimidated by the term

"takings" and its associated syndrome: "lawyer, lawsuit and legal fees." As a result, many local governments will not establish regulations and/or zoning that support public access for fear of legal and financial repercussions–especially in the current political climate, which is anti-regulation and very supportive of private landowner rights. In fact, any type of regulatory "taking" is rare. The U.S. Supreme Court has held that the mere diminution of property values is insufficient to demonstrate a "taking." Natural resource protection, scenic view ordinances, historic preservations, design controls, and protection of environmentally sensitive areas are all valid purposes for land use regulations.[9]

Permit Conditions

Public access to the shore may be required as a condition for permit approval. Examples of permit conditions include the mandatory provision of parking facilities, handicapped facilities, the construction of boardwalks and small parks, and limitations of building size. Limiting building size and height is a means to preserve visual access to the coast. One of the most commonly used regulations–the provision of a public easement across the property to the shore–can solve the age-old dilemma of how to get to the public portion of the shore.

Twenty-one coastal states implement permit conditions for the enhancement or preservation of public access (Table 3). Very few of these states had any specific outcome data on the amount of public access secured by the enforcement of permit conditions.

Permits– Connecticut

The Connecticut Coastal Management Act requires that towns conduct a coastal site plan review of proposed development projects within the coastal boundary to determine their potential effects on coastal resources, public access opportunities, and water-dependent uses. Planning and zoning commissions and zoning boards of appeal conduct these reviews as part of the routine zoning and building permit review of local government. Developers are required to assess the potential impacts of their projects and to demonstrate that the proposed activities are consistent with the policies and standards in the Connecticut Coastal Management Act.

When the Mystic River Tavern was built, the developer was required to provide a section of the Mystic shorefront walkway, a system of public accessways that, when completed and linked together, will be more than 2.5 miles long and will run along the waterfront linking Route #1 with historic Mystic Village and the Mystic Aquarium. The developer of the Mystic River Tavern built a wooden walkway along the project's entire river frontage. The process of coastal site plan review will ensure that any future development adjacent to this part of the shorefront will provide additional sections of the walkway. So Connecticut provides an example of a win-win situation on the permit/public access issue.

[9] Duerksen, J. and J. Roddewig. 1994.

Permits– Northern Mariana Islands

The Northern Mariana Islands Coastal Resources Management Act authorizes the Northern Marianas Coastal Program to determine whether a proposed project would provide adequate public access to and along the shoreline before any permit for development may be issued. The Northern Marianas, through their coastal management program, protect public access, in remote locations on Saipan–areas traditionally used by the public. In those locations that may be affected by eventual development, public access will remain and be enhanced by the developer as part of the conditions for permit approval. These requirements may include a public access plan, access roads and trails, construction of shoreline facilities, and putting up signs. In addition, any project proposed within the lagoon, reef area, or other area of particular concern must be evaluated in terms of compatibility and potential impacts on public access and the surrounding environs.

Zoning

Zoning regulations that provide for, preserve, and/or enhance public access include county/municipal land use laws, which dictate how land is to be used. The various types of zoning regulations that can be of benefit are restrictions on building heights within the waterfront area to preserve coastal vistas; zoning overlay districts, which can protect and preserve water-dependent use and coastal habitats; and construction setbacks for residential, commercial, and industrial development. There are 13 states and three territories that implement zoning as a means to either protect, preserve, or enhance public coastal access (Table 3).

Zoning– Maine

In New England, the Maine Coastal Program, through the Department of Environmental Protection, has revised their model shoreland zoning ordinance to strengthen the protection of water-dependent uses and to enhance public access opportunities in municipal shoreline districts. The ordinance includes the establishment of a maritime district that gives priority to commercial fishing and maritime industries for access to the waterfront. Approximately 100 towns have incorporated these districts into their municipal zoning ordinances.

Zoning– Guam

The Territory of Guam implements zoning ordinances to protect and provide public access opportunities. In Guam, there are two regulations enacted for the purpose of protecting clear view of the coast. Section 13417(a)(3)(b) of the Territorial Seashore Protection Act, a zoning overlay, requires that developers not interfere with or detract from the line of sight toward the sea from the territorial highway nearest the coast. The second regulation is from their zoning law and states that "no building or structure shall be erected or maintained, nor shall any existing building or structure be altered, enlarged, moved, or maintained, to exceed a height limit of 30 feet." Both of these regulations are being implemented for new coastal construction.

Public Trust Doctrine

The National Public Trust Study defines the Public Trust Doctrine as follows:[10]

> "In the United States, shorelands, bottomlands, tidelands, tidewaters, navigable freshwaters, and the plant and animal life living in these waters are accorded special treatment by the public, but held in trust by the State for the benefit of the public. Generically, the body of lay pertaining to these lands, waters, and living resources is called the Public Trust Doctrine".[12]

The Public Trust Doctrine establishes the right of the public to enjoy trust waters, lands and living resources for a wide variety of recognized uses. In the United States, each state has the authority and responsibility for applying the Public Trust Doctrine to public trust lands within its jurisdiction. However, there are significant differences in how coastal states handle public trust issues, and to the extent to which their legislatures, judiciaries, and administrative agencies have applied the Public Trust Doctrine and its underlying principles.

Incorporating public trust principles into state coastal management programs, aging regulations, and adjudicatory decisions is an effective means of providing public access to coastal resources held in trust by state governments. Several coastal states have constitutional provisions, which, although they often do not use the term public trust, clearly recognize the responsibilities of the state to manage and preserve its public trust lands, waters and resources. Other states have taken a more expansive view of their trust responsibilities, extending them beyond traditional public trust resources[12] (Table 3).

Another issue under the Public Trust Doctrine is the extent to which the public has the right of access to pass over privately held land. In Maine, the scope of the application of public trust rights beyond those originally recognized is restricted. In 1989, the Maine Supreme Court ruled, by a slim majority, that public trust rights are limited to the traditional uses of fowling, fishing and navigation; not to be expanded to include recreational purposes, the state must pay just compensation to the owners of the land for an easement. [Bell v. Town of Wells, 557 A.2d 168 (ME)][12]

Other states, by contrast, have recognized the Public Trust Doctrine as a critical tool needed to open access to public trust lands and waters, and have relied upon the courts, legislatures, and state government agencies to implement programs. For example, the New Jersey courts have recently held that the public must be given access to the dry sand areas as reasonably necessary under the Public Trust Doctrine. In a court case in 1984 which involved a quasi-public body, the Bay Head Improvement Association, which was restricting access to a beach held in trust by the association, the court held that the association's restricted policies frustrated the public's right to access the tidelands. The court made the logical connection between the recognition of a public trust beach and the right to access that beach even if that meant crossing private property. [Matthews v. Bay Head Improvement Association, 95 N.J. 306, 471 A.2d 355 (1984)][12]

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[10] Slade, 1990.

Public Trust Doctrine– Massachusetts

In their efforts to secure public access for the redevelopment of urban waterfronts, Massachusetts towns were aided by a landmark ruling of the Massachusetts Supreme Judicial Court in 1979, which held that lands seaward of the historic extreme low water mark (such as filled tidelands and wharves) could be held by private parties "only to fulfill a public purpose," and that the rights of the grantee to that land are ended when the purpose is extinguished. The consequences of this ruling are far-reaching, as there are over 40 Massachusetts communities with significant coastal landfill. In the city of Boston, for example, 570 acres of the Back Bay are located on filled Commonwealth tidelands. This means that any development on these lands would be restricted to projects that have a benefit to the public as a whole, rather than to a private developer. In 1983, the Massachusetts General Court made dramatic changes to the existing waterways licensing law. Following the 1979 Court ruling on tidelands ownership, the new legislation requires that development on Commonwealth tidelands must not only serve a proper public purpose, but the purpose "shall provide a greater public benefit than public detriment to the rights of the public in said lands."

A recent enactment by the state legislature has given public officials an effective tool for acquiring public access, especially in urban areas. For a century, Massachusetts General Law, Chapter 91, has required a license for all structures built upon or filling tidelands.

Public access has also been used to safeguard coastal views as well as physical access. A particularly interesting example of this is Boston's Harbor Hotel. The architectural design of the hotel, built during the late 1980s, was altered to incorporate an arch several hundred feet high, in order to preserve the view of Boston Harbor. Now, thousands of motorists on the Southeast Expressway can view the coast each time they pass the waterfront hotel.

Massachusetts regulates coastal development under the Public Waterfront Act (310 CMR 9.00, Ch.91) established in 1990. This act, through the Department of Environmental Protection (DEP), secures many public access benefits along the shoreline, particularly on filled tidal areas within developed ports and harbors. The Act requires public access as a condition of licensing a wide range of projects on tidelands, great ponds, and non-tidal rivers and streams. Activities requiring authorization include the placement of structures, filling, dredging, changes in use, and structural alteration. Chapter 91 of the Act provides towns with a powerful tool to encourage developers of waterfront property–much of which consists of filled tidelands–to provide public benefits, chief among which can be public access.

Public Trust Doctrine– Hawaii

With its roots in customary Hawaiian law, the Public Trust Doctrine holds that public thoroughfares, easements, roadways, and trails were held in trust for the public. This principle was confirmed by the Ancient Highway Trails Act of 1893, which confirmed public ownership of all trails and accessways that were public at that time. It is now the basis for public ownership of all accessways and trails. The state has asserted this public claim when access is threatened by development or jeopardized by private landowners.

Liability Waivers and Tax Incentives

State laws that give incentives to landowners to provide easements across their property in the form of tax deferrals and liability waivers provide excellent opportunities for creating public access. Liability waivers provide a strong incentive for the litigation-wary landowner to provide public access by waiving legal liability for any accident or injury occurring on that portion of the property deeded as an easement for public use. Once the easement has been accepted by the proper state authorities and then authorized for public use, the landowner is immunized from legal and insurance liabilities.

Liability waivers are typically issued by state statute and granted in the case of donated easements. Because of the potential legal issues and expenses that could be incurred as a result of an injury on the property, the release from that responsibility has resulted in landowner liability waivers becoming one of the most popular incentives for providing a public easement across private property to reach the shore.

Sixteen states have enacted liability waivers for landowners providing public access easements (Table 3).

Liability Waivers– Maine and Connecticut

Maine: The Maine Tort Claims Act limits liability of the private landowners who allow the public to access their land for recreational or harvesting purposes. This has resulted in safeguarding traditional access for water-dependent uses in coastal regions where the landscape was being developed for tourism.

Connecticut: Connecticut limits landowner liability. A landowner who makes any portion of his land available to the public without charge for recreational purposes does not accept responsibility for nor incur liability for any injury occurring on the property. This has increased the number of public access easements across private property.

Property tax deferrals or discounts are often linked to liability waivers. When private landowners provide public access, a property tax deduction or deferral is granted. Tax breaks may be granted for the donation of land as a public easement, for a deeded walkway, or even for the restriction of development to preserve the historical significance and/or environmental fragility of the land.

Eleven states and one territory are currently offering some form of a property tax break for these land donations. (Table 3).

Tax Incentives– Washington and Florida

In Washington, the "Open Space Taxation Act" authorized the assessment and taxation of specified lands on the basis of current use, rather than true and fair value. The Act is designed to provide an incentive to property owners to limit land development in order to protect and conserve natural and scenic resources. In Washington, the open space tax relief program offers reduced property tax rates to owners of agricultural open space, timber lands, and open space lands in exchange for the owner agreeing to keep the designated parcel in its original use. This tax relief program is implemented at the local level, and each local government may implement their own policies regarding the continued protection of open space for public coastal access purposes. Therefore, offering owners of open space a reduced tax rate helps to keep those parcels reserved for open space, even for the provision of coastal visual access. This encourages and motivates them to provide easements across their parcels to the shore.

Tax Incentives– U.S. Virgin Islands

The U.S. Virgin Islands (USVI) offer a strong financial incentive for commercial/industrial landowners. Through the Industrial Development Program, landowners, in particular owners of hotels and resorts; who dedicate easements for public access may obtain the benefits of 100 hundred percent exemption from USVI gross receipts, property, and excise taxes; or 90 percent exemption from USVI corporate income tax, and only a 10 percent tax on USVI customs duty. The tax benefits are available on 10- to 15-year terms, with possible five-year extensions.

Agency Coordination

By spearheading the collaboration of multi-agency and state and local efforts, the CZMA often catalyzes agencies to work together to safeguard public access through the enforcement of coastal regulations. State CZM programs can leverage partnerships among other state and federal agencies and local governments to help them achieve the common goal of providing public access to the shore.

The benefits derived from this shared responsibility are far-reaching. Agency coordination in developing and implementing coastal regulations that mandate public access provides tremendous savings. The costs can be shared by assigning agencies different tasks such as policy development, implementation, enforcement, or monitoring to determine the impacts of the regulations.

By involving different agencies with varying jurisdictions, a diverse range of coastal public access opportunities such as highways, wharves, fishing piers, and bridges can be secured. Working with state and local historic societies, a CZM program can protect historically or culturally significant sites along the shoreline. By also working with the US Department of Fish

& Wildlife, nature conservancies, and land trusts, there are opportunities to provide public access and protect sensitive habitat from further development.

Conclusions on Regulatory Programs

Effective use of coastal regulations depends upon the political climate and will of those in power to implement the regulations. Many coastal states are pursuing legislation for tax breaks and liability waivers, in addition to statutory regulations.

Use of the Public Trust Doctrine and private property tax and liability incentives will become even more critical as coastal property becomes less available to the public. In the situations where coastal development has a 300 year history, such as Boston, Massachusetts; Newport, Rhode Island; and Connecticut's urban areas, aggressive use of the Public Trust Doctrine to secure public access on filled tidelands becomes crucial to maintaining public use of an urbanized, heavily developed shoreline.

4.2.3 Planning: Effective Networking Tools

Planning programs, when combined with implementation through local land-use regulations, zoning and subdivision ordinances, and other actions, can provide on-the-ground protection of existing public access, and even accommodate future demands for public access. The level of impact that planning offers depends upon the integration and sharing of resources, the aggressiveness of the policies, the standards of implementation, and the amount of exemptions, special exceptions, and variances granted by local government. Twenty-five to 27 states use planning tools to provide public access to the shore (Table 3).

The Benefits of Planning

There are many benefits associated with planning tools or programs when states use them to address the demand for public access. Access management plans foster integrated management of the coast between the state and local agencies and/or among many state agencies. Resources are shared (either funding or staff support and expertise), and this can have greater impact on preserving, enhancing, and providing additional public access opportunities. Most federal funding programs require planning for public access, by either determining need or identifying supply. By completing a planning exercise and developing priorities for public access, states and municipalities qualify for additional funding, often by federal agencies outside of the realm of NOAA. By leveraging the CZM efforts to complete the planning process, additional non-CZM dollars may become available for providing public access.

The Limitations of Planning

The most critical phase of the planning process is implementation. The lack of staff, financial resources, or expertise to complete a plan that addresses public access issues is a common shortcoming of many coastal programs. State coastal staffs are frequently struggling to address immediate issues and may rarely have the luxury of planning for the future. Often, once a plan is completed, it sits on a shelf, never to be implemented. A public access plan may be completed and include steps for implementation, but since there is no funding for implementation, the plan is never carried out. Planning must include steps for implementation as well as sufficient

financial resources to carry out the plan. Otherwise, even the most wisely crafted planning document will be worthless.

Another limitation of states' efforts in planning for public access is keeping them update. Several coastal states completed a fairly comprehensive plan addressing all of the key public access issues within their state. In some cases, demand analyses were conducted and state, regional, and local public access needs were assessed. However, these plans have not been updated in 10 to 15 years and therefore are presently of little value in addressing current key issues.

Indicators of the effectiveness of the planning tools and programs employed by states to meet the demand for public access include:

- The number of approved plans in which public access needs, improvements, and acquisition are explicitly discussed (e.g., through harbor management plans, statewide guide plans, special area management plans, and local comprehensive community plans)
- The amount of access (acres/linear miles) designated for public use by enforceable state or local plans
- The regular completion of statewide inventories of publicly held land
- Regularly updated statewide mapping of the amount and location of public access

Public Access Plans

Public access plans are meant to address key issues. The plans may outline the supply and demand issues of public access opportunities, identify the need for the improvement of existing sites in terms of site construction, development and maintenance, or target areas where additional public access is desired for the purpose of prioritizing future funding possibilities. Washington, Pennsylvania, Florida, Massachusetts, California, North Carolina, and South Carolina have all used public access planning to achieve successful results.

Twenty-five states have public access plans.

Public Access Plans– Pennsylvania

Pennsylvania established Public Access Management Plans (PAMP) in 1995 in order to focus better its limited resources and help define how CZM can act as a facilitator in fulfilling public access needs in two coastal zones, the Atlantic coast and the Great Lakes coast. The objective of the PAMP is to consolidate all CZM and non-CZM resources, thus offering a broader spectrum of opportunities for providing public access. PAMPs will encourage a more coordinated approach among all public access providers in addition to sharing the limited resources available.

Pennsylvania took the PAMPs a step further in 1995 by establishing Memoranda of Understanding (MOUs), or letters of agreement, to develop stronger links between the appropriate public access providers. The MOUs are enforceable mechanisms that the state can use to ensure that agencies adopt the new public access policies and PAMPs. The MOUs are program agreements between the

Department of Environmental Resources (DER) and other state agencies and/or commissions that detail the manner in which they will use their authorities in furtherance of the program's policies. The MOUs will more closely link state agencies' involvement, provide an avenue to better coordinate and address the provision of public access, and direct limited resources toward providing public access opportunities in Pennsylvania's coastal zones.

Public Access Plans– Washington

The state of Washington has implemented the Shoreline Access Act, which encourages each municipality to develop a comprehensive shoreline access plan. This public access plan may be either a policy document establishing the framework for determining permit conditions, or it may be a comprehensive action plan, such as a waterfront enhancement plan, wherein the public access objectives are achieved through a combination of private permit conditions and public acquisition and development. These plans must include identified goals for public access; public/private implementation strategies; standards for private development; design and signage; and for providing privacy for adjacent landowners; and methods for determining and addressing conflicts with other CZMA goals, such as natural resource preservation.

The state guidelines specify that shoreline access programs must include plan elements that pertain to the restoration and preservation of the natural shoreline resources (such as scenic vistas), estuarine areas for fishing and wildlife protection, beaches, and other valuable natural or esthetic features.

Public Access Plans– South Carolina

South Carolina pursued a planning program with the objective of providing beach access and additional parking facilities. In 1988, the South Carolina Code of Laws was amended to include new provisions that require state and local communities to prepare comprehensive beach management plans. Within these plans the issue of beach access and parking had to be addressed. Specifically, beach management plans address the public access issue by requiring local communities to prepare as part of this larger plan a beach access program to preserve and enhance the existing public access. Each local comprehensive beach management plan must contain an inventory of public beach accesses and attendant parking, in addition to a plan for enhancing public access and parking.

Public Access Plans– Florida

Florida completed a statewide beach access study in 1987 in which beach access problems were defined and the nature, location, and severity of the shortage of public beach access was identified. The document, "Florida's Beach Access: Planning for the Future," identified the issue, the problems associated with beach access throughout the state, and made policies and technical recommendations to develop a comprehensive beach access program. Policy and legislative recommendations were identified to ensure adequate beach access throughout the

state. Guidance was also provided which outlined the appropriate steps to be taken in developing a comprehensive beach access program. Information and findings provided in this report were used in establishing the "coastal element" of Florida's Growth Management Legislation. Many of the findings of this 1987 report have been addressed, such as the need to provide incentives for private property owners to dedicate easements across their property and the need to develop areas that could be opened immediately to the public with slight improvements.

Other Local/State Planning Efforts

Many coastal states are addressing public access needs indirectly through other planning efforts that are not specifically focused on the issue of public access. Even though public access may not be the direct target, addressing the issue of public access in relation to a specific project is sometimes (or often) critical to achieving a successful outcome. Examples of these types of planning efforts include harbor management plans, urban waterfront development plans and special area management plans.

Twenty-four states are addressing coastal access issues through statewide, regional, or local plans of other agencies (Table 3).

Local and State Planning– Rhode Island

In 1988, the Rhode Island Coastal Resources Management Council (CRMC) developed guidelines for communities to use in developing harbor management plans. Harbor management plans identify user conflicts and issues of environmental and habitat degradation and poor water quality affecting municipalities' small harbor areas. One of the elements of a municipal harbor plan is the required completion of an inventory of all of the communities' public access sites. The purpose of this inventory is to prioritize those areas in need of further site development and maintenance. One of the benefits of harbor management planning is that particular attention is paid to the needs of boaters and fishermen. Identifying the supply and demand for boat ramps, fishing piers and public docks is the focus of these types of plans.

As a result of this planning process, the Town of North Kingstown, Rhode Island, which had previously listed only three public access sites, established a small working subcommittee to research all of the land evidence records and historic maps. The result of the committee's efforts was to identify over 90 existing and potential public access sites. The harbor management plan supported these findings. The plan was adopted by the town, which is now working together with the CRMC to formally designate those sites as public right-of-ways to coastal waters.

Local and State Plan– New York

The State of New York, in a 1993 Section 309 project, developed regional coastal management programs (RCMPs) that refine the state coastal policies to reflect the unique characteristics of the distinct coastal regions of the state. These RCMPs act as substitutes for the state coastal management program. The regional plans address the areas of wetlands, cumulative and secondary impacts, coastal hazards and public access as components of regional coastal management programs. The RCMPs include an inventory and analysis of public access, trends identifying the use of coastal resources, revised policies and guidelines, and a public investment strategy. The first of these regional planning efforts occurred in Long Island Sound. There, appropriate standards were drafted for the entire New York State Long Island Sound Region (north shore of Long Island, New York City and the Long Island Sound shore of Westchester County).

Maps and Inventories

Inventories provide detailed information on the number, size and location of public coastal access sites statewide as well as the type of facilities and shoreline characteristics, locally or regionally. Maps and inventories can offer an integrated view of all of the uses occurring at public access areas, as well as the types of habitat located at the site and the potential impact that public access could have one these habitats. This will better prepare site designers to accommodate these variables into a site or park design that best provides for public use while mitigating negative impacts on the resource.

However, completing a thorough, accurate inventory is an expensive proposition. Therefore, in many cases what currently exists is an inventory that is out of date and/or has been completed for only a specified area or region within the state. Of the 39 coastal states and territories, only a few regularly update their access inventories and maps.

At least 25 coastal states/territories are completing inventories and mapping projects of their public access areas either regions within the state or statewide. (American Samoa and Puerto Rico are the only two coastal territories that have not completed inventories of public access areas.)

Maps and Inventories– Maine and Massachusetts

The Maine Coastal Program, with assistance from local and regional organizations, prepared an inventory and analysis of all shoreline access sites along the coast that are available to the public. The inventory helps to quantify what type of access is already available, to what extent it matches the need for access, and how best to meet future demand. Another benefit of the public access site inventory is that it provides a basis for state funding decisions regarding acquisition and development of coastal access areas.

In 1986 and 1987, the Massachusetts Department of Environmental Management (DEM) undertook a study to determine the extent and distribution of publicly owned and protected lands along the coast. This study involved a survey of land

records for each municipality along the coast and resulted in a comprehensive database (Coastal Property Inventory), which lists coastal properties owned by public agencies or by private nonprofit land organizations dedicated to protecting these lands and making them more accessible.

Agency Coordination

The purpose of The Open Space and Recreation Mapping Project of the Massachusetts Geographic Information System (Mass GIS) is to map all conservation and recreational lands in the state. This includes federal lands, municipal holdings, and lands held by trust and other nonprofit organizations. Recreational lands and facilities throughout the state will also be mapped, including private lands used for recreational purposes that are not necessarily protected by deed. All of this information is being compiled with the aid of Mass GIS in the Office of Environmental Affairs Data Center. The GIS data will be fully integrated with the 1995 update of the State Comprehensive Outdoor Recreation Plan. The final result will be a statewide database of open spaces and recreational facilities that can be viewed, analyzed, and queried using both maps and inventories.

In 1992, Mass GIS began to coordinate the statewide mapping of locally protected open space. Conservation commissions, planning agencies, land trusts, watershed associations, and parks and recreation directors, among many others, are helping to map local open spaces and recreation facilities for each municipality in the Commonwealth. On request and for a fee, GIS can provide maps of the state's coastline, protected and recreational open space, land use, census data, topography, and sensitive environmental areas. These coastal maps are important tools for the development of integrated coastal policy and planning. To date, over half the towns have provided data for this effort, and updates provided to Mass GIS keep the maps current.

Conclusions on Planning Approaches to Preserving Public Access

Quite a few CZM programs have pursued aggressive planning efforts to designate coastal access sites. These efforts have provided the benefit of integrated coastal planning. Integrated planning addresses the need to balance public desire to get to the coast in both urban and rural areas with the need to protect coastal habitats. Integrated planning also allows multi-state and local agencies to share resources and coordinate policy implementation and development. The success of these plans depends upon the amount of public involvement that takes place throughout the entire process. Public participation in planning for public access creates increased public awareness of the severity of the issue.

Through the U.S. Department of Interior's "Land and Water Conservation Program" every state has a State Comprehensive Outdoor Recreation Plan, which is kept up-to-date, but does not differentiate recreational inland vs. coastal sites. Although many states have completed public access inventories, the accuracy and frequency of updating these inventories are inconsistent. Very few coastal states have any information about the number of public access sites and the extent of access to those sites prior to the implementation of their state CZM programs. This lack of baseline data makes it impossible to determine the effectiveness of the individual state CZM programs, or to compare systematically the achievement across state programs.

As coastal populations increase, demand studies and needs assessments will become critical. Yet, very few states have completed needs assessments of future demand for public access–a first step in making plans to supply that demand.

Many coastal states do not have accurate up to date mapping of access sites–an important tool in developing a public access plan. Mapping is important for locating the number and proximity of access sites within a given area, for identifying potential user conflicts, and for identifying impacts on coastal resources by public access to the shoreline. Geographic information mapping systems can provide valuable information on the quantity and quality of access sites juxtaposed with coastal development patterns and location of sensitive habitat. Regularly updated maps and inventories create awareness of the supply and demand inequities. Mapping is also useful for identifying the most appropriate locations for future public coastal access.

Recommendations for Planning

Regular, accurate inventories of coastal public land should be completed as a quantitative measure of the effectiveness of state coastal programs in providing public access to the shore. Use of GIS, mapping, and inventories will enable coastal programs to share their data with other agencies, groups, and individuals. Mapping and data from the inventories will provide valuable information on existing site availability as well as on site dislocations and inequities. All of this information should be used to develop strategies on how best to meet the future demand for public access, including the diversifying number of locations of public access.

4.2.4 Technical Assistance: Cost-Effective Tools to Provide and Enhance Public Access

Technical assistance means providing expertise of all sorts to foster research, planning, site design, construction, and maintenance, which will result in the preservation and enhancement of public access. Technical assistance can range from legal expertise in assessing the statutes of right-of-ways to financial expertise in improving existing access sites, to engineering expertise in incorporating access into the design of urban waterfront revitalization projects.

The Benefits of Technical Assistance

The benefits offered by technical assistance can improve the quality of public access available and expand the variety of uses of a given site. Federal programs that grant funds for the design, development, construction, and maintenance of public access sites (such as the CZMA 306A program) for a particular group of users ensure the sustainability of various types of access. For example, federal funding programs exist for the development and improvement of piers and boat ramps specifically for fishing (e.g., Dingle/Johnson and Wallop/Breaux grants). After that base of funding is in place, local maintenance and site enhancement through "adopt-a-spot" programs can come into play, fostering stewardship of public access and providing sustainable solutions for continued high-quality public access.

The Limitations of Technical Assistance

The availability of technical assistance varies among the coastal states. In cases where technical expertise has been provided, it is often short-term. It is very difficult to document and measure the effectiveness of its impacts. For instance, quantitatively, there may be the same number of

access sites in 1990 as there were in 1970; however, many sites that were perhaps unusable in 1970 may be substantially improved and subsequently much visited. Yet, these qualitative improvements are not systematically counted and recorded.

Technical assistance, depending on the purpose and design, can provide on-the-ground improvements in public access. The level of success that results from technical assistance depends upon the availability of staff time, funding and implementation of the design. The indicators of effectiveness of the technical assistance programs and tools employed by states to provide coastal public access to the shore include:

- The number and quality of sites improved by technical assistance
- The amount and consistency of site maintenance and/or management
- Legal research that identifies potential new sites for access
- Other unique models in which expertise is shared for the purpose of assisting state coastal zone management programs in providing public access to the shore

Site Design, Construction and Maintenance

This category addresses the improvement of existing sites. For instance, for access to beaches such as things as assistance in the construction of boardwalks, and dune walkovers are examples. For access from urban shorelines, examples include repair of docks, piers, or boat ramps that may be dilapidated, overgrown, or silted in. Improvements in this category also include the provision of lighting, parking, park benches, picnic tables, and trash receptacles.

Site Design, Construction and Maintenance– Oregon

The Oregon Department of Land Conservation and Development (LCDC) administers the federal 306A funding program for low-cost construction and land acquisition projects on the coast. Each year, LCDC makes the funds available to coastal communities, ports, and nonprofit organizations on a competitive basis for small-scale construction and land acquisition projects. Each recipient must contribute a certain percentage of the total cost of the project.

As a result, the state completed 46 federal 306A projects. A field guide, "Oregon's Coastal Resources Management Improvement Sites," which maps the location of each site, accompanied by photographs and short descriptions of the site and overall project costs was produced in 1995. It includes a wide variety of projects.

One project, in Port Oxford, provided a recreational boat hoist enabling the port authority to launch pleasure and recreational boats directly into the ocean. The port authority had a second hoist that is used almost exclusively by the commercial fishing fleet.

In Clatsup County in northern Oregon, the students of Seaside High School helped to finance a wooden observation deck with funding from the high school's Ecology Club. The second phase, funded by 306A, includes an elevated wooden

walkway, access stairs to the estuary, and interpretive signs. The project provides physical, visual, and interpretive access to the estuary. The observation deck and the pathways accommodate physically challenged visitors.

Legal Research

As the trend in providing new avenues for public access continues to shift toward the provision of rights-of-way across private property, the dependence on legal research becomes greater and greater. Legal research is needed because the determination of ownership, or private vs. public use rights, hinges upon the legal history of ownership, which often traces back a hundred years or more. The research is quite complicated; land evidence records, historic records of property tax payments, and title searches are required to determine public ownership or use.

While legal expertise is critical to this research, the limited budgets of state and local agencies are a constraint. Lawyers command a high fee, normally ranging from $175 to $350 per hour. Several coastal states with CZM funding have developed innovative programs to access the legal expertise necessary for a variety of tasks, from completing complicated discovery on rights-of-way to warding off intimidating tactics of developers and their attorneys.

Legal Research– Massachusetts

The Massachusetts Coastal Zone Management Office (MCZM) has created a Pro Bono *Attorney Clearinghouse for Coastal Access to assist communities in their accessway preservation efforts. The goal of the Clearinghouse is to help coastal communities surmount legal hurdles that might heretofore have thwarted grassroots preservation efforts. Municipalities, citizens groups and other organizations may be able to obtain free (*pro bono*) legal assistance on issues concerning the preservation of historic rights-of-way to the sea. Attorneys may be sought to perform legal research, locate and interpret legal documents, conduct title research, and assist in negotiations and arbitrations.*

Use of the Clearinghouse is voluntary and operates on a referral basis only. Upon receiving a request for referral, the MCZM General Counsel will forward the request to all members of the Clearinghouse. Attorneys who are interested in offering their services pro bono *on the identified project will independently contact the requesting entity. When an agreement between the community and a* pro bono *attorney is consummated, it is reported to MCZM.*

At the completion of the pro bono *work, a report is made to MCZM by both the community and the attorney. These reports are used by MCZM to determine both the effectiveness of the Clearinghouse and to identify how, if necessary, to better serve both the communities and the volunteer attorneys.*

Legal Research– Rhode Island

The Rhode Island Coastal Resources Management Council's (CRMC) right-of-way (ROW) discovery program determines whether or not a right-of-way in question is legally open to the public based on historic records documenting past

use. Over the years, research conducted by CRMC legal counsel has allowed for over 210 pathways to become available to the public with funding through CZM monies from OCRM. CRMC is responsible for the continuing discovery and designation of public coastal rights-of-way to the shore.

Handicapped Access

Over the past several decades, the rights of the handicapped to gain access to public areas and recreation facilities have gained increased attention and concern. Progress has been made in designing accessways free of barriers for the physically handicapped and the aged. California, New Jersey, Michigan, and Oregon have been designing and constructing innovative systems for providing wheelchair access.

Not only have states been implementing innovative design standards for wheelchair access, but many states have mandated that handicapped access be provided at all newly improved coastal sites. In the Mariana Islands, all new facilities constructed on the shoreline must meet the handicapped accessibility laws required by the islands.

Handicapped Access– Michigan

Michigan's state park system has been identified as one of the best in the country. Of the state's 96 state parks, 43 are located in coastal areas, and these include 138,869 acres of coastal property. Michigan continues to acquire land and improve recreational facilities and programs in the coastal park system.

The Michigan Department of Natural Resources (DNR) has a long-standing policy of making recreation opportunities accessible to people with disabilities. The Land and Water Management Division plans to formalize a policy that would require public access facilities and programs funded and operated by the DNR to be handicapped accessible. The DNR has published a guidebook to assist local governments in providing programs and facilities to serve those with disabilities. The guide will help to ensure that DNR and local recreational facilities and programs, comply with all applicable federal and state laws and that standards not only include the construction of new facilities, but also the retrofitting of existing facilities to make them barrier-free. The Land and Water Conservation Fund gives a high priority to proposed projects involving such retrofitting.

Handicapped Access– California

In 1982, California implemented state regulations entitled "Regulations for the Accommodation of Physically Handicapped Persons in Buildings and Facilities Used by the Public" which stated that coastal access facilities should be designed for use by the disabled whenever this would not result in material damage to the environment or unreasonable hardship to the landowner. If the facilities are constructed with state, county or municipal funds, or the funds of any state political subdivision, California state laws instruct that these facilities (e.g., buildings, curbs, sidewalks, and related structures) be accessible and usable by the physically handicapped.

In 1990, the California State Coastal Conservancy prepared a booklet, "A Wheelchair Riders Guide: San Francisco Bay and Nearby Shorelines." The guide provides fairly detailed information on 20 handicapped-accessible sites around San Francisco Bay. The booklet includes maps of wheelchair routes to the sites, photographs, site descriptions, and a statement on the degree of difficulty for wheelchair accessibility. It also includes information about the availability of facilities at each site, the types of environment and terrain at each site, and the hours of operation and phone numbers for each site. The guide was written by an architect who has used a manual wheelchair since early childhood and explored the accessible sites for the California State Conservancy. The guide is in great demand and has already been reprinted.

At Doheney State Beach, Orange County, California, a beach-going wheelchair is now available to the public. The all-plastic Surfchair, provided by the non-profit California Aquatic Safety, Inc., enables people with mobility impairments to travel over the sand along the surf zone and even into the water. This is the second Surfchair in use at California's beaches; the first is located in Santa Cruz at Cowell's Beach.

Official Guidelines

Guidelines include documents, pamphlets, and reports that provide information on how to improve the provision of public access. The guidance offered by state and federal agencies is wide-ranging, and includes such topics as designs for accessways, how to research and designate rights-of-way, and how to fund public access improvement projects.

Official Guidance– New Jersey

In 1990, New Jersey published a manual, "Waterfront Public Access: Design Guidelines," as a reference for local governments, private developers and others who are interested in providing access to New Jersey's coastal resources. The manual presents background and design information dealing with the public's right to waterfront access, how it is provided in New Jersey, and design concepts for both ensuring substantial access and minimizing potential conflicts between private landowners and the general public.

The manual explains what public access is and why it should be provided and maintained for its citizens. It includes an overview of the legal issues surrounding the right to public access in New Jersey, and ways to secure and acquire public access. Specific design guidelines are also provided for a variety of shorefront types. There are design standards and criteria, illustrated schematic drawings for dune walkovers, handicapped-access ramps, piers, decks, bikeways, boat ramps, docks, and shore protection structures.

The booklet also includes information on how to maintain sites once they are put in place. Alternative maintenance agreements are suggested, such as those

involving government agencies, homeowners associations, citizens groups, land trusts, and others. These agreements address the issue of continued funding for maintenance of waterfront public access.

Official Guidance– Chesapeake Bay Area (Pennsylvania, Virginia and Maryland)

In 1987, the governors of the Chesapeake Bay states (Pennsylvania, Maryland, and Virginia), the mayor of Washington, D.C., the Environmental Protection Agency, and the Chesapeake Bay Commission entered into the Chesapeake Bay Agreement to improve the water quality of the bay and its tidal tributaries. One of the major initiatives of the agreement is the improvement of public access to the tidal waters of the bay. The agreement outlines four general objectives to support the initiatives: to improve and maintain access to the bay, including public beaches, parks and forested land; to improve opportunities for recreational and commercial fishing; to secure shoreline acreage to maintain open space and provide opportunities for passive recreation; and to secure necessary acreage to protect unique habitat and environmentally sensitive areas.

A publication, "Chesapeake Bay Area Public Access Technical Assistance Report," helps to meet these objectives by providing a guide for locating and developing access sites. The report also identifies potential sources of technical assistance to aid localities with acquisition and development. The four types of public access covered in the guide include boat-related access, swimming access, fishing access and natural area access.

For each of the types of urban and rural access areas, the technical report offers suggestions and guidance on site selection, including user issues and environmental considerations such as topography, soils and substrate materials, surface water hydrology, vegetation/wildlife habitat areas, water quality, wetland delineation, and cultural resources. Information is provided on site limitations and site characteristics. Design criteria are provided for site plan layout, land requirements, parking, boat ramps, pedestrian requirements, deck construction, trash disposal, signage, traffic, handicapped facilities, sewage facilities, and pumpouts. Long-term site management and maintenance is also addressed.

Conclusions Regarding Technical Assistance Tools for Providing Public Access

Technical assistance for site development and improvements provides immediate, on-the-ground results. The federal funding from the 306A program provided $4.5 million for technical assistance for improvement or acquisition of 455 sites nationally. Sites that have been improved or regularly maintained build public awareness and appreciation of a newly enhanced coastal experience.

The trend has been to increase networking opportunities, particularly in light of shrinking federal budgets. Taking advantage of technical assistance not only increases the number and quality of public access, but also serves to protect and improve what currently exists. CZM has played an

active role in leveraging multi-agency and private/public partnerships to preserve, provide and enhance public coastal access.

4.2.5 Public Outreach: A Critical Tool for Future Support of Public Access

Public education and outreach refers to that suite of educational programs and products that serves to raise awareness not only of the importance of public access but also of the challenges that CZM programs face in providing public access to the shore.

Education and outreach provide information about the varied issues associated with public access. These programs also provide an opportunity to promote community and individual stewardship of existing public access. Public policy concerning access is often swayed by dominant public opinion. Therefore, public education and outreach efforts are critical in preserving funding and staff for programs that maintain and improve public access.

All 29 of the state coastal programs employ at least one type of program or tool to provide public education and/or outreach opportunities. The most commonly employed include public access guides (used by 22 states); interpretive displays (used by 24 states); signage programs (used by 25 states); and other creative initiatives, such as workshops, videos, and television programs (Table 3).

The Benefits of Public Education and Outreach

In order to build any constituency for the integrated balance of coastal uses, the public must have the means to access, and, more importantly, experience all that the coast has to offer. Public education on the issues of public access and how, when, and where to best experience the coast is crucial to the CZMA.

Access to the coast for swimming, fishing, sailing, or wandering the urban or beach shorefront improves quality of life, provides the opportunity to appreciate the beauty of coastal habitats, offers the chance to observe a working waterfront and port area, and lets one appreciate the need for an equitable balance of uses. Constituencies are needed to support the CZM efforts to manage the coastline nationally, state-by-state, and locally.

The benefits derived from state and local efforts to provide public education and outreach opportunities have been enhanced by the critical nature of the Public Trust Doctrine and the recent legal interpretations of its impact on public lands. Tidal waters, tidelands, bottomlands and their living resources are to be held in trust for the public. For the public to benefit from this "trust," they must have access to the resources.

Engaging citizens and civic organizations in efforts to protect, preserve and provide public access fosters community stewardship of the coast, which in turn becomes a source of local pride. Also, as federal and state funding diminishes, the community's role in preserving and maintaining public access becomes ever more critical. Responsibility for maintaining existing access sites and rediscovering new ones is shifting from the government to nonprofit and civic organizations.

Community stewardship helps ensure that the quality of these sites is maintained over the long term.

Guides and signs provide a strong tool to stop encroachment, abuse and abandonment of access sites by adjacent landowners or local government. Guides and signs lend legitimacy to the access areas and rights-of-way, and encourage ongoing maintenance and upkeep.

Limitations of Public Education and Outreach

Although public access guides and signs and other education and outreach efforts provide many benefits, if they are not maintained and updated, their usefulness is negligible and they can even be counterproductive. Many access guides researched and written in the 1980s are now outdated and often frustrate the public due to their inaccuracy. Recent gains in public access areas should be consistently added to existing guides. This can be difficult, as OCRM funding provisions are restricted to new and/or innovative efforts, rather than to making past efforts current.

Time and effort spent on distribution of informational materials can also be a limiting factor, especially if the distribution of high-quality publications only spreads the word to an extremely small sector of the population.

The indicators of effectiveness of public outreach programs and tools employed by states to provide public access include:

- The number of public access signs
- The number and quality of interpretive displays
- The production of access guides (If produced, how often and how many have been distributed?)
- The existence and activity of citizen advocacy groups (How many have been established? What are their objectives? What have they done?)

Public Access Guides

Public access guides provide maps and an inventory of selected public access sites for a given state or within a prescribed region. Information is provided on how to get to the site, what the natural features of the site are, what the available amenities of each site are–such as parking, restrooms and lifeguards–and what the types of uses best suited for each site are. There are two basic forms of public access guides: a coffee table-style book that includes informative articles relating to coastal issues and topics; or a much thinner version–a catalogue or magazine. The book format tends to feature articles on the surrounding habitat, history of the region and its uses, and the myriad issues associated with public access efforts within that area. The magazine style, which deals with similar topics, is better suited to "roll up and take with you."

Twenty-three coastal states have developed coastal access guides. The first state to do so was California in 1981; a second edition of the guide was published in 1995.

Public Access Guides– Chesapeake Bay Area (Pennsylvania, Virginia and Maryland)

"The Chesapeake Bay and Susquehannah River Guide" is a first of its kind. It is a comprehensive multi-state guide to public access opportunities for the whole Chesapeake Bay region. The guide sparked several other initiatives. In 1994, Pennsylvania created a Public Access Task Force to establish public access priorities and steer the development of Public Access Management Plans (PAMPs). In 1995, PAMPs were established with the objective of addressing public access through a more unified approach by creating better working relationships among all providers, as well as focusing limited available resources on public access priorities in the coastal zone.

Public Access Guides– South Carolina

After Senator James Waddell appointed a Blue Ribbon Committee on Beachfront Management to investigate the needs of beach management and public access in October of 1996, South Carolina looked at long-term solutions much more seriously. The committee found that there was a need to preserve existing access and promote increased public access to South Carolina's beaches. The South Carolina Public Beach & Coastal Access Guide, along with the accompanying database, is the first collection of South Carolina public access information. This guide was the result of a year of hard work and cooperation from over 300 local, state, federal, and commercial agencies and individuals who manage outdoor recreation lands and facilities. The guide incorporates information about 264 local, state, federal, and commercial facilities located in the designated area from the Intracoastal Waterway to the Atlantic Ocean. Public comment has since been solicited and there are plans to update the guide in a future edition.

Signage

Signs that mark the location of public access often have a standard logo that is easily recognizable. The various types of signs range from posts and large sign boards to bronze medallions located in the ground. Effective signage in state CZM programs not only demarcates the access site but also notes the public or private organization that has responsibility for improving or maintaining it. Twenty-five coastal states and territories include signs at public access sites (Table 1).

Signage– California, Rhode Island, and Washington

In 1979, legislation was enacted directing the California Coastal Commission and State Coastal Conservancy to establish a comprehensive program to maximize coastal access. In cooperation with the California Department of Transportation and the Conservation Corps, coastal access signs are being installed along the coast, indicating where accessways are located. Legislation also mandated that the Commission prepare a guide to all coastal accessways. The Coastal Commission and the State Coastal Conservancy created a logo as the official symbol to appear on all coastal access signs.

* * *

Rhode Island's Coastal Resources Management Council (CRMC) and the Department of Environmental Management adopted an official logo to be used on all public access signs. Once CRMC has designated a right-of-way as public, a sign must be placed there. Additionally, the state's Adopt-A-Spot program mandates the placement of a public access sign at the point, which bears the sponsor's name and conditions for using that site.

* * *

The Washington Department of Ecology employed an interesting method to select a public access logo that created public awareness by engaging state residents. The Department of Ecology held a statewide contest to design a public access symbol in 1984. A Seattle high school student won the contest, and the design is now the official state public access logo.

Conclusions on Public Outreach and Education

Signs marking public coastal access areas, interpretive displays, and access guides are but a few of the techniques states are using to educate the public on the location, number, and relevance of public access sites. Public sentiment about the issue of access is expressed by the existence and activity of citizen advocacy groups, who ensure that issues of public access remain on the forefront of the decision-making agenda for the coast.

As funding for direct coastal land acquisition declines, public education efforts are becoming more critical. Public education on the issues associated with public access creates widespread awareness of the need to preserve existing coastal access and to meet the future demand expected as coastal population increases. Public outreach efforts create opportunities for collaborating and partnering with the private sector in efforts such as site improvement and maintenance, perpendicular access across private property secured by conservation easements, tax rate reductions, and liability waivers, and acquisition of coastal property such as multi-state agency shared funding initiatives.

Recommendations for Public Outreach and Education

Federal and state funding sources should include public education and outreach efforts. State CZM program budgets rarely include these efforts. However, because national, state, and local funding resources are on the decline, efforts should be made to link with the private sector to provide public education and outreach opportunities such as coastal access signs, public access guides, public workshops on access issues, and newsletters. Public access initiatives will continue to advance as long as the issues associated with access remain a priority of an aware and concerned public.

4.3 Adequate Funding of the CZM Programs to Provide Public Access is Essential

In 1980, Congress amended the CZMA with a special Section 306A to specifically provide for public access, as CZM effectiveness, with respect to the core goal of public access, was being "hindered by increasing coastal population, soaring coastal property values, lack of state regulations to negotiate public access from development projects, and insufficient funds to acquire and improve coastal lands for public recreational opportunities."[11]

In this instance, there are quantitative measures which are summarized in Tables 4 and 5. The quantitative indicators are:

- The number of access improvement projects funded by each state using 306A monies is an outcome indicator (Table 4)
- The numbers of dollars spent for a variety of projects in each state from FY 85 – FY 88, the first four years of the federal/state program indicates the level of effort each state put towards providing public access (Table 5)

The amount of CZM money and the state share dollars were clearly documented, so it is possible to assess the relative impact of the CZM program compared to the state contribution to acquire and improve coastal public access sites. It is important to note, however, that the state contribution might not have occurred at all without the leveraging power of the CZM funding.

The 306A program offered the flexibility needed to address different local access needs–a hallmark of the effectiveness of CZM. The different kinds of access activities that various states initiated are summarized in Table 6. Section 306A was added in 1980 to the CZMA to allow states to acquire land and fund low-cost construction projects to provide and improve public access to coastal waters. Existing public access sites were enhanced by the construction of paths, piers, walkways, recreational trails, parking lots, boating ramps, interpretive signs, and other site improvements. Additionally, 306A funds have been used by states to acquire small properties for public access. In many cases, 306A funding for public access has served as "seed" money to leverage additional public and private investment. Between 1985 and 1989, the first four years of acquisition and low-cost construction funds were allocated; states were awarded approximately $17.5 million, which was matched with $18.2 million in state and local funds. (NOAA, 1990)

Construction projects comprised 80 percent of all 306A project types and 64 percent of the federal 306A expenditures ($10,588,239), and provided on-the-ground outcomes of relatively inexpensive access to coastal areas. Urban waterfront projects accounted for six percent of the 306A projects and only five percent of the 306A expenditures. Eligible activities included rehabilitation of piers for compatible public and commercial activity, urban shoreline stabilization, and the removal or replacement of pilings to increase recreational use (Table 5).

[11] OCRM/NOAA, 1998.

Table 4. CZMA 306A Expenditures By State, FY 1985 – 1988 (Unadjusted Dollars)

State	306A Projects	Federal 306A $	State 306A $	Federal CZMA $	% of Award
Michigan	111	$2,294,528	$2,358,767	$7,797,000	29
Maine	48	$1,312,652	$3,732,693	$6,376,000	21
North Carolina	38	$3,115,736	$2,293,961	$7,058,000	44
Wisconsin	30	$1,431,954	$1,647,006	$3,421,000	42
Mississippi	29	$1,011,643	$584,099	$2,141,000	47
Maryland	26	$939,220	$592,043	$7,797,000	12
New Jersey	25	$1,090,228	$261,063	$9,797,000	11
Oregon	22	$437,090	$311,083	$3,584,000	12
Pennsylvania	22	$1,021,920	$903,889	$2,989,000	34
New Hampshire	17	$578,840	$1,383,077	$1,366,000	24
South Carolina	17	$400,000	$384,019	$6,116,000	7
Washington	15	$714,912	$194,664	$7,786,000	9
New York	12	$364,154	$401,537	$7,914,000	5
Rhode Island	10	$155,600	$251,346	$2,434,000	6
Puerto Rico	9	$196,955	$87,780	$4,645,000	4
Alabama	5	$111,480	$121,000	$2,296,000	5
California	5	$1,091,500	$1,083,800	$7,415,000	15
Louisiana	5	$90,000	$160,000	$7,797,000	1
American Samoa	2	$40,000	$0	$1,864,000	2
Delaware	2	$15,800	$0	$2,281,000	1
Virginia	2	$76,000	$76,000	$4,704,000	2
Connecticut	1	$16,430	$1,230	$3,003,000	1
Guam	1	$45,000	$0	$1,881,000	2
Northern Marianas	1	$39,780	$0	$1,910,000	2
Alaska	0	0	$0	$7,797,000	0
Florida	0	0	$0	$7,797,000	0
Hawaii	0	0	$0	$2,923,000	0
Massachusetts	0	0	$0	$5,700,000	0
Virgin Islands	0	0	$0	$1,940,000	0
TOTAL	**455**	**$16,591,422**	**$17,576,057**	**$141,529,000**	**12**

Table 5. CZMA 306A Expenditures By Project Type, (Unadjusted Dollars) FY 1985-1988

Project Type	#	Federal $	State $	Total $
Coastal Parks	73	$1,856,350	$1,508,014	$3,364,364
Boat/Fishing Piers	72	$2,104,172	$2,257,741	$4,361,913
Walkways/Overlook/Blinds	62	$1,847,324	$1,959,731	$3,807,055
Boat Ramps/Launches	36	$1,115,353	$827,737	$1,943,090
Dune/Beach Walkovers	34	$720,214	$553,179	$1,273,393
Acquisition	33	$4,442,531	$7,632,765	$12,075,296
Foot Trails	23	$572,513	$736,879	$1,309,392
Dune Restoration	22	$919,356	$80,290	$999,646
Parking Lots/Access Roads	20	$640,664	$497,197	$1,137,861
Displays/Signs	14	$237,830	$104,300	$342,130
Shoreline Stabilization	8	$252,540	$205,030	$457,570
Lighthouse Restoration	7	$102,500	$103,100	$205,600
Restrooms/Bathhouses	7	$284,344	$61,392	$345,736
Vegetative Restoration	6	$88,630	$26,330	$114,960
Buildings	6	$191,425	$278,580	$470,005
Project Designs	6	$190,810	$48,100	$238,910
Historic Structure Restoration	5	$161,800	$180,450	$342,250
Museums	4	$36,050	$36,810	$72,860
Stormwater Management	4	$102,614	$81,794	$184,408
Marinas	4	$260,000	$301,138	$561,138
Living Resource Restoration	3	$211,000	$18,000	$229,000
Bridge Work	2	$125,902	$50,000	$175,902
Bike Trails	2	$72,500	$7,500	$80,000
Buoys	1	$10,000	$20,000	$30,000
Beach Clean-Ups	1	$45,000	$0	$45,000
TOTAL	**455**	**$16,591,422**	**$17,576,057**	**$34,167,479**

Table 6. CZMA Section 306A Public Access Projects, FY 1985-1989.

PROJECT TYPE	AK	AL	AS	CA	CT	CNMI	DE	FL	GU	HI	LA	MA	MD	ME	MI	MS	NC	NH	NJ	NM	NY	OR	PA	PR	RI	SC	VA	USVI	WA	WI	TOTAL
Coastal Parks			1										2	9	28	1	1	3	1		4	7	5	3	1	2			1	4	73
Boat/Fishing Piers		1											7	17	15	11	3	1	1		2	5	3		4	3			3	3	72
Walkways/Overlook/Blinds, Etc.													8	8	26	1	6					1	2			3			1	6	62
Boast Ramps/Launches											4		1	3		10		1			1	2	5		1					8	36
Dune/Beach Walkovers		1												1	4		20									7			1		34
Acquisition				5									1	4		1	7	3			1	3	1	1	1				5		33
Foot Trails													1	2	13			1			1	1								4	23
Dune Restoration															7			1	19												27
Parking Lots/Access Roads													7	4	4	1	1	1			7	1	7	1		1					20
Display Signs		3					1								4		1		1	1									1	2	14
Shoreline Stabilization			1												4			2									1				8
Lighthouse Restoration															3	1					1				1					1	7
Restrooms/Bathhouses									1				1						2			1			2						7
Vegetative Restoration						1							3			1											1				6
Buildings																							1	4					1		6
Project Designs													3		2							1									6
Historic Structure Restoration																		2					3								5
Museums															4																4
Stormwater Management							1						1				1												1		4
Marinas															1			1												2	4
Living Resource Restoration																2		1													3
Bridge Work													1		1																2
Bike Trails																										1			1		2
Buoys											1																				1
Beach Clean ups																			1												1
TOTAL	0	5	2	5		1	2	0	1	0	5	0	28	48	88	29	38	17	29	1	12	22	27	9	10	17	2	0	15	10	455

Design, educational, and interpretive projects accounted for seven percent of 306A projects and four percent of federal 306 expenditures. These projects included large engineering designs, public access educational materials, pamphlets, newsletters, and interpretive signs and materials for public recreational areas (Table 5).

The states that used a significant amount (20 percent or more) of their 306 implementation awards on 306A projects during the first four years of program implementation include Mississippi, North Carolina, Wisconsin, Pennsylvania, Michigan, New Hampshire, and Maine.

Overall, most state and territory coastal programs have made some progress toward improving public access; however, it also appears reduced funding is a problem. The 306A program is no longer funded, core 306 funding has not kept up with inflation and the §309 Program is not the ideal solution for achieving these improvements due to sporadic funding sources and insufficient time to effect program change. The most effective means of providing public access to the shore is through acquisition of coastal property, then using the limited funds available in §309 program for acquisition of private property is not sufficient.

Another shortcoming of the §309 program is the restrictive timeframe. Funding justification for this program is that the outcome of the project should result in a sufficient improvement in the way the program is operated, or a program change. Preserving or improving public access through comprehensive planning, or new legislation or local ordinances typically requires political and/or public involvement or approval. This alone becomes a burdensome standard as the political process requires an enormous investment of time. Developing an acquisition strategy or innovative statewide funding source, such as the use of impact and user fees to provide public access, typically requires more time from program inception to program implementation than that of a 1- to 2- year grant cycle.

5.0 CONCLUSIONS

5.1 Coastal States and Territories Are Actively Working to Provide Public Access to the Shore

Over the past 20 years, all states have made some progress in providing and preserving coastal public access; even though declining financial resources and staff support have limited many state efforts. There is considerable variability in state efforts in terms of the emphasis placed on acquiring access sites, developing planning tools for future access, and research and dissemination of public education materials. The key tools used in providing public access to the shore are: purchase of access sites; incorporation of access sites and facilities in state and local plans and/or coastal development; preserving access through regulatory review; technical assistance to expand the capacity of existing access sites; and fostering public education and awareness of the importance of monitoring coastal access for the public. Virtually all of the states and territories have specific policies to promote and protect public access and work cooperatively with other agencies and NOAA to achieve this core objective.

5.2 The CZMA Creates a Unique Niche for Public Access

The CZMA encourages each coastal state and territory to fulfill the act's mandate by whatever means are best given the economic social, legal context of the state. Coastal states have been very inventive about the variety of tools and approaches they have used and adapted to their own political and institutional setting, in ways that a central federal approach might not have achieved. There are many examples where the CZMA has been the prime catalyst in leveraging public access initiatives among state and federal agencies, public organizations, and the private sector.

The role of the state coastal programs in providing public access to the coast varies state to state. In many ways, this is largely dependent upon the institutional framework of each state. In networked states, there is often involvement by many agencies; in these cases CZM has played a role in coordinating joint agency involvement. In other states where coastal zone management is mandated by comprehensive coastal legislation, state coastal program involvement may be dictated by the parameters of the legislation. In states with a combination of multi-agency involvement and legislation addressing public access, the coastal program may play a less visible, but nonetheless critical role. In one state, the coastal program worked out an arrangement in which public access is addressed directly by the State Department of Parks and Recreation; however, funding of a full-time staff person within the Parks Department who addresses public access issues is provided by the state coastal program.

5.3 Technical Assistance and Public Outreach Are Key Activities

The trend for providing public access is shifting to the provision of technical assistance and public outreach. Traditionally, acquisition and regulatory tools and programs have provided the greatest amount and most effective means of public coastal access. These types of tools and programs are used less frequently, however, as funding to purchase coastal sites has dramatically decreased. Regulations that mandate some form of public access also encounter political resistance and are costly to implement and enforce.

Opportunities for partnering, and for sharing resources and varying types of expertise, are greatest in the areas of technical assistance and public outreach. For example, legal expertise is a newer form of technical assistance that many states are eagerly pursuing. Legal assistance helps in securing rights-of-way, in fostering implementation of the Public Trust Doctrine for tidelands and in developing local legal defense efforts inappropriate development. Coastal engineering assistance is used to provide site designs at a minimal expense–and such site improvements are important because they often provide a low-cost method of enhancing public access to existing sites.

Public outreach efforts, such as public education and awareness, are becoming more critical. Public education on the issues associated with public access creates widespread awareness of the need to preserve existing coastal access and to meet the future demand expected by increasing numbers of coastal population. This awareness often creates opportunities for collaborating and

partnering with the private sector in efforts such as site improvement and maintenance (e.g., Adopt-A-Spot), perpendicular access across private property (e.g., conservation easements, tax rate reductions and liability waivers) and acquisition of coastal property (e.g., multi-state agency shared funding initiatives).

5.4 Accurate Monitoring Data Are Needed

A quantitative assessment of whether coastal states and territories have effectively provided public access to the shore through their CZM programs is extremely difficult. The data are not adequate and are generally unavailable for a number of reasons. Often the data do not exist, were never reported or recorded, or were not made available to the CZMA Assessment Team. A few states–North Carolina, New Jersey, New York–and one territory–Puerto Rico–never responded to the public access surveys.

Even in the many instances where public access was identified as a priority and the states provided adequate information on the processes used to facilitate public access (i.e., tools and/or programs), there was very limited quantifiable outcome data resulting from the implementation of CZM tools and/or programs. The scant outcome data that a few states recorded was not comparable to that collected from other states. This made cross-state analysis impossible; even when coastal access guides, maps and inventories were available, these documents were seldom updated and usually contained only a selected number of sites. Every two years, each coastal program undergoes a national review (Section 312 of the CZMA). However, quantitative information on number of access sites or qualitative descriptions of types of sites is not documented as part of this review.

If the process indicators cannot be linked to outcomes, a strong assessment of effectiveness cannot be done. Even the most basic measurement of outcomes–the number of public access sites acquired as a result of CZM efforts–would move closer to determining the effectiveness of CZM in meeting the national public access objective. But the data does not exist and without it as a first step, a more subtle determination of the quality of access sites cannot be accomplished.

5.5 Resource Protection Is Balanced with Public Access

Coastal states are extremely inventive and resourceful in providing coastal access opportunities that balance natural resource protection with getting the public to the shore. For instance, dunes are being preserved by dune walkovers, wetlands are protected by catwalks, and sensitive habitats and wildlife are spared the injury of active public recreation by regulations that limit public access. For a more complete description of habitat protection issues, please refer to the comparison reports of this national assessment by Good and by Berndt-Cohen.

5.6 Networking Is Critical

Creating partnership opportunities and leveraging funding is much more prevalent in networked CZM states. Therefore, networked CZM states appear to be achieving dual core objectives of the national CZMA–providing public access to the shore, and maximizing state, local, and federal agency coordination and collaboration. However, as a result of being efficiently networked, it becomes almost impossible to accurately measure and account for the impact and effectiveness of CZM involvement in providing public access compared to the impact of any other federal, state, or private partners.

5.7 The Public Trust Doctrine Plays an Important Role

The Public Trust Doctrine (which says that title to tidal and navigational freshwaters, the lands beneath, as well as the living resources inhabiting these waters is held in trust by the State for the public benefit and use) has varying judicial success rates throughout the state coastal programs; however, it remains an important tool for providing public access.

6.0 RECOMMENDATIONS

6.1 Develop Accurate Databases and Conduct Needs Assessments

In order to accurately determine the effectiveness of the CZMA and each of the federally approved state coastal management programs, accurate data must be collected, reported, and recorded. Regular reporting of the number, size, and location of public access sites that have been acquired as the result of CZM efforts is essential to a national assessment. The quality of access sites, based on a set of established criteria, should also be assessed regularly in order to determine how access has improved as a result of CZM efforts.

The database should not only be accurate in terms of the number of existing public access sites, but the types of tools and programs used to acquire public access should also be documented. This is important for determining the effectiveness of state CZM efforts and for sharing the results of specific tools and programs with other state CZM programs. The data should be collected in a consistent manner, at regular intervals, as part of the biannual 312 review of each coastal program.

OCRM should revise, simplify, and combine the coastal states reporting requirements under Sections 306, 309, and 312. Uniform reporting would simplify the process, provide meaningful information, and enable coastal states to more easily share valuable outcome data. OCRM should develop a computerized coding system by state coastal program, type of issue (e.g., public access), tool and subtool categories (e.g., regulatory-permit conditions), project results, and

outcome data (indicating the impact of implementing the CZM tool/program to address the issue).

Because accurate and precise data collection methods are essential to ensuring trend data for future studies, it is important that this database be regularly maintained. At a minimum the types of information to be collected on a national basis should include:

- Summarized state CZM program changes, improvements and amendments to their coastal program
- Annual program activities in relation to the coastal issue (e.g., public access)
- A comprehensive inventory and summary of projects by issue categories, preferably GIS based
- A list of reports produced by state CZM programs

Those states and territories with computerized permit tracking systems should be encouraged to revise the individual permit entries to include data on the type of project, area and resources affected, length of shoreline affected, size of project, permit restrictions/conditions, and other data that could be summarized relatively easily every year or two.

Once coastal public access databases have been developed and an accurate baseline has been established, coastal public access needs assessments should be conducted. Changing trends in coastal population have been forecasted. Several national studies have predicted a dramatic increase in coastal population. Needs assessments are required to best determine how to meet the growing future demand for public access.

What might also contribute to the adaptive learning process through information sharing would be a literature review. Conducting a complete literature review and then making those results widely available would provide not only useful long-term benefits, but also a solid foundation upon which to disseminate the innovative tools and techniques coastal states have developed to address particular challenges and issues within this field.

In order to surmise whether CZM programs are effectively meeting this core goal, it is important to document not only the number of access sites but also whether or not they are being used. A site or right-of-way may exist, but is it truly accessible? Are sites sufficiently safe, accessible and enjoyable enough so people use them? Do states with the highest coastal population have the greatest number of access sites? (Does this serve as a proxy indication of need?) Some information of this type (such as park attendance) exists for some, but not most, access sites. For each of these levels of assessment, the management process or tools should be linked to actual outcomes in order to achieve a fair measure of effectiveness.

6.2 Establish a Clearinghouse of Innovative Tools and Programs

It would be useful to have one central location where states can readily obtain up-to-date information about successful tools and innovations used by other coastal programs around the

country. Information about the effective public access tools and programs contained in the state profiles that were prepared as part of this report can be a useful starting point. It is important to constantly share information with other state coastal programs to contribute to the adaptive learning of individual states and the OCRM.

Taking the results of a literature review and comparing of the varying degrees of success in providing coastal public access throughout the coastal state programs, and hosting both national and regional workshops would provide a great opportunity to share information on the success and failures of the myriad of tools and techniques available.

In particular, if a clearinghouse were in place, many of the nonregulatory approaches, such as the use of technical expertise, public outreach, and/or planning, could be more readily adapted for use by other coastal states. Even in cases where institutional context must be similar for successful adoption of regulatory or partnering approaches, a searchable database of case examples would be useful. Sharing CZM tools and programs that successfully provide and preserve public access is cost-effective.

6.3 Document CZM Public Access Successes

NOAA needs to make stronger efforts at communicating the specific successes of state CZM programs in preserving and providing public access to the shore. Communication efforts should be targeted beyond Washington, D.C. and beyond the CZM community. There has been a tremendous amount accomplished at the national, state, and local levels. Documenting and communicating these successes should include the myriad ways in which CZM has provided public coastal access in creative, cost-effective, and opportunistic ways. The audience for this communication should include potential partners for future collaborations, such as private foundations, local governments, non-CZM states, academia, and tourism related business and redevelopment agencies. Multiple media methods include use of the World Wide Web, interactive CD-ROM programs, state and federal annual reports to Congress, progress reports, and summaries published in marine trades journals and reports. Public access inventories and assessments could be incorporated annually into the National Coastweeks celebration each year to report states' progress toward meeting this core objective.

6.4 Funding of State CZM Programs

Competition from other resource protection efforts or economic revitalization projects for dwindling public funds is increasing. The funding gap is further widened by the fact that coastal property is exceedingly costly, for more than inland properties. Fewer and fewer sites are available for purchase as coastal development continues. As coastal population and development increases, increased funding for CZM is essential to acquire additional access opportunities as well as to expand capacity and monitor existing coastal access for the public.

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8.0 APPENDICES

Appendix A—Rhode Island Public Access Profile

BACKGROUND & CONTEXT

Rhode Island's coastal zone includes all tidal waters from mean high water seaward. It extends landward to include non-tidal ponds associated with barrier beaches and coastal physiographic features including coastal beaches; barrier islands and spits; coastal wetlands; coastal headlands, bluffs and cliffs; rocky shores; manmade shorelines; and dunes. The coastal zone also includes land and water areas extending 200 feet landward from these coastal features. For those areas designated by Rhode Island's special area management plans, the boundary includes the entire coastal watershed.

Public Access In Rhode Island

Coastal Population Growth and Development Pressures

Rhode Island's coastal area is densely populated. With 950 people per square mile, Rhode Island has the 5th most densely populated coastal zone in the nation (NOAA, 1990. 50 Years of Population Change Along the Nation's Coasts: 1960-2010). The findings from Rhode Island's Final Environmental Impact Statement (1978) showed that residential development in the coastal area was increasing more rapidly than in any other region of the state. The study reports that from 1970 to 1990, Rhode Island's coastal population increased 6 percent (see Table 1). There is an intense demand for access to Rhode Island's 420-mile-long shore by residents of the state and by residents of the southern New England region who visit Rhode Island.

Rhode Islanders have enjoyed a long-standing tradition of protected public access to the coast for fishing, swimming, birding, boating and gathering seaweed for agricultural purposes, as guaranteed by the state constitution (RI Constitution, Article I, §17). During the economic boom of the 1980s, undeveloped coastal lots all but disappeared, and coastal real estate prices sky-rocketed. As private ownership of coastal property increased, public access opportunities diminished.

To help meet the increasing demand for public access to the shore, many Rhode Island state and local government agencies have embarked on several ambitious programs to purchase land along the coast. One of these, involving the expenditures of open space bonds approved by the voters has resulted in at least 500 acres of coastal lands in public ownership. Federal government agencies have expanded public coastal land holdings at various national wildlife refuges and in the Narragansett Bay Estuarine Research Reserve. Even private organizations and local land trusts are seeking to protect coastal lands from development by purchasing easements, development rights and small parcels.

Importance Of Providing Public Access In The State

Issue Importance at the Time of Coastal Zone Management Program Approval (1978). During the early 1970s, Rhode Island had many coastal management issues to battle. Rhode Island was besieged by large-scale development proposals which included the development of four nuclear power plants; at least two oil refineries; and several storage facilities for Liquid Natural Gas; sand and gravel extraction projects; desalination plants; and several major large scale dredging projects for proposed "super port" development. At that time there was no legislation in Rhode Island that addressed the concerns of coastal development. Coastal management activity was individually handled by local government.

PUBLIC ACCESS DATA SUMMARY

Context Data Public Access in Rhode Island		Pre-CZMP (FEIS)	Post CZMP	COMMENT
Year Coastal Management Program Received Federal Approval	1978	---	---	
State Public Access Jurisdiction	MHWL	---	---	RI Constitution Art. I, §17
Amount of Coastline Miles	420	---	---	
Coastal Population (k)		859 (1960)	1,002 (1990)	
Population Density (per linear mile)		2,238 (1960)	2,585 (1990)	
% Public Land		12 miles	14.4 miles	Source: State Comprehensive Outdoor Recreation Plan 1967, 1992
% Private Land				
Number of Sites		148	410	Estimated guess based on Public access guide, 1992 SCORP, and ROW Discovery Program Reports
Issue Importance		moderate	medium	
Type of Coastal Program	CCL	1956 RIGL§.46-23-1	RIGL§.46-23-1, Amended 1971	RIGL§46-23-1, Amended 1971

MHWL - Area of state (public) jurisdiction is from the mean high water line seaward
Comprehensive Coastal Legislation (CCL) - Indicates a program that is based primarily on a single comprehensive coastal law.

In 1958, the Rhode Island General Assembly created the Commission on Discovery and Utilization of Public Rights-of-Way. The purpose of this commission was:

- to define what public coastal access means ;
- inventory all known public access rows along RI's shoreline;
- map the public rows on aerial maps; and
- make recommendations regarding future development of public row sites for active recreational use.

Upon completion of the report the General Assembly established a permanent commission designating it the Rhode Island Commission on the Discovery and Utilization of Public Rights-of-way (ROW Commission). The report had three major findings:

- there is no legislation dealing with the management of shoreline property ;
- the intent of the RI courts with respect to private ownership of shoreline property is unclear; and
- there are no RI statutes governing coastal development.

The Commission made two recommendations based on the findings of their 1958 report:

- the ROW Commission should work closely with the Department of Natural Resources to establish a continuing program for the investigation and evaluation of sites for future site development;
- establishment of legislation concerning shoreline development, specifically the protection of scenic and environmentally sensitive areas and recreational areas of use.

In 1974, the ROW Commission published and distributed a map showing the location of the 148 public coastal ROWs documented in their 1970 report. These maps represented the first systematic attempt to document and expand public coastal access through the discovery of legal ROWs in Rhode Island. In 1977, the commission was abolished, its duties and responsibilities reassigned to the newly created Coastal Resources Management Council (CRMC). CRMC elected to set up a standing subcommittee to address coastal access ROWs.

Evolution of Issue Importance

At time of program approval, the issue of public access was ranked as a moderate priority. Although tourism and commercial and recreational fishing have long traditions of importance to the state, the perception in regard to the adequate supply of public access prior to coastal program approval was that Rhode Island did not have anything to worry about. Rhode Island's western neighbor, Connecticut had lost nearly all of its limited public access to coastal development. To the north, Massachusetts did not have nearly as many beach miles as Rhode Island, particularly since the public jurisdiction to the shoreline was from the low-water mark to the water. Therefore, the view at that time was that Rhode Island was in good shape, and the public access effort should be directed at simply documenting what was available.

This perception changed somewhat after the coastal development boom of the 1980s. As military coastal property was being vacated, and in the aftermath of several hotly contested court battles over the development of several coastal properties with a long tradition of public use, public complacency about the availability of public access in RI changed. Securing coastal public

access became a very important issue. Public interest and awareness increased, citizen advocacy groups formed, and inventories of what sites were in the public domain and the potential for additional property were aggressively pursued. Additional public support was evidenced by the passage of multi-million dollar public bond referendums and hotly contested battles over many CRMC ROWs. Court rooms and CRMC conference and hearing rooms were jam-packed as public access issues were argued.

During the harbor management planning process in the late 1980s, in Rhode Island's 21 municipalities, which directly fronted the shore, civic groups formed with the objective of identifying potential public accessways for improvement, development, maintenance and acquisition. Once the community completed their Harbor Management Plan (HMP) and it was adopted by the CRMC, a listing of potential ROWs was sent to the ROW subcommittee for further legal research and subsequent hearings upon public designation. In many cases, municipalities had never gone through the ROW designation process and therefore had few (or in some cases no) ROWs. In four different communities that had adopted their HMP and completed the CRMC designation process there was a 30 to 200 percent increase in the number of public ROWs designated.

In 1990, during the Section 309 Coastal Grants Enhancement program of the federal Coastal Zone Management Act (CZMA), the CRMC held a few public hearings for the public to prioritize eight coastal issues. As a result of these public hearings and correspondence, the issue of the need to improve public access efforts was ranked in the top three of most important issues by Rhode Islanders.

KEY MANAGEMENT AUTHORITIES AND POLICIES

State Agencies and Organizations

Coastal Resources Management Council. Rhode Island's Coastal Management Program is based on the Coastal Resources Management Act of 1971, which created the CRMC. The CRMC is a state council, established by the state legislature, with an executive director and staff which administers Rhode Island's coastal zone program through direct permitting. The state recently enacted its Comprehensive Planning Act, which now requires that all planning and zoning at the municipal level be consistent with the Rhode Island Coastal Management Program.

The CRMC has attempted to improve shoreline access opportunities for more than 20 years. Its role has been twofold. First, by its continuous effort to uncover and identify all public ROWs over private land to tidal water, the CRMC provides a clear and legal designation of available public pathways to the shore. Second, the CRMC requires anyone who applies for coastal permits to demonstrate that the proposed project will neither unreasonably interfere with, impair, nor impact existing public access.

Department of Environmental Management. The Rhode Island Department of Environmental Management (DEM) oversees the management, maintenance and acquisition of state parks and beaches. DEM also oversees the management of open space bond money for state or municipal acquisition and/or development of various coastal open space areas. Site selection is determined

by a statewide committee, the Recreation Resource Review Committee. A member from the CRMC sits on that committee and advises the members on the purchase or acquisition of coastal properties. Regarding boating and fishing access, DEM oversees the Dingle/Johnson Act funds, which are used to acquire and maintains boat ramps for fishing and/or boating access to saltwater and freshwater statewide.

Division of Statewide Planning. The Division of Statewide Planning oversees the development of Local Comprehensive Community Plans, integration of those management plans and other state and local management plans (e.g. HMPs, fisheries management plans, special area management plans) into a state guide plan. Statewide Planning also completes the inventories required by the State Comprehensive Outdoor Recreational Plans (SCORP) process and completes demand analyses for recreational needs and facilities. Statewide recreational uses, facilities and needs are researched, surveyed, inventoried and documented through the SCORP. The first SCORP (and saltwater beach inventory) was completed in 1967; the most recent inventory and recreational demand analysis was in 1992.

Policies Prior To CZM Approval

A number of laws and policies that were important for the provision and protection of coastal public access were in place prior to Rhode Island developing its coastal management program. Listed below, is a brief description and their role in furthering the goals of providing public access to the shore.

RI Constitution Article 17, Right-of-Way Discovery Program RI General Laws Ch. 23 §46-23-6(E). The state constitution guaranteed free access along the shore for the specific uses of fishing, navigation and gathering seaweed." The area of free public accessibility was also established as the shoreline from the water line up to the high tide line. The ROW Discovery Program pursued the designation of pathways as publicly owned, based on the documentation and testimonials of historic public use.

1958 - Rights-of-Way Discovery and Designation Process. Under Rhode Island General Law, the CRMC is responsible for the continuing discovery and designation of public coastal rights-of-way to the shore. The law spells out in detail the documentation needed for citizens and/or local municipalities to commence a ROW discovery process. The CRMC may only determine whether or not the ROW in question is legally open to the public based on historic records documenting past use. They do not have the authority to mandate a ROW be open for public use.

Policies After CZM Program Approval

The Rhode Island Coastal Management Program is based primarily on a single piece of comprehensive coastal legislation (R.I.G.L. Sec. 46-23-1).

1988 - Harbor Management Planning Program. The CRMC requires municipalities to develop and formally adopt municipal harbor management plans. One of the requirements of these plans is for the municipality to complete an inventory of existing public coastal access sites, and, additionally, to furnish a list of sites needed for improvement. As a result of this program over 400 sites have been identified for further investigation by CRMC to determine whether the site is

open and available for public use. One of the greatest benefits thus far has been the identification of the dire need to repair boat ramps to Narragansett Bay. As a result of this process, the need has been formally recognized, and in several instances, grant money was made available and boat ramps repaired for public use.

1993 - Recreational Boating Facilities. The Rhode Island Coastal Resources Management Program's policy states that "All recreational boating facilities shall be designed and constructed in a manner which does not impede or detract from and whenever practicable, promotes public access along the shore."

1994 - Dock Registration Program. As part of the Submerged Tidal Lands Leasing Program (developed under the CZMA's Section 309 Enhancement Grants Program) the CRMC adopted regulations for what they have termed the Dock Registration Program. Before instituting a Submerged Lands Leasing Program, CRMC needed to develop an accurate inventory of existing docks and in-water structures. The Dock Registration Program establishes a system for registering all docks, and brings them into the submerged lands lease system. Funding from the registration fees is intended for improving public access.

1995 - Adopt-A-Spot Access Program. Upon mutual agreement between CRMC and the local government in regard to access site maintenance and improvement, CRMC will provide municipalities public coastal access signs free of charge. This program addresses the issue of maintenance, development and management of coastal public rights-of-way. Eligible sponsors of these sites include private citizens, businesses, nonprofit organizations, educational institutions and local government agencies. Upon adoption, the sponsor is required, by a legally binding contract, to maintain and improve the site. In return, a sign is provided at the site (through the DEM) with a recognizable statewide access logo indicating that the site is open to the public and identifying the site sponsor.

MANAGEMENT PROCESSES AND TOOLS

State Coastal Zone Management authority and policies are implemented through a variety of tools. For the provision of public access to the shore these tools are categorized as follows:

- Acquisition Programs;
- Regulatory Tools;
- Planning Tools;
- Technical Assistance;
- Public Education and Outreach; and
- Agency Coordination.

Acquisition Programs

Acquisition, for the purposes of this study, is defined as the purchase of all legal rights to a property. A public entity may acquire ownership in fee simple by purchasing the land or through the exercise of eminent domain. Ownership of waterfront land in fee simple by a public entity is the most effective way to secure public access along the coast.

Publicly Funded Acquisition

Public funding refers to the provision of federal, state and/or local funding for the purpose of acquiring coastal property for public access to the shore. These include federal initiatives such as the CZMA Section 306A program, Section 309 Coastal Enhancement Grants program and other non-CZMA initiatives such as the Land and Water Conservation Fund (SCORP), the Department of Interior's Wallop/Breaux Act funding and U.S. Fish and Wildlife Service's Dingle/Johnson Act funds. Each of these federal programs requires a match of non-federal dollars. CZM programs have partnered with other state and local agencies to provide additional coastal access to the shore. Therefore, federal funding by the CZMA leverages other federal dollars and local private dollars for acquiring and improving public access.

An example of a public acquisition program for the state of Rhode Island includes the CRMC's ROW Discovery Program. Although the CRMC does not actually acquire the property, as a result of a very thorough historical legal research process and many public hearings, the use of coastal rights-of-way are designated as either "public" or "not public." Once a public designation has been given, the CRMC will implement its decision by undertaking any enforcement action necessary if the ROW is ever blocked from public use.

Other examples of acquisition programs includes the provision of open space bond money available through the DEM. Although this program is not administered by the CRMC, the Council is a member of the Recreation Review Committee, which selects the sites to acquire with open space bond money. CRMC provides direction for the selection of coastal sites and any site development and or improvements are completed under the aegis of the state Coastal Resources Management Program. An example of a major coastal acquisition using the open space bond money occurred in 1990 when Black Point, a prime piece of oceanfront property, was acquired, saving it from being developed into 250 condominium units. Town beaches, parks and other local access opportunities are also a very important example for communities. On occasion, local governments will put referendums on public ballots to raise money to buy local parcels.

Privately Funded Acquisition

The purchase of coastal land by private entities such as The Nature Conservancy, Audubon Society, local land trusts or other nongovernmental organizations (NGOs) is another important means of providing public access. Private funding is often provided as match for state and federal grants. Public access to a privately owned parcel is usually restricted for those which contain environmentally fragile habitats; and therefore, the type of public use and amount of public access can be restricted by these organizations.

Conservation Easements

Property easements, such as conservation easements, secure a limited legal right to utilize some aspect(s) of a piece of land. Easements may be acquired through the same means as those used in fee simple acquisition. An easement may be obtained through eminent domain, agreed purchase or dedication.

A property owner may offer a conservation easement on their land to a public or nonprofit entity in exchange for the assurance that the land will only be utilized in a specific manner, such as for farming or grazing livestock. The conservation easement may be for the entire parcel of land or for a portion of it. If it is specified that the land is to be utilized for public access or public recreation, this type of easement could be as valuable as fee simple ownership.

Conservation easements have become a more common means of preserving public access and limiting coastal development. Since the Rhode Island legislature enacted the "Landowner Liability Act" for private owners of shorefront property, donating an easement to a coastal area for either public access or restricted development has become increasingly popular. (See "Regulatory Programs" below.)

Regulatory Programs

Public access to the coast can be provided by regulatory means including statutes enacted by state legislation; executive orders, regulations, and county and municipal ordinances; and the application and implementation of the Public Trust Doctrine, which is interpreted and implemented state-by-state.

Permit Condition

Public access to the shore may be required as a condition for permit approval. Examples of permit conditions include the mandatory provision of parking facilities, handicapped facilities, the construction of boardwalks and small parks, limitations and building size. Limiting building size and height is a means to preserve visual access to the coast. One of the most commonly used regulations–the provision of a public easement across the property to the shore–can solve the age-old dilemma of how to get to the public portion of the shore.

In Rhode Island, permit conditions are not mandated by any state or local agency, but instead addressed on a case-by-case basis. The CRMC will typically meet the developer and come to agreement on a viable project that provides ample public access. Through recent large-scale commercial waterfront developments, the CRMC has secured public waterfront parks in upper Narragansett Bay. Public access had previously not existed in this area of the Bay.

The CRMC also implements policies that preserve and protect the scenic value of the coastal region through Section 330 of the Rhode Island Coastal Management Resources Plan. Guidelines mandate that every effort should be made to safeguard significant views to and across the water from highways, scenic overlooks, public parks and other vantage points. Further requirements are that structures along the water's edge should be screened by native vegetation with minimal disruption to landforms. The CRMC provides literature guidance for preserving the visual character and quality of coastal landscapes in Rhode Island in its publication, *Building at the Shore: A Handbook for Residential Development on the Rhode Island Coast.*

Liability Waivers

State laws which give incentives to landowners to provide easements across their property in the form of tax deferrals and liability waivers provide excellent opportunities for creating public access. Liability waivers provide a strong incentive for a litigation-wary landowner to provide public access by waiving their legal liability for any accident or injury occurring on that portion of the property deeded as an easement for public use. Once the easement has been accepted by the proper state authorities and then authorized for public use, legal and insurance liabilities are released from landowner.

Liability waivers are typically issued by state statute and granted in the case of donated easements. Because of the potential legal issues and expenses which could be incurred as a result of an injury on the property, the release from that responsibility has resulted in landowner liability waivers becoming one of the most popular incentives for providing a public easement across private property to reach the shore.

In Rhode Island, liability waivers offer an incentive for private property owners to help provide public access to the shore. Under Rhode Island's legislation, private landowners' liability is limited if public use is permitted of their land. When the CRMC designates ROWs and/or stipulates public access as a condition of granting a permit, the landowner will automatically be granted liability limits.

Zoning Regulations

Zoning regulations that provide for, preserve and/or enhance public access include county/ municipal land use laws which dictate how land is to be used. The various types of zoning regulations which can be of benefit are: restrictions on building heights within the waterfront area to preserve coastal vistas; zoning overlay districts which can protect and preserve water-dependent use and coastal habitats; and construction setbacks for residential, commercial and industrial development. Rhode Island is among ten states that implement zoning as a means to either protect, preserve or enhance public coastal access.

In Rhode Island, land use is implemented at the local level. Because of this, zoning varies greatly from town-to-town. Very few communities have any zoning ordinances or overlays that mandate public access. Some communities have enforced waterfront overlay districts in which all coastal development must be water-dependent, and not prohibit the public from accessing the shore. These variances have also enforced height restrictions for those buildings located directly on the water so that visual access will not be impaired.

Public Trust Doctrine

In the United States, shorelands, bottomlands, tidelands, tidewaters, navigable freshwater, and the land and animal life living in these waters are accorded special treatment under state and federal law. For the most part, these lands, waters and wildlife are owned by the public, but are held in trust by the state for the benefit of the public. The body of law pertaining to these lands, waters and living resources is called the Public Trust Doctrine.

The Public Trust Doctrine establishes the right of the public to use and enjoy trust waters, lands and living resources for a wide variety of recognized uses. In the United States, each state has the authority and responsibility for applying the Public Trust Doctrine to public trust lands within its jurisdiction. However, there are significant differences in how coastal states handle public trust issues, and the extent to which their legislatures, judiciaries and administrative agencies have applied the Public Trust Doctrine and its underlying principles. [Slade, 1990]

In order for a state, especially the coastal zone management program, to take full advantage of the Public Trust Doctrine, the doctrine must not only be recognized by state courts, but also by state statutory and regulatory laws. Before an agency can adopt and implement regulations based upon the Public Trust Doctrine, it must be lawfully authorized to do so. To that end, many of the state coastal zone management programs have been unable to successfully implement statutory and regulatory laws based on the Public Trust Doctrine with the primary purpose of securing public access to the shore.

The Dock Registration Program (Submerged Lands Leasing Program) includes the recent implementation by the CRMC of mandating that all commercial and residential docks be registered and have taxes levied on them. The revenues are then used for public access initiatives. The CRMC has recently implemented a Dock Registration Program. As of November 1996, 1,535 docks have been registered through the program. (Pers. Comm. Jeff Willis, CRMC, November 12, 1996)

Planning Tools

Planning programs, when combined with implementation through local land use regulations, zoning and subdivision ordinances, and other actions can provide on-the-ground protection of existing public access, and even accommodate future demands for public access. The level of impact that planning can provide depends upon the integration and sharing of resources, the aggressiveness of the policies, the standards of implementation, and the amount of exemptions, special exceptions and variances granted by local government.

Inventories and Mapping

Inventories provide detailed information on the number, size, location, type of facilities and shoreline characteristics of public coastal access sites statewide. Inventories document the available supply of public access in order to plan for future needs. The regular completion of inventories to identify past, present and future trends of public access site use and demand is all important in the planning process. One of the most difficult aspects of determining the effectiveness of coastal states in providing public access to the shore is locating accurate inventories of public access.

Maps and inventories can offer an integrated view of all of the uses occurring at public access areas, as well as the types of habitat located at the site and the type of habitat or area to be impacted. This will better prepare site designers to accommodate these variables into a site or park design that provides the greatest benefit for the uses while mitigating negative impacts on the resource.

An inventory of public access sites by type, location and use has been collected by the Rhode Island Department of Planning since the late 1960s for the SCORP. However, no distinctions are made to determine if the site is coastal, and in many cases the data is inaccurate or difficult to interpret. These inventories were used extensively for the completion of the state's first comprehensive access guide.

Mapping of public access sites in Rhode Island first occurred in the 1970s under the directive of the CRMC's subcommittee on ROWs. Recent efforts include the Rhode Island Geographic Information System (GIS) Inventory coordinated by the Department of Planning, a public access guide published by RI Sea Grant and an updated version of the CRMC map of ROWs and also, CRMC's annual report to the legislature, "Designation of Public ROWs to the Tidal Areas of the State".

Management Planning

Some coastal states are addressing public access needs and demands through other planning efforts not specifically focused on the issue of public access. Even though public access is not the direct target, addressing the issue of public access in relation to the specific project is critical to achieving a successful outcome. Examples of these types of planning efforts include harbor management plans, urban waterfront development plans and special area management plans.

In 1988, the CRMC developed guidelines for communities to use in developing harbor management plans. Harbor management plans identify user conflicts and issues of environmental and habitat degradation and poor water quality affecting municipalities' small harbor areas. One of the elements of a municipal harbor plan is the required completion of an inventory of all of the communities' public access sites. The purpose of this inventory is to prioritize those areas in need of further site development and maintenance. One of the benefits of harbor management planning is that particular attention is paid to the needs of boaters and fishermen. Identifying the supply and demand for boat ramps, fishing piers and public docks is the focus for these types of plans.

As a result of this planning process, the Town of North Kingstown, which had previously listed only three public access sites, established a small working subcommittee to research all of the land evidence records and historic maps. The result of their efforts was to identify over 90 existing and potential public access sites. The harbor management plan supported these findings. The plan was adopted by the town, which is now working together with the CRMC to formally designate those access areas as publicly usable.

Technical Assistance Tools/Programs

Technical assistance means providing expertise of all sorts to foster research, and planning and site design which will result in the preservation and enhancement of public access. Technical assistance can range from legal assessments of the status of rights-of-way to financial assistance in improving existing access sites to engineering expertise for providing access in urban waterfront revitalization, fishing piers or bridge abutments to walkways over dunes or wetlands.

In Rhode Island, examples of site design include the provision of assistance by an engineer from either the Parks and Recreation Department or the CRMC technical engineering staff to assist in the specific design of an access site. These efforts have resulted in the design of several boat ramps and stairs leading to the coast over rough, rocky or steep terrain.

Site development has occurred through open space money, local and private funding efforts. The Adopt-a-Spot program enabled a private fishing club to rebuild two silted in boat ramps that had been out of use for over 10 years. The location of these ramps provide access for the state's large boating population.

Site maintenance and management is successfully employed through the state ROW marking program. Private nonprofits, businesses or any group or individual can "adopt" an access site (typically pathways) by signing a yearly contract which requires weekly pickup of garbage and encourages development and improvement or the addition of picnic tables, park benches and, in some instances, lighting.

The dependence upon legal research assistance becomes greater and greater as the trend in providing new avenues for public access continues to shift toward the provision of ROWs across private property. Legal research is needed because the determination of ownership or private vs. public use rights, hinges upon the legal history of ownership which often traces back a hundred years or more. The research is quite complicated; land evidence records, historic records of property tax payments and title searches are required to determine public ownership or use. Legal expertise is critical.

However, the limited budgets of state and local agencies are a constraint to pursuing legal expertise is the limited budget of state and local agencies. Lawyers command a high fee, normally ranging from $175 to $350 per hour. Several coastal states, with CZM funding, have developed innovative programs to receive the legal expertise needed to perform a variety of tasks, from completing complicated discovery on rights-of-way to warding off intimidating tactics of developers and their attorneys.

The Rhode Island CRMC's ROW Discovery Program determines whether or not a ROW in question is legally open to the public based on historic records documenting past use. Over the years, research coordinated by CRMC's legal counsel supported by funding by the Office of Oceans and Coastal Resource Management at the National Oceanic and Atmospheric Administration has allowed for over 210 pathways to become available to the public.

Public Education And Outreach Tools

Public education and outreach refers to that suite of educational programs and products which serve to raise awareness on the importance of public access and on the challenge of providing public access to the shore.

Education and outreach not only provide information about the varied issues associated with public access, but also provide an opportunity to promote community involvement and individual

stewardship of existing public access. Public policy concerning access is often swayed by dominant public opinion. Therefore, public education and outreach efforts are critical to preserve funding and staff for programs that support of the provision of public access.

Signs which mark the location of public access often have a standard logo which is easily identifiable throughout the state. The various types of signs include posts, large sign boards or bronze medallions located in the ground. Effective use of signage in state CZM programs not only marks the access site, but also notes the public or private organization that has the responsibility to improve or maintain it.

Rhode Island's Adopt-a-Spot program (see above description) uses signage that displays a statewide public access logo that is easily recognizable. The signs also provide information that encourages proper use of the site.

An interpretive display of signs erected by the Narragansett Electric Company at its Manchester Street power station in Providence has enhanced the recent redevelopment of an industrial waterfront site in the state's capital.

Public access guides provide maps and an inventory of selected public access sites within a prescribed region. Information is provided on how to get to the site, what the natural features of the site are, the available amenities of each site such as parking, restrooms and lifeguards, and the types of uses best suited for each site.

"*Public Access to the Rhode Island Coast,*" was published in 1993 as a cooperative effort among Rhode Island Sea Grant, the University of Rhode Island Coastal Resources Center and the CRMC. Since then, many more ROWs have been designated as publicly accessible. An updated edition of the guide is planned for the future.

CRMC's "*A Citizens Guide to Assisting in the Rights-of-Way Designation Process*" is a booklet providing information on what an average citizen can do and how to go about doing it with respect to the ROW designation process.

Fact sheets on the state ROW determination process and the history of the Public Trust Doctrine in Rhode Island have been published and widely distributed to the public. Also, URI School of Oceanography provides a public education program, the "Narragansett Bay Classroom" and classes focusing on public access issues have been standing room only since their inception.

Agency Coordination

CRMC and DEM - Under the administration of the Recreation Resources Review Committee, the CRMC sits as a member to offer guidance and advocacy during the decision making process for the expenditure of open space bond money. This committee serves as a coordination mechanism to ensure that coastal ROWs are included in site development and funding requests and that projects proposed for funding are consistent with the goals of the state's coastal management plan.

The CRMC and the Department of Administration/ Division of Statewide Planning - The primary areas of coordination between these two agencies involve data tracking and planning consistency. The Division of Statewide Planning oversees the SCORP inventories and the State Guide Plan. All local/regional plans must be consistent with the State Guide Plan, which incorporates harbor management plans and special area management plans.

The CRMC - Under its ROW Discovery Program, the CRMC works to mark public access areas. CRMC provides the "Adopt-A-Spot" signs to groups who volunteer to sponsor and maintain ROWs.

ON-THE-GROUND' OUTCOMES OF POLICY IMPLEMENTATION

Rhode Island's coastal management program implementation can, in some cases, be tracked "on-the-ground" by monitoring selected "outcome indicators." Outcome indicators are defined as the practiced results of implementation decisions that emerge geographically and are the subject to some degree of measurement (e.g. linear miles, acreage, number of access sites) where data is available. An example of an outcome indicator might be the amount of access gained as a result of a regulatory program that mandates public access as a condition of permit approval. Other examples could be the number of scenic vistas protected as a result of a local zoning ordinance that prohibits waterfront development above one story or the number of public access sites that have improved, maintained and been designated by signs as a result of a community's involvement in a nonregulatory program, such as the "Adopt-A-Spot" program. Outcomes are described for the six categories of processes and tools described in Part C: acquisition, planning, regulatory, technical assistance, public outreach and agency coordination. These outcomes are preceded by an examination of data availability in the state.

Outcome Monitoring And Record Keeping

Much of the information reviewed to determine the outcomes for providing public access is derived from databases, inventories, maps, published data reports and public access guides. The Rhode Island Department of Administration, Division of Statewide Planning maintains all of the SCORP inventory data. The SCORP information has been very helpful in terms of tracking the trends and status of public coastal sites in Rhode Island since 1967. However, the SCORP inventory only reports beach frontage (not ROWs) and there is no breakout of categories such as coastal open space, coastal parks, docks or wild life refuges. If one is not familiar with Rhode Island, one would have no idea whether a park, open space or other accessway is coastal or inland.

ROWs have been updated, mapped and inventoried by the CRMC since 1958. Every year the CRMC provides an annual report on the status of the ROW Discovery Program. This provides an extremely useful source of accurate information for the public and other agencies.

Unfortunately, Rhode Island does not have an inventory of statewide federal, state or locally owned coastal properties. This would provide an extremely useful source of information.

Similarly, Rhode Island maintains a state Geographic Information System in which data layers such as wetlands, soils and historic sites are recorded. It would be helpful to add ROWs and federal, state and locally owned property to the central database.

As of the beginning of 1997, the only document in which there is an inventory of public coastal access sites in Rhode Island is the state guide, "*Public Access to the Rhode Island Coast:.*" published by CRMC in 1992. Although this was a first attempt to comprehensively list all of the different types of access throughout the state, sites currently involved in litigation and those that are deemed to be dangerous or in poor condition are left out. It would be useful to have a complete listing of all public access sites, regardless of status, for future planning. Sites in poor condition could be prioritized for future funding or other development programs. Documenting the location of all of these sites would be valuable for future open space acquisitions–purchasing property adjacent to public property with parking and other amenities, even if it is a smaller parcel, would be more valuable than purchasing a tract of isolated land with promising potential only if heavy additional investments were made.

Categorical Outcomes

Acquisition Program Outcomes

Assumption: Acquisition programs place private lands into public holdings. Along the coast, these acquisitions tend to serve both recreational use demands, and resource protection goals. Acquisition of large resource systems or acquisition of lands adjacent to existing holdings provide excellent access opportunities to the public and also create a central location for the public to use the shore. Larger regional parks are typically equipped with the facilities the public seeks such as parking, bathrooms and lifeguards. In areas where the coastal habitat is fragile, the preference would be to access one specific area for public use, thereby decreasing–or possible eliminating–public use in other areas along the coast, coastal erosion or nesting grounds for endemic species make the area extremely environmentally sensitive.

Effectiveness: The outcome indicators to measure the effectiveness of state land acquisition tools used to secure coastal land within the public domain are:

- the amount of coastline acquired, acreage, shoreline miles;
- the acquisition tools/programs; and
- the increase in the amount, percentage, number and acreage of coastline state ownership.

PUBLIC ACCESS
ACQUISITION OUTCOMES

ACQUISITION OUTCOME	# OF SITES 1970	# of SITES 1990	ACCESS TYPE	COMMENTS
CRMC ROW Discovery Program	148	210	ROWs	Beginning in 1978, the CRMC has been tasked by the Legislature to carry out the continued discovery and designation of all public ROWs to the shore. Of the 306 reviewed by the CRMC, 210 have been designated as public.
Dock Registration Program	0	1,535 docks	Dock	Funds from these docks will be used to improve public access

KEY:

P -STATE/COUNTY/LOCAL PARK
ROW - RIGHT OF WAY
BR - BOAT RAMP
DA - DISABLED ACCESS
FP - FISHING PIERS
WR - WILDLIFE REFUGE
SV - SCENIC VISTAS

The principal state acquisition tools for providing public access to the shore is Rhode Island's ROW Discovery Program. This program is administered by the CRMC and has resulted in at least one right-of-way for every two miles of shoreline. It should be noted that although this designation process does not actually acquire the land, it does designate, by law, the public use of the land.

Since the adoption of Rhode Island's coastal resources management program, CRMC has designated 210 ROWs. This has resulted in the public being able to gain access to areas of the shore unreachable prior to 1978. Because the CRMC has been so actively involved in securing these often contended ROWs, public awareness has increased and now plays an integral role in the designation process. There has been a great deal of public support for coastal access from citizens in the community at numerous public hearings. The media coverage, regardless of the outcome, has resulted in the public learning more about ROWs, where they are, what constitutes a ROW and issues involving adjacent private landowners. As a result, the previous sentiments of complacency toward public access are long gone. Rhode Islanders are now much more educated about the issues associated with provision of public access to the shore.

Regulatory Program Outcomes

Assumption: Regulatory programs, depending on their purpose and design, can provide front-line protection of existing public access and, in some instances, provide for additional public access to the shore. The level of success they provide varies depending on the jurisdictional area covered, the types of prohibitions and limitations placed on activities within the area, exceptions and or variances allowed and the level of enforcement and penalties for violations.

State laws which require public access as a condition of permit approval offer significant opportunities for public access. The laws which offer incentives to private land owners in the form of tax deferrals and liability limitations open the door to public access in areas where much of the waterfront is privately held–particularly when coastal property is prohibitively expensive. State laws which zone for public access by requiring sufficient public parking or limiting building heights to promote and preserve visual access to the shore also serve to protect public access.

Effectiveness: The "outcome indicators of effectiveness" for state regulatory program tools employed to provide public access are:

- the coastal development permit conditions mandating coastal access, improvements and or parks
- the number/amount of easements granted for public access to the shore based on tax incentives and liability restrictions
- the number of permits where development restrictions apply, such as those on building size (height) and location
- the number of permits requiring public parking and/or other means of public accessibility to a coastal site
- the number of areas, acres and shoreline miles mandating public use of property as part of a permit or plan approval

PUBLIC ACCESS
REGULATORY PROGRAM OUTCOMES

REGULATORY OUTCOME	# OF SITES	SIZE	ACCESS TYPE	COMMENTS
CRMC Permit Conditions	3		P, ROW, FP, SV, P	Not mandated by law, but consistently practiced by the CRMC in large scale waterfront development projects, such as Manchester Street Station (Providence), Riverbend Marina (Westerly) and Wharf Tavern (Warren).
Public Use of Private Lands (RIGL 32-6-5)			E, P	Limits landowner liability.
Town of Narragansett Waterfront Overlay District			SV, P	Local zoning ordinance limits waterfront building height, identifies water-dependent use as priority use for waterfront area.

KEY:

P -STATE/COUNTY/LOCAL PARK
ROW - RIGHT OF WAY
BR - BOAT RAMP
DA - DISABLED ACCESS
FP - FISHING PIERS
WR - WILDLIFE REFUGE
SV - SCENIC VISTAS

The principal state regulatory tools available in Rhode Island are the Land Owner Liability Act and permit conditions negotiated by the CRMC on a case-by-case basis (typically for large scale waterfront development).

Planning Program Outcomes

Assumption: Planning programs, when combined with implementation through local land use regulations, zoning and subdivision ordinances, and other actions, can provide on-the-ground protection of existing public access and accommodate future demands for public access. The level of impact that planning can provide depends upon the integration and sharing of resources, the aggressiveness of the policies, standards and implementation, and amount of exemptions, special exceptions and variances granted by local government.

Effectiveness: The "outcome indicators of effectiveness" for planning tools/programs employed to meet the demand for public access are:

- The regular completion of statewide inventories of publicly held land;
- The regularly updated statewide mapping of the amount and location of public access;
- The number of approved plans in which public access needs, improvements and acquisition are explicitly discussed such as harbor management plans, comprehensive community plans, shoreline access plans and special area management plans; and
- The number of acres areas and shoreline miles designated for public use by enforceable state or local plans, or other means which are enforced through zoning or other ordinances and regulations.

Technical Assistance Outcomes

Assumption: Technical assistance, depending on the purpose and design, can provide positive results for the provision of public access. The level of success depends upon the availability of staff time, funding and implementation of the design. In the case of legal research, the CRMC's technical assistance has had tremendous benefit to local municipalities. Legal research is expensive, yet the availability of legal expertise to discover rights-of-way and then designate them as public has allowed for over 210 pathways to become available to the public. Other technical assistance available includes the access inventories and determination of access need in harbor management plans. As a result of CRMC's efforts, access demand has been determined, and long range plans have been made to accommodate public need.

Effectiveness: The "outcome indicators of effectiveness" for technical assistance programs and tools employed to provide public access are:

- Site development;
- Site maintenance/management;
- Legal research;
- Miscellaneous.

Public Education And Outreach

Assumption: Public education and outreach, can provide not only information and learning to the public about the many issues associated with coastal access, but is also an opportunity for community involvement and individual stewardship of existing public access. Public policy

concerning access is often swayed by dominant public opinion, therefore public outreach efforts become critical when attempting to preserve funding, staff or policies in support of the provision of public access.

Effectiveness: The "outcome indicators of effectiveness" for public outreach programs and tools to provide public access are:

- The number of public access signs erected at sites
- The number of interpretive displays
- A public access guide - Has one been done? How often? How many have been distributed?
- The number of citizen advocacy groups - How many have been established? What have they done?

The most recent accomplishments are improved public education and awareness about the location of public access sites in Rhode Island, and the 1992 publication of the first state guide to coastal access, *Public Access to the Rhode Island Coast: A Selective guide to parks, wildlife refuges, beaches, fishing sites, boat ramps, pathways, and views along Rhode Island's Coast*. ROWs, fishing piers, view sites, local, state and federal parks, and bike paths are included in the guide.

Concerning the issues of site maintenance, development and management, in 1995 CRMC inherited all authority and responsibility over public access site maintenance and management from the state DEM. Through the revamped "Adopt-A-Spot" Program, the CRMC can now designate public access ROWs and establish maintenance, signage and management programs for the sites.

PUBLIC ACCESS
PLANNING PROGRAM OUTCOMES

PLANNING OUTCOME	# OF SITES	SIZE	ACCESS TYPE	COMMENTS
Comprehensive Planning and Land Use Regulation Act (RIGL §45-23-25)	39		SV, P, WR, OS, BR	All local plans must be consistent with the State Guide Plan. The state may not undertake any action which would be inconsistent with the objectives of the local plans.
Special Area Management Plans	5		WR, FP, SV, BR	Special Area Management Plans have been written for: Providence Harbor; the Salt Pond Region; Narrow River; Pawcatuck Estuary and Little Narragansett Bay; and Newport Harbor (not yet adopted).
Harbor Management Plans (RI CRMP Sec. 300.15)	18		D, BR, ROW, P, WR	Requires inventory of access sites and identification of need for improvement to sites.
Mapping	329 sites		P, ROW, WR, BR, SV	CRMC ROW updates; SCORP, Harbor Management Plans; Comprehensive Community Management Plans; Rhode Island public access guide.
Inventory	410 sites		P, ROW, WR, BR, SV	Annual CRMC ROW Updates, SCORP, Harbor Management Plans, Comprehensive Community Management Plans, Rhode Island public access guide.

PUBLIC ACCESS
TECHNICAL ASSISTANCE OUTCOMES

TECHNICAL ASSISTANCE	# OF SITES	SIZE	ACCESS TYPE	COMMENTS
CRMC ROW Discovery Program R.I.G.L. (46-23-17)	210		ROW	The CRMC's legal counsel researches titles and all relevant legal/historical documentation to determine public vs. private use of ROWs.
Adopt-a-Spot Program	unknown		ROW, FP, BR, VA	Private organizations and civic groups "adopt" a site and contractually pledge to maintain and improve the site.

KEY:

P -STATE/COUNTY/LOCAL PARK
ROW - RIGHT OF WAY
BR - BOAT RAMP
DA - DISABLED ACCESS
FP - FISHING PIERS
WR - WILDLIFE REFUGE
SV - SCENIC VISTAS

PUBLIC ACCESS PUBLIC EDUCATION OUTCOMES				
PUBLIC EDUCATION OUTCOMES	**# OF SITES**	**SIZE**	**ACCESS TYPE**	**COMMENTS**
Adopt-a-Spot Program	60		ROW	Once a site is adopted, a sign is erected with the sponsors' name. All signs have the same easily recognizable logo.
Public Access to the Rhode Island Coast: A Selective guide to parks, wildlife refuges, beaches, fishing sites, boat ramps, pathways, and views along Rhode Island's Coast, published 1992	390 sites		ROW, FP, WR, P, VA, DA, BR	Jointly funded by the CRMC, RI Sea Grant and URI Coastal Resources Center, 20,000 guides have been sold.
Citizen advocacy groups: Friends of the Waterfront, Save the Bay, RI Audubon, etc.			Newsletters, walks, interpretive public access work shops	
Newsletters, publication: ROW Designation Fact Sheet, Citizen's Guide to Assisting in the Right-of-Way Designation Process, Annual ROW Report Updates				Explains the CRMC's role in the designation process, and also explains the process by which a ROW can be researched and designated.

KEY:

P -STATE/COUNTY/LOCAL PARK
ROW - RIGHT OF WAY
BR - BOAT RAMP
DA - DISABLED ACCESS
FP - FISHING PIERS
WR - WILDLIFE REFUGE
SV - SCENIC VISTAS

CASE EXAMPLES OF SUCCESSFUL PROCESSES AND TOOLS

Narragansett Electric Company/Manchester Street Station - Providence

Problem: Major redevelopment of an electric power substation along the Providence River in a highly industrialized area which offered no public access opportunities to the shoreline.

Program: The CRMC permit review (based on the Rhode Island coastal management program's goals, policies and standards).

Results: As a condition of assent, the CRMC required the development and implementation of a public access component to the permit request. The newly redeveloped site, "Collier Park," was opened to the public during the summer of 1996. It provides a boat launching facility with docks, numerous interpretive displays, and signs, docking piers, grassy areas for picnics, numerous benches and tables, and ample public parking.

Marker Posts and Signage at CRMC-designated ROWs

Problem: The CRMC would designate public ROWs, yet no marker posts identifying the site as public would be erected to promote the use of those sites.

Program: The ROW Discovery Program. This CRMC program has been expanded to include free posts and signs when CRMC designates a ROW, with provisions that the site will be maintained appropriately.

Results: Since fall of 1993, CRMC has provided 83 signposts to seven municipalities. The posts are constructed to be nearly indestructible and are made of processed, recycled wood and plastic materials and support fiberglass signs. City officials have embraced the program, and due to their implementation efforts, have made it a huge success in addressing the public's inability to locate coastal access areas.

Riverbend Marina

Problem: Significant expansion of an existing marina near downtown Westerly at the head of the Pawcatuck River. Restricted availability of public access.

Program: The CRMC permit review (based on the Rhode Island coastal management program's goals, policies and standards).

Results: As a condition of the permit, public parking spaces and a public dock have been provided.

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Appendix B—State Profile Survey

Contributions of the STATE Coastal Management Program in Providing Public Access to the Shore

This part of the CZM effectiveness study focuses on the contributions of state CZM programs in providing public access to the shore. Our general approach is to identify a state's CZM institutions and implementation activities that help to provide public access to the coast and describe these activities in a consistent format so as to allow aggregation of data for a national perspective and, to the extent possible, quantify them in terms of impacts or outcomes.

FORMAT FOR THIS SURVEY

This survey consists of specific questions designed to assess the contributions of your state's CZM program in providing public coastal access to the shore. The questions focus on both the management processes of CZM (program elements, tools, and procedures) and the outcomes or impacts of these processes. There are programs other than CZM that use the same or similar management measures and tools, however, we are concerned only with trying to understand the impacts of CZM programs, including networked elements.

Using information available from OCRM files, national data sources, and information from your state, the study team has made an initial attempt at filling in the survey. While this has helped educate us about your program, there are undoubtedly misperceptions and errors in our preliminary assessment, as well as significant gaps. Also, we have most likely missed things. Please add them. We look forward to working with you to develop an accurate assessment of the contribution of your CZM program in providing public access to the shore.

PART A - Important Public Access Definitions

Please list below all public access related terms within your state coastal program in addition to the coastal program areas of jurisdiction. If there are networked agencies, please describe.

A-1. COASTAL PROGRAM JURISDICTION. What are the boundaries of coastal zone jurisdiction within your state?

A-2. KEY PUBLIC ACCESS DEFINITIONS. What are the key definitions associated with public access?

PART B - Issue Importance

In this section, it will be important to convey not only the importance of the issue within your state, but also the context within which the issue plays a role. In some cases, the issue of public access had been addressed long before program approval; in others, the issue has become a focus of much activity. In either case it will be important to accurately convey the context for each state's involvement with the issue.

B-1. ISSUE IMPORTANCE AT CZM APPROVAL. How important was the issue of coastal public access in your state when the CZM program was adopted? (Check a box and explain below)

___ Very important or critical (CRI)
___ Moderately important (MOD)
___ Minor or not important at all (MIN)

B-2. ISSUE IMPORTANCE LATER. Did public access become a priority issue in your state later or, if already important, did the issue become less important or change? If so, when and how did these changes manifest themselves? (Check box and explain below)

___ Became very important or critical later (CRI)
___ Became moderately important later (MOD)
___ Stayed minor or not important; or became less important (MIN)

B-3. MAJOR ACCOMPLISHMENTS. Given the priority accorded to public access in your state, what would you judge to be the major contributions of your state CZM program in providing public access to the shore? (attach sheet if needed)

B-4. KEY REFERENCES AND DATA. Are there specific reports, studies, databases, GIS outputs, or other hard data that we can retrieve from you to help document these contributions? (Please list the most important examples. If you list a source here and refer to it later, just use a reference number)

PART C - Status and Trends of Public Access

This information is based on national level data or state data, if available. It is intended to be used as the baseline to estimate the amount of public access provided by CZM processes and tools.

C-1. HISTORIC TRENDS OF PUBLIC ACCESS. What was available prior to program approval? What was the amount of public access to the shore (linear mileage/acreage)?

C-1.2 REGULATORY PERMITS. Were there any regulatory permits requiring access and actual implementation prior to CZM program approval?
Please Describe.

C-1.3. DISABLED ACCESS. What was the amount of public access available for disabled persons prior to CZM program approval?
Please Describe.

C-1.4 TYPE OF PUBLIC ACCESS. What types of public access were available in your state prior to program approval? (boat ramps, scenic vistas, state/county parks, rights-of-way, fishing piers) Is there a document or report available which would give an accurate inventory of what was currently available within your state? Please attach or list reference information.

C-2. AMOUNT OF PUBLIC ACCESS TODAY. Please list the number of public access sites and amount of acreage within your state. Attach databases, reports or maps, if available.

C-2..2 REGULATORY PERMITS. Does your state CZM program grant regulatory permits which require public coastal access?

Please Describe.

PART D - Programs, Policies, Regulations and Management Tools Used to Provide Public Access to the Shore

Please describe whether or not you have any of the following programs, policies or processes within the STATE Coastal Management Program. Please include dates, status and significant results.

D-1. ACQUISITION PROGRAM. Does your state coastal program have an acquisition program which includes any of the following:

___ public investment for land acquisition
___ access development/design/maintenance
___ conservation easements
___ transfer of development rights
Please describe:

D-1b. FUNDING. How much has been spent since program approval by:

___ federal government
___ state coastal program
___ local governments
___ private resources

D-2. PERMIT REQUIREMENTS. Does your state coastal program mandate permit requirements dedicating access as part of a development. Yes: No:
Please describe:

D-3. ZONING REQUIREMENTS. Acquisition through state and/or local zoning. Yes: No:
Please describe:

D-4. INCENTIVE PROGRAMS. Are there any state/local sponsored incentive programs which offer tax/liability breaks? Yes: No:
Please describe:

D-5. TECHNICAL ASSISTANCE. Does the State offer any technical assistance programs relating to the improvement, maintenance or provision of public access?
Yes: No:
Please describe:

D-6. PUBLIC OUTREACH. In terms of public outreach and involvement, does the STATE Coastal Program provide any of the following:
___ signing program
___ interpretive display program
___ access guides
___ other public education initiates focusing on the awareness of the issue, stewardship of the resource, etc.
___ have any citizen advocacy groups resulted from state involvement in the issue of public access?
Please describe:

PART E. Case Study Examples

Are there any outstanding models of success that resulted from the application of a particular coastal zone management tool or program within your state in dealing specifically with the CZMA core objective of public access? In selecting this example, please review the criteria listed below.

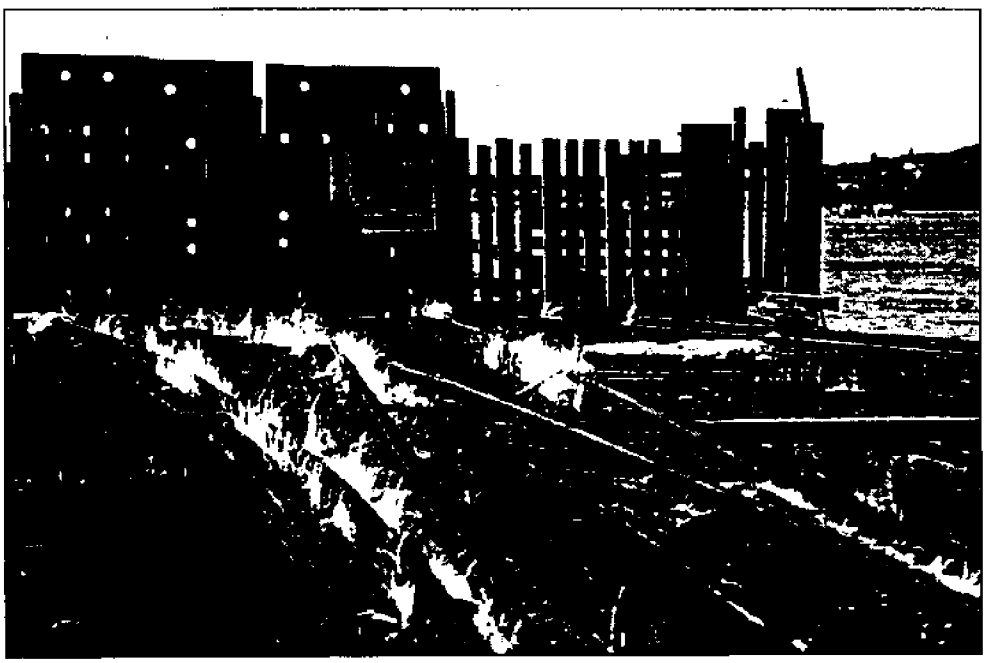
E-1. CRITERIA FOR SELECTION OF CASE STUDIES
___ Potential models may be transferable to other states
___ CZM played an influential role in the success of the case study
___ Examples of management tools that worked successfully
___ Provides an indicator of improved governmental

Examples of STATE Case Studies:
Please describe below.

Appendix C—State Profiles

National Coastal Zone Management Effectiveness Study

The Effectiveness of Coastal Zone Management Programs in Redeveloping Deteriorating Urban Ports and Waterfronts



Washington Sea Grant Program
University of Washington

and

School of Marine Affairs
University of Washington

December 1998

National Coastal Zone Management Effectiveness Study

The Effectiveness of Coastal Zone Management Programs in Redeveloping Deteriorating Urban Ports and Waterfronts

Final Report

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Acknowledgments

During twenty months in 1995-96 the authors badgered state coastal program managers and their staff for detailed information about the workings of their programs and the communities whose urban waterfronts they have helped revitalize. We are immensely grateful to those of you who took time away from more pressing tasks to assist us construct the state profiles and identify the case examples upon which our assessment of CZM's effectiveness in addressing this issue rests. In some cases we were probing individuals' memories for events that happened ten, or perhaps 20 years ago. Most states' staff undertook extensive research themselves to assemble lists of waterfronts, identify the CZM grant dollars invested in them, and track down the results achieved on the ground in those communities. This study would have been impossible to begin, let alone complete, without the commitment of those dedicated professionals.

We are grateful to the director and staff of NOAA's Office of Ocean and Coastal Resources Management (OCRM) for opening their files to us and providing access to a sterling group of advisors from state coastal programs, academe and the federal establishment. In particular, we are grateful to OCRM's Bill Millhouser whose patience, good humor and extensive knowledge of CZM nationally, helped keep this project on track.

Distance between the universities in which the CZM Effectiveness Study team work imposed severe limits on the kind and frequency of close professional and personal interactions among our colleagues that sustain group efforts like this one. But, without even those few team meetings we did have, it would have been difficult to maintain our momentum and enthusiasm. We learned from each other, leaned on each other, and, sometimes, fought with each other over ideas and approaches. I acknowledge a debt of gratitude to Pam, Tina, Virginia and Marc for their contribution to this report and to my own professional growth. And to my friend and colleague Jim Good, I give my heartfelt thanks for another warm, collaborative venture.

The lion's share of data gathering fell on the students shoulders. Lilly Ferguson gave stalwart service during the first half of the project and Sean Hastings continued to stalk the coasts for data even after funding for his support expired. Sean's insights informed this report throughout.

During much of this study my normal marine advisory responsibilities got short shrift. My appreciation to Louie Echols, Director, and Mike Spranger, Assistant Director for Marine Advisory Services, Washington Sea Grant Program, for recognizing that the effort needed and effort funded in this project were mismatched, and that the goal was worthy of substantial Sea Grant subsidy.

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The Effectiveness of Coastal Zone Management Programs in Redeveloping Deteriorating Urban Ports and Waterfronts

A National Overview

Context and Purpose

> "Congress finds and declares that it is the national policy... to encourage and assist the states to exercise effectively their responsibilities in the coastal zone through the development and implementation of management programs...which programs should at least provide for...assistance in the *redevelopment of deteriorating urban waterfronts and ports*, and sensitive preservation and restoration of historic, cultural, and esthetic coastal features..." (PL 92-583) (Emphasis added.)

Few national coastal zone management (CZM) objectives have a more diverse and extensive constituency than does revitalizing urban waterfronts. Fishers, boaters, joggers, walkers, shoppers, bicyclists, photographers, maritime history buffs, tourists, people watchers and artists all benefit when formerly deteriorated, walled-off waterfronts become accessible, safe and inviting. Inner city and suburb come together at waterfront festivals and other events; and new immigrants and long-established families rub shoulders at waterfront take-out fish 'n chips counters. Downtown property developers and marine conservation groups can and do join in developing and supporting waterfront plans that reinvigorate coastal economies and sustain marine environments.

But, sixteen years after the federal coastal zone management act amendments of 1980 declared waterfront revitalization to be a national goal, little had been done to assess the effectiveness of CZM in addressing it. This study is the first attempt to capture the scope and meaning of on-the-ground outcomes that have resulted from the efforts of the 29 state and territories' coastal management programs to address this goal.

Study Approach

To assess the contributions each state's coastal management program (CMP) has made to achieving waterfront revitalization, we asked five questions:

1. How important is the issue in each state?
2. What tools are available in the state's CMP?
3. How does this suite of tools compare with those of an *ideal* waterfront revitalization program?
4. What tools were actually utilized, on the ground, in the state's deteriorated waterfront districts?
5. What proportion of the state's CMP capacity to effect waterfront revitalization was put to use?

Study Methods

Surveys of state CMPs' officials, augmented by program documents and reports on states' program achievements, produced the information we used to create state "profiles"— descriptions of the way each state's CMP addresses waterfront revitalization, and measures of outcomes achieved in each waterfront district where the CMP was involved. The salient data we assembled were: Characteristics of the state's coastal zone affecting this issue; categories of state policies in place; a list of waterfront districts in which CZM resources had been expended, the stage of revitalization reached and scope of improvements made in each district; and, the CZM tools available to the state's CMP, those actually utilized in each waterfront, together with the program manager's assessment of the importance and effectiveness of each tool or suite of tools.

Principal Findings and Conclusions

On-the-Ground Outcomes

This study has identified 303 waterfront districts in communities throughout the nation's coastal zone that benefited from their states coastal management programs' (CMPs) attention to the national goal of revitalizing deteriorated ports and urban waterfronts. The real number of revitalizing waterfronts is undoubtedly much higher. These waterfront districts range in size and complexity from small bay front villages along coastal estuaries to redevelopment areas abutting the densely populated metropolitan shores of some of the nation's largest cities. Revitalization is "complete" in only 10% of the districts, but, in more than one-third of these waterfronts, investments have been made to improve infrastructure and develop multiple projects.

Within these revitalized and revitalizing waterfronts other important, complementary national CZM goals are being realized. Degraded coastal environments are being restored as brownfield sites are cleaned up and contaminated harbor sediments are capped; historic structures are being reused for new people-friendly activities; traditional and new marine industries are being protected from encroachment by non-water dependent uses; plazas, parks, trails, boardwalks, viewing towers and fishing piers are luring people back to the water's edge; and, waterfront festivals and events, aquariums, maritime museums and harbor tours are delighting them when they get there.

In the adjacent uplands, hotels and tourist centers, retail boutiques and restaurants serve residents, visitors and tourists, and produce economic benefits to the community. Waterfronts are being re-linked with the downtown cores their wharves and docks originally served.

All this has been achieved through partnerships involving state's CMPs, local communities, non-profit organizations, universities, and other state and federal funding and planning assistance programs. It is the nature of such partnerships that the exact contribution of each partner to the results achieved is difficult to fully assess, but simple to recognize. In 244 of these districts states have documented use of specific CZM tools to support revitalization.

The states most active in this enterprise have extensive shorelines harboring communities that have been impacted by industrial change: manufacturing plant closures due to decline in the metals and heavy fabrication industries, and contraction of ports around the Great Lakes; decline and restructuring of resource-dependent industries—fishing and wood products harvesting and manufacturing—in the Pacific Northwest and New England; and, contraction of defense-based industries and closure of military bases in California.

Revitalization Tools and Processes

In implementing these strategies, state CMPs used three kinds of tools to assist communities in revitalizing their waterfronts: *Designation of waterfronts* for revitalization, preparation of *Special Area Management Plans,* and forging *partnerships* are proactive tools used by the states to signal local cities and towns that specific waterfronts are deteriorated, that it is state policy that they should be revitalized, and that the state CMP will assist them in the process. Providing *financial assistance, technical assistance,* producing *guidance documents* and undertaking *education and training* programs are tools the states use to support local revitalization efforts. *Local coastal program amendment review, project review* and *environmental review* are tools states use to react to local initiatives and ensure state CZM policies are being achieved and regulations met during implementation of waterfront plans and projects.

The most commonly used tools were *financial assistance* to, and *partnering* with local communities, followed by *technical assistance* and *project review.* These tools were also ranked the most important by state program managers.

Not all states' CMPs have access to the full suite of tools that would comprise the "ideal" waterfront revitalization program; and not all states have fully utilized the tools they have. The *degree* to which CMPs have utilized available tools in assisting their coastal communities revitalize their waterfronts is a measure of these programs' contribution to results achieved "on the ground."

Overall Effectiveness of States' Programs

Fourteen states matched all four criteria used to determine effectiveness in addressing this issue area:—

- the CMP has articulated through formal policy or other means (such as guidance documents) the state's intent to assist cities revitalize their deteriorated or under-utilized waterfronts
- the CMP has provided financial and/or technical assistance, or entered into another form of active partnership with such cities, to plan for and implement waterfront revitalization
- on-the-ground improvements have resulted that bring social and economic benefits to the community and achieve other coastal management goals on its waterfront, including:

enhancing public access to the water, giving priority to water-dependent industry, restoring degraded environments, and conserving historic sites and structures

- states have documented utilization of a significant suite of their available tools in all the specific waterfronts their CMPs claim to have affected

Effective Strategies

These fourteen states determined that revitalizing their deteriorated urban waterfronts and ports was an issue of sufficient priority to warrant attention through their CMP's, and they found the necessary resources and employed the tools they had at hand to address the issue. Three effective, though not mutually exclusive, strategies they employed stand out:—

Promoting state assistance programs—used in Maine, Michigan, New York, Oregon, Pennsylvania, Washington and Wisconsin. These states, for the most part, comprise regions that have sustained significant industrial change over the last two decades which resulted in abandoned factories, wharves and docks along their downtown waterfronts. Their CMPs rank among the most active programs addressing this issue and have achieved extensive on-the-ground outcomes.

Targeting specific waterfronts and ports—used in Massachusetts, Pennsylvania and Mississippi. Each of these states took an inventory of their urban coasts, established a target list of deteriorated or underutilized waterfronts and/or ports, designated them for action, and assisted some or all of those communities develop and implement revitalization plans and projects.

Delegating responsibility to a networked agency—used in Hawaii and California. Hawaii used an existing state community redevelopment agency to deliver urban waterfront revitalization services to the Honolulu downtown waterfront, while California created a new agency—the California State Coastal Conservancy—and a special funding source to accomplish revitalization in numerous coastal towns and cities throughout the state.

Recommendations

National Funding

Improving CZMs effectiveness in this program area can be accomplished, first, through restoration of national funding to NOAA to assist the states continue to foster waterfront revitalization in their coastal cities and towns. This action would reverse the disturbing trend towards termination, or drastic reductions in states' assistance to their local government partners.

Improved funding would also permit the hiring and retaining of staff with subject area expertise in OCRM to enhance program activity in support of state programs addressing this issue—in particular, education & training, and routine monitoring and evaluation of states' coastal programs.

A National Needs Assessment

Conducting a national needs assessment now would provide for more efficient, targeted state programs to assist local government in future years. A significant step in undertaking such an assessment would be to *elevate waterfront revitalization as a national enhancement objective in §309 of the federal CZM Act.* The effect of this change would be to require each state's CZM agency to undertake a conscious, deliberate assessment of the issue, develop a strategy to address waterfront revitalization priorities in its CMP, and receive supplementary federal funding to implement the strategy.

Building on this study's nationwide inventory of waterfronts undergoing revitalization, OCRM should develop and maintain an *urban waterfronts inventory.* The database developed for this study should be expanded to include a listing of all urban places located on coastal waterways (marine shores, estuaries and tidal reaches of rivers). States' coastal managers should be asked to review the listings and to add notations concerning known, remaining areas of significant waterfront deterioration and dilapidation that might warrant attention over, say, the next five years.

State and Federal Program Monitoring and Data Management

Better record-keeping, data management and program monitoring at state and federal levels would permit important program achievements to be identified more easily, and progress towards national goals measured more continuously.

States CMPs should report to OCRM information on §306 and §306A grants to local governments or other entities in a standardized format that would identify the primary and secondary purposes of the grant, the dollar amount awarded, and a brief synopsis of the results achieved. States should also be encouraged to report awards of state-funded grants used to support CMP goals and policies.

OCRM, in turn, should maintain an active and accessible database of such grants, coded to permit retrieval by state, grant recipient (municipality, university, state agency, etc.) and program area supported (public access, waterfront revitalization, etc.)

1.0 Introduction

1.1 Purpose of this Study

This document reports the results of one element of a five-part study of the effectiveness of the 29 states' coastal management programs in addressing three core objectives of the federal CZM program. These core objectives were: 1. natural resource protection; 2. public access; 3a. priority consideration of water dependent uses; and 3b. revitalizing deteriorated urban waterfronts. The overall study focuses on program results—on the ground outcomes—and attempts to link these results to the policies, tools, and processes used by the 29 states' programs to achieve them. The strength of the linkages between program activities and program outcomes is an indication of the extent of CZM's contribution to the results.

The three core objectives were broken down into five specific program areas, each the subject of investigation by an individual research team member. These were:

- protection of beaches, dunes, bluffs and rocky shores (Core objective 1)
- protection of estuaries and coastal wetlands (Core objective 1)
- public access to the coast (Core objective 2)
- priority consideration of port development (Core objective 3a)
- revitalizing deteriorated urban waterfronts and ports (Core objective 3b)

The last—revitalizing deteriorated urban waterfronts and ports—is the subject of this report.

1.2 Overall CZM Goal for Waterfront Revitalization

Section 303 of the federal coastal zone management act (FCZMA) of 1972, as amended in 1980, reads, in part:

> "Congress finds and declares that it is the national policy... (2) to encourage and assist the states to exercise effectively their responsibilities in the coastal zone through the development and implementation of management programs to achieve wise use of the land and water resources of the coastal zone, giving full consideration to ecological, cultural, historic, and esthetic values as well as the needs for compatible economic development, which programs should at least provide for—
> "...(F) assistance in the *redevelopment of deteriorating urban waterfronts and ports*, and sensitive preservation and restoration of historic, cultural, and esthetic coastal features..." (PL 92-583) (Emphasis added)

In 1980 the FCZMA was amended through passage of the Coastal Resource Improvement Act (PL 96-464) which added §306A—resource management improvement grants.

> "The Secretary may make grants to any eligible coastal state to assist that state in meeting one or more of the following objectives:
>
> "... (2) The *redevelopment of deteriorating and under utilized urban waterfronts and ports* that are designated under section 305(b)(3) in the state's management program as areas of particular concern." §306A.(b)(2)

These sections of the FCZMA constitute the authority for the Office of Ocean and Coastal Resources Management (OCRM) to provide funding to states for waterfront revitalization planning, design, engineering, land acquisition, and certain low cost construction projects including "...paths, walkways, fences, parks, and the rehabilitation of historic buildings and structures..." and for "...the rehabilitation or acquisition of piers to provide increased public use, including compatible commercial activity... installation or rehabilitation of bulkheads for the purpose of public safety or increasing public access and use... removal or replacement of piling...(for) increased recreational use of urban waterfront areas."
Educational, interpretive, and management costs were also allowable expenditures under this section. (§306A.(c)(2))

The CZMA defines the term urban waterfront or port as: "any developed area that is densely populated and is being used for, or has been used for, urban residential, recreational, commercial, shipping, or industrial purposes" (§306A.(a)(2)). This broad definition could accommodate virtually any shoreline adjacent to urban areas on marine or Great Lakes waters. The phrase "waterfront *revitalization*" does not appear in the act; but its common usage in coastal management publications and within the coastal management community suggests it is synonymous with (or perhaps the consequence of) "waterfront *redevelopment,*" the term used in the act.

It is clear that the intent of congress was that waterfront redevelopment had as its primary purpose the opening up of formerly run-down waterfronts for recreation and public access. Commercial activities that were compatible with these primary purposes were appropriate uses, even in refurbished over water piers; which suggests that a suspension of strict water-dependency requirements could occur where adaptive re-use of obsolete piers required it. Waterfront redevelopment and conservation of historic, cultural and esthetic coastal features, are policies that are juxtaposed in §303(2) of the FCZMA suggesting a strong link between them. Together with §306A funding for educational and interpretive programs, these policies provided coastal managers with strong guidance and incentive to conduct waterfront revitalization in a fashion that would produce broad public benefits and heritage conservation.

1.3 Overview of this Report

Section 2 of this report sets out the national context for waterfront revitalization as an issue, identifies the forces that have affected the condition of the nation's waterfronts over the last four decades, and reveals the involvement of CZM late in a national trend already underway. We review the highlights of the professional CZM literature that has addressed waterfront revitalization, particularly work using case studies to document on-the-ground outcomes. Previous CZM evaluation studies that have utilized program expenditures as a measure of program issue

focus, or have relied on interviews with program professionals and other experts, are also reviewed for any light they may shed on waterfront revitalization.

Section 3 examines five conceptual problems that must be overcome to fully assess the effectiveness of CZM programs in addressing this issue area, and sets the stage for our study design in Section 4.

In Section 4 we set out the definitions of waterfronts and waterfront revitalization that we shall use throughout this study, and the assumptions we make about the respective roles played by state CMPs and local towns and cities undertaking waterfront revitalization. The remainder of this section describes our program evaluation methodology; data sources; our survey design, testing, and refinement; and, the limitations of our data. Considerable space in Section 4 is given to defining and describing the indicators we use to measure the progress coastal communities are making in revitalizing their waterfronts, and the tools state programs use to assist them. "Process outcomes" measure the stage reached in the development of waterfront plans; while "on the ground outcomes" measure the stage reached in their implementation and the scope of revitalization achieved through waterfront projects and activities. Our core methodology for assessing effectiveness of states' CMPs in assisting local communities attain these outcomes is laid out here: a consecutive and cumulative set of four process and outcome conditions states and local communities must have met.

In Section 5 we present the research results. First comes a national summary of how states' coastal managers rated the priority of waterfront revitalization at three points in time: at program approval, in 1980 when the CZMA was amended to include the issue as a national objective, and in 1995-96 when this study was undertaken. Next, states' use of CMP policies that address waterfront revitalization and other core CZM objectives affecting the shape and content of waterfront plans and projects are enumerated for the nation. We then document states' use of tools to assist local cities and towns implement these policies in specific urban waterfronts and the importance state officials attach to them; special attention is given to levels of funding for local government. Section 5 continues with a national tabulation of on-the-ground outcomes revealing the extent, stage and scope of revitalization results. Focusing at the state level, a comparison of outcome indicators is undertaken using a matrix to group states with similar stage and scope of outcomes. Brief descriptions of each state's achievements are included.

Next, we identify CZM's contributions to these outcomes through CMPs' statewide policies and use of tools. From the "best" components of the 25 state programs on which we have data, we construct a "straw man" ideal waterfront revitalization program—the authorities, policies and suite of tools a state might use to address waterfront revitalization. Each state's actual program is then compared to the ideal, and its strengths and shortcomings noted. The relative contribution made by each state's CMP to the on-the-ground outcomes achieved in the state's waterfront

districts is assessed by measuring the degree to which states' use of available tools reflects the importance they attached to the issue. Finally, using the method described in Section 4, we assess the effectiveness of states' CMPs in addressing waterfront revitalization.

In Section 6 we lay out our study's conclusions about the overall effectiveness of CZM in addressing the national issue of revitalizing deteriorated waterfronts, and the kinds of effective strategies used by states' CMPs. In this section we also reiterate and summarize the limitations of our study based on its design, the quality and completeness of data available, and the lack of a national needs definition for the issue of waterfront revitalization.

Section 7 contains our recommendations for improving the performance of CZM in addressing this issue at both state and federal levels: Restoring federal funding to states, undertaking a national urban waterfronts needs assessment and increasing the capabilities of OCRM to assist states.

Section 8 presents our bibliography organized under general and state-by-state categories.

Appendices provide the reader with a sample "State Profile"—the summary of information about a state's CMP, its treatment of waterfront revitalization and the detailed results achieved; profile summaries for all the states, including those for which we have little tools or outcome data; a copy of the questionnaire we used to collect data from the states; a summary of state data sources and quality; a list of waterfront communities and districts where revitalization has occurred, or is presently underway, organized by state; and, finally, a "model" CZM waterfront revitalization grant application from Michigan's CMP.

2.0 Background and Context

Waterfront revitalization was already well underway in the nation's larger seaport cities (Baltimore, New York, San Francisco, Boston, Seattle, etc.) before the 1980 CZMA amendments focused state CZM programs' attention on deteriorated and underutilized urban waterfronts and port areas. These run down waterfronts were artifacts of several national trends having their origins in the 1950's and -60's: The shrinkage of some ports as a result of containerization of cargoes and load centering; port abandonment of downtown piers, wharves and transit sheds in favor of new container terminals constructed on flat, less-developed industrial shorelines; the demise of ocean going passenger liners as the airlines' international reach expanded with the advent of jet transports; the suburbanization of downtown manufacturing establishments, including water-dependent and water-related industries, as a result of efficient truck transportation; urban renewal and downtown revitalization; improvements in water quality and growth in tourism/recreation, especially boating and other water-based activities.

Over the next two decades, major structural changes in the economies of coastal counties in the Great Lakes, the Pacific Northwest and parts of New England resulted in further deterioration of ports and waterfronts serving the needs of mining, fishing, lumber and other natural resource extraction and harvesting industries, and the shore-based manufacturing firms dependent upon these raw materials. These changes were felt not only in the economy of the affected regions, but also in their cultures which were often defined by mining, fishing or logging.

Several authors have identified these underlying structural changes and the problems and opportunities they presented planners and coastal managers in the 1970s, (Moss, 1976; Hershman, et al, 1978; Wrenn et. al., 1983), and planning and architectural journals devoted whole issues to waterfront revitalization (Progressive Architecture, June, 1975; Planning, Nov. 1979)

On June 1, 1978 more than a dozen federal agencies signed a memorandum of understanding (MOU) promising to promote urban waterfront revitalization efforts. Signatories included: NOAA's Office of Coastal Zone Management (OCZM), Environmental Protection Agency (EPA), National Endowment for the Arts (NEA), National Trust for Historic Preservation (NTFHP), US. Army Corps of Engineers (USACOE), Department of Transportation (DOT), Heritage Conservation and Recreation Service (HCRS), National Park Service (NPS), Economic Development Agency (EDA), Maritime Administration (MARAD), and the Office of Federal Insurance & Hazard Mitigation (OFIHM). These agencies also formed an "Urban Waterfront Action Group" with the aims of establishing an information clearinghouse, improving program and permit coordination, and exploring new coordinating mechanisms. This preliminary move to focus and rationalize federal involvement in waterfront revitalization occurred two years before congress

amended the CZMA and made redeveloping deteriorated urban waterfronts and ports a national goal.

In 1980 OCZM and HCRS jointly published a major guide to waterfront revitalization (Breen, Kaye, O'Connor and Rigby, 1980). Improving Your Waterfront: A Practical Guide[1], was a comprehensive, case study-based compendium of information which addressed, primarily, the implementation phase of the redevelopment process, provided access to major federal sources of funding and technical assistance, and articulated the importance of achieving CZM goals in urban waterfronts.

Municipal governments, ports and public development corporations have teamed with private sector interests to take on large city waterfront projects. Federal urban renewal and community development agencies have helped fund planning studies, site acquisition, site clearance and cleanup, and new infrastructure along the waterfront. Because of CZM's late start and the magnitude of financial resources required to revitalize waterfront areas, CZM agencies have been forced to be "niche players." CZM has provided a forum for resolving contentious waterfront development issues, and its policies have kept on the urban waterfront agenda those affirmative national coastal goals of expanding public access, restoring degraded environments, preserving cultural and historic buildings and sites, and giving preference to coastal dependent industries—the "working waterfront" issue. This last goal has proven to be the most contentious and elusive. Competition from non-water dependent development—restaurants, housing, hotels, offices—and water dependent development of a purely recreational nature—marinas, yacht brokers, etc.—displaces industrial water dependent businesses that support commercial fishing fleets and other maritime enterprises. (Breen and Rigby, 1985; Goodwin, 1988)

Brower, et al, (1991) assessed CZM's achievements in seven national issue areas by analyzing five years of §306 and §306A expenditures. *Urban waterfront development* was one of those issues, accounting for 7.5% of total expenditures, or $14.3 million from 1982 to 1987. Broken down by state, Brower's data provided very useful intelligence about the priority the issue received around the nation—information that played a significant role in focusing our research efforts. The state coastal management program summaries contained useful anecdotal information about program achievements in waterfront revitalization, as well as general descriptions of the states' programs.

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[1]Two of this study's authors, Anne Cowey-Breen and Dick Rigby, went on to found *The Waterfront Center*, a Washington, DC-based educational and consulting organization which has produced several important publications on waterfront revitalization and has conducted a national annual conference every year since 1983.

3.0 Conceptual Challenges in Assessing CZM Programs' Contribution to Waterfront Revitalization

3.1 Overview

Several conceptual and practical problems attend the measurement of effectiveness of states' CZM programs in meeting the national goal of revitalizing under-utilized and deteriorated urban waterfronts and ports. Five problems in particular must be overcome: knowing the number of communities in each coastal state having deteriorated or under-utilized waterfronts; delineating the extent of each waterfront district to be revitalized in those communities; distinguishing the unique contributions of CZM programs to the timing, character and quality of revitalized waterfronts; determining the relative importance of assistance provided by CZM programs vis-à-vis other contributing entities in achieving successful revitalization; and, finally, factoring in the costs of achieving on-the-ground results—i.e. program efficiency.

3.2 Establishing the Target Population of Waterfronts

The first is the problem of establishing the target population, or a "control total," of waterfront communities or districts needing revitalization. Without an explicitly defined target population of under-utilized or deteriorated waterfront districts, state programs' progress towards achieving waterfront revitalization lacks a reference point.

"Under-utilized" and "deteriorated" are not absolute terms—many working waterfronts have an unkempt appearance that belies their economic vitality; and, at times of downturns in fisheries or other resource-based marine enterprises, docks and shoreside plants may seem under-utilized, until demand picks up again. Attempts to revitalize these gritty waterfronts might have unintended and unfortunate economic and social consequences.

3.3 Scale and Complexity of Waterfronts

Second, deteriorated urban waterfronts vary greatly in *scale* and *complexity*. A small town may have a single abandoned industrial site that dominates its waterfront, while a large city could have several waterfront "districts," each with its own problems of deterioration or under utilization, and unique opportunities for redevelopment. What, then, are the geographic limits of each "waterfront?" Where should we draw its boundaries?

3.4 Significance of the State CZM program's role

Third, is the *significance* of the state CZM program's role in waterfront revitalization. Did CZM involvement accelerate revitalization? Did CZM expand the number of coastal communities choosing to undertake revitalization? In what ways do revitalized waterfronts reflect the values and principles embodied in the state's CMP? What CZM goals beyond that of bringing life back to

abandoned waterfronts have been achieved? Is there more public access to the water? Have ports and water-dependent industries been protected from displacement by retail, recreation and tourist activities? Have formerly contaminated sites been restored, or the contaminants at least been confined? Were historic waterfront sites and structures restored, conserved and interpreted?

3.5 Attribution of the State CZM program's contribution

Fourth, revitalizing waterfronts may be part of a broader program of urban renewal, or downtown revitalization which would proceed with or without CZM involvement. Thus there is a problem of *attribution:* Which governmental entity or program takes how much credit for results gained through collective efforts? The city that initiated the revitalization and sought planning, feasibility and construction grants wherever it could find them? The state or regional community development agency that supplied financial and technical assistance? The port authority that undertook a major redevelopment project on waterfront lands it owned, without outside assistance or funding? A federal housing or economic development agency that provided funding for a demonstration project? A state outdoor recreation planning agency that acquired land for a waterfront park? Clearly, each has a claim on some of the credit for successful revitalization.

3.6 Costs and Program Efficiency

Finally, the issue of the costs of achieving on-the-ground outcomes attained is an important consideration in determining program effectiveness. Program effectiveness is related to program efficiency. The same outcomes achieved at lower cost would point to higher efficiency, and hence, greater program effectiveness. Here we have a conceptual problem, however: expenditure of CZM §306 or 306A funds is an indicator of a CMP's involvement in revitalizing a waterfront district and is a critical link between CZM policy and on-the-ground outcomes—the greater the level of funding, the higher the degree of CMP involvement. The most efficient use of CZM funds might result in substantially smaller outlays than those observed, with a higher share of costs being borne by local governments and the private sector.

4.0 Measuring Effectiveness of State CZM Programs in Meeting the National Goal of Waterfront Revitalization

4.2 Definitions

4.2.1 Waterfront Revitalization

Waterfront revitalization is a process that begins with the desires of a community to improve its waterfront, proceeds through a series of planning steps and public review to adoption of a waterfront plan. Implementation of the plan involves public and private actions, investment decisions and developments which occur, ideally, in a coordinated fashion. Dilapidated structures are razed, infrastructure upgraded, land parcels assembled for private development, public walkways and viewpoints, and waterside improvements such as visiting vessel floats or docks are installed; leased space is rented in new or refurbished buildings, townsfolk and visitors discover a new amenity at their backdoor, pedestrian counts rise and new businesses respond to the market opportunities they present. Perhaps a harbor festival is planned by the local Chamber of Commerce, or the state Coastweeks coordinator helps arrange waterfront walks and harbor clean-up days in cooperation with a local marine trades association.

The end point of this planning and development process is an accessible, clean and safe downtown waterfront alive with people enjoying new activities and events. It is also a waterfront hospitable to both traditional and new marine industries that help bring a note of authenticity to the visitor's waterfront experience.

4.2.2 Waterfront District

The concept of a waterfront district helps to identify distinct nodes of revitalization activity within long urban shoreline reaches. For example, the shoreline adjacent to a community's Central Business District may undergo redevelopment that focuses on public access through shoreline promenades and public piers, but which also encourages significant retail, restaurant and entertainment activity on adjacent upland sites or in adaptively reused break-bulk cargo transit sheds.

In contrast, revitalization of obsolete port/industrial facilities some distance from the CBD might be focused on new recreational boating facilities, marine services and fishing piers, with the development of adjacent uplands for housing or commercial offices.

The extent of districts may be self-evident because they are contained between reaches of relatively homogenous land uses—housing, large scale industrial plants, or existing public waterfront parks. In other cases the boundaries may be indistinct, particularly where long reaches of industrial waterfront have been abandoned and only a small part abuts a commercial center, or residential neighborhood, which might form the nucleus for revitalization planning efforts.

4.3 Assumptions

4.3.1 States' CZM Programs' Roles in Waterfront Revitalization

CZM agencies are "niche players" in waterfront revitalization because CZM programs started well after the waterfront revitalization trend was underway and because CZM never had the financial resources required to revitalize waterfront areas through large capital projects. Two primary roles State CZM programs can play are first, to foster or ignite local cities' interest in undertaking waterfront revitalization, and, second, to ensure that waterfront plans and projects undertaken by those cities incorporate other coastal management goals such as enhancing public access, restoring deteriorated coastal environments and protecting healthy ones, conserving historic structures and cultural sites, and, where possible, preserving water-dependent industries. This last goal has proven to be the most contentious and elusive. Competition from non-water dependent development—restaurants, housing, hotels, offices—and water dependent development of a purely recreational nature—marinas, yacht brokers, etc.—displaces industrial water dependent businesses that support commercial fishing fleets and other maritime enterprises. (Breen and Rigby, 1985; Goodwin, 1988).

States carry out these roles by using some or all of the following tools and processes: *Designating* certain waterfronts as deteriorated and targeting them for revitalization; providing *funding* to assist in developing local plans; promulgating *guidelines* and principles to ensure comprehensiveness and consideration of the unique needs of coastal-dependent activities and protection of coastal environments in those plans; undertaking *educational programs* to share experience and showcase results; fostering *partnerships* between waterfront cities and federal and state agencies, non-profit organizations, ports and other institutions; and funding carefully selected *demonstration* or "seed" projects that will lead to further public and/or private investment in waterfronts. *Special area management plans (SAMPs)* may also be helpful for identifying areas within an urban harbor for W-R.

Through whatever regulatory tools are available, state programs also may review adoption of waterfront revitalization plans—using their authority to oversee *amendments to local coastal programs,* for example. Waterfront *projects* and their *environmental* effects may be reviewed for compliance with CMP policies and standards through state or federal consistency procedures, or direct oversight authority where that exists.

Not all deteriorated waterfronts are susceptible to revitalization, though few could not be improved. Local and regional economic conditions will determine whether the community is growing or declining; site factors—physical amenity, presence of contaminants in soils, quality of coastal waters for recreation, adjoining neighborhood characteristics, etc.—will influence the kinds of new land and water uses that could be attracted to the waterfront. Perturbations in the quantities of natural resources available for harvest, and changes in management policies affecting who can

harvest them, will have major consequences for some existing resource-dependent waterfront industries. When selecting communities in which to invest scarce federal, or state planning and project development funds, state coastal managers need to understand these contextual factors and the limitations they impose on waterfront revitalization.

4.3.2 Local Governments' Role in Waterfront Revitalization

Waterfront revitalization is largely the business of cities. While CZM programs can designate specific deteriorated waterfronts as targets for state funding and technical assistance, and provide some initial funds, the initiative to act on such designations must arise within the cities themselves. Knowledge about, and the skills needed to achieve waterfront revitalization are often available in larger cities' planning, community development, and public works departments, but smaller cities will have to contract with urban design and planning consultants, and waterfront development experts for such knowledge and skills. More often than not municipal governments team up with ports and public development corporations and private sector interests to take on large city waterfront projects. In addition to CZM, cities seek federal urban renewal and community development funds for planning, site acquisition, site clearance and cleanup, and new infrastructure along the waterfront.

4.4 Methodology

4.4.1 Overview

The results of State CZM programs' involvement in waterfront revitalization fall on a continuum. At one end of the continuum are the CZM laws and policies that shape a state's coastal agenda for its urban waterfronts and provide the authority and tools with which to address it; at the other end are on-the-ground outcomes—physical improvements to deteriorated waterfronts such as refurbished buildings, improved infrastructure, and new economic activity. In the middle are the initial application of CZM tools and processes (e.g. financial and technical assistance being provided to local cities) and the intermediate results achieved through the use of these tools—process outcomes—such as feasibility studies undertaken, or waterfront plans developed.

Our approach to assessing the effectiveness of CZM in assisting state's achieve these outcomes will be to document the linkage between a state CMP's policies, its application of CZM tools in specific waterfront districts and their effects throughout the stages of waterfront revitalization realized in those districts. The result is a measure of the *relative* contribution each state CMP has made to the on-the-ground results achieved in each waterfront.

We began by constructing "profiles" of each state's CMP and its treatment of waterfront revitalization as an issue in the state. The information for each profile was assembled through detailed surveys of state CMPs' officials, augmented by a thorough review of program documents

and reports on states' program achievements. From these profiles, a database was created with a record for each waterfront district and summary records for state and national aggregates. Each record contained fields for CZM policies; CZM grant funds and total dollars invested; stages of revitalization reached; scope of revitalization achieved; and CZM tools utilized, their importance, rank and effectiveness as judged by CMP managers.

4.4.2 CZM Tools and Processes

Table 4.1 lists the tools we believe to be in use by states' CZM programs and the indicators that provide evidence of their use. The tools fall into three categories: Proactive, supportive and reactive. *Designation, SAMPs,* and *partnerships* are proactive tools used by the states to signal to local cities and towns that specific waterfronts are deteriorated, that it is state policy that they should be revitalized, and that the state CMP will assist them in the process. *Financial assistance, technical assistance,* producing *guidance documents* and undertaking *education and training* programs are tools the states can use to support local revitalization efforts, once they are initiated. When local waterfront plans and projects are proposed, *LCP amendment review*, and *project review* and *environmental review* are tools states may use to react to local initiatives and ensure the multiple CZM objectives described above are being met.

4.4.3 Scoring Tools and Processes Used

In assessing the states' contributions to waterfront revitalization we felt that a higher weight should be given to the use of *proactive* tools than to *reactive* tools. And some *supportive* tools are more important than others—financial assistance to local governments, in particular. We therefore propose weighting the tools in use as shown in Table 4.1. These weightings will be used in assessing the contributions states have made to achieving the on-the-ground results in revitalizing waterfront districts discussed below. An *ideal* waterfront revitalization program would have access to this complete suite of tools.

State program managers were asked to rate the importance of tools in use in their states' CMPs on a scale of Low (1), Medium (2) and High (3). Their mean ratings, in general, correspond well with the author's weightings, but there were some exceptions. Managers rated Designating waterfront districts—a *proactive* tool—and Education & Training and Guidance Documents—*supporting* tools—lower than any of the *reactive* tools at their disposal. And, while rating Financial Assistance higher than any other tool, it was by much less than the author's 2:1 weighting margin. CMP managers' ratings appear to be skewed by the differences in the suites of tools available among their programs. For example, while any state's CMP has the prerogative to provide federal CZM §306 funding assistance to local governments, far fewer have the authority to

Table 4-1: PROCESSES/TOOLS AND INDICATORS

Process/Tool	Indicators	Author's Weighting	CMP Managers' Rating
Proactive Tools			
Designation of Deteriorated Waterfront Districts	Number and identity of waterfront districts designated for W-R in states' CZM program documents	2	1.9
Partnerships developed by state CMP with or between cities and other agencies and institutions	Number and identity of revitalizing waterfront districts engaging in partnerships with, or fostered by state CMP	2	2.5
Special Area Management Plans (SAMPs) undertaken that identify revitalization opportunities	Number and identity of waterfront districts affected by SAMPs	2	2.1
Supportive Tools			
Financial Assistance to Local Governments	Dollars awarded through grants to cities for developing W-R plans or implementing W-R plans and projects; number and identity of revitalizing waterfront districts receiving grants	4	2.6
Technical Assistance to Local Governments	Character of W-R technical assistance projects undertaken by states' CZM programs; number and identity of revitalizing waterfront districts receiving technical assistance	2	2.4
Guidance Documents and Publications developed by states' CZM programs	W-R guidance documents produced for use by local governments or others; number and identity of revitalizing waterfront districts using guidance documents	2	1.8
Education and Training	Workshops, seminars, conferences and short courses sponsored or co-sponsored by states' CZM programs; number and identity of revitalizing waterfront districts participating	2	1.9
Reactive Tools			
Local Coastal Program Review	Authority in state to review LCPs; number and identity of revitalizing waterfront districts affected	1	2.1
Review of Waterfront Projects	Authority in state to review waterfront projects; number and identity of revitalizing waterfront districts affected	1	2.4
Review of Environmental Impacts	Authority in state to conduct environmental reviews of plans and/or projects; number and identity of revitalizing waterfront districts affected	1	2.2

review amendments to LCPs or waterfront projects permitted locally; and, those that do place a high rating on their importance.

4.4.4 Process Outcomes

A *process outcome* is an intermediate step in the progression from a pure process (e.g. awarding a grant) to a pure on-the-ground outcome (e.g. a rebuilt waterfront pier). In the process of waterfront revitalization the most common intermediate outcome is a waterfront plan . Often, a much more complex series of planning and design activities must be undertaken before waterfront revitalization projects are begun: soils engineering studies, environmental surveys and assessments, market feasibility studies, archeological surveys, or urban design studies are commonly undertaken in larger cities' waterfronts. But the outcome of these studies will likely lead to the development of a waterfront plan.

4.4.4.1 Process outcome indicators

- waterfront plan underway
- waterfront plan completed

In some cases—particularly small town waterfronts—projects may be undertaken without benefit of a formal plan, simply because they are needed and have public support. A new boat landing, a short boardwalk, or a waterfront street end park can stand alone as a simple improvement that leads to private investment in adjacent properties.

4.4.5 On-the-ground Outcomes

"On-the-ground" outcome indicators are designed to capture three dimensions of revitalization: the *extent* of revitalization occurring in a state, the *stage* of revitalization achieved in each waterfront district and *scope* of waterfront improvements, programs and activities realized.

The *extent* measure provides, for each state, evidence of the number of waterfront districts in coastal communities that have received some form of waterfront revitalization assistance from the state's CMP; this information could be compared to the number of waterfronts targeted for revitalization in state CMPs, where such a list has been created.

The *stage* measure enables us to account for and compare progress being made in revitalizing waterfronts of different kinds and scales and measures the maturity of waterfront revitalization achieved in each district receiving assistance from CMPs.

The *scope* measure, captures the diversity of waterfront improvements, programs and activities achieved, and reveals the range of other coastal management goals being realized through waterfront revitalization.

4.4.5.1 On-the-ground Outcome Indicators

Extent Indicator

- number of waterfront districts undergoing revitalization in a coastal state

Stage Indicators

- waterfront improvement project underway
- one or more projects completed
- infrastructure and multiple projects developed
- completely revitalized waterfront (see definition at section 4.2.1, supra)

Scope Indicators

- public access—parks, plazas, boardwalks, viewing towers, interpretive signage, other access
- marine activity—guest boating facilities, commercial boating facilities, fishing piers, water tours, other marine
- historical/cultural structures/sites conserved
- landside economic activity—retail/restaurant, hotels, marine industries, tourist centers, other landside
- clean-up/environmental restoration
- festivals or maritime events

4.4.6 Scoring Outcomes

Simple numerical "scores" can be constructed to indicate the *stage* of revitalization reached in each waterfront district. Districts would score one point for starting a waterfront plan, and two points for completing one. Additional points would accrue for undertaking a development project, completing a project, completing multiple projects and infrastructure upgrades, and for completely revitalizing the waterfront. Maximum possible *stage score* is six (6).

Similarly, to indicate the *scope* of revitalization achieved, points would accrue for each kind of improvement that advanced CZM goals—enhancing public access, giving priority to coastal dependent industry, restoring degraded environments, conserving historic sites and structures, etc. Landside developments such as restaurants, retail establishments, or hotels that enlivened the waterfront, as well as waterfront festivals and other events, would add to the district's score. (Multiple examples of a single kind of improvement do not add further points since the object is to score the *diversity* of improvements, not their *number*.) Maximum possible *scope score* is twenty (20).

Purists might argue that improving public access, or contributing to the retention of coastal dependent industries should receive more weight than developing waterfront restaurants, retail establishments, or hotels. Our position will be that each kind of waterfront improvement listed above has the potential for enhancing the vitality of the whole waterfront district for the benefit of a broad spectrum of users. We deliberately excluded from this list uses that have predominately private benefits and exclude the public from the waterfront—in particular, private housing and commercial office space. Such uses may be necessary to produce revenues in adaptively reused

buildings, worthy in their own right for conservation. Our points go to conserving the structure, not to the residential or office uses it houses.

These scores provide a means for comparing the results achieved on a community-by-community basis; and, when averaged across all communities in a state, provide coarse measures of a state's achievements to date in addressing this CZM issue area. None of the outcomes—extent, stage or scope of redevelopment achieved—can be attributed to a state's CMP unless a link is established back to relevant CZM policies and the use of CZM tools to realize them; otherwise, the credit properly belongs to the cities themselves. Documenting such links became the most challenging component of our data gathering and effectiveness assessment protocols.

4.4.7 Assessing Effectiveness

Our approach to assessing the effectiveness of CZM in assisting states achieve these outcomes follows the overall CZM Effectiveness Study's approach discussed in Hershman, et al. (1998). We attempt to document the linkage between a state CMP's policies, its application of CZM tools in specific waterfront districts and their effects throughout the stages of waterfront revitalization realized in those districts. The result is a measure of the *relative* contribution each state CMP has made to the on-the-ground results achieved in each waterfront.

For the purposes of this study a CMP will be considered effective if the following four conditions are satisfied:

- the CMP has articulated through formal policy or other means (such as guidance documents) the state's intent to assist cities revitalize their deteriorated or under-utilized waterfronts
- the CMP has provided financial and/or technical assistance, or entered into another form of active partnership with such cities, to plan for and implement waterfront revitalization
- on-the-ground improvements have resulted that bring social and economic benefits to the community, and
- the community has achieved other coastal management goals on its waterfront, including enhancing public access to the water, giving priority to water-dependent industry, restoring degraded environments, and conserving historic sites and structures

4.5 Data Sources

4.5.1 Context Factors

There is a paucity of consistent, systematically-organized data on towns and cities in the states' coastal zones at both state and national levels. Some state program documents provided general descriptions of the condition of their urban waterfronts at time of program approval and identified some of the causes of abandonment or deterioration. A few other states produced a list of their

coastal towns. However, except where specific waterfronts were designated as Geographic Areas of Particular Concern (GAPCs) in a state's coastal program, the number of waterfront communities and districts that might be targeted for revitalization in each state was unknown.

Atlases and general geographic sources were used to identify context factors where the state's program documents were silent.

4.5.2 State Laws and Policies

State CZM Program documents—FEIS's in most cases—provided baseline information about the structure, scope and legal authorities of each states' program and the way it addressed waterfront revitalization. Written and/or oral responses to our questionnaire, discussed below, augmented and updated information gleaned from program documents and identified any significant program changes. Other national CZM studies, notably Knecht and Cicin-Sain's (1995) publication reporting the results of his survey of professionals' opinions on CZM accomplishments, Brower's (1991) expenditure-based study of program achievements, a recent CZMA §309 program improvements study (Coastal Resources Center, 1994) and an OCRM "work in progress" database detailing §312 state CMP program evaluation information from the last twenty years, were consulted for richer insights into the operational aspects of states' programs. For those states that neither returned our phone calls nor responded to our questionnaire the information available in these published sources constituted our sole source.

4.5.3 CZM Processes and Tools

While the availability of certain tools to effect waterfront revitalization could be inferred from official program documents (e.g. oversight of local coastal plans or review of permits issued by local government, etc.), interviews with state officials provided the richest source of information. Some state's were unable to identify the tools used in specific waterfront communities or districts, preferring instead to characterize tools used in a statewide context. This is not surprising since some of the generic tools identified in our survey (e.g. education and training, guidance documents and publications) are usually available to all local jurisdictions—sometimes in other states—but establishing the fact of their use in a specific waterfront is difficult. For example, did staff from a specific coastal community attend a state CZMP-sponsored workshop, or read a guidance document published by the program? And, if they did, was the information actually used in undertaking a waterfront revitalization plan or project?

4.5.4 Process and On-the-Ground Outcomes

To identify waterfront communities and districts where revitalization efforts had taken place, we relied primarily on written survey data and telephone interviews with state officials. In turn, they

used state CZM grants awards data, where available, to augment staff's familiarity with their state's waterfronts. However, where states did not respond to our survey, we had no access to consistent, systematically-organized national data on §306 and §306A expenditures to point us towards specific communities and districts where CZM-funded waterfront plans and projects had been undertaken. Similarly, the paucity of consistent, systematically-organized data on towns and cities in the states' coastal zones at both state and national levels referred to earlier, severely limited our capability to assess the completeness of outcome data collected from state officials.

The scope of the research tasks undertaken by the investigators generally precluded contact with officials or staff in individual cities revitalizing their waterfronts—the sheer numbers of phone calls would have overwhelmed our graduate student assistants and telephone resources.' Unfortunately, it is at the municipal level where the richest data and qualitative information are to be found: project-scale financial information, attendance records of waterfront festivals and events, "before and after" photographs showing the design features of redeveloped waterfront sites. We simply had neither the time nor resources to explore this rich layer of data[2].

4.6 Survey design, testing, and refinement

A questionnaire was designed to gather responses to a list of questions based on the process and outcome indicators outlined above. During December, 1995, and January, 1996, the survey was mailed to five states, and follow up interviews were conducted with state CZM program officials in SC, HI, PA and OR. The poor responses to several detailed waterfront district land use and land area questions caused substantial revisions to, and simplification of, the questionnaire before a second version was mailed to another five states in February, 1996. Minor adjustments were made following review of the preliminary survey results by the Study Team during its second meeting in Washington, DC., March 17-19, 1996, and the revised questionnaire was mailed to all 29 states and territories with approved coastal programs.

Between the team meeting in March and the July 16-17 meeting in Seattle, approximately ten states had completed and returned surveys. As the data were being processed and our methodology tested, it became clear that more detailed information was needed to better link the use of CZM tools and processes with the outcome data that the states had provided. It also had become apparent that we were unlikely to get complete outcome data from all the states, and that, given the time and staff constraints, it would be necessary to prioritize our efforts for the remainder of the data gathering phase of the project.

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[2]For this level of detail the reader is referred to sources such as Ann Breen and Dick Rigby's handsome publication, *Waterfronts: Cities Reclaim Their Edge* which documents 75 mostly-North American, award-winning waterfront projects through color photographs and text, or other publications of The Waterfront Center that address design quality and other issues in revitalizing urban waterfronts.

Consequently, in September 1996, a supplementary survey instrument was developed and targeted at the states most likely to have been active in waterfront revitalization. Henderson's analysis of states' §306 & §306(A) expenditure categories (in Brower, et al 1991) provided an independent basis for identifying states that had had active urban waterfront revitalization programs underway between 1986 and 1990 (in Brower, 1991). Augmented by information gained from states that already had responded to our primary questionnaire by the Spring of 1996, we generated a list of 14 states to receive a supplementary survey. These states were surveyed intensively during the period from early September, 1996, into early January, 1997. (A copy of the final version of the questionnaire appears as Appendix C.)

Responses to the survey questions were used to construct "profiles" of each state's coastal management program and the way it addressed the national objective of revitalizing urban waterfronts. The state profiles provided the backbone for fleshing out a national assessment of the overall effectiveness of CZM.

4.7 Data Management

Using Panorama™ for the Macintosh, a database was created with a record for each waterfront district and summary records for state and national aggregates. Each record contained fields for CZM policies, CZM grant funds and total dollars invested, stages of revitalization reached, scope of revitalization achieved, and CZM tools utilized. To permit comparison among states, weighted scores were constructed for stage and scope of revitalization, and for the range of CZM tools available to and utilized by the state. From this database we created a "profile summary" for each waterfront district, state and the nation as a whole. (Appendix A contains national and state profile summaries.)

4.8 Data Reliability and Quality

4.8.1 Institutional Memory

Our heavy dependence on surveys and interviews for collecting process and outcome data presented some insuperable problems. Many states' programs are now 15-20 years old and original senior staff and program managers have retired or moved to other positions. As a consequence, institutional memory of program activities that occurred even as recently as a decade ago has been lost. Files containing the early history of the coastal program, in some cases, have been archived or are otherwise inaccessible, and computer-accessible information is often limited in age, depth and completeness. In short, many states could not answer—or answer easily—some of the most basic questions concerning their activities in urban waterfronts since time of program approval. (Appendix D contains a table showing, state-by-state, the source and quality of data we used to construct state profiles.)

4.8.2 Multiple Viewpoints and Interpretations

Many of our questions required judgment and interpretation: ranking the importance and effectiveness of CZM tools, assessing the importance of waterfront revitalization as an issue in the state at some past time. Different individuals made different judgment calls on these questions. To whose opinion, then, to give most weight? And, how should these opinions be assessed against independent data sources?

4.8.3 Agency Staff Loads

Finally, some states' programs have suffered severe staff cuts in recent years; fewer staff remain to carry out the same or expanded work loads. And like the sheep on the commons, sometimes there were just too many of our investigators and graduate student assistants grazing on state programs staffs' time... Understandably, but regrettably, the demands we placed on these staff, in some cases, overwhelmed their capacity to respond in a timely fashion, if at all. Several states could provide descriptive data for only a portion of the waterfront districts they had assisted in revitalizing, thereby severely limiting a complete and accurate treatment of their states' program achievements.

4.8.4 Investigators' Biases

The investigators are much more familiar with the West Coast states' CMPs than with those from other regions. In some cases they or their colleagues have been involved professionally with revitalizing waterfronts in their home states. Consequently, the contextual information as well as process and on-the-ground outcome data are more richly represented in these states' profiles and analyses.

5.0 Research Findings

5.1 National Results

5.1.1 Issue Prioritization

Urban waterfront revitalization is presently considered a high priority in 13 of the 29 state CMP's, a medium priority in four states and low to medium-low priority in eight states; four states did not rate the priority of the issue. Prioritization of waterfront revitalization gained in importance from program inception to the present in nine states, stayed the same in twelve, and decreased in importance over time in four states. (See Table 5.1.) What is surprising is that some of the most active CMP's in revitalization efforts rated the issue as a low priority at time of program approval.

Table 5.1: STATES' COASTAL PROGRAM MANAGERS' RATING OF THE IMPORTANCE OF WATERFRONT REVITALIZATION AS AN ISSUE IN THEIR STATES

Issue Importance	At Program Approval	1980 Amendments	Present	Direction of Change
High/Med-High	7	8	13	9 More Imp.
Medium	11	7	4	12 Same Imp.
Low/Med-Low	7	8	8	4 Less Imp.
Unknown	4	4	4	4 Unknown
TOTALS	29	27	29	29

Several contextual factors affect the way a state's determination of issue importance changes over time. For example, in California, the importance of waterfront revitalization diminished when state bond funding ran out; and, in Washington State, following several years of intensive program activity addressing the issue, there was a switch in CMP focus to natural resource issues as high levels of sustained population growth threatened wetlands and other critical areas.

5.1.2 Coastal Management Policies

Table 5.2 shows the number of states having in place policies that directly promote waterfront revitalization and support other complementary coastal management objectives discussed earlier.

Surprisingly, this study found that in only 15 of the 29 states' CMPs was there policy language explicitly addressing *waterfront revitalization*; and that, among the 14 states without clear policy guidance in this area are found some of those most active in waterfront revitalization, as indicated either by number of revitalizing waterfronts, or the stage and scope of revitalization achieved, e.g. Michigan, Pennsylvania and Wisconsin.

On the other hand, 26 states' CMPs contained explicit policies promoting *public access*, and all 29 had language protecting *water-dependent industry*, and conserving important *historic sites and cultural features*; and 19 states CMPs contained policies promoting *restoration of degraded coastal*

environments. These affirmative coastal policies give guidance on the shape and content of waterfront revitalization.

Other policies identified as helpful in achieving appropriately-sited, high-quality waterfront redevelopment included *visual design standards* to control views of the water from land and preserve appropriate scale and massing of development; and, *harbor management planning*, to ensure compatibility between land and water uses and the efficient utilization of scarce shoreline space.

Table 5.2: STATE COASTAL PROGRAM'S POLICIES AFFECTING WATERFRONT REVITALIZATION

POLICIES	(Number of States)
Waterfront Revitalization	15
Public Access	26
Water Dependency	29
Hist/Cultural Conservation	29
Environmental Restoration	19
Other Policy	4

5.1.3 Coastal Management Tools Used

In the 244 individual waterfront districts for which we have *tools* data, the most frequently used coastal management tools used by the states' CMPs to assist communities redevelop their waterfronts were, in order of use, *financial assistance* (208 districts), *partnering* (180) and *technical assistance* (168). (See: Table 5.1, above.) In one hundred-twenty five districts all three

Table 5.3: STATE COASTAL PROGRAM'S POLICIES AFFECTING WATERFRONT REVITALIZATION

TOOLS	(Number of Waterfront Districts)
Designation	49
Financial Asst.	208
Technical Asst.	168
Guidance Documents	74
Education & Training	53
Partnering	180
SAMPs	17
Local Coastal Prog. Review	83
Project Review	128
Environmental Review	103
Other Tools	2

tools were used as a suite. Managers usually ranked these tools first or second in importance for addressing this issue in their programs. (See: Table 5.4, below.)

Tools used to affect the quality of waterfront projects and to ensure other coastal management goals were being addressed included technical *reviews of waterfront projects* (128) and review of their *environmental impacts* (103). These two tools were applied jointly in 89 waterfronts and were ranked, on average, second by program managers who used them. Review of *amendments to local coastal programs* as a way to ensure statewide interests were being addressed in waterfront revitalization plans, occurred in 83 districts, and managers who used this tool placed it in a third ranked tier. *Designation* of deteriorated waterfront districts for attention in states' programs occurred in less than 50 instances, but those managers whose programs used this tool ranked them, on average, better than second in importance to technical and financial assistance, and partnering.

Table 5.4: IMPORTANCE & RANKING OF TOOLS—SUMMARY FINDINGS

Tool	Importance		Rank	
	Mean	Times Scored	Mean	Times Ranked
Fin. Asst.	2.6	14	1.5	13
Partnerships	2.5	13	1.7	12
Tech. Asst.	2.4	14	1.3	11
Project Rev.	2.4	14	2.0	12
Environ. Rev.	2.2	13	2.0	9
SAMP	2.1	9	2.0	5
LCP	2.1	8	2.6	7
Designation	1.9	12	1.9	7
Ed. & Tr.	1.9	12	2.0	7
Guidance Docs.	1.8	14	2.0	11

(Importance scores High: 3; Med: 2; Low: 1. Rank 1st: 1, 2nd: 2, 3rd: 3)

Table 5.4 shows, in summary form, the way CMP managers in the states' assessed the coastal zone management tools that they used to effect waterfront revitalization in their states. These tools, identified earlier in Table 4.2, above, were rated for their importance—(L)ow, (M)edium, (H)igh—and the top three were ranked. Within the state's most active in waterfront revitalization there is a consistent use of three tools and a high ranking of their importance. Clearly, *financial assistance* to local government to develop plans and projects through the §306 and 306A grant programs, staff *technical assistance* to local communities, and *partnering* with federal, state, and local agencies, and private entities are the most widely used *suite* of tools. And state CMP officials judged them to be the most important.

5.1.3.1 Financial Assistance

Table 5.5 shows the aggregate level of CZM grants awarded by state CMPs to local government for waterfront revitalization plans and projects, and the total monies invested by public and private entities that we were able to document in this study.

The study identified over $30 million in federal and state CZM grants awarded to local governments undertaking waterfront revitalization plans and projects in two thirds of the waterfront districts. Because many states were unable to provide expenditure data, this number greatly underestimates the true magnitude of CZM funds invested in revitalizing the nation's urban waterfronts. The amount of non-CZM public funds invested in those same waterfronts is also largely unknown.

Table 5.5: CZM FUNDING IN WATERFRONTS

FUNDING	($000's)
CZM Funds	$30,100
Total Funds Invested	$429,784

We had hoped that *total $s invested* would provide a sound measure of the propensity of state CMP's investments in waterfronts to attract other public and private capital. Unfortunately, this was the most elusive datum we sought, and our results are spotty and incomplete. Private capital investment in physical waterfront improvements and programs for waterfront art and events is vastly greater than the $430 million identified through the study's surveys. For example, one state—Connecticut—identified private/public funding ratios of 1,000:1 resulting from state waterfront revitalization expenditures[3] —a "return" 77 times greater than the 13:1 ratio documented in this study! And in Michigan, the revitalization of Detroit's deteriorated industrialized waterfront was initiated by a CZM-funded $82,000 grant, "Linked Riverfront Parks Master Plan". The project was designed to create several parks along the Detroit River that are linked by a bike path system. This linked park system has stimulated millions of dollars in private investment and has created an estimated 1,200 new jobs. The investment resulted in $37 million of additional federal, state and local government funds. In turn, those dollars have stimulated $210 million of private investment in housing, office and commercial development.

5.1.3.2 Technical Assistance and Partnerships

Providing *technical assistance* to local government, and engaging in *partnerships* with individual communities and other agencies lead the tools used in more than half of the identified waterfronts in which states' programs have been engaged, and were used jointly with financial

[3]See Connecticut's state profile in Appendix_.

assistance in 125 waterfront districts. Technical assistance by state CMP staff comes in a variety of forms including assistance in preparation of waterfront revitalization plans to ensure compliance with state standards; providing expertise to address specific, substantive issues in waterfront revitalization such as historic preservation, or financing public projects; or help in resolving complex environmental clean-up tasks that require multi-agency cooperation.

Most state programs characterized their relationship with waterfront cities as the principal *partnership* for effecting waterfront revitalization, particularly in cases where the participation of cities in waterfront planning was voluntary. Productive partnerships have been forged with other state agencies having community development or planning assistance programs, with sea grant colleges' advisory/extension program staff for educational purposes, and with other federal agencies.

5.1.3.3 Other Processes and Tools

Education and training programs and use of *guidance documents* produced for local governments have been utilized in less than a quarter of the districts, but this number is "soft" and probably underrates the use of these important tools nationally—guidance documents produced in one state may find use in neighboring states or across the nation. In some cases, this pair of tools is used jointly to promote waterfront revitalization and to educate local officials about grants and other assistance programs available from state and federal sources.

State *review* by CMP staff of *Local Coastal Programs (LCPs)* and amendments to them, is an important tool to affect waterfront revitalization in states where LCPs are mandated, but also in states where voluntary local coastal planning, once undertaken, is subject to state review. Compliance with other state CMP goals—enhancing public access, protecting water-dependent industry, etc.—can be assured during review of plan amendments designed to implement waterfront redevelopment objectives. Review of LCPs was utilized in more than 25% of revitalizing waterfront districts, nationwide.

Project review and *environmental review* by the states' CMP agencies were, respectively, the fourth and fifth most-used tools. Through these reviews of waterfront redevelopment projects, Public Trust rights can be secured and environmental protection assured. Such reviews are carried out through specific authorities given to state CZM agencies to review locally-issued permits, through consistency provisions which empower those same agencies to review permits or licenses issued by other state or federal agencies, or through National Environmental Policy Act (NEPA) and state-level "little NEPA" environmental reviews of governmental actions.

Special Area Management Plans (SAMPs) appear to have contributed little to revitalizing waterfronts; we could identify only 17 waterfront districts in seven states that had been affected by use of this tool, and not all benefited, as some SAMPs failed to be adopted. A SAMP's highest

value for this issue area appeared to be in identifying deteriorated urban waterfront districts within larger geographic zones (bays, estuaries, etc.) and the opportunities these districts might present for revitalization; or, designating certain shorelands surplus to the needs of ports and marine industry, and zoning them for urban development. Such lands become surplus either because excessive areas of shorelands were zoned for industrial use at time of program approval and demand for these uses did not materialize, or because major industries have closed their plants and left behind underutilized or vacant sites.

We discovered 49 waterfront districts in seven states that had received formal *designation* in states' CMPs either as *geographic areas of particular concern* (GAPCs) eligible for federal §306 assistance, or some similar designation under a state program provision targeting them for special planning attention. In many cases these were active port areas threatened by intrusion of non water-dependent uses. Focusing limited financial and staff resources on high priority waterfront districts can be particularly appealing to states wishing to take a strongly proactive role in waterfront revitalization.

Other tools identified during interviews included *advocacy* of local waterfront revitalization plans by state CMPs during contested project permitting proceedings; state review of the "scoping" of work plans developed by local ports and municipalities prior to undertaking *port master plans*; and, mandated *periodic review of LCPs* to check that land and water use zoning and regulations are functioning as intended.

5.1.4 On-the-ground Outcomes

This study has identified 303 urban waterfront districts in the nation's coastal zone that have benefited from the 25 state and territorial coastal management programs for which we have substantially complete data. The real number of revitalizing waterfronts is undoubtedly higher since some state programs gave us only a selected subset of their complete suite of waterfronts undergoing revitalization. These waterfront districts range in size and complexity from small bayfront villages along coastal estuaries to redevelopment areas abutting the densely populated metropolitan shores of some of the nation's largest cities.

Table 5.6 shows the aggregate national results of the study, including the extent of revitalization undertaken, stage of revitalization reached and scope of outcomes achieved.

5.1.4.1 Extent of Revitalization

The distribution of these 303 waterfront districts among coastal states is highly uneven: The states most active in this enterprise have extensive shorelines harboring communities that have been impacted by industrial change: manufacturing plant closures due to decline in the metals and heavy fabrication industries, and contraction of ports around the Great Lakes (New York, Michigan,

Wisconsin and Pennsylvania); decline and restructuring of resource-dependent industries—fishing and wood products harvesting and manufacturing—in the Pacific Northwest (Washington) and New England (Maine); and, contraction of defense-based industries and closure of military bases (California). The mid-Atlantic, southeast and island states have far less extensive activity in this program area (See Table 5.7, below).

Table 5.6: NATIONAL RESULTS—OUTCOMES

TYPE OF OUTCOME	Number of Waterfront Districts	Percent of Waterfront Districts
EXTENT OF REVITALIZATION		
Total Number of Waterfront Districts Identified in Study	303	100%
STAGE OF REVITALIZATION		
Plan Underway	42	14%
Plan Complete	200	66%
Project Underway	32	11%
Multiple Projects Underway	31	10%
Infrastructure & Projects Complete	112	37%
Revitalization Complete	30	10%
SCOPE OF REVITALIZATION		
Landside Development		
Retail/Restaurant	82	27%
Hotels	33	11%
Marine Industry	63	21%
Tourist Centers	55	18%
Other Landside	33	11%
Public Access		
Parks	163	54%
Plaza	51	17%
Boardwalks	127	42%
Viewing Towers	79	26%
Signage	86	28%
Other Access	43	14%
Marine Activity		
Guest Boating Facilities	109	36%
Commercial Boating Facilities	78	26%
Fishing Piers	108	36%
Water Tours	43	14%
Other Marine	36	12%
Other		
Historic/Cultural Conservation	72	24%
Environmental Cleanup/Restoration	55	18%
Festivals & Events	72	24%

5.1.4.2 Stage of Revitalization

Revitalization is "complete" (as defined in 4.2.1 above) in only 10% of these districts identified in this study, but in more than one third of these waterfronts investments have been made to improve infrastructure and develop multiple projects. In an additional 14% of these districts, at least one redevelopment project is underway. Revitalization plans have been developed with CZM assistance or funding in 200 waterfront districts, and are currently underway in 42 others.

5.1.4.3 Scope of Revitalization

The most common waterfront improvements undertaken are those which enhance important national CZM goals, i.e. increasing public access, fostering water-dependent uses and activities , conserving important cultural and historic resources, and restoring degraded urban coastal environments. Environmental cleanup has been undertaken in at least 55 sites. To reconnect people with their waterfronts, over half the revitalizing districts have developed shoreside parks; and over one third have built fishing piers, or boardwalks. Viewing towers or interpretive signage to augment physical access to the shore are installed in 25% of the districts.

Marine activities for visitors and tourists include harbor tours (43), guest facilities for recreational boating activity (109), and other miscellaneous water-based activities such as historic vessels, boat ramps, charter fishing boats, dinner cruises and marine educational facilities. Facilities for commercial boating activity were found in 79 of the districts harbors; other commercial marine facilities included ferry terminals and boatyards. In at least 20% of the communities, a healthy complement of landside marine support industry has been fostered; the list includes cargo handling facilities, fish auction houses, marine science centers, and ferry terminals.

Enlivening the landside of one-in-four of the districts are restaurants and/or retail establishments; a smaller number have tourist services centers (55) and hotels (33). Other facilities on land that were identified included convention centers, aquariums, casinos, marine science educational facilities and, poignantly, fishermen's memorials to commemorate those lost at sea.

Historic buildings and sites have been restored, conserved or protected in almost one quarter of the waterfront districts. Festivals and other events that celebrate communities' linkage to the sea took place at over 70 sites.

5.2 State Outcomes

5.2.1 Overview

Table 5.7 summarizes the outcomes achieved by state CZM programs: column 1 shows the *extent score*, or the number of waterfront districts that have undergone, or are undergoing revitalization, in which the state CMP has invested CZM resources—funds, state CMP staff time, etc. Column 2 shows the amount of federal §306 or §306A and state CZM funds invested in them. Next is shown the *estimated* total public and private investment in these waterfronts. In the fourth

and fifth columns, appear the two other outcome measures of the revitalization process—*stage* and *scope score* , discussed above.

Table 5.7: STATE OUTCOMES

State	Extent Score (No. of Active Waterfront Districts)	Documented CZM $s (000s) Invested	Documented Total $s (000s) Invested	Stage Score (Max: 6.0)	Scope Score (Max: 19.0)
Alaska	13	No Data	No Data	3.2	3.9
Alabama*	0	—	—	—	—
American Samoa	1	No Data	No Data	4.0	5.0
California	16	$15,818	$51,627	3.8	3.2
Commonwealth of Northern Mariana Islands	No Data	No Data	No Data	No Data	No Data
Connecticut	9	$105	$291,025	5.3	5.0
Delaware	No Data	No Data	No Data	No Data	No Data
Florida	14	$103	$331	2.8	3.0
Guam	1	$0	$0	1.0	0.0
Hawaii	1	$0	$0	5.0	16.0
Louisiana*	0	—	—	—	—
Maine	19	$201	$1,259	3.7	3.5
Maryland	15	Yes	$89.55	3.5	3.6
Massachusetts	13	$0	$0	3.2	2.9
Michigan	20	$3,465	$49,500	4.0	5.2
Mississippi	8	No Data	No Data	3.3	5.3
New Hampshire	10	$134	$1,201	4.0	2.0
New Jersey	7	No Data	No Data	3.0	9.8
New York	45	$2,741	$2,979	3.3	6.2
North Carolina	8	$701	$22,043	1.5	4.8
Oregon	11	$275	$2,916	3.7	7.9
Pennsylvania	21	$3,136	$3,136	2.7	3.3
Puerto Rico	3	$0	$0	4.0	7.0
Rhode Island	No Data	No Data	No Data	No Data	No Data
South Carolina	9	$0	$0	3.6	9.6
Virgin Islands	No Data	No Data	No Data	No Data	No Data
Virginia	12	$277	$475	1.4	1.7
Washington	28	$1,670	$1,670	4.2	11.0
Wisconsin	19	$1,450	$1,450	5.1	4.7
US TOTALS	303	$30,099	$429,784	3.5	5.2

There is much variation among states in the numbers of waterfronts they have helped revitalize and in the stage and scope of revitalization reached in each waterfront. It is useful, for discussion purposes at least, to compare groups of states on the basis of two of these outcomes—stage and

* Waterfront Revitalization was not deemed an issue warranting state CMP attention in Alabama and Louisiana

Table 5.8: STATE COASTAL MANAGEMENT PROGRAM GROUPINGS BASED ON STAGE & SCOPE OF WATERFRONT REVITALIZATION OUTCOMES

	Advanced Stage (Score ≥4.0)	**Middle Stage (Score 3.0-3.9)**	**Early Stage (Score<3.0)**
Broad Scope (Score>6.0)	(Hawaii) (Puerto Rico) *Washington*	(New Jersey) *New York* Oregon (South Carolina)	
Moderate Scope (Score 3.5-6.0)	(American Samoa) Connecticut **Michigan** New Hampshire *Wisconsin*	(Alaska) Maine Maryland (Mississippi)	*North Carolina*
Limited Scope (Score<3.5)		**California** (Massachusetts)	Florida (Guam) Pennsylvania Virginia

Legend for State Program CZM funding (§306, 306A & state grants) for waterfront plans and/or projects in support of revitalization:

Text Symbol	**CZM Dollars Invested (per Waterfront District)**
State name in plain text	<$50,000
State name in italics	$50,000 - $99,999
State name underlined	$100,000 - $149,999
State name in bold	>$150,000
(State) name in parentheses	Unknown level of funding

scope of revitalization—since these indicators measure the degree of completion reached in revitalization and the satisfaction of multiple coastal management goals achieved along the way. But, recalling caveats stated in an earlier section of this report, CMPs must play the hand they are dealt with respect to both the number of waterfronts in their states needing revitalization and the susceptibility of those waterfronts to being revitalized. The mix of type, size and condition of urban waterfront districts in a state forms a contextual constraint on what those communities can themselves expect to accomplish on the ground, and by extension what the state's CMP can help them achieve.

Table 5.8 shows nine groups of state programs displayed as a matrix. These groups are based on their scores—*Early, Middle, Advanced* for *stage* of revitalization, and *Limited, Moderate,*

Broad for program *scope* (both scores averaged across all waterfront districts in the state). The numeric ranges of *stage* and *scope* of revitalization scores that define each group are shown in parentheses in the group sub-headings. Also shown in this table is the level of funding for waterfront revitalization, including federal CZM §306 and §306A and state CZM grants awarded to local government for waterfront studies, plans and projects. Funding is used as one indicator of program activity level, and is expressed as average dollar outlays *per waterfront district.* The range of funding level into which a state falls is displayed in the style of text used for the state name in the matrix. The waterfront revitalization activities of the grouped states' CMPs, including the evolution of the importance they attached to the issue, the tools and processes they used and the results achieved, are discussed briefly below.

5.2.2: State-by-State Review

5.2.2.1 Advanced Stage/Broad Scope (≥4.0/>6.0)

Three states form this group—Hawaii, Puerto Rico and Washington—and account for 32 waterfront districts. Honolulu, Hawaii, and San Juan, Puerto Rico, are, respectively, capitals of a tropical island state and commonwealth, and each caters to significant international tourism; both have a rich colonial history predating their current US affiliation; and, each city accommodates its island's principal port. In both Hawaii and Puerto Rico waterfront revitalization had generally low priority at time of program approval in 1978, and in 1980 when the CZMA amendments became law, and they remain low to the present day. Neither CMP has provided any financial assistance to local government to undertake waterfront revitalization plans or projects. Yet in Honolulu and San Juan, significant revitalization has been achieved in the downtown waterfronts. Honolulu's Kakaako district and adjacent downtown waterfronts have been extensively revitalized for tourism uses. In both programs the principal responsibility for urban redevelopment lies in networked agencies—Hawaii's Community Development Authority and Puerto Rico's Planning Board—which, in turn, are required to incorporate CZM goals in their planning and land use decisions.

The decline and restructuring of resource-dependent industries—fishing and wood products harvesting and manufacturing—and the contraction of smaller ports in the Pacific Northwest caused dilapidation and industrial abandonment along Washington State's urban shorelines. In response, Washington's CMP ranked waterfront revitalization a high priority at the inception of its coastal management program and has promoted waterfront revitalization through a broad suite of CZM processes and tools— education & training programs and guidance documents, coupled with financial and technical assistance to local governments. Waterfronts along Puget Sound and the state's outer coast estuaries incorporate public access enhancements, foster retention of both commercial and recreational marine industries, and accommodate appropriate commercial landside

developments. Restaurants are considered a "water enjoyment" use and are allowed in adaptive reuse of over water structures such as the refurbished pier sheds along Seattle's Elliott Bay.

5.2.2.2 Early Stage/Limited Scope (<3.0/<3.5)

At the opposite end of the spectrum are four states: Florida, Guam, Pennsylvania and Virginia that account for 48 waterfront districts. Florida has a young and emerging program in waterfront revitalization. The issue was assigned a "medium" priority and gained little attention until recently, when it assumed a "high" priority. Significant revitalization outcomes have been realized in the Tampa, Gulfport and Pensacola waterfronts; others are still at the early planning stages.

Recently, the state's CMP agency has undertaken a formal needs assessment to guide a future technical assistance program for local coastal communities. The *Waterfronts Florida Program* has designated three small cities as *Waterfronts Florida Communities*, and has targeted a highly focused technical and financial assistance program at them.

As an issue in the state's CMPs, waterfront revitalization has had a consistent medium priority in Guam. A waterfront development plan is underway for Agana, Guam's port and capital, but few on-the-ground outcomes are yet in place.

Pennsylvania has coastal zone segments on both Lake Erie and an Atlantic estuary—the Delaware River, itself a heavily urbanized shoreline. CMP policies encourage port activities and "urban base enhancement," which might be interpreted to apply to waterfront revitalization. The state ranked waterfront revitalization a consistently "High" priority since program approval in 1980 and designated 7,444 acres of deteriorated waterfront, comprising 27 waterfront districts in Philadelphia and Erie, as Geographic Areas of Particular Concern (GAPCs). Eleven of these districts have been the subjects of more than $3 million of CZM grants and show some early signs of on-the-ground results.

If just the downtown Philadelphia and Erie waterfronts were considered, Pennsylvania would be one of the highest ranking CMPs in terms of the maturity of its revitalization activity. These score are diluted, however, by a large number of smaller waterfront districts along the Delaware River that have not realized the same advanced stage or scope of redevelopment as the metropolitan waterfronts. The state has used an extensive suite of tools to achieve its on the ground results; in addition to designating waterfronts as GAPCs, the state has used financial assistance, technical assistance, and environmental review most frequently.

At time of the CZM Effectiveness study, Virginia had the nation's youngest coastal management program, approved in 1986. Except for a few years in the early 90s, when the priority for waterfront revitalization was considered "medium" in the state, Virginia's CMP had given a low priority to the issue. Despite this low issue priority and the absence of an explicit policy addressing revitalization, the CMP agency has nonetheless created training opportunities for

its local government "coastal partners" and invested considerable §306 and 306A funds to assist twelve waterfront communities, include Newport News, Cape Charles, Portsmouth and Richmond. The resulting improvements primarily enhance public access—fishing piers, boardwalks, and trails.

5.2.2.3 Middle Stage/Moderate Scope (3.0-3.9/3.5-6.0)

Clustered in the middle of the table are four dissimilar states—Alaska, Maine, Maryland and Mississippi—accounting for 55 waterfront districts undergoing revitalization. The importance of waterfront revitalization as an issue has risen from medium at time of program approval to high today in Alaska, and has been consistently high in Mississippi; but in Maryland the issue has declined from a medium rating at program approval to low today. Maine considered waterfront revitalization a low priority from 1978 until the present and now ranks it a medium/low issue. All states but Alaska have explicit waterfront revitalization policies in their CMPs.

Alaska has used a locally-implemented designation process—Areas Meriting Special Attention (AMSAs)—to identify urban shorelines in need of development and redevelopment. The state provides financial assistance—in undocumented amounts—to local communities to develop plans and implement projects which the CMP reviews for consistency with both statewide standards and enforceable local policies. Thirteen waterfront districts and communities spread throughout this enormous state, in the Anchorage area, the Aleutian Islands, on the Seward Peninsula and in Southeastern Alaska panhandle, have benefited from CMP assistance. Of these, Skagway, Ketchikan and Sitka have realized the most extensive waterfront improvements. Commercial moorage (including cruise ship docks), tourist-serving facilities, parks and waterfront events comprise the generally *moderate* scope of improvements achieved, and reflect the important role coastal and marine tourism plays in Alaskan harbors.

Maine has explicit policies addressing waterfront revitalization. Its Waterfront Action Grant Program has provided matching grants on a competitive basis to communities for acquisition and improvement of public access sites, and has been used to implement urban waterfront revitalization plans. Besides access, Maine's waterfronts have experienced significant outcomes in commercial fishing fleet and recreational moorage, and historic and cultural conservation. Portland's downtown waterfront, South Portland, Augusta, Bath and Bangor are among the 19 waterfront districts achieving significant revitalization.

Maryland's CMP has entered into partnerships with and provided financial assistance to 15 communities along both shores of Chesapeake Bay despite according the issue a low priority since 1980. Betterton, Princess Anne and Rock Hall have reached an advanced stage of revitalization by incorporating a small number of improvements, primarily parks and public access. Annapolis has revitalized its harbor, focusing on its importance as a marine recreational center for Chesapeake

Bay. Baltimore's Inner Harbor is perhaps the best-known and certainly among the nation's most successful large city waterfront revitalization projects, but much of the planning for, and implementation of the Inner Harbor project occurred prior to 1980. Maryland CMP's involvement was focused on the public promenade, ensuring continuous public access opportunities. Public access, marine activity and environmental cleanup are the most common improvements reflecting achievement of CZM goals.

Mississippi's CMP has given waterfront revitalization a consistently high priority since program approval. The state has an explicit policy to revitalize waterfronts and designated eight cities' waterfronts as Special Management Areas. These waterfronts are: Waveland, Bay St. Louis, Pass Christian, Long Beach, Gulfport, Biloxi, Pascagoula and Moss Point. Plans are completed for all these communities and Biloxi and Pascagoula in particular have achieved significant on the ground outcomes. Through partnership with the state, all have achieved results using a suite of CZM tools that included financial and technical assistance, in addition to designation.

5.2.2.4 Advanced Stage/Moderate Scope (≥4.0/3.5-6.0)

Pairs of New England and Great Lakes states, and American Samoa comprise this group which account for over 59 waterfront districts undertaking revitalization.

Michigan and Wisconsin each have extensive shorelines harboring communities impacted by industrial change—manufacturing plant closures due to decline in the metals and heavy fabrication industries, and contraction of ports around the Great Lakes. Both states' coastal programs have rated waterfront revitalization high since the 1980 CZMA amendments and each has provided substantial CZM funding and staff resources for financial and technical assistance to their local governments. In FY 1996 almost one million dollars was to have been available to local communities in Michigan, benefiting Rust Belt industrial cities on four of the five Great Lakes—Erie, Huron, Ontario and Michigan. In addition, Wisconsin has produced guidance documents and conducted education & training programs for local governments.

In a word, both of these Great Lakes programs have *promoted* waterfront revitalization in their states through the use of a broad suite of CZM tools and processes. Among the waterfront districts benefiting from their CMPs are Detroit's Riverfront, Mackinaw and Petoskey in Michigan, and Kenosha, Kewaunee, Marinette, Racine and Superior in Wisconsin.

The importance of waterfront revitalization as an issue in Connecticut was high at time of program approval and has not diminished since then. The state has relied primarily on technical assistance, review of local plans and projects, and environmental review to affect waterfront revitalization; financial assistance has been quite limited, and designation of waterfront zones for urban development is done at the local level, not by the state CMP. Use of these tools appears to

have been effective in achieving advanced stages of revitalization in eight of nine waterfront districts, seven of which are judged to be "completely revitalized"—Bridgeport, Milford, two districts in New Haven, New London, Norwalk, Norwich and Stamford.

In New Hampshire, from 1982 when the ocean and harbor segment of its coastal program gained approval, until today, waterfront revitalization has remained a medium priority. Like other New England States, New Hampshire has strong water-dependency policies favoring ports, the fishing industry and public access. The state CMP designated the Port of Portsmouth as a GAPC to protect its port functions and accommodate their expansion, and provided financial and technical assistance to effect revitalization in Portsmouth and eight other urban waterfront communities. Plans and projects—primarily parks, trails, bulkheads and other public access improvements—have been undertaken in Exeter, Dover, Newcastle and Durham.

American Samoa has undertaken revitalization in only one waterfront district, but has achieved moderate stage and scope of development. The CMP now places a "high" priority on waterfront revitalization, up from "medium" at time of program approval in 1980. Samoa does not have an explicit policy to revitalize waterfronts . Revitalization activity is limited to Pago Pago harbor, which was designated as a Special Management Area to protect port and other coastal dependent activity, and water quality in the harbor. Improvements include a landside plaza with restaurant, guest boating facilities and marine industry.

5.2.2.5 Middle Stage/Broad Scope (3.0-3.9/>6.0)

Two adjacent metropolitan states, New York and New Jersey, together with Oregon and South Carolina comprise this grouping. In 1980, New Jersey's CMP upgraded the priority assigned to waterfront revitalization in 1978 at time of program approval from "medium" to "high," where it remains to the present. The program has explicit policy language on this issue and has utilized an extensive suite of tools to address revitalization, the most important of which are designation, project review, partnering and technical assistance. Revitalization has been undertaken in seven waterfront communities, and advanced, mature stages of redevelopment have been attained in Atlantic City, Hoboken and Jersey City. Camden and Edgewater have undertaken significant public access projects.

As an issue in its CMP, New York State has rated waterfront revitalization high since program approval in. The state has explicit policies addressing waterfront revitalization and has assisted a large numbers of communities achieve wide ranges of revitalization outcomes in terms of stage of revitalization reached and scope of development achieved. These results have been gained primarily through the use of financial and technical assistance to, and partnerships with local governments.

Since the state's CMP was approved in 1982, almost $5M of federal and state CZM funds has been invested in planning studies, and pre-construction and construction projects in 45 coastal communities where significant waterfront deterioration/dilapidation existed. Since 1991, monies from the state $100M "Environmental Protection Fund"—derived from a tax on real estate transfers and recycling fees for batteries and other hazardous materials—have been used for specific waterfront revitalization plans and projects. Concrete outcomes in the form of waterfront projects completed or underway are evident in half (23) these communities and the remainder have Local Waterfront Revitalization Programs (LWRPs) approved or approaching approval. Eighteen have developed multiple new projects with infrastructure improvements, and 2 of these communities are judged to be "completely revitalized."

The scale of waterfront revitalization districts in which CZM has played a role ranges from small villages on Long Island Sound, through abandoned industrial tracts on Lake Erie, to huge swaths of Manhattan's Hudson River shoreline. Albany, Buffalo, Oswego, segments of the shores of the five New York City boroughs, and Oyster Bay have benefited from the state's aggressive waterfront revitalization program.

South Carolina provided no information on issue importance. The state does not have an explicit waterfront revitalization policy in its CMP. South Carolina has used SAMPs and a SAMP-like planning process—the Charleston Harbor Project—to identify areas of deterioration suitable for revitalization, but has relied almost exclusively on project review to influence waterfront revitalization. However, the degree of linkage between CMP policies and some very successful revitalization results—especially in Charleston—is weak; and, therefore, the importance of the role played by the CMP in this issue area is not as evident as it is, for example, in natural resource protection.

5.2.2.6 Early Stage/Moderate Scope (<3.0/3.5-6.0)

In North Carolina waterfront revitalization has moved from holding a low priority at time of program approval in 1978, to a high priority today. The CMP has relied on financial and technical assistance, guidance documents and project review for its suite of tools to address this issue. Seven cities have undertaken waterfront revitalization including Washington, Elizabeth City, Plymouth, Hartford, Morehead City, Bayboro and Columbia. In each, waterfront projects are currently underway and public access has been incorporated in the form of parks, signage and fishing piers. Wilmington is a success story where a $180,000 CZM planning grant in 1984 has attracted $104 million in public and private investment to the Cape Fear Riverfront. Retail shops, restaurants and hotels have been developed as part of the city's revitalization effort.

5.2.2.7 Middle Stage/Limited Scope (3.0-3.9/<3.5)

In California waterfront revitalization as an issue has declined from a medium rating at program approval in 1977, to medium/low today. Three agencies share responsibility for implementing the state's CMP: The California Coastal Commission, the Bay Area Conservation and Development Commission (BCDC) and the California State Coastal Conservancy. Through the Conservancy, California has undertaken a highly focused and well funded waterfront revitalization assistance program. This study has documented sixteen waterfront districts in communities throughout the state's 1,100 mile ocean shoreline, and around San Francisco Bay, that have been improved through the Conservancy's funding and planning assistance programs, and its help in coordinating site acquisition, enhancement and restoration. The real number is probably significantly more—perhaps 50. Restoration and redevelopment of the Santa Monica Pier, Steam's Wharf in Santa Barbara, and San Francisco's Pier 7 are examples of the Conservancy's attention to high quality design and the primacy of public access in its funded projects.

The California Coastal Commission and the Bay Area Conservation and Development Commission have important regulatory oversight of the development and amendment of local coastal plans, and over development permits issued for waterfront projects by local governments. These two agencies are the regulatory partners of the Conservancy, ensuring that coastal management goals are being met during revitalization of waterfronts in their respective coastal jurisdictions.

The current focus of attention in the Bay Area is on the potential for revitalization of ten recently-closed military bases. These closures have opened up miles of previously inaccessible waterfront, but poor infrastructure and the liability issues surrounding contaminated sites have chilled the interest of local government and other public agencies in these areas.

BCDC, working with the City of Richmond and the Richmond Redevelopment Agency, crafted a Special Area Plan to revitalize the waterfront. A "new" section of the city was discovered complete with a marina, residential and commercial development including the expansion of large R&D and multi-media corporations. A Special Area Plan being undertaken with assistance from and the involvement of BCDC will revisit older policies affecting revitalization of the Port of San Francisco's downtown waterfront finger piers. Designed to prevent further Bay filling, these polices have had a chilling effect on redevelopment that could increase public access to and enjoyment of the Bay[4].

Revitalization in much of Boston's waterfront and adjacent downtown predates federal approval of the Massachusetts' CMP in 1978: James Rouse's "festival marketplace" theme was already imprinted on Faneuil Hall and the Quincy Market; redevelopment of several historic stone

[4]Information about these two waterfronts came to us too late to be included in the process and outcomes tables in this report.

wharves on the downtown waterfront for housing was complete; and Waterfront Park had been built.

The importance of waterfront revitalization as an issue has been consistently high in Massachusetts where its CMP has focused revitalization activity primarily in "Developed Port Areas," protecting water dependent industries, revitalizing ports, and promoting public coastal access, where appropriate. Commercial development is generally permitted only outside DPAs, or under very restricted circumstances on lands within them. The state has used designation (either Developed Port Areas or a Special Assistance Development Areas) to steer technical and financial assistance—in undocumented amounts—to ports and municipalities to undertake Port Master Plans or Harbor Management Plans, including South Boston, Quincy, New Bedford, Gloucester, Beverly, Salem and Newburyport. Public access and maritime industry support facilities are prominent features in these waterfronts.

In helping communities develop Port Master Plans (in DPAs), Massachusetts' CMP has encouraged reinvestment in maritime industry and steered "people place" activities to areas not needed for port or maritime industry use. An example of the results of this planning is the Quincy Shipyard Plan. (The shipyard closed in 1986.) Three communities were involved in this partnership effort: Quincy, Braintree and Weymouth, with the state providing technical assistance to develop a plan for balancing uses in this DPA. The plan calls for developing a shipbuilding/shipbuilding museum/maritime engineering and industry center. High tech and tourism uses are proposed to buffer the surrounding neighborhood from marine industry on 25% of land where commercial uses are allowed.

5.2.8 Ungrouped States

Four states (Commonwealth of the Northern Marianas, Delaware, Rhode Island, Virgin Islands) provided no data and could not be scored on either outcome measure; their level of program activity in waterfront revitalization is unknown.

5.2.9 Non-Participating States

Two remaining states—Alabama and Louisiana—had no involvement in waterfront revitalization because the subject was not a significant issue for either state; their priorities lay elsewhere.

5.3 Attribution of On-the-ground Outcomes to States' CMPs

5.3.1 Approach

Among the assumptions we made at the beginning of this study was that waterfront revitalization was the business of cities. The role of states' CMPs was to ignite cities' interest in undertaking revitalization and assist them accomplish that goal in ways that achieved other CZM objectives.

For states having, and fully utilizing, an "ideal" waterfront revitalization program, their contribution to the collective on-the-ground achievements of the cities whose waterfronts they helped revitalize would be more compelling. To the degree that states lack specific building blocks of that ideal program, or fail to utilize those they have, their capacity to effect revitalization in their coastal cities would be diminished, and so would be their share of the credit for on-the-ground outcomes achieved.

With this in mind, we asked five questions:

1. What tools are available in each state's CMP?
2. How does this suite of tools compare with those of an ideal waterfront revitalization program? (Tools Potential)
3. What tools were actually utilized, on the ground, in waterfront communities? (Tools Score)
4. What proportion of the state's CMP capacity to effect waterfront revitalization was put to use? (Tools Utilization)
5. How does the utilization of available tools compare to the importance the state attached to the issue following the 1980 CZMA amendments, when waterfront revitalization became a national CZM goal?

5.3.2 An "Ideal" Waterfront Revitalization Program

In an ideal world, states considering undertaking waterfront revitalization assistance programs would have in place certain preconditions necessary for a successful program outcome. Based on a review of the literature, information gained from this study about the strengths and weaknesses of states' programs, and the investigators' professional experience, it is possible to describe some of the attributes of an "ideal" waterfront revitalization component of a CZM program. Following each attribute discussed below is a case example drawn from the study illustrating a program, policy, tool or process used by a state in a particularly effective way to achieve on-the-ground outcomes.

5.3.2.1 Authority

The state legislature would have given the lead CZM agency (or a networked community development or similar agency) the statutory authority (or directive) to provide financial, technical and other assistance to local communities specifically for the purpose of revitalizing their deteriorated urban ports and waterfronts. The statute (or, failing that, an executive order from the Governor's Office) would describe, in general terms, the outcomes sought and the roles to be played by state and local governments (and, perhaps, public port authorities) acting in partnership, to achieve them. A corollary responsibility for oversight by the state CZM agency would be

specified to ensure statutory goals are being achieved by local governments that receive waterfront revitalization funds from (or through) the state CZM agency.

Case Example: California

California's Coastal Management Program has a specific policy and program tailored to urban waterfront restoration. The California State Coastal Conservancy's (SCC) Urban Waterfront Program was initiated under the Urban Waterfronts Restoration Act of 1981 (California Public Resources Code Section 31300 et seq.), and is incorporated into the SCC's enabling act in Ch. 7. The Act directs the Conservancy "to *promote excellence of design and...stimulate projects which exhibit innovation in sensitively integrating man-made features into the natural coastal environment.*" Through the Urban Waterfronts Program, the Conservancy assists in the planning, design and implementation of waterfront, and coastal development and conservation projects which are consistent with uses designated as high priority under the California Coastal Act of 1976, as amended. Additionally, the Conservancy has expended funds allocated to it by several bond acts voted by the electorate in 1976, 1980, 1984 and 1988.

The Conservancy is authorized to assist in the development of urban waterfront projects within the Coastal Zone of the state as defined by California Public Resources Code Section 30103, and within the permit jurisdiction and affected environs of the San Francisco Bay Conservation and Development Commission as defined by CA Government Code Section 66610.

An effective urban waterfront revitalization policy must produce results (i.e. revitalization plans and projects). The SCC's Urban Waterfront Program has been extremely active over the last 15 years, highlighted by impressive revitalization plans and projects. Backed by a clearly defined and aggressive policy to promote and sponsor revitalization, the Coastal Conservancy has gone forth with generous financial contributions and specialized technical assistance from San Diego in the south to Eureka in Humboldt County to the north. Over 50 revitalization projects and plans have been undertaken to date by the Coastal Conservancy, of which, only 16 have been documented in this study.

5.3.2.2 Policies

The state's CZM program would contain strong policy language to ensure that planning and projects undertaken in urban waterfronts embodied the core objectives of CZM for public access, protection of coastal dependent industry and ports, conservation restoration and interpretation of historic and culturally-significant structures and sites, restoration of degraded coastal environments, and any other goal of particular local significance.

Case example: New York

New York relies on a well-funded voluntary partnership with local municipalities. Under provisions of the Waterfront Revitalization of Coastal Areas and Inland Waterways Act (WRCAIWA) Executive Law, Article 42, and its implementing regulations (6 NYCRR 601) each coastal community has the option to implement a Local Waterfront Revitalization Program (LWRP) to manage coastal development, whether the concern is protecting critical resources or revitalizing deteriorated waterfronts. Critical to the LWRP is the establishment of local land use regulations and other local laws to enforce State coastal policies.

There are 44 policies established in the WRCAIWA. In general, coastal policies promote the beneficial use of coastal resources by encouraging the siting of water dependent uses, expansion of ports and small harbors, *revitalization of waterfronts*, and expansion of access and recreation opportunities. (Emphasis added.)

Specifically, five policies guide municipalities in addressing waterfront revitalization as defined in this study:—

Policy 1: Restore, revitalize, and redevelop deteriorated and underutilized waterfront areas for commercial, industrial, cultural, recreational and other compatible uses.

Policy 2: Facilitate the siting of water-dependent uses and facilities on or adjacent to coastal waters.

Policy 4: Strengthen the economic base of smaller harbor areas by encouraging the development and enhancement of those activities which have provided such areas with a unique identity . . . .

Policy 5: Encourage the location of development in areas where public services and facilities essential to such development are adequate.

Policy 6: Expedite existing permit procedures in order to facilitate the siting of development activities at suitable locations.

5.3.2.3 Inventory and Designation

An inventory of urban waterfronts in the state's coastal zone, undertaken in partnership with local governments, would have identified the scale and scope of deterioration, dilapidation and abandonment affecting waterfront districts. This knowledge would permit a strategic deployment of state program resources to a prioritized list of designated waterfront communities and districts.

Case Example: Mississippi

The Mississippi Coastal Management Program designated eight urban waterfronts in 1980 as Special Management Areas (SMA's), because they represent unique economic and social benefits to the coast at locations that provide important opportunities for public access to the waterfront. As urban waterfronts near high density population centers have lapsed into decline, they offer

excellent access and economic opportunities to large numbers of people. These waterfronts include historical points of interest and provide unique visual opportunities to the public. In addition, SMA's usually address port facilities. The identified areas are listed below and appear on the map shown in Figure 5.1.

- Waveland (at Coleman Avenue.)
- Bay St. Louis (Downtown commercial district)
- Pass Christian (harbor and scenic drive-city hall to Hancock Bank)
- Long Beach (Beach commercial area at Jeff Davis and the beach to encompass the harbor and adjacent beachfront land)
- Gulfport Harbor Square
- Biloxi (Downtown redevelopment areas including commercial and recreational small craft harbors)
- Pascagoula (Along Front Street)
- Moss Point (Downtown along old Hwy. 63 from O'Leary Lake to the Moss Pt. city limits)

In all of the designated waterfront areas for redevelopment the Mississippi CMP has supported revitalization plans and projects. In each waterfront financial and technical assistance was provided. The Biloxi Waterfront Master Plan initiated the redevelopment of 45 acres of deteriorated waterfront (abandoned pier facilities, processing plants and several vacant land-locked parcels). The redevelopment efforts to the waterfront area (catalyzed by the MCMP) include the modernization of a seafood industry museum, acquisition of 17 acres of land, and the construction of a $5.4 million, 300-slip marina and fuel dock and a marine education center. Festivals and other activities on the waterfront have attracted a large number of visitors to the area each year.

Case Example: Pennsylvania

In 1980, during development of the state's CMP, Pennsylvania designated 26 waterfront areas, comprising 7,500 acres of urban waterfront land, as Geographic Areas of Particular Concern (GAPCs) and candidates for revitalization. Over the last 15 years the CMP has been actively involved in over half of the originally designated areas by providing funding and technical assistance for planning and small construction projects.

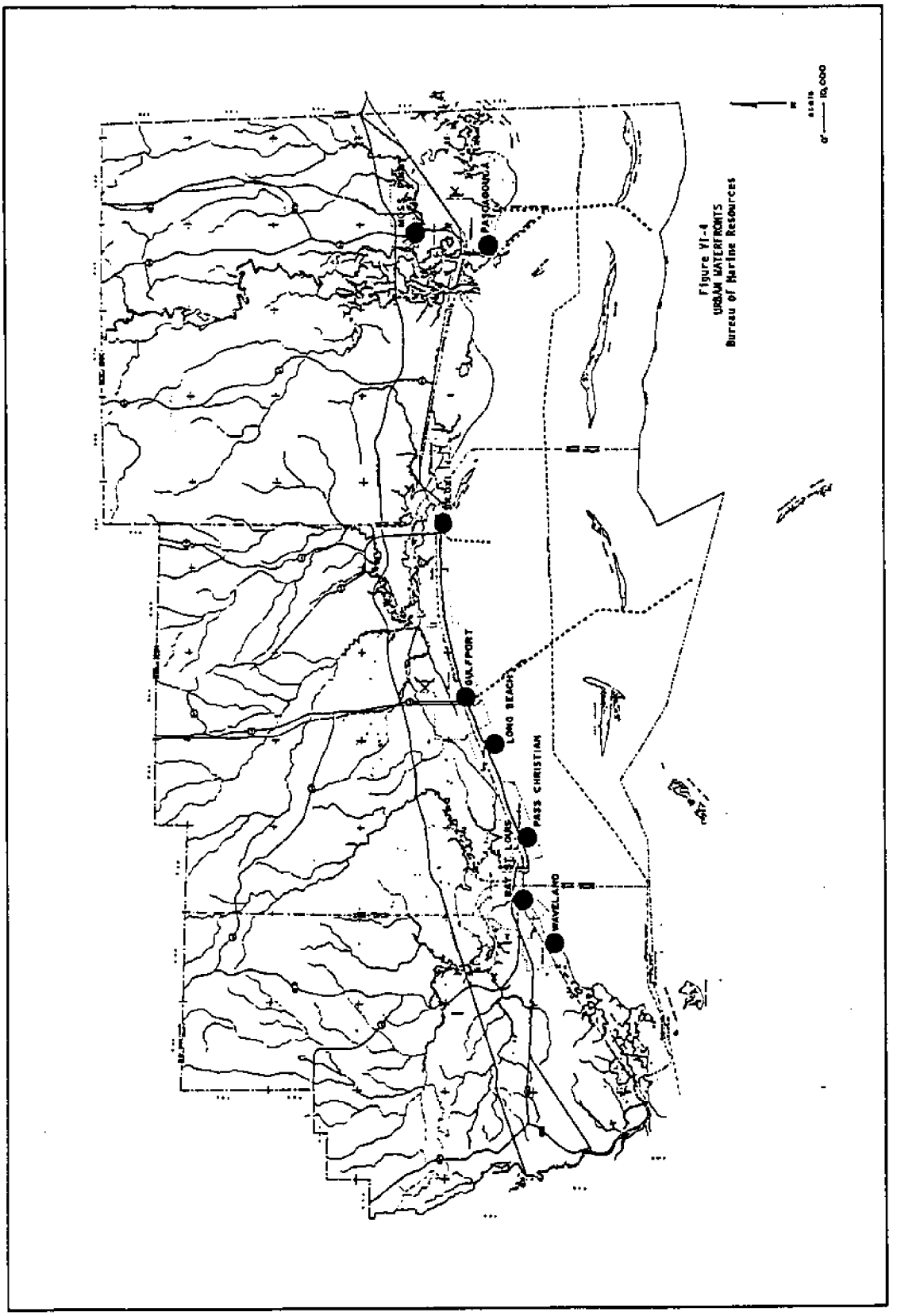


Figure 5-1: MISSISSIPPI'S WATERFRONTS DESIGNATED FOR REVITALIZATION

5.3.2.4 Financial Assistance: Funding, Performance Standards and Oversight

A competitive urban waterfront grant program with detailed guidelines and criteria for planning and construction grants would be used to direct state and federal CZM funding to the most deserving communities and ensure core CZM objectives were being met. (This approach would enable CZM program oversight of waterfront revitalization in states where neither local coastal programs, nor state oversight of general comprehensive local land use plans, are in place.)

Case Example: Michigan

Under the §306 and §306A federal funding programs a majority of the state coastal management programs have awarded grants to local communities for revitalization planning and small construction. Preceding the 1980 CZMA amendments, Michigan's CMP developed a competitive grants program for local communities that paved the way for future funding practices in Coastal Zone Management nationally. Michigan's CMP continued to be leader in the early 1980's in the provision of small grants to local governments for low-cost construction of public access and other shoreline improvements.

Roughly a third of Michigan's federal grant is passed on to local communities in the form of 306 and 306A grants. For Fiscal Year 1996 close to one million dollars was available to local communities. These local communities and private interests have, in turn, matched these funds. Today, Michigan's CMP strives to improve its grant program, and a model grant application and a new application form to assist applicants has been developed (See Appendix F).

Augmenting CZM funding, other sources include: State General Fund, Recreational Improvement Fund, Michigan Natural Resources Trust Fund, Protecting Michigan's Future Bond Fund, and federal Intermodal Surface Transportation Efficiency Act (ISTEA) funds .

The use of CZM funds is strongly linked to economically successful waterfront revitalization in Michigan. For example, the revitalization of Detroit's deteriorated industrialized waterfront was initiated by a CZM-funded $82,000 grant, "Linked Riverfront Parks Master Plan". The project was designed to create several parks along the Detroit River that are linked by a bike path system. This linked park system has stimulated millions of dollars in private investment and has created an estimated 1,200 new jobs. The investment resulted in $37 million of additional federal, state and local government funds. In turn, those dollars have stimulated $210 million of private investment in housing, office and commercial development.

5.3.2.5 Technical Assistance

The state CZM program would have trained staff, knowledgeable about urban waterfront planning and development, to provide assistance to local governments during all phases of the waterfront revitalization process. Where in-house expertise didn't exist, staff would act as a referral source,

fielding queries to experts in a community development, submerged land management, fisheries, or other agencies in state or federal government.

Case Example: California Coastal Conservancy

The California Coastal Conservancy has provided staff and technical assistance in all phases of revitalization project planning and development, including: technical assistance for project feasibility and site analysis, plan preparation and planning approvals; assistance in designing financing strategies, obtaining project financing and property acquisition, and the construction of site improvements. The Conservancy has devoted much of its staff and consultant resources to pre-project planning, design and analysis in order to maximize the chances of successful implementation (Beyeler 1994).

5.3.2.6 Guidance Documents

Guidance documents for small and large cities undertaking waterfront plans and projects would be produced, or assembled from other sources. These would provide general information about waterfront problems, issues, planning and development, and specific guidance to achieve compliance with the state's waterfront revitalization program guidelines. A "quick reference library" of materials produced by other states' CZM programs, universities, and professional planning or urban development organizations promoting waterfront redevelopment, would be made available to local governments and ports.

Case Example: Oregon

Waterfront Revitalization for Small Cities, (Good and Goodwin, 1990) a planning guide for non-metropolitan coastal cities, was written and published with partial funding from DLCD through a CZM 306 grant. An *Oregon Supplement* (Stambaugh and Good, 1990) which augmented the general information in the guidebook with Oregon-specific regulatory and financial assistance programs, was also published using this grant.

So far, 1,500 copies of *Waterfront Revitalization for Small Cities* have been sold nationwide and internationally—evidence that Oregon CMP's investment in this guidebook has benefited coastal management throughout the country and abroad.

5.3.2.7 Education & Training

State staff would undertake statewide or regional training programs to promote the urban waterfront grant program and familiarize local partners with the information and assistance available to them. These regional programs would be complemented by community-specific workshops, tailored to address local problems or opportunities that arose during pre-grant application, planning or project implementation stages of revitalization.

As experience is gained and a significant number of waterfront communities begin to achieve results, the state CZM program, perhaps in collaboration with universities and neighboring states' CZM agencies, would host a statewide conference or symposium. Here, local governments would share their experiences, showcase their successes and dissect their failures. Any need for mid-course corrections to the content or administration of the state's urban waterfront grant program would become apparent at this stage and might lead to legislative or regulatory changes being proposed.

Case Examples: Washington

In February, 1980, Washington's Department of Ecology, the state's CZM lead agency, sponsored a three-day Urban Waterfront Workshop in Bellingham. The workshop was set up to help local governments learn more about what other cities and counties were doing to revitalize their waterfronts. *(Source: Shoreline/Coastal Zone Management , March, 1980)*

Later that year WDOE in collaboration with the Washington Sea Grant Program and the College of Architecture and Urban Planning, University of Washington, funded a Shoreline Design Awards Program to honor outstanding shoreline development and restoration projects. An exhibit of the eight winning projects—six of which were urban development and public access projects in revitalizing waterfront districts—toured the state. *(Source: Shoreline/Coastal Zone Management , November, 1980)* See Figure 5.2.

In 1981 WDOE co-sponsored a four-day Waterfront Revival Conference in Bellingham which addressed maritime heritage issues and how public waterfronts can be planned, funded and built. *(Source: Shoreline/Coastal Zone Management , August, 1981)*

WDOE, again in collaboration with the Washington Sea Grant Program, cosponsored the Seattle Waterfront Symposium in 1982. This four-day educational event utilized an international panel of waterfront development experts to help the City of Seattle and its waterfront stakeholders explore plans, projects and ideas for Seattle's central waterfront. Many of the panel's recommendations were incorporated into the City of Seattle's Harborfront Plan and the Port of Seattle's redevelopment strategies for its downtown piers and land holdings in the adjacent uplands. *(Source: Seattle Waterfront Symposium Notebook, 1982.)*

After contracting with an urban design consultant to create a guidance document on urban waterfront development for local governments (MAKERS, CH2M-Hill, Hall and Associates, *Urban Waterfront Policy Analysis,* Washington State Department of Ecology, 1986.) WDOE conducted a workshop at Lake Chelan in 1986 to transfer the information to local shoreline/coastal planners.

Because of the number of smaller communities with deteriorated waterfronts in Washington's coastal zone, the WDOE in April, 1987, teamed with the Washington and Oregon Sea Grant

Eight Projects Honored in Design Awards Program

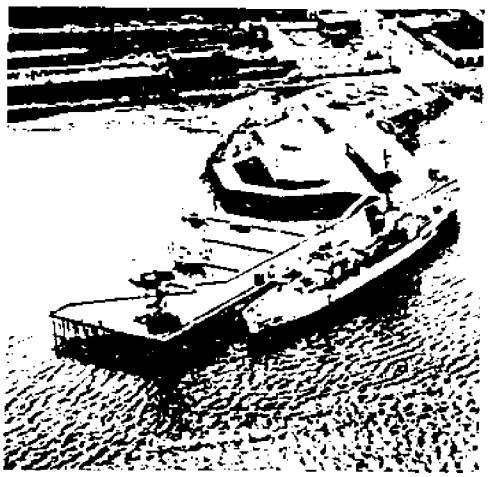
Eight shoreline projects have eived recognition in the Shoreline Design Awards Program, a special Year of the Coast event. The winners were announced October 17 by Dr. Ray Schneider of the University of Washington Department of Architecture; and Dr. Alyn C. Duxbury of Washington Sea Grant.

The Gas Works Park received a First Award in the Adaptive Re-use category. According to Duxbury, chairman of the jury, the Gas Works Park is a "magnificent example of a re-used facility." He praised the effective open-sided weather shield which allows the structure to serve as an all-weather play and picnic area "unequalled elsewhere in Seattle." He also noted that the park has stimulated improvements in the adjacent community while it relieves the shorelines of continuous industrial/commercial ...

...efield Office Park in Bellevue received a First Award in the Industrial/Commercial Shoreline Use category. The project was cited for its "ability to blend into and enhance an area by preserving the natural setting required by the associated wildlife, while at the same time making it accessible to commercial use in an unobtrusive way."

Five entries received awards in the Recreational Development category. The First Award went to the Port Angeles Municipal Pier. Commodore Park, Seattle, received an Award of Merit. Honorable mentions were awarded to the Cedar River Trail System, Renton; Seattle Aquarium; and the UW Waterfront Activities Center.

The Washington State Parks and Recreation Commission was granted an Award of Merit in the Shoreline Protection and Restoration category for dune stabilization at Twin Harbors State Park.



Alignment of the Port Angeles pier helps block out the industrial aspects of the harbor, offers protection from wind and weather, and focuses the user toward the open water.

An exhibit displaying the winning projects is available for one-month bookings beginning in January 1981. Call Bob Goodwin, UW Coastal Resources Specialist, at (206) 543-9293.

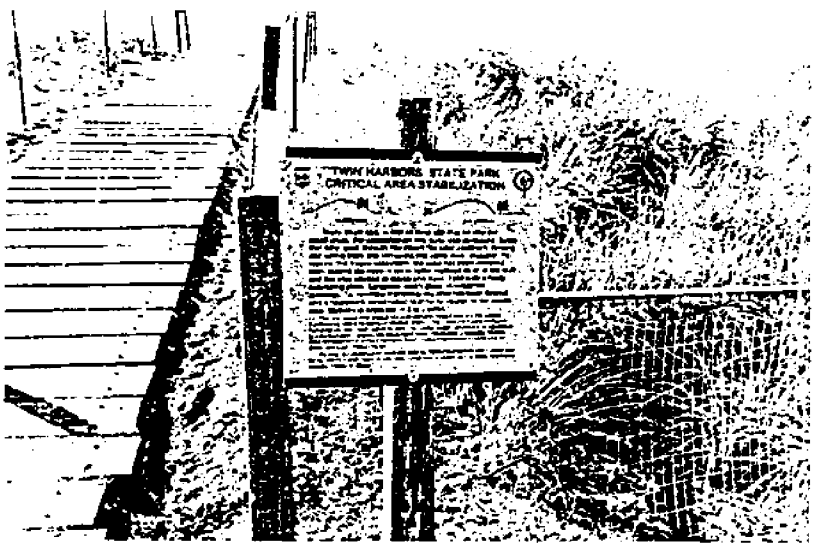


Photo by David Heiser, State Parks

...e Twin Harbors stabilization project "demonstrated how nature, assisted by man, can be used to exploit natural resources." Five acres of dune grass were planted and fenced to prevent trampling. Boardwalk protects dune and gives access to beach.

Winners were announced at a banquet at the Seattle Center in conjunction with the "Who's Minding Our Coast?" conference. Recognition was given to both the project designer and client.

Members of the jury were Duxbury; Peter Staten, TRA; Don Erickson, City of Seattle Department of Community Development; Ken Caldwell of Jones and Jones; and David McKinley of McKinley Associates.

Sponsors of the design awards program included the University of Washington's Department of Architecture and College of Architecture and Urban Planning, Washington Sea Grant, and the Department of Ecology. It was endorsed by a number of professional associations, the Washington State Arts Commission, and the Washington Environmental Council, among others.

Figure 5-2: WASHINGTON STATE'S SHORELINE DESIGN AWARDS PROGRAM

College Programs, and the Washington State Department of Community Development to sponsor a two-day, bi-state conference in Ocean Shores, Washington, titled, *Waterfront Revitalization for Smaller Communities* . One-hundred-fifty participants from cities, ports and chambers of commerce in Washington and Oregon were exposed to case studies drawn from five small "peer" communities in Washington and British Columbia. Workshops were conducted on coastal tourism, recreational boating and marinas, and interpreting marine environments. Experts presented lectures on revitalization topics that included: using consultants; economics of waterfront development; public and private financing; and, managing waterfront parks and public facilities. A 200-page *Proceedings* of the workshop was produced in paperback book form by Washington Sea Grant and distributed both nationally and internationally. WDOE provided a grant to the University of Washington to plan and conduct the conference, subsidized some small town staff's participation through "scholarships," and defrayed part of the publication and distribution costs of the conference *Proceedings*.

5.3.2.8 Partnering

State CMPs and local towns and cities will act in partnership to design waterfront revitalization plans and projects that meet state and, by extension, national objectives for CZM. But, as we've pointed out earlier, developing and implementing waterfront revitalization plans require the involvement of many actors besides state CMPs and local governments. Other state and federal agencies must concur on issuance of permits in waterways and wetland areas, and should be brought into the planning process at early stages to avoid later derailment of plans. Where contamination of soils from abandoned manufacturing plants, bulk storage facilities, or old port terminals is likely, EPA, NOAA and state environmental protection and submerged lands agencies will need to participate in developing plans for site remediation, damage assessment and other thorny issues before any development will be permitted. A state CMP can be the convenor of interagency panels and workshops to assist local governments address such issues and begin to scope plans to address them.

Case Example: Connecticut

The Bridgeport "Charrette" may best exemplify the partnerships a coastal program can help forge to benefit local communities undertaking waterfront revitalization. The "Charrette"—an intensive, community-based planning and design process—was conducted over a July weekend in 1996, to address redevelopment proposals for the reuse of a 12+ acre contaminated "brownfield" site on the Bridgeport waterfront. The site is owned by the United Illumination Co. and is occupied by their now-closed power plant.

Organized under the auspices of Yale University's School of Architecture, this professionally-facilitated two-day event involved design professionals, local community groups and members of a

local Native American Tribe, as well as federal, state, and local government officials. Connecticut CMP's staff participating in the "charrette" roved through the breakout groups advocating the importance of incorporating CMP goals, particularly public access and water-dependency, into the design plans for the site.

As a result of the "charrette," these goals of the CMP are articulated in United Illumination's "Request for Qualifications" which, at time of press, was being advertised to the development community—the first step in selecting a qualified developer for the project. Connecticut CMP staff view the Bridgeport "Charrette" as an example of proactive, as opposed to reactive, involvement of a CMP in helping cities achieve appropriate waterfront revitalization.

5.3.2.9 Special Area Management Planning (SAMP's)

Special Area Management Planning has not been used extensively by the nation's coastal management programs to address revitalization of urban waterfronts, but where it has been used it is viewed as important and complementary to the other tools CMP's utilize.

SAMPs can fill a unique need: Identifying urban shorelands that have become surplus to the needs of ports and other marine industry. SAMPs will be used to tackle estuary-wide, bay-wide, or harbor-wide comprehensive planning and coastal resource management issues that span more than one political jurisdiction, involve multiple levels of government and require regional watershed scale approaches to be successful. CMPs can use the SAMP process to uncover information about the likely long term needs of different coastal industries for waterfront sites—ports and marine transportation, water-dependent manufacturing, marine recreation—and balance these legitimate economic needs against the natural resource systems their facilities are likely to impact. This is the ideal planning context within which waterfront revitalization can proceed: Decisions concerning largely irreversible changes in urban shoreline land use can be made with far more confidence when the regional needs of important marine sectors are understood.

Case Study: Wisconsin

This study identified a recently adopted SAMP in Wisconsin that addressed future development and redevelopment along the City of Superior's deteriorated industrial waterfront. Superior and neighboring Duluth, Minnesota, are inland ports providing the Great Lakes steel industry with access to ore, while also shipping some general cargoes. Much of the old ore transshipment infrastructure is underutilized and deteriorating. The City of Superior is committed to reindustrializing parts of its lakefront.

While most significant wetlands in the City of Superior's waterfront were already delineated and protected as "Natural Areas," some smaller wetlands were not. Several waterfront development proposals intruded on these unprotected wetlands leading to uncertainty for both development and environmental interests. The SAMP was undertaken for the city by the

Northwest Wisconsin Regional Planning Commission (RPC), one of three RPCs that partner with the Wisconsin CMP to provide planning and technical assistance to local governments. Because the SAMP was initiated out of sequence with the WCMP grant cycle, the project was ineligible for CZM funding. Nonetheless, the WCMP was an active supporter of the SAMP and provided access to key wetlands staff in another RCP.

Following adoption of the SAMP in 1996, the City of Superior incorporated the SAMP's policies and permitting provisions into its revised comprehensive plan which was adopted in 1998. Permits issued by the City for developments that are consistent with the SAMP are treated like "general permits" by reviewing agencies at state and federal levels. According to NWRPC's Steve Andrews, the SAMP reserves the shoreline for water related industrial and non-profit historical heritage uses, funneling non water related development to upland sites.

"The SAMP defines the geographies where new development or redevelopment may occur, the permit conditions under which it will be permitted and the level of environmental protection and/or wetlands mitigation that will be required," observed Andrews. "As a consequence the needs of both economic development and environmental interests are being met."

5.3.2.10 Local Coastal Program Review

State review of Local Coastal Programs (LCPs) is an important tool to affect waterfront revitalization not only in states where LCPs are mandated, but also where voluntary local coastal planning, once undertaken, is subject to state review. Compliance with other state CMP goals—enhancing public access, protecting water dependent industry, etc.—can be assured during review of plan amendments designed to implement waterfront redevelopment objectives.

Case Example: Washington

In 1976, the year Washington's CMP received federal approval, a Seattle commercial real estate developer was proposing a very large, overwater, mixed-use development that would replace two deteriorated wooden finger piers on Elliott Bay along downtown Seattle's Central Waterfront. With the exception of a small marina, the project comprised entirely non-water dependent uses—a hotel, an office tower and retail activity. This proposal surfaced as the City of Seattle was drafting its first Shoreline Master Program (SMP) as required by the state's 1971 Shoreline Management Act (SMA).

To accommodate large mixed-use projects on the Central Waterfront the City included a "planned unit development" provision in the first SMP it submitted for the approval of the Washington Department of Ecology (WDOE), the state's CZM lead agency. The WDOE approved Seattle's SMP but insisted upon the planned unit development provision being removed and replaced with more specific permitted land and water uses and development standards for the area.

The proposed development, which would have run afoul of state submerged lands leasing terms (specifically, uses of state Harbor Areas) as well as the water-dependency policies of the SMA, was shelved and the site subsequently developed as an extension of the Washington State Ferries Colman Dock terminal, a water-dependent use.

WDOE's tactful but firm handling of the City's attempt to accommodate large mixed-use developments in its SMP set the stage for more appropriately scaled adaptive reuse of Elliott Bay's old finger piers, the preservation of water-dependent uses they support, and the protection of the views of Seattle's Harbor from downtown.

5.3.2.11 Project review

An ideal CMP would recognize that it is at the individual project level that many of the public benefits of revitalized waterfront districts are realized. Preservation and enhancement of public access to the water's edge, adaptive reuse of historic structures to conserve the past, or maintenance of water views from upland streets are achieved or lost through incremental project-by-project decisions.

While not all CMPs will have direct permitting or permit review authority, those that do have significant leverage to influence successful implementation of a waterfront revitalization plan. And for those CMPs that do not have such authority, federal and state consistency procedures offer alternative opportunities to ensure state program policies are addressed in projects requiring action by other state or federal agencies.

Case Examples: New York

Any waterfront development project requiring a state or federal permit or license is reviewed by NYCMP staff for consistency with the policies of the state's coastal program which includes all approved Local Waterfront Revitalization Programs (LWRPs). This review is seen as a highly important tool to affect changes in inappropriate development projects.

"The LWRP provides a vehicle for negotiations over controversial projects," observed Wilbur Woods, Director, Waterfront & Open Space Planning, NYC Dept. of City Planning.

For example, when the City of New York proposed to ease prison crowding by mooring prison barges in the East River, the NYCMP raised objections, based on the approved LWRP, during state consistency review of the US Army Corps of Engineers permit. An interim permit to moor the barges *temporarily* was approved; and, subsequently, when the crowding crisis had passed, the barges were removed.

In another example from New York State, the Oswego Port Authority had proposed constructing a 75 ft. high potash storage dome which the City of Oswego argued would block significant upland views of their historic waterfront on Lake Ontario, violating a provision in their LWRP for protecting the viewshed. During a state consistency appeal, the Port claimed the project

was consistent; the City disagreed and the NYCMP cited the LWRP provision in support of the City. The Secretary of State ruled for the City and ordered the project be modified. The Port acquiesced and the dome was lowered.

5.3.2.12 Environmental Review

Using NEPA or the state's "little NEPA," the CMP would review governmental actions affecting the environment, and scrutinize waterfront plans and projects to ensure they avoided the many environmental pitfalls of urban shoreline development (re-suspending contaminants during dredging of polluted sediments, interrupting fish passage by bulkhead construction, or destroying prime fish habitat through dredge and fill operations, etc.).

Case Example: California Coastal Commission

The California Coastal Commission reviews permits issued by local governments for consistency with the approved local coastal program, the California Coastal Act, and the California Environmental Quality Act—a state "little NEPA." The Coastal Commission uses informal pre-permit discussions as well as formal permit reviews to affect the quality of development and redevelopment projects.

In 1994, the City of Eureka in Humboldt County, California, proposed to construct a berthing facility for visiting vessels—including tall ships—as well as local recreational smallcraft. The site is adjacent to the community's Adorni Center, a recreation facility and outdoor amphitheater located in an area undergoing revitalization at the northern end of the downtown Eureka waterfront. During pre-permit discussions with the North Coast office of the California Coastal Commission, the issue of the project's impact on a narrow band of eelgrass arose. The emerging design accommodated the staff's concerns about the dock "shading out" this important marine habitat, which, they believed, was a spawning ground for herring—an important local fishery.

When the permit was issued for the project the Commission imposed two conditions: first, to require monitoring the eelgrass bed for three years to detect any project-induced changes; and, second, to define a construction window to avoid disrupting herring spawning. (The latter condition was subsequently removed when it was shown that herring did not spawn in that particular area.)

When complete, this public berthing facility will provide important public access, in an environmentally benign fashion, to and from the waters of Humboldt Bay near Eureka's revitalizing Old Town district.

5.3.2.13 Sponsoring Waterfront Festivals and Maritime Events

Supporting and hosting of maritime celebrations and events focused on the urban waterfront is an excellent way to bring the public "back" to the waterfront. COASTWEEKS, a month-long

national celebration held during September and early October each year, is a perfect opportunity for CMP's to sponsor music festivals, boat building shows and exhibits, arts and crafts fairs, tall ship tours, harbor cruises, marina cleanups, etc.

Case Examples: South Carolina, California

South Carolina and California CMP's lead the nation in hosting Coastweeks events centered around revitalized waterfronts. In Charleston, South Carolina, harbor cruises, museum tours and bay festivals draw the public back to the waterfront to realize and appreciate the wonderful amenities their revitalized waterfronts offer.

The Morro Bay community implemented a California Coastal Conservancy-supported waterfront plan to improve commercial fishing facilities and public access to the waterfront. The California Coastal Commission is the state sponsor of Coastweeks, promoting a wide array of waterfront festivals and activities. "Harbor Days" in Morro Bay is a weekend-long Coastweeks celebration hosted along Morro Bay's working waterfront and, every year, an art festival, waterfront boat tours and a salmon bake draw thousands of people to this town of 9,500 residents.

5.3.2.14 Monitoring and Evaluation

Finally, the state CZM program, with assistance and financial support from NOAA/OCRM would have created (or adopted) a computer-based information system to monitor program performance. The system would track *program inputs* (expenditures, staff effort), *program outputs* (grants awarded, education and training events undertaken, guidance documents and publications produced, etc.), and *program results* (waterfront plans produced, waterfront projects completed, waterfront events that took place). Periodically, state program staff or consultants would undertake detailed case studies of representative waterfront districts to determine *program impacts* (community economic benefits realized, improvements to visual appearance of waterfronts achieved, new public access gained and other CZM objectives met).

Case Example: Connecticut

Connecticut's CMP undertook a comprehensive ten-year assessment of its accomplishments and reported the results in an elegant 1988 publication, *Coastal Management in Connecticut Beyond the First Decade*. The results of many of Connecticut's waterfront revitalization efforts funded earlier were thoroughly documented. This case study-based documentation of program results is a model other coastal states might emulate. The author concluded:

> "Coastal management has played a key role in the revitalization of urban waterfronts and ports across the state, and the restorations have translated into jobs for thousands of residents and millions of dollars in new capital investment. The ratio of coastal management dollars invested on the coast to that invested by public and private sources for continuing or expanding those same projects is often greater than 1:1000."

5.3.3 State Programs' Use of Tools

Table 5.9 summarizes the state CMP'S use of tools and processes in two ways—those in *general use* throughout the state, and those whose use has been documented in *specific waterfront districts*. Using the author's tools weightings described earlier, tools potential was calculated by summing the weighted tools available to the CMP and dividing by the maximum possible weighted

Table 5.9: PROCESSES AND TOOLS USED BY STATES WITH APPROVED COASTAL PROGRAMS*

State	Desig-nation	Finan. Asst.	Tech. Asst.	Guid. Docs.	Educ. & Train.	Partn-ering	SAMP	LCP Rev.	Proj. Rev.	Env. Rev
Alabama	o									
Alaska	o	•	o	o	o	o	•	o	o	
Am. Samoa	o	o	o			o			o	o
California	•	•	•	•	o	•		•	•	o
Common. of N. Mariana Islands	o									
Connecticut	•	•	•		•	•		•	•	•
Delaware			o	o					o	o
Florida	o	•	o	o	o	o		o	o	•
Guam	o	o	o	o		o	o		o	o
Hawaii	•					•			•	•
Louisiana						o		o	o	o
Maine		•	o	o	o	•			o	
Maryland	o	•	o	o	o	•			o	o
Massachusetts	•	•	•	•	o	•	•	•	o	•
Michigan	o	•	•	o		•			•	•
Mississippi	•	•	•	o	•	•	•		o	o
New Hampshire	o	o	o			o			o	o
New Jersey	•	•	o	o	o	o	o		o	o
New York	o	•	•		o	•		•	•	•
North Carolina		o	o	o					o	
Oregon	o	•	•	•	•	•	•	•	o	•
Pennsylvania	•	•	•	•	•	•	o	•	•	•
Puerto Rico			o						o	
Rhode Island	o	o	o	o	o	o	o			o
South Carolina	o	o	o	o	o	o	•	o	•	o
Virginia	o	o			o	o	o		o	o
Virgin Islands							o			
Washington		•	•	•	•	•	•	•	•	•
Wisconsin		•	•	•	•	•	•		•	

Legend for table:

- o Tools in general use statewide
- • Tools in use "on the ground" in specific waterfront districts

* 29 states had approved coastal programs in 1995 when the study commenced.

tools total available in the ideal waterfront revitalization program described above. Tools score was calculated by summing the weighted tools utilized on the ground by the CMP divided by the maximum possible weighted tools total. Tools utilization is the ratio of tools score to tools potential—an indicator of how much of its tools capacity the CMP has used in specific waterfronts.

Table 5.10 presents these scores for 17 states where data were available to support the use of tools on the ground in specific waterfronts. Also shown is the importance states attached to the issue at time of program approval, in 1980 when the waterfront revitalization amendments were added to the CZMA, and currently (1996). (Appendix A displays all the tools used by states with approved CMPs when this study was undertaken. Included are tools whose use was not documented on the ground in specific waterfronts, but were used statewide according to CMP officials.)

Table 5.10: ISSUE IMPORTANCE AND USE OF WATERFRONT REVITALIZATION TOOLS BY SEVENTEEN STATES' COASTAL PROGRAMS*

State	Tools Potent	Tools Potent. Rank	Tools Score	Tools Score Rank	Tools Utiliz.	Tools Utiliz. Rank	Issue Import @ Prog. Approv.	Issue Import 1980	Issue Import 1996
ALASKA	0.80	H	0.12	L	15%	L	M	M	H
CALIFORNIA	0.80	H	0.48	L	60%	M	M	M	L/M
CONNECTICUT	0.75	M	0.51	M	68%	M	H	H	H
FLORIDA	0.85	H	0.08	L	9%	L	M	M	H
HAWAII	0.30	L	0.30	L	100%	H	L	L	L
MAINE	0.65	M	0.28	L	43%	L	L	L	M/L
MARYLAND	0.80	H	0.30	L	38%	L	M	L	L
MASSACHUSETTS	0.80	H	0.37	L	46%	L	H	H	H
MICHIGAN	0.70	M	0.40	L	57%	M	H	H	H
MISSISSIPPI	0.80	H	0.54	M	68%	M	H	H	H
NEW JERSEY	0.80	H	0.76	H	95%	H	M	H	H
NEW YORK	0.80	H	0.49	L	61%	M	H	---	H
OREGON	0.85	H	0.30	L	35%	L	M	M/H	H
PENNSYLVANIA	0.80	H	0.37	L	46%	L	H	H	H
S CAROLINA	0.90	H	0.08	L	9%	L	No Data	No Data	No Data
WASHINGTON	0.75	M	0.75	H	100%	H	H	M	M
WISCONSIN	0.65	M	0.51	M	78%	H	M	H	H

*Insufficient data for the remaining 12 states

States' tools potential and tools scores have no absolute meaning. A tools potential of 0.95 simply means that the state has at its disposal a suite of CZM tools whose capacity is only 5% below the theoretical maximum of the ideal program. A state CMP with a tools score of 0.5 cannot claim 50% of the credit for revitalization outcomes in its waterfront districts! What the score does mean is that the state, in assisting local communities to undertake waterfront revitalization, has utilized

half of the theoretical maximum capacity of our ideal program. A tools utilization of 60% means that the state has utilized 60% of the tools available in that state.

In all, we were able to score seventeen states' use of tools on the ground *(tools score)* and to calculate the *tools potential* for all but one of the states. However, potential tools data were not verifiable for several states that did not respond to our survey.

The *tools potential* in states' CMPs ranged from a high of 0.90 in S. Carolina to a low of 0.10 in the N. Marianas and Alabama (not a participant in waterfront revitalization). *Tools scores* were highest in New Jersey (0.76) and lowest in Florida and S. Carolina (each 0.08). *Tools utilization rates* varied from a high of 100% (Hawaii, Washington) to a low of 9% (Florida, South Carolina).

In Table 5.10 we display these scores as High, Medium or Low and compare them to the *issue importance* that waterfront revitalization was assigned by the states' CMP managers. There is strong conformance between the issue importance in 1980 (when waterfront revitalization became a national goal of the amended CZMA) and the state's utilization of tools to address it in six states: California (Medium), Maine (Low), Maryland (Low), New Jersey (High), Washington (High) and Wisconsin (High). In terms of tools and processes they used in assisting waterfront communities, these states appear to have met their goals.

States that placed a High importance on the issue, but appear to have underutilized the tools available to them are: Alaska[5] (specific tools underutilized—Designation, Guidance Documents, Education & Training, and Environmental Review), Florida[6] (all tools except Financial Assistance), Massachusetts (Guidance Documents, Education & Training, Project Review[7]), Oregon (Designation[8], Partnering, Project Review) and Pennsylvania (Financial Assistance, Education & Training, Partnering). Hawaii placed a Low importance on the issue but fully utilized the tools at its disposal. Connecticut , Michigan, Mississippi and New York all rated the issue High and achieved Medium utilization scores; Designation, Guidance Documents, and Education & Training appear to be the tools least utilized in Michigan's waterfronts, and, in New York, Designation and Education & Training were underutilized. Guidance Documents, Project Review and Environmental Review appeared to be underutilized in Mississippi's waterfronts.

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[5]Some descriptive data that arrived too late to incorporate in the study suggests that Alaska has utilized more tools than the state originally was able to document.

[6]As noted above, Florida's new initiative in this issue area, the Waterfronts Florida Program, could push the state into a well-targeted, highly effective use of an expanded suite of tools.

[7]This finding seems at odds with the "High" importance the state CMP staff assigned to *project review* as a tool. All projects in the state's tidelands and *former* tidelands require a Waterways License. During the review, there are opportunities to place conditions on development to provide public access to and from the water's edge and to protect present and future water-dependent uses from encroachment by non water dependent uses. In their response to our survey, the state failed to link this important tool to specific waterfront districts undergoing revitalization.

[8]Oregon has used SAMPs to allocate certain estuarine shoreline areas that are surplus to the needs of water dependent industry for urban development and redevelopment. In a sense, this is a form of designation.

The tools available to states' CMPs are constrained to some extent by state laws. State oversight of local coastal programs, or authority to review and appeal local approval of coastal projects, for example, probably derive from a state's general planning statute or special coastal management law. Other tools such as providing local government with federal CZM funds to undertake planning studies, producing and distributing guidance documents, or planning and conducting education and training programs for local officials, are, in most cases, discretionary and available to most coastal programs.

Institutional capacity to reach program goals entails more than an ideal suite of policies and tools, however. Leadership, adequate funding, qualified staff with enthusiasm for their work, assignment of program responsibility to an agency whose overall mission complements CZM, and an executive and legislature supportive of that agency are at least as important. This study did not attempt to collect information from the states that would enable us to assess these dimensions of CZM programs; but we certainly encountered CMP managers and staff whose knowledge, skills and enthusiasm were a potent force in helping coastal towns and cities in their states achieve waterfront revitalization. We also encountered states where CZM program responsibility had been shifted downwards to less prominent positions in state government.

With these caveats in mind, we can tentatively suggest that the *utilization* of tools available to coastal management program officials is a good indicator of linkage between a CMP's policies for waterfront revitalization and on-the-ground outcomes in revitalizing waterfront districts. But we cannot assign any *absolute* value to this linkage. Unlike the case in some other coastal management issue areas, the state's role is that of a partner with cities and towns undertaking revitalization of their waterfronts. A state CMP cannot lay claim to credit for so many acres of waterfront that has been revitalized, as they might lay claim to so many acres of wetlands protected by purchase, or miles of coastal bike trail acquired using CZM funds.

5.4 Overall Effectiveness of States' Coastal Management Programs

At an earlier point in this report (section 4.4.7) we defined the conditions necessary for a CMP to be considered effective in addressing waterfront revitalization. These include some, but not all of the elements of an "ideal waterfront revitalization program," together with a suite of concrete, on-the-ground outcomes.

In Table 5.11 we bring together the evidence for determining which states' CMPs have met those conditions. In column one are listed all the 29 states and territories with approved CMPs in 1995. The 25 states remaining in column two are those whose CMPs satisfied condition one: Their CMPs articulated through formal policy or other means (such as guidance documents or education and training programs) their intent to assist cities revitalize their deteriorated or under-utilized waterfronts. Condition two—that the CMP provided financial and/or technical assistance,

or entered into another form of active partnership with cities, statewide, to plan for and implement waterfront revitalization—is applied to states in column two resulting in 23 states remaining in column three.

To appear in column four, states must have satisfied the third and fourth conditions: On-the-ground improvements have resulted that bring social and economic benefits to the community, and achieve other coastal management goals. Minimum scores of 2.0 for both stage and scope of

Table 5.11: STATE CMPs' COMPOSITE EFFECTIVENESS EVALUATIONS

States & Territories with approved[9] CMPs	...and CMP W-R Policies	...and CMP W-R Assistance	...and On-the-Ground Outcomes	...and W-R Tools Used On-the-Ground
ALABAMA[10]				
ALASKA	•	•	•	
AMERICAN SAMOA	•	NO DATA	NO DATA	NO DATA
CALIFORNIA	•	•	•	•
CNMI	•	NO DATA	NO DATA	NO DATA
CONNECTICUT	•	•	•	•
DELAWARE	•	•	NO DATA	NO DATA
FLORIDA	•	•	•	
GUAM	•	•		NO DATA
HAWAII	•	•	•	•
LOUISIANA[10]				
MAINE	•	•	•	•
MARYLAND	•	•	•	•
MASSACHUSETTS	•	•	•	•
MICHIGAN	•	•	•	•
MISSISSIPPI	•	•	•	•
NEW HAMPSHIRE	•	•	•	NO DATA
NEW JERSEY	•	•	•	•
NEW YORK	•	•	•	•
NORTH CAROLINA	•	•		NO DATA
OREGON	•	•	•	•
PENNSYLVANIA	•	•	•	•
PUERTO RICO		NO DATA	NO DATA	NO DATA
RHODE ISLAND	•	•	NO DATA	NO DATA
SOUTH CAROLINA	•	•	•	
VIRGIN ISLANDS	NO DATA	NO DATA	NO DATA	NO DATA
VIRGINIA	•	•		NO DATA
WASHINGTON	•	•	•	•
WISCONSIN	•	•	•	•

revitalization would ensure these conditions had been met. For a state to achieve these scores, communities receiving assistance in revitalizing their waterfront districts would have either completed a waterfront plan and have in place two or more qualifying waterfront activities, or have

[9] Twenty-nine state programs had been approved at time of this study's inception (1995).
[10] As noted earlier, waterfront revitalization was not deemed an issue warranting state CMP attention in Alabama and Louisiana.

undertaken two or more qualifying waterfront physical improvements. Eighteen of the 23 states appearing in column three met these minimum criteria.

Finally, to be considered effective, states' must have documented utilization of a significant suite of their available tools in waterfronts their CMPs claim to have affected. A minimum tools utilization score of 0.35 was set to ensure this degree of involvement in local communities' efforts.

In column five appear the 14 states that met all the criteria for effectiveness. (The names of these states are displayed in bold type in the first column.) There are robust process and outcome data, augmented by compelling qualitative information in state profiles, to support the inclusion of each of these 14 states in the "effective programs" group; but, the group is far from homogenous. Some CMPs just achieve one or more of the minimum scores chosen as criteria for a state to be retained in successive stages of the evaluation described above, while others greatly exceed them all. Moreover, the *extent* of the CMPs involvement varies enormously from program to program: Hawaii's revitalization of its sole waterfront, Honolulu, versus New York State's substantial assistance to at least 45 communities must be acknowledged as a factor affecting *degree* of program effectiveness. On the other hand, the divergent contextual factors in these two distinctly different states must be used to temper assertions that New York's CMP has been *more* effective in addressing this issue than has Hawaii's.

In general, contextual information that would help define the magnitude of the problem (number of waterfronts and the severity of their deterioration) is missing. Only where an inventory has been undertaken and a number of waterfronts has been designated for assistance (as in the cases of Massachusetts, Mississippi and Pennsylvania) can we see a clear target for states' CMPs to aim at—coastal program characteristics that, consequently, reinforce these three states' places in the "effective programs" list.

New Hampshire and North Carolina are "probable" effective programs, but there is a lack of robust outcome data to support a definitive effectiveness determination. Florida, as noted earlier, has recently undertaken *Waterfronts Florida*, a comprehensive financial and technical assistance program that will, doubtlessly, move the state into the "effective programs" list. Puerto Rico appears to lack an adequate suite of CZM tools to address waterfront revitalization, yet has high *stage* and *scope* scores for its on-the-ground outcomes (see Table 6). One inference would be that while the State Planning Board has given the Puerto Rican Land Administration significant autonomy to work with coastal cities, it achieves conformance to CZM principles in its general statewide planning role. Unfortunately we lack data about use of tools on-the-ground in three San Juan waterfront districts. No determination of effectiveness is made for Puerto Rico's CMP.

Similarly, no determination of effectiveness has been made for CMPs in American Samoa, the Commonwealth of the Northern Mariana Islands, Delaware, Guam, the Virgin Islands, or Virginia due to lack of outcome or tools-in-use data.

6.0 Conclusions

6.1 National Achievements

We have shown that at least 244 discrete waterfront districts in the nation's coastal zone have benefited, to varying degrees, from their states CMPs' attention to the national goal of revitalizing deteriorated urban waterfronts and ports.

This is a conservative finding for two reasons. First, for the remaining 59 districts identified in this study where we lack tools-in-use data, we have the assurance of state program managers that their programs did, in fact, contribute to on-the-ground outcomes. Second, we know that our waterfront data are incomplete. In at least two states, the number of districts for which state program officials provided data was substantially less than the total that had undertaken waterfront revitalization with assistance from their CMPs. And, we have no data at all for four states and territories, some of which undoubtedly have addressed this issue and achieved results.

Other affirmative national CZM goals—increasing public access to the shore, giving siting priority to coastal dependent uses, conserving the historic and cultural heritage of the coast, and restoring degraded coastal environments—are being achieved in revitalized urban waterfronts. Brownfield sites are being cleaned up and contaminated sediments capped; historic structures are being reused for new people-friendly activities; traditional and new marine industries are being protected from encroachment by non-water dependent uses; plazas, parks, trails, boardwalks, viewing towers and fishing piers are luring people back to the water's edge; and, waterfront festivals and events, aquariums, maritime museums and harbor tours are delighting them when they get there. In the adjacent uplands, hotels and visitor information centers, retail boutiques and restaurants serve residents, visitors and tourists, and produce both social and economic benefits to the community.

6.2 State Achievements

All this has been achieved through partnerships between states' CMPs, local communities, other state and federal funding and planning assistance programs, non-profit organizations and universities. It is the nature of such partnerships that the exact contribution of each partner to the results achieved is impossible to measure, but simple to recognize.

We have also demonstrated that there is a sequence of elements in state coastal programs that lead from the articulation of CZM policies addressing this issue, through CZM tools and processes applied to implement those policies, to concrete, on-the-ground outcomes that achieve the national goal for this important CZM issue.

Fourteen states were judged effective and another two "probably" effective in carrying out their responsibilities under §303 (2) (F) of the FCZMA for redeveloping deteriorated urban waterfronts

and ports. There is no evidence that any of the states for which we have outcome data have been unequivocally ineffective in addressing waterfront revitalization. Two states' programs—Alabama and Louisiana—concluded that, because of contextual issues such as patterns of urbanization in the CZ, fully-functioning ports, or a program focus on natural resource protection and restoration, waterfront revitalization was not an issue they needed to address. For the remaining 11 states we simply have insufficient on-the-ground data—or no data at all—to support an unambiguous finding.

But is also clear that not all states have sought out, adopted and utilized the full suite of tools and processes that could be employed to identify, encourage and assist communities whose deteriorated waterfronts have been in need of revitalization.

6.3 Strategies Used by Effective States

Given the heterogeneity of states coastal programs, and the multiplicity of problems their waterfront cities confront, we found wide variations in the strategies adopted by the fourteen unequivocally effective states. Of these strategies, three are distinctive though not mutually exclusive.

6.3.1 Promoting Comprehensive Financial and Technical Assistance Programs

In many states where waterfront revitalization has occurred, the communities undertaking revitalization plans and projects appear to have self-selected, responding to the availability of financial or technical assistance through their states' CMPs.

Among the states CMPs that have sought partnerships with local communities by actively promoting their financial and technical assistance programs are eight that have achieved the most extensive waterfront revitalization results. California (16+ waterfront districts), Connecticut (9) Maine (19), Michigan (20+), New York (45), Oregon (11), Washington (28), and Wisconsin (19).

These states, for the most part, comprise regions that have sustained significant industrial change over the last two decades which resulted in abandoned factories, wharves and docks along their downtown waterfronts. Such willing state/local partnerships as achieved in these states auger well for achieving on-the-ground results—a sort of free marketplace for those willing to make the effort to revitalize (towns and cities) and those willing to pay some of the price to achieve it (state CMPs).

6.3.2 Targeted Urban Waterfronts and Ports

A handful of states undertook an inventory of their coastal communities, either at time of program approval, or following the 1980 amendments to the FCZMA, to determine a target list of deteriorated or underutilized waterfronts and/or ports and designated them for action. American Samoa, Massachusetts, Pennsylvania and Mississippi employed this approach, motivated by both

common and dissimilar concerns: American Samoa through a SAMP process to develop the Pago Pago Harbor area in a way that emphasizes its irreplaceable value as a working port and safe harbor and protects its natural resources and water quality; Massachusetts through designation of 12 Developed Port Areas and 20 Special Assistance Development Areas sought to protect and revitalize ports and other coastal dependent uses from encroachment by non-coastal dependent commercial and residential development, and to enhance access to the coast by undertaking port master plans and harbor management plans; Pennsylvania designated 27 deteriorated waterfront districts for state financial assistance to undertake planning, historic/cultural restoration, and revitalization; Mississippi sought revitalization of eight designated Gulf Coast waterfronts for public access, recreation, efficient urban service delivery, and for heritage conservation.

Each state has achieved significant results using this focused approach to revitalization: In Massachusetts 13 waterfront districts have undertaken revitalization with state funding and assistance; in Pennsylvania 21 on their Delaware River and Lake Erie shores; and in Mississippi all eight designated districts have achieved revitalization results.

Other states have encouraged local communities to designate areas of deteriorated waterfronts for revitalization. Alaska cities, for example, have used Areas Meriting Special Attention (AMSAs)

6.3.3 Delegating to a Specialized Networked Agency

Three states employed networked arrangements to deliver urban waterfront revitalization services to local towns and cities. The Hawaii Community Development Authority was given responsibility for redeveloping the Kaka'ako Community Development District in Honolulu which abuts the downtown Honolulu waterfront. While no other waterfronts in the state's eight major islands have been designated for, or have undertaken revitalization with CZM involvement, the achievements on the Honolulu waterfront—particularly restoration of the Aloha Tower passenger terminal—have been noteworthy.

In Puerto Rico the Planning Board adopted the CZM program goals and policies as an element of the statewide land use plan and delegated responsibility for waterfront revitalization to the Puerto Rican Land Administration. Some redevelopment of piers has occurred in San Juan's harbor with Port Administration involvement, but our information about CZM involvement is sketchy.

The California State Coastal Conservancy is the designated agency for administering the state's Urban Waterfront Restoration Act of 1981, and coordinating activities of all other state and federal agencies whose programs affect California's urban waterfronts. The SCC helps to initiate revitalization through funding and planning assistance, coordinating acquisition, enhancement and restoration in waterfront revitalization efforts. At least sixteen, and possibly 50 waterfronts have benefited from the Conservancy's funding and planning assistance program.

In these three states the networked agencies developed productive partnerships with local governments and conducted their revitalization efforts under the watchful eyes of their respective CMPs' lead agencies who ensured coastal management goals and policies were being met either through their oversight of local plans and review of permits (Calif. and PR), or through their direct involvement in scoping the waterfront plans (Hawaii).

6.4 Study Limitations

6.4.1 Data Availability

Studies such as this one that seek to document program processes and outcomes over a lengthy span of time—in this case 20-25 years—confront almost insuperable data problems. Personnel changes, record keeping practices, budget cuts and staff priorities confound the best attempts to assemble reliable and consistent information from program managers. In this particular program area the kinds of data needed to measure outcomes—land uses, kinds of development, financial and economic data, etc.—are rarely maintained by state CZM agencies.

The decision to focus our data collection at the state level was driven by budget and time considerations, and lead to reliance on the memories and experience of a relatively small number of CMP staff in each program. As a consequence, in the case of 11 of the 29 state and territories with approved programs, we have no data to link their CMPs' use of specific CZM tools and processes to individual waterfront districts; and, in four states we have no outcome data at all.

6.4.2 Data Quality

The data assembled through this study do not capture the whole scope of waterfront revitalization, its visual and esthetic quality, or the levels of use revitalized districts attract (program impact). Nor does this study capture all the contextual factors—the history, politics, regional economic conditions and events—that created the problems on the waterfront, or will mediate their resolution.

A richer vein of information available at the municipal level remains largely untapped. We have little graphical documentation (maps, plans, before-and-after photographs, etc.) of the on-the-ground outcomes of waterfront revitalization; and, more importantly, we lack an independent assessment of the effectiveness of contributions made by state CMPs to those outcomes from the "client group" which those programs serve. Searching out that kind of information is a task for another study with a staff and travel budget an order of magnitude larger than this one had...

6.4.3 Unmet Conceptual Challenges

At the beginning of this report we identified five conceptual and practical problems that attend the measurement of effectiveness of states' CZM programs in meeting the national goal of

waterfront revitalization. We have failed to address two: knowing the number of communities in each coastal state having deteriorated or under-utilized waterfronts; and, factoring in the costs of achieving on-the-ground results—i.e. program efficiency.

A true determination of CZM's effectiveness in responding to the national goal of waterfront revitalization would require knowledge about the magnitude of the problem being addressed—the number of deteriorated waterfronts in the coastal zone, and the scope and scale of their deterioration. We found no evidence that such a target has ever been defined at the national level, and only three states (Massachusetts, Mississippi and Pennsylvania) that had undertaken an inventory of their waterfronts. Without a well-defined program target, it is not possible to assess the true meaning of results obtained. (Do the 303 waterfront districts we identified in this study that have undergone, or are undergoing revitalization constitute 50% of the problem? 90%? We simply do not know.)

Rigorous assessment of effectiveness would also require some attention to the overall program costs incurred by each state in each waterfront district, not just the CZM grants passed through to local governments. Has CZM been cost-effective in addressing this issue? Did all §306 and 306A grants produce the results sought and lead to significantly more private investment in the target waterfronts? We have some data to suggest many CZM-funded projects lead to major accomplishments and economic benefits; others, clearly did not.

At least in part, we have addressed the three remaining problems: the scale and complexity of waterfronts; the significance of CZM's role in revitalization; and, attribution of the state CZM program's contribution to revitalization.

There is no evidence that any of the states for which we have outcome data have been wholly ineffective in addressing waterfront revitalization. The terms "extent," "stage" and "scope" of revitalization, as used to define on-the-ground outcomes in our study, do not capture the whole character of waterfront revitalization or its context in individual cases. Small numbers of waterfronts in which quite simple kinds of improvements have been achieved may well address the needs of those communities for improved access and amenity; and, reaching a workable plan for a single, major, metropolitan waterfront and breaking ground for the first symbolic public or private improvement, may represent a monumental achievement. In neither case would a state's outcome scores be high, however.

7.0 Recommendations

7.1 Recommendations for Improving the Effectiveness of State and Federal CZM Programs in Waterfront Revitalization

7.1.1 Funding of State Programs

Few national CZM objectives have a more diverse and extensive constituency than does revitalizing urban waterfronts. Fishers, boaters, joggers, walkers, shoppers, bicyclists, photographers, maritime history buffs, tourists, people watchers and artists all benefit when formerly deteriorated, walled-off waterfronts become accessible, safe and inviting. Inner city and suburb come together at waterfront festivals and other events; and new immigrants and long-established families rub shoulders at waterfront take-out fish 'n chips counters. Downtown property developers and marine conservation groups can and do join in developing and supporting waterfront plans that reinvigorate coastal economies and sustain marine environments.

There is overwhelming evidence from our study that financial assistance to local governments is the single most important tool available to states' CMPs to forge partnerships with cities to affect waterfront revitalization planning and, through low-cost projects, plan implementation. Furthermore, while CZM's financial contribution to waterfront revitalization represents a small proportion of all monies expended, it is an important catalyst to ignite local interest and demonstrate early success. Many states that hitherto provided §306 and 306A grants no longer do so due to federal funding cuts.

7.1.1.1 Restore Federal CZM Funding Levels

Without restoration of federal CZM funding to levels that will support increased grants to the coastal states, many coastal programs will be unable to maintain viable levels of financial and technical support for waterfront revitalization (as well as many other important areas of CZM).

7.1.2 National Urban Waterfronts Needs Assessment

This study has reported wide variations in the ways CMPs have addressed the needs and opportunities for urban waterfront revitalization in their states' coastal zones. Several have undertaken careful assessments of coastal cities' waterfronts and designated specific districts for attention. Others have relied entirely on cities to nominate themselves for financial and technical assistance offered by the state on a competitive awards basis. As a consequence, there are no consistent sources of information that could be aggregated to document the national need for CZM assistance to revitalize deteriorated waterfronts and establish a credible national priority for this important issue area. Two recommendations are made to alleviate this shortcoming.

7.1.2.1 Elevation of Waterfront Revitalization as a National Issue

To enhance the likelihood of achieving more comprehensive approaches to waterfront revitalization around the nation's coasts, NOAA/OCRM should consider promoting legislative changes to the CZMA that would add the issue to the Act's §309 enhancement objectives. The effect of this change would be to require each state's CZM agency to undertake a conscious, deliberate assessment of the issue, develop a strategy to address waterfront revitalization priorities in its CMP, and receive supplementary federal funding to implement the strategy. An additional advantage gained from elevating the issue to §309 status would be a more consistent monitoring of program results as the preceding year's strategy outcomes are assessed during each §309 grant cycle.

7.1.2.2 Urban Waterfronts Inventory

The problems these investigators encountered over data availability/accessibility point to a need for more consistent program monitoring and computer-based record keeping at both state and national levels. A handful of state programs—notably Maine and Connecticut, and to a lesser degree Pennsylvania and Washington—were able to provide detailed computer records which documented grant awards and the scope of the revitalization projects undertaken.

Records of §306 and §306A grants awarded by states to local governments are a potentially rich source of information on states' programs waterfront revitalization activities. Some states were able to provide printouts showing the dollar amount, recipient and purpose of grants they awarded to local governments. Had such records been available in a properly-documented and specifically-coded computerized *national database*, our data-gathering task would have been dramatically reduced in complexity, and the scope and accuracy of our data markedly enhanced.

States CMPs should be required to report to OCRM information on §306 and §306A grants to local governments or other entities in a standardized format that would identify the primary and secondary purposes of the grant, the dollar amount awarded, and a brief synopsis of the results achieved. States should also be encouraged to report awards of state-funded grants used to support CMP goals and policies.

OCRM should maintain an active and accessible database of such grants, coded to permit retrieval by state, grant recipient (municipality, university, state agency, etc.) and program area supported (public access, waterfront revitalization, etc.)

Building on this study's nationwide inventory of waterfronts undergoing revitalization, OCRM should develop and maintain an urban waterfronts database. The database should be expanded to include a listing of all urban places located on coastal waterways (marine shores, estuaries and tidal reaches of rivers)[11]. States' coastal managers should be asked to review the listings and to add

[11]Some states CMPs include a list of coastal towns and cities with their population, but the information is usually

notations concerning known, remaining areas of significant waterfront deterioration and dilapidation that might warrant attention over, say, the next five years.

The database should be capable of easy data export and import, run on desktop computer systems, and should contain a set of fields applicable in every state, and optional fields to accommodate unique needs and opportunities. The waterfront district should form the basic record in the database. Key fields might include:

- location (district, city, county, state)
- extent (acres, city blocks, feet of shoreline)
- waterbody (river, lake, marine embayment or open shore)
- present condition (descriptive text on deteriorated waterfront structures, abandoned industrial sites, access opportunities, etc.)
- brief history of waterfront (descriptive text on factors leading to present condition, and current status of those factors etc.)
- federal CZM funds spent (§306, §306A)
- other federal or state funds spent (plans, projects)
- municipal funds spent (plans, projects)
- partnerships developed (names of agencies, non profits, etc.)
- present stage of redevelopment indicators (Outcome Stage Indicators as defined in this study)
- present scope of redevelopment indicators (Outcome Scope Indicators as defined in this study)

Where states maintain records of development permits issued by local governments, flagging permits issued for projects (including environmental cleanup) within revitalizing waterfront district boundaries would yield additional and useful "scope" information (purpose/use; dollar value; date of construction complete, etc.).

7.1.3 Subject Area Expertise and Responsibility in NOAA/OCRM

It was not clear to the investigators that anyone in NOAA/OCRM was tasked with addressing waterfront revitalization as a major issue in reviewing state programs, or monitoring program amendments; nor did there appear to be individuals with significant expertise within OCRM to

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out of date. NOAA/ORCA staff indicated to this investigator that such data may be already available on a coastal watershed basis, but would need parsing to limit listings to the CZ.

assist regional program monitors in this subject area. This was not always the case, however. In earlier years there were several highly knowledgeable staff in the former OCZM who undertook training and technical assistance programs that benefited the states, and provided a core area of expertise in matters affecting the urban coast.

7.1.3.1 NOAA/OCRM Staffing

NOAA/OCRM should recruit (or retain) staff to lead the office in this subject area and prepare to undertake significant new responsibilities if recommendation 7.1.1.1 were implemented.

7.1.3.2 Education and Outreach

NOAA/OCRM, in partnership with the coastal states and other NOAA offices, should help organize and provide funding for a reinvigorated education and outreach program in waterfront revitalization. Educational activities should build on the experience gained by some of the "leader states" in this issue area and focus on regional audiences facing similar urban coastal issues—brownfields, marine resource declines, small port development, adaptive reuse of historic structures, mixed use developments, creative financing, etc.

OCRM should strengthen and continue partnerships with other NOAA entities, including the NOS Coastal Services Center and the National Sea Grant College Program, to gain the widest range of expertise and regional reach for educational programs.

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Appendices

Appendix A: State Profile Summaries

SUMMARY DATA FOR ALABAMA

POLICIES

Waterfront Revitalization

RevitalizationNo

Other CZM Goals

Public Access	Yes
Water Dependency	Yes
Hist/Cultural Conservation	Yes
Environmental Restoration	No

Other Policy

TOOLS

Designation	Yes
Financial Asst.	NA
Technical Asst.	NA
Guidance Documents	NA
Education & Training	NA
Partnering	NA
SAMPs	NA
Local Coastal Program Review	NA
Project Review	NA
Environmental Review	NA
Other Tools	No

Tools Effectiveness:
Not determined

Tools Score:
Not determined

OUTCOMES

Funding ($000's)

CZM Funds: Yes

Total Funds: $Unknown

No. of Waterfront Districts

0

Stage of Development

Plan Underway	0
Plan Complete	0
Project Underway	0
Multiple Projects Underway	0
Infrastructure & Projects Complete	0
Revitalization Complete	0

Stage Score: 0.0

SCOPE OF DEVELOPMENT

Landside Development

Retail/Restaurant	0
Hotels	0
Marine Ind.	0
Tourist Centers	0

Other Landside

CONCLUSIONS

OUTCOMES

Other CZM Goals

Public Access

Parks	0
Plaza	0
Boardwalks	0
Viewing Towers	0
Signage	0
Other Access	0

Marine Activity

Guest Boating	0
Comml. Boating	0
Fishing Piers	0
Water Tours	0
Other Marine	0

Other

Historic/Cultural Conservation	0
Env. Cleanup/Restoration	0
Festivals & Events	0

Scope Score: 0.0

Coastal Zone Management in Alabama is not used or applied to the redevelopment of dereriorated and underutilized urban watefronts. No determination of effectiveness is offered.

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

SUMMARY DATA FOR AMERICAN SAMOA

POLICIES

Waterfront Revitalization

RevitalizationNo

Other CZM Goals

Public Access	Yes
Water Dependency	Yes
Hist/Cultural Conservation	Yes
Environmental Restoration	No
Other Policy	No

TOOLS

Designation	Yes
Financial Asst.	Yes
Technical Asst.	Yes
Guidance Documents	No
Education & Training	No
Partnering	Yes
SAMPs	No
Local Coastal Program Review	NA
Project Review	Yes
Environmental Review	Yes
Other Tools	

Tools Effectiveness: Not determined

Tools Score: Not determined

OUTCOMES

Funding ($000's)

CZM Funds:	Yes
Total Funds:	$1.00

No. of Waterfront Districts

1

Stage of Development

Plan Underway	0
Plan Complete	1
Project Underway	0
Multiple Projects Underway	1
Infrastructure & Projects Complete	0
Revitalization Complete	0

Stage Score: 4.0

SCOPE OF DEVELOPMENT

Landside Development

Retail/Restaurant	1
Hotels	0
Marine Ind.	1
Tourist Centers	0
Other Landside	

CONCLUSIONS

OUTCOMES

Other CZM Goals

Public Access

Parks	0
Plaza	1
Boardwalks	0
Viewing Towers	0
Signage	0
Other Access	0

Marine Activity

Guest Boating	1
Comml. Boating	0
Fishing Piers	0
Water Tours	0
Other Marine	0

Other

Historic/Cultural Conservation	0
Env. Cleanup/Restoration	1
Festivals & Events	0

Scope Score: 5.0

Urban waterfront revitalization is a high priority in the Pago Pago Harbor area. We found no specific policies related to revitalization. However, designation of the Pago Pago Harbor for a Special Area Management Program addresses redevelopment in the Pago Pago area. There is a clear policy on protecting water dependent industries and historically significant areas. In addition to the SAMP designation, financial assistance, and partnering with the public and private sectors, have been highly effective in the redevelopment of American Samoa's major urban center.

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

SUMMARY DATA FOR CALIFORNIA

POLICIES

Waterfront Revitalization

Revitalization	Yes

Other CZM Goals

Public Access	Yes
Water Dependency	Yes
Hist/Cultural Conservation	Yes
Environmental Restoration	Yes
Other Policy	

TOOLS

Designation	4
Financial Asst.	14
Technical Asst.	14
Guidance Documents	10
Education & Training	0
Partnering	14
SAMPs	0
Local Coastal Program Review	5
Project Review	8
Environmental Review	0
Other Tools	0

Tools Effectiveness: 2.54

Tools Score: 0.48

OUTCOMES

Funding ($000's)

CZM Funds:	$15817.70
Total Funds:	$51627.00

No. of Waterfront Districts

16

Stage of Development

Plan Underway	1
Plan Complete	14
Project Underway	6
Multiple Projects Underway	2
Infrastructure & Projects Complete	7
Revitalization Complete	0

Stage Score: 3.8

SCOPE OF DEVELOPMENT

Landside Development

Retail/Restaurant	6
Hotels	1
Marine Ind.	1
Tourist Centers	2
Other Landside	1

CONCLUSIONS

OUTCOMES

Other CZM Goals

Public Access

Parks	4
Plaza	3
Boardwalks	6
Viewing Towers	4
Signage	2
Other Access	0

Marine Activity

Guest Boating	1
Comml. Boating	3
Fishing Piers	6
Water Tours	1
Other Marine	0

Other

Historic/Cultural Conservation	2
Env. Cleanup/Restoration	3
Festivals & Events	2

Scope Score: 3.2

The triple agency CMP structure in California is unique as it relates to urban waterfront revitalization. The California Coastal Conservancy has sponsored urban waterfront revitalization primarily through financial and technical assistance and partnering with state and local government agencies. The Coastal Commission provides the regulatory oversight and, with the Conservancy's involvement, ensures the implementation of public access, water dependent, historical preservation and environmental restoration goals. The Conservancy has been able to spur interest in local communities to revitalize deteriorated waterfronts, and aid in the planning process to address regulatory issues, up front. This has undoubtedly reduced controversy and provided regulatory consistency when permitting comes before the CCC and BCDC. The SCC's urban waterfront program, guided by strong policy, provides the tools and processes to carry out the policy objectives. Despite the low issue importance to the CMP, there are several successful examples of urban waterfront revitalization with CZM involvement. In the identified urban waterfront districts the

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

application of these tools has had a medium to highly effective result in promoting the revitalization. The California CMP is an exemplary, highly effective program in urban waterfront revitalization.

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

SUMMARY DATA FOR CNMI

POLICIES

Waterfront Revitalization

Revitalization Yes

Other CZM Goals

Public Access Yes

Water Dependency Yes

Hist/Cultural Conservation Yes

Environmental Restoration No

Other Policy

TOOLS

Designation Yes

Financial Asst. Unk

Technical Asst. Unk

Guidance Documents Unk

Education & Training Unk

Partnering Unk

SAMPs Unk

Local Coastal Program Review Unk

Project Review Unk

Environmental Review Unk

Other Tools Unk

Tools Effectiveness:
Not determined

Tools Score:
Not determined

OUTCOMES

Funding ($000's)

CZM Funds: Yes

Total Funds: $Unknown

No. of Waterfront Districts

0

Stage of Development

Plan Underway	0
Plan Complete	0
Project Underway	0
Multiple Projects Underway	0
Infrastructure & Projects Complete	0
Revitalization Complete	0

Stage Score: 0.0

SCOPE OF DEVELOPMENT

Landside Development

Retail/Restaurant	0
Hotels	0
Marine Ind.	0
Tourist Centers	0
Other Landside	

CONCLUSIONS

OUTCOMES

Other CZM Goals

Public Access

Parks	0
Plaza	0
Boardwalks	0
Viewing Towers	0
Signage	0
Other Access	0

Marine Activity

Guest Boating	0
Comml. Boating	0
Fishing Piers	0
Water Tours	0
Other Marine	0

Other

Historic/Cultural Conservation	0
Env. Cleanup/Restoration	0
Festivals & Events	0

Scope Score: 0.0

Effectiveness of the Commonwealth of the Northern Mariana Islands Coastal Management Program's (CNMICMP's) urban waterfront revitalization efforts cannot be determined due to insufficient data reported. Given the lack of major concentrated urbanized areas on the Islands, and the relative recent development of the major cities it is not surprising that revitalization in not a major issue for the CZMP.

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

SUMMARY DATA FOR CONNECTICUT

POLICIES

Waterfront Revitalization

RevitalizationYes

Other CZM Goals

Public AccessYes

Water DependencyYes

Hist/Cultural Conservation Yes

Environmental Restoration Yes

Other PolicyYes

TOOLS

Designation	8
Financial Asst.	4
Technical Asst.	9
Guidance Documents	0
Education & Training	3
Partnering	4
SAMPs	0
Local Coastal Program Review	9
Project Review	9
Environmental Review	9
Other Tools	0

Tools Effectiveness: 3.00

Tools Score: 0.51

OUTCOMES

Funding ($000's)

CZM Funds: $105.20

Total Funds: $291025.00

No. of Waterfront Districts

9

Stage of Development

Plan Underway	1
Plan Complete	8
Project Underway	0
Multiple Projects Underway	0
Infrastructure & Projects Complete	1
Revitalization Complete	7

Stage Score: 5.3

SCOPE OF DEVELOPMENT

Landside Development

Retail/Restaurant	5
Hotels	1
Marine Ind.	3
Tourist Centers	2
Other Landside	1

CONCLUSIONS

OUTCOMES

Other CZM Goals

Public Access

Parks	7
Plaza	1
Boardwalks	5
Viewing Towers	1
Signage	2
Other Access	0

Marine Activity

Guest Boating	6
Comml. Boating	5
Fishing Piers	3
Water Tours	1
Other Marine	2

Other

Historic/Cultural Conservation	3
Env. Cleanup/Restoration	0
Festivals & Events	5

Scope Score: 5.0

Waterfront revitalization had high priority in Connecticut's CMP when it was approved in 1980, and continues to enjoy that status to this day. Connecticut has strong policies addressing revitalization of the state's urban waterfronts and ports. The Coastal Act directs the state CMP to both protect and promote water dependent uses, including public access. Through review of Municipal Coastal Programs (MCPs), Harbor Management Plans (HMPs) and significant coastal projects, the state has the authority to ensure that CZM goals are incorporated in local plans and projects on both the "wet" and landward sides of the state's coastal zone. In addition to its review authority, the CT CMP has provided financial and technical assistance, and has utilized guidance documents in its partnership with local municipalities to achieve waterfront revitalization.

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

SUMMARY DATA FOR DELAWARE

POLICIES

Waterfront Revitalization

Revitalization No

Other CZM Goals

Public Access	Yes
Water Dependency	Yes
Hist/Cultural Conservation	Yes
Environmental Restoration	Yes
Other Policy	

TOOLS

Designation	No
Financial Asst.	No
Technical Asst.	Yes
Guidance Documents	Yes
Education & Training	No
Partnering	No
SAMPs	No
Local Coastal Program Review	No
Project Review	Yes
Environmental Review	Yes
Other Tools	

Tools Effectiveness: Not determined

Tools Score: Not determined

OUTCOMES

Funding ($000's)

CZM Funds: Yes

Total Funds: $Unknown

No. of Waterfront Districts

0

Stage of Development

Plan Underway	0
Plan Complete	0
Project Underway	0
Multiple Projects Underway	0
Infrastructure & Projects Complete	0
Revitalization Complete	0

Stage Score: 0.0

SCOPE OF DEVELOPMENT

Landside Development

Retail/Restaurant	0
Hotels	0
Marine Ind.	0
Tourist Centers	0
Other Landside	

CONCLUSIONS

No determination of effectiveness due to lack of data.

OUTCOMES

Other CZM Goals

Public Access

Parks	0
Plaza	0
Boardwalks	0
Viewing Towers	0
Signage	0
Other Access	0

Marine Activity

Guest Boating	0
Comml. Boating	0
Fishing Piers	0
Water Tours	0
Other Marine	0

Other

Historic/Cultural Conservation	0
Env. Cleanup/Restoration	0
Festivals & Events	0

Scope Score: 0.0

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

SUMMARY DATA FOR FLORIDA

POLICIES

Waterfront Revitalization

Revitalization	Yes

Other CZM Goals

Public Access	Yes
Water Dependency	Yes
Hist/Cultural Conservation	Yes
Environmental Restoration	NA
Other Policy	

TOOLS

Designation	0
Financial Asst.	5
Technical Asst.	0
Guidance Documents	0
Education & Training	0
Partnering	0
SAMPs	0
Local Coastal Program Review	0
Project Review	0
Environmental Review	1
Other Tools	0

Tools Effectiveness: 2.50

Tools Score: 0.08

OUTCOMES

Funding ($000's)

CZM Funds:	$102.96
Total Funds:	$331.42

No. of Waterfront Districts

14

Stage of Development

Plan Underway	1
Plan Complete	4
Project Underway	2
Multiple Projects Underway	0
Infrastructure & Projects Complete	2
Revitalization Complete	0

Stage Score: 2.8

SCOPE OF DEVELOPMENT

Landside Development

Retail/Restaurant	0
Hotels	0
Marine Ind.	1
Tourist Centers	0
Other Landside	0

OUTCOMES

Other CZM Goals

Public Access

Parks	2
Plaza	0
Boardwalks	3
Viewing Towers	0
Signage	1
Other Access	2

Marine Activity

Guest Boating	1
Comml. Boating	1
Fishing Piers	0
Water Tours	0
Other Marine	0

Other

Historic/Cultural Conservation	0
Env. Cleanup/Restoration	1
Festivals & Events	0

Scope Score: 3.0

CONCLUSIONS

Urban waterfront revitalization was a low to medium priority in the early development stages of the Florida Coastal Management Program (FCMP). The creation of a Waterfronts Florida Program in 1995 has designated waterfront revitalization as a high priority issue. With this new direction the FCMP is positioning itself to become a strong advocate and supporter of urban waterfront revitalization. The Waterfronts Florida Program shows excellent issue identification and strategizing by the FCMP. The FCMP will carry out it's new mission through a variety of tools—most importantly, with financial assistance and partnering. This study has identified two key CZM-sponsored waterfront revitalization projects; however, there is a lack of concrete quantitative and qualitative outcome data on Florida's numerous urban waterfronts to support a definitive determination of effectiveness. The new Working Waterfronts Program is designed to increase the FCMP's involvement throughout the state and will be a program worth watching over the next few years.

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

SUMMARY DATA FOR GUAM

POLICIES

Waterfront Revitalization

RevitalizationNo

Other CZM Goals

Public Access	Yes
Water Dependency	Yes
Hist/Cultural Conservation	Yes
Environmental Restoration	Yes
Other Policy	

TOOLS

Designation	Yes
Financial Asst.	Yes
Technical Asst.	Yes
Guidance Documents	Yes
Education & Training	No
Partnering	Yes
SAMPs	Yes
Local Coastal Program Review	No
Project Review	Yes
Environmental Review	Yes
Other Tools	

Tools Effectiveness:
Not determined

Tools Score:
Not determined

OUTCOMES

Funding ($000's)

CZM Funds: Yes

Total Funds: $Unknown

No. of Waterfront Districts

1

Stage of Development

Plan Underway	1
Plan Complete	0
Project Underway	0
Multiple Projects Underway	0
Infrastructure & Projects Complete	0
Revitalization Complete	0

Stage Score: 1.0

SCOPE OF DEVELOPMENT

Landside Development

Retail/Restaurant	0
Hotels	0
Marine Ind.	0
Tourist Centers	0
Other Landside	

CONCLUSIONS

OUTCOMES

Other CZM Goals

Public Access

Parks	0
Plaza	0
Boardwalks	0
Viewing Towers	0
Signage	0
Other Access	0

Marine Activity

Guest Boating	0
Comml. Boating	0
Fishing Piers	0
Water Tours	0
Other Marine	0

Other

Historic/Cultural Conservation	0
Env. Cleanup/Restoration	0
Festivals & Events	0

Scope Score: 0.0

Because of a lack of outcome data for the Agana Waterfront, no determination of the effectiveness of Guam's Coastal Management Program is offered.

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

SUMMARY DATA FOR HAWAII

POLICIES

Waterfront Revitalization

Revitalization Yes

Other CZM Goals

Public Access Yes

Water Dependency Yes

Hist/Cultural Conservation Yes

Environmental Restoration No

Other Policy Yes

TOOLS

Designation	1
Financial Asst.	0
Technical Asst.	0
Guidance Documents	0
Education & Training	0
Partnering	1
SAMPs	0
Local Coastal Program Review	0
Project Review	1
Environmental Review	1
Other Tools	0

Tools Effectiveness: Unknown

Tools Score: 0.30

OUTCOMES

Funding ($000's)

CZM Funds: Yes

Total Funds: $Unknown

No. of Waterfront Districts

1

Stage of Development

Plan Underway	0
Plan Complete	1
Project Underway	0
Multiple Projects Underway	0
Infrastructure & Projects Complete	1
Revitalization Complete	0

Stage Score: 5.0

SCOPE OF DEVELOPMENT

Landside Development

Retail/Restaurant	1
Hotels	0
Marine Ind.	1
Tourist Centers	1
Other Landside	

CONCLUSIONS

OUTCOMES

Other CZM Goals

Public Access

Parks	1
Plaza	1
Boardwalks	1
Viewing Towers	1
Signage	1
Other Access	1

Marine Activity

Guest Boating	1
Comml. Boating	1
Fishing Piers	0
Water Tours	1
Other Marine	1

Other

Historic/Cultural Conservation	1
Env. Cleanup/Restoration	1
Festivals & Events	0

Scope Score: 16.0

Even though waterfront revitalization has had a consistently low priority in its CMP, the State of Hawaii has used its networked program in an efficient and targeted fashion to enhance the revitalization of Honolulu's downtown waterfront. The Office of State Planning utilized the staff and financial resources of another state agency's program (Hawaii Community Development Authority's Kaka'ako Community Development District), and the Aloha Tower Development Corporation in partnership with the City and County of Honolulu to undertake the necessary planning and urban design, financing and redevelopment tasks, while focussing their own limited staff effort on ensuring state coastal management objectives and policies were being properly implemented.

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

SUMMARY DATA FOR LOUISIANA

POLICIES

Waterfront Revitalization

RevitalizationNo

Other CZM Goals

Public Access	No
Water Dependency	Yes
Hist/Cultural Conservation	Yes
Environmental Restoration	No
Other Policy	

TOOLS

Designation	No
Financial Asst.	No
Technical Asst.	No
Guidance Documents	No
Education & Training	No
Partnering	Yes
SAMPs	No
Local Coastal Program Review	Yes
Project Review	Yes
Environmental Review	Yes
Other Tools	

Tools Effectiveness:
Not determined

Tools Score:
Not determined

OUTCOMES

Funding ($000's)

CZM Funds: Yes

Total Funds: $Unknown

No. of Waterfront Districts

0

Stage of Development

Plan Underway	0
Plan Complete	0
Project Underway	0
Multiple Projects Underway	0
Infrastructure & Projects Complete	0
Revitalization Complete	0

Stage Score: 0.0

SCOPE OF DEVELOPMENT

Landside Development

Retail/Restaurant	0
Hotels	0
Marine Ind.	0
Tourist Centers	0
Other Landside	

OUTCOMES

Other CZM Goals

Public Access

Parks	0
Plaza	0
Boardwalks	0
Viewing Towers	0
Signage	0
Other Access	0

Marine Activity

Guest Boating	0
Comml. Boating	0
Fishing Piers	0
Water Tours	0
Other Marine	0

Other

Historic/Cultural Conservation	0
Env. Cleanup/Restoration	0
Festivals & Events	0

Scope Score: 0.0

CONCLUSIONS

Waterfront revitalization is not a priority issue for Louisiana's CZMP, thus no determination of effectiveness is offered.

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

SUMMARY DATA FOR MASSACHUSETTS

POLICIES

Waterfront Revitalization

Revitalization Yes

Other CZM Goals

Public Access Yes

Water Dependency Yes

Hist/Cultural Conservation Yes

Environmental Restoration Yes

Other Policy Yes

TOOLS

Designation	10
Financial Asst.	5
Technical Asst.	7
Guidance Documents	1
Education & Training	0
Partnering	10
SAMPs	4
Local Coastal Program Review	5
Project Review	0
Environmental Review	5
Other Tools	1

Tools Effectiveness: 3.00

Tools Score: 0.37

OUTCOMES

Funding ($000's)

CZM Funds: Yes

Total Funds: $Unknown

No. of Waterfront Districts

13

Stage of Development

Plan Underway	9
Plan Complete	2
Project Underway	2
Multiple Projects Underway	1
Infrastructure & Projects Complete	7
Revitalization Complete	0

Stage Score: 2.9

SCOPE OF DEVELOPMENT

Landside Development

Retail/Restaurant	0
Hotels	0
Marine Ind.	0
Tourist Centers	3
Other Landside	1

OUTCOMES

Other CZM Goals

Public Access

Parks	10
Plaza	2
Boardwalks	2
Viewing Towers	2
Signage	0
Other Access	1

Marine Activity

Guest Boating	0
Comml. Boating	3
Fishing Piers	5
Water Tours	2
Other Marine	7

Other

Historic/Cultural Conservation	0
Env. Cleanup/Restoration	0
Festivals & Events	0

Scope Score: 2.9

CONCLUSIONS

Waterfront revitalization was given a high priority in Massachusetts' CMP at time of program approval in 1978, remained high when the 1980 CZMA amendments were passed, and remains high to this day. The state has strong policies to encourage the revitalization of ports and waterfronts, giving highest priority to the protection of water dependent uses on present or former (filled) state tideland areas. Non-water dependent uses in revitalizing waterfronts are strictly limited in Developed Port Areas, but are permitted outside DPAs, subject to waterways permit review. Mass CMP has used federal and state CZM funding, technical assistance, and guidance documents to assist local governments undertake harbor plans programs and port master plans in designated ports that are consistent with the CMP goals. Project reviews for waterways licenses are used to achieve public benefits where non-water dependent uses are proposed.

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

SUMMARY DATA FOR MARYLAND

POLICIES

Waterfront Revitalization

Revitalization Yes

Other CZM Goals

Public Access Yes

Water Dependency Yes

Hist/Cultural Conservation Yes

Environmental Restoration Yes

Other Policy

TOOLS

Designation	0
Financial Asst.	15
Technical Asst.	0
Guidance Documents	0
Education & Training	0
Partnering	15
SAMPs	0
Local Coastal Program Review	0
Project Review	0
Environmental Review	0
Other Tools	0

Tools Effectiveness: 2.60

Tools Score: 0.30

OUTCOMES

Funding ($000's)

CZM Funds: Yes

Total Funds: $89.55

No. of Waterfront Districts

15

Stage of Development

Plan Underway	0
Plan Complete	11
Project Underway	0
Multiple Projects Underway	0
Infrastructure & Projects Complete	0
Revitalization Complete	4

Stage Score: 2.5

SCOPE OF DEVELOPMENT

Landside Development

Retail/Restaurant	2
Hotels	2
Marine Ind.	1
Tourist Centers	1
Other Landside	0

CONCLUSIONS

OUTCOMES

Other CZM Goals

Public Access

Parks	10
Plaza	2
Boardwalks	6
Viewing Towers	1
Signage	1
Other Access	1

Marine Activity

Guest Boating	5
Comml. Boating	3
Fishing Piers	3
Water Tours	1
Other Marine	0

Other

Historic/Cultural Conservation	1
Env. Cleanup/Restoration	7
Festivals & Events	7

Scope Score: 3.6

Urban waterfront revitalization was a medium priority during the early 1980s in Maryland's CMP, and today is a low priority; natural resource protection and enhancement have taken precedence. Maryland's CMP has designed guidelines that local jurisdictions must incorporate in any waterfront revitalization plan or project. The main goal of the Critical Areas Act emphasizes minimizing adverse impacts to water quality and wildlife habitat, redevelopment of urban areas with public access in mind helps to achieve this goal. The Maryland CMP identified 15 cities/communities where waterfront revitalization has taken place. The key processes and tools contributing to the revitalization in these areas include financial assistance to local communities for planning and implementation of the plans, partnering with state and local agencies, and designation of Coastal Areas in the Critical Areas Buffer Zone. Overall, Maryland's Coastal Management Program is found to be moderately effective in promoting and supporting urban waterfront revitalization.

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

SUMMARY DATA FOR MAINE

POLICIES

Waterfront Revitalization

Revitalization Yes

Other CZM Goals

Public Access Yes

Water Dependency Yes

Hist/Cultural Conservation Yes

Environmental Restoration NA

Other Policy

TOOLS

Designation	0
Financial Asst.	18
Technical Asst.	0
Guidance Documents	0
Education & Training	0
Partnering	18
SAMPs	0
Local Coastal Program Review	0
Project Review	0
Environmental Review	0
Other Tools	0

Tools Effectiveness: Unknown

Tools Score: 0.28

OUTCOMES

Funding ($000's)

CZM Funds: $200.50

Total Funds: $1259.13

No. of Waterfront Districts

19

Stage of Development

Plan Underway	0
Plan Complete	16
Project Underway	2
Multiple Projects Underway	0
Infrastructure & Projects Complete	12
Revitalization Complete	0

Stage Score: 3.7

SCOPE OF DEVELOPMENT

Landside Development

Retail/Restaurant	0
Hotels	0
Marine Ind.	1
Tourist Centers	7
Other Landside	6

CONCLUSIONS

OUTCOMES

Other CZM Goals

Public Access

Parks	12
Plaza	0
Boardwalks	6
Viewing Towers	1
Signage	1
Other Access	0

Marine Activity

Guest Boating	11
Comml. Boating	7
Fishing Piers	5
Water Tours	3
Other Marine	3

Other

Historic/Cultural Conservation	8
Env. Cleanup/Restoration	0
Festivals & Events	0

Scope Score: 3.5

Waterfront revitalization is considered a low to medium priority to the MeCMP. There is a definitive policy on promoting port and harbor development and redevelopment based on the water-dependent nature of these entities. The MeCMP continues to improve public access and promote harbor and marina expansion and development. There are elements of waterfront revitalization in these efforts. The key processes and tools used by the MeCMP to promote revitalization are financial assistance, through the Waterfronts Grant Program, and technical assistance in developing plans for local governments and ports. It is our opinion that the MeCMP has been highly effective in promoting revitalization given its financial support and involvement in revitalization planning and project development, and the resulting improvements to waterfront communities. The results have been increased public access, incorporation of marine activities, historical preservation and numerous festivals and maritime events.

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

SUMMARY DATA FOR MICHIGAN

POLICIES

Waterfront Revitalization

RevitalizationNo

Other CZM Goals

Public AccessYes

Water DependencyYes

Hist/Cultural Conservation Yes

Environmental Restoration Yes

Other PolicyNo

TOOLS

Designation	0
Financial Asst.	18
Technical Asst.	18
Guidance Documents	0
Education & Training	0
Partnering	8
SAMPs	0
Local Coastal Program Review	0
Project Review	18
Environmental Review	18
Other Tools	0

Tools Effectiveness: 2.61

Tools Score: 0.40

OUTCOMES

Funding ($000's)

CZM Funds: $3464.60

Total Funds: $9499.90

No. of Waterfront Districts

20

Stage of Development

Plan Underway	5
Plan Complete	6
Project Underway	9
Multiple Projects Underway	12
Infrastructure & Projects Complete	19
Revitalization Complete	2

Stage Score: 5.8

SCOPE OF DEVELOPMENT

Landside Development

Retail/Restaurant	4
Hotels	1
Marine Ind.	1
Tourist Centers	1
Other Landside	0

CONCLUSIONS

OUTCOMES

Other CZM Goals

Public Access

Parks	18
Plaza	1
Boardwalks	14
Viewing Towers	10
Signage	6
Other Access	7

Marine Activity

Guest Boating	10
Comml. Boating	7
Fishing Piers	11
Water Tours	1
Other Marine	1

Other

Historic/Cultural Conservation	6
Env. Cleanup/Restoration	0
Festivals & Events	4

Scope Score: 5.2

Michigan's Coastal Management Program (MICMP) has been a national leader in urban waterfront revitalization planning and project development. Waterfront revitalization is clearly a major concern in Michigan's heavily industrialized waterfronts, and the state's CMP has made revitalization a high priority issue. The MICMP was one of the first state CZMPs to use §306 funds to promote waterfront revitalization by providing planning and small construction grants to local communities. Financial assistance combined with technical assistance and rigorous project review has resulted in a multitude of mature, revitalized waterfront areas. A comprehensive Natural Resources and Environmental Protection Act provides the guidance and regulatory necessities for revitalization, though specific language on revitalization of urban waterfronts is absent. Given the challenge of literally hundreds of deteriorated, abandoned and contaminated waterfront sites, the CMP has stepped up and shown how proactive, guided support can lead to economically viable and publicly-oriented revitalization. Overall, the MICMP has been extremely

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

effective in urban waterfront revitalization and should be considered an exemplary program in addressing this national goal.

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

SUMMARY DATA FOR MISSISSIPPI

POLICIES

Waterfront Revitalization

Revitalization Yes

Other CZM Goals

Public Access Yes

Water Dependency Yes

Hist/Cultural Conservation Yes

Environmental Restoration Yes

Other Policy No

TOOLS

Designation	8
Financial Asst.	8
Technical Asst.	8
Guidance Documents	0
Education & Training	2
Partnering	8
SAMPs	1
Local Coastal Program Review	0
Project Review	0
Environmental Review	0
Other Tools	0

Tools Effectiveness: 2.00

Tools Score: 0.54

OUTCOMES

Funding ($000's)

CZM Funds: Yes

Total Funds: $Unknown

No. of Waterfront Districts

8

Stage of Development

Plan Underway	0
Plan Complete	8
Project Underway	0
Multiple Projects Underway	5
Infrastructure & Projects Complete	0
Revitalization Complete	0

Stage Score: 3.3

SCOPE OF DEVELOPMENT

Landside Development

Retail/Restaurant	0
Hotels	1
Marine Ind.	2
Tourist Centers	2
Other Landside	0

CONCLUSIONS

OUTCOMES

Other CZM Goals

Public Access

Parks	3
Plaza	1
Boardwalks	1
Viewing Towers	1
Signage	4
Other Access	7

Marine Activity

Guest Boating	2
Comml. Boating	0
Fishing Piers	8
Water Tours	0
Other Marine	0

Other

Historic/Cultural Conservation	2
Env. Cleanup/Restoration	2
Festivals & Events	6

Scope Score: 5.3

Urban waterfront revitalization is a high priority issue for the MSCMP. Although no specific revitalization policy was found, the program's goals specifically incorporate public access, water-dependent uses and historical preservation for urban waterfront redevelopment. Early on, the MCMP designated eight urban areas with waterfronts to be redeveloped. Financial assistance to local communities from §306 and §306A funds, and partnering have been key processes and tools to revitalization efforts in these areas. In Pass Christian and Biloxi the combination of these tools was rated as highly effective. Biloxi stands out as a prime example of CZM success in revitalization. These same tools were rated as moderately effective in revitalizing the Waveland, Long Beach, Gulfport, and Pascagoula waterfront areas. In Bay St. Louis and Moss Point CZM tools and processes have had a low effectiveness in the revitalization process. CZM staff point out that there was very little local enthusiasm in the Bay St. Louis case to carry out the revitalization project. Given the MSCMP target of specific potential revitalization areas, and subsequent financial and planning assistance, we feel the MSCMP has been highly effective in urban waterfront revitalization.

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

SUMMARY DATA FOR NORTH CAROLINA

POLICIES

Waterfront Revitalization

RevitalizationNo

Other CZM Goals

Public Access	Yes
Water Dependency	Yes
Hist/Cultural Conservation	Yes
Environmental Restoration	No
Other Policy	

TOOLS

Designation	No
Financial Asst.	Yes
Technical Asst.	Yes
Guidance Documents	Yes
Education & Training	No
Partnering	No
SAMPs	No
Local Coastal Program Review	No
Project Review	Yes
Environmental Review	No
Other Tools	

Tools Effectiveness:
Not determined

Tools Score:
Not determined

OUTCOMES

Funding ($000's)

CZM Funds:	$701.48
Total Funds:	$22043.32

No. of Waterfront Districts

8

Stage of Development

Plan Underway	0
Plan Complete	1
Project Underway	7
Multiple Projects Underway	0
Infrastructure & Projects Complete	1
Revitalization Complete	0

Stage Score: 1.5

SCOPE OF DEVELOPMENT

Landside Development

Retail/Restaurant	2
Hotels	1
Marine Ind.	0
Tourist Centers	2
Other Landside	0

CONCLUSIONS

OUTCOMES

Other CZM Goals

Public Access

Parks	8
Plaza	0
Boardwalks	7
Viewing Towers	0
Signage	7
Other Access	0

Marine Activity

Guest Boating	1
Comml. Boating	0
Fishing Piers	7
Water Tours	0
Other Marine	0

Other

Historic/Cultural Conservation	1
Env. Cleanup/Restoration	0
Festivals & Events	2

Scope Score: 4.8

The North Carolina Coastal Management Program (NCCMP) has judged the waterfront revitalization issue to be a high priority. While there is no clear policy directed toward waterfront revitalization, it is clear that the NCCMP has contributed CZM funding to waterfront planning and projects, and that there are projects underway in seven coastal cities and communities. It would appear the state has been moderately effective in promoting urban waterfront revitalization. Core CZM goals have been incorporated in the revitalization efforts in the identified cities. However, given the lack of detail on waterfront revitalization plans and projects, it is difficult to determine overall effectiveness of the NCCMP.

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

SUMMARY DATA FOR NEW HAMPSHIRE

POLICIES

Waterfront Revitalization

Revitalization Yes

Other CZM Goals

Public Access	Yes
Water Dependency	Yes
Hist/Cultural Conservation	Yes
Environmental Restoration	Yes
Other Policy	

TOOLS

Designation	Yes
Financial Asst.	Yes
Technical Asst.	Yes
Guidance Documents	No
Education & Training	No
Partnering	Yes
SAMPs	No
Local Coastal Program Review	No
Project Review	Yes
Environmental Review	Yes
Other Tools	

Tools Effectiveness:
Not determined

Tools Score:
Not determined

OUTCOMES

Funding ($000's)

CZM Funds:	$134.00
Total Funds:	$1201.00

No. of Waterfront Districts

10

Stage of Development

Plan Underway	0
Plan Complete	9
Project Underway	0
Multiple Projects Underway	9
Infrastructure & Projects Complete	0
Revitalization Complete	0

Stage Score: 3.6

SCOPE OF DEVELOPMENT

Landside Development

Retail/Restaurant	0
Hotels	0
Marine Ind.	0
Tourist Centers	0
Other Landside	

OUTCOMES

Other CZM Goals

Public Access

Parks	5
Plaza	4
Boardwalks	5
Viewing Towers	1
Signage	0
Other Access	0

Marine Activity

Guest Boating	4
Comml. Boating	0
Fishing Piers	0
Water Tours	0
Other Marine	0

Other

Historic/Cultural Conservation	0
Env. Cleanup/Restoration	0
Festivals & Events	0

Scope Score: 3.3

CONCLUSIONS

Waterfront revitalization is a medium priority for New Hampshire's Coastal Management Program (NHCMP). There is clear and definitive urban waterfront revitalization policy, as well as water-dependency and historic preservation policies. Public access is considered water dependent. The NHCMP has been active in promoting revitalization planning primarily through financial and planning assistance to local communities. These planning efforts have resulted in increased public access and guest boating facilities. In addition, the CMP has been involved in a number of revitalization projects that address specific CZM goals to promote public access, water-dependency, and historic preservation. Without explicit details on revitalization projects it is difficult to assess the degree to which the CMP has been involved. We conclude that the CMP has been moderately effective in promoting waterfront revitalization.

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

SUMMARY DATA FOR NEW JERSEY

POLICIES

Waterfront Revitalization

Revitalization Yes

Other CZM Goals

Public Access Yes

Water Dependency Yes

Hist/Cultural Conservation Yes

Environmental Restoration Yes

Other Policy No

TOOLS

Designation	7
Financial Asst.	6
Technical Asst.	7
Guidance Documents	7
Education & Training	7
Partnering	7
SAMPs	0
Local Coastal Program Review	0
Project Review	7
Environmental Review	5
Other Tools	0

Tools Effectiveness: 2.50

Tools Score: 0.76

OUTCOMES

Funding ($000's)

CZM Funds: Yes

Total Funds: $Unknown

No. of Waterfront Districts

7

Stage of Development

Plan Underway	0
Plan Complete	0
Project Underway	0
Multiple Projects Underway	0
Infrastructure & Projects Complete	6
Revitalization Complete	0

Stage Score: 3.0

SCOPE OF DEVELOPMENT

Landside Development

Retail/Restaurant	5
Hotels	2
Marine Ind.	2
Tourist Centers	2
Other Landside	2

CONCLUSIONS

OUTCOMES

Other CZM Goals

Public Access

Parks	4
Plaza	5
Boardwalks	6
Viewing Towers	1
Signage	5
Other Access	0

Marine Activity

Guest Boating	4
Comml. Boating	1
Fishing Piers	4
Water Tours	4
Other Marine	1

Other

Historic/Cultural Conservation	3
Env. Cleanup/Restoration	5
Festivals & Events	3

Scope Score: 8.3

The key to successful urban waterfront revitalization in New Jersey has been a reliance on project and permit review, and partnering with other state and local agencies. The use of pre-permit review conferences has led to better permit compliance. The revitalization of Atlantic City, Jersey City, Hoboken and Weehawkin has been influenced by the highly effective use of CZM technical assistance, education, partnering, and project review. These same processes and tools have had a medium effectiveness in the towns of Edgewater, Camden and City of Elizabeth. To a limited extent financial assistance in the form of grants from the CZMP has contributed to planning and minor construction projects in waterfront revitalization districts. CZMP staff expressed a need to revitalize more of the deteriorated and underutilized waterfronts in the state, but that the program is limited by staff time and money to do so. Given the expected need for urban waterfront revitalization in this historic Atlantic seaboard state, the high importance of the issue to the CZMP, a comprehensive set of networked state laws and agencies, the CZMP has been highly effective in contributing to urban waterfront revitalization.

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

SUMMARY DATA FOR NEW YORK

POLICIES

Waterfront Revitalization

Revitalization Yes

Other CZM Goals

Public Access Yes

Water Dependency Yes

Hist/Cultural Conservation Yes

Environmental Restoration Yes

Other Policy Yes

TOOLS

Designation	0
Financial Asst.	45
Technical Asst.	45
Guidance Documents	0
Education & Training	0
Partnering	45
SAMPs	0
Local Coastal Program Review	32
Project Review	22
Environmental Review	22
Other Tools	1

Tools Effectiveness: Unknown

Tools Score: 0.49

OUTCOMES

Funding ($000's)

CZM Funds: $2741.25

Total Funds: $2978.95

No. of Waterfront Districts

45

Stage of Development

Plan Underway	11
Plan Complete	32
Project Underway	1
Multiple Projects Underway	4
Infrastructure & Projects Complete	16
Revitalization Complete	2

Stage Score: 3.3

SCOPE OF DEVELOPMENT

Landside Development

Retail/Restaurant	11
Hotels	5
Marine Ind.	8
Tourist Centers	2
Other Landside	2

CONCLUSIONS

OUTCOMES

Other CZM Goals

Public Access

Parks	23
Plaza	4
Boardwalks	12
Viewing Towers	12
Signage	8
Other Access	1

Marine Activity

Guest Boating	18
Comml. Boating	9
Fishing Piers	16
Water Tours	6
Other Marine	7

Other

Historic/Cultural Conservation	9
Env. Cleanup/Restoration	10
Festivals & Events	11

Scope Score: 5.6

NY State's Coastal Management Program (NYCMP) is unique in the manner chosen to address waterfront revitalization: The statute from which the program derives its authority is titled Waterfront Revitalization and Coastal Resources Act and is focussed on partnerships with villages, towns and cities in the coastal zone to achieve its goal. Waterfront revitalization has been a consistently high priority in the state's CMP since it was approved. There are strong policies in place addressing each aspect of waterfront revitalization that this study assumes are important, and every LWRP must address each of them. The Dept. of State has employed tools selectively to implement its program, choosing technical and financial assistance, and partnering to help local communities develop LWRPs, and using its review authority to ensure those programs are approvable. Waterfront development projects are reviewed, where applicable, through state and federal consistency determinations which are triggered by applications for other agencies' permits. The NYCMP staff, in their dealings with other agencies, act as advocates for municipalities with approved plans

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

when opportunities arise to promote LWRP implementation, or when circumstances appear to jeopardize it. This is a robust, effective program with much already achieved and more promised.

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

SUMMARY DATA FOR OREGON

POLICIES

Waterfront Revitalization

Revitalization Yes

Other CZM Goals

Public Access Yes

Water Dependency Yes

Hist/Cultural Conservation Yes

Environmental Restoration Yes

Other Policy No

TOOLS

Designation	0
Financial Asst.	11
Technical Asst.	5
Guidance Documents	1
Education & Training	1
Partnering	1
SAMPs	2
Local Coastal Program Review	1
Project Review	0
Environmental Review	1
Other Tools	0

Tools Effectiveness: 2.82

Tools Score: 0.30

OUTCOMES

Funding ($000's)

CZM Funds: $274.78

Total Funds: $2916.33

No. of Waterfront Districts

11

Stage of Development

Plan Underway	0
Plan Complete	11
Project Underway	0
Multiple Projects Underway	2
Infrastructure & Projects Complete	5
Revitalization Complete	0

Stage Score: 3.7

SCOPE OF DEVELOPMENT

Landside Development

Retail/Restaurant	6
Hotels	1
Marine Ind.	4
Tourist Centers	1
Other Landside	5

OUTCOMES

Other CZM Goals

Public Access

Parks	7
Plaza	4
Boardwalks	5
Viewing Towers	9
Signage	8
Other Access	5

Marine Activity

Guest Boating	8
Comml. Boating	3
Fishing Piers	6
Water Tours	2
Other Marine	5

Other

Historic/Cultural Conservation	6
Env. Cleanup/Restoration	0
Festivals & Events	2

Scope Score: 7.1

CONCLUSIONS

The decline in natural resource-based economies in Oregon's coastal urban centers has necessitated that waterfront revitalization be a high priority for the DLCD's CMP. State planning Goal 17 encourages urban coastal management that balances CZM goals for increasing public access and the siting of water-dependent uses. CZM §306 and §306A funding for planning and construction projects is an essential tool in promoting waterfront revitalization and has been used in a variety of communities on a variety of revitalization projects. §306 funds also supported the production of a guidance book on waterfront revitalization for small cities. Technical assistance and estuary planning, similar to the SAMP process, has been applied in Astoria, Reedsport, Coos Bay and Bandon. The DLCD believes that the use of these tools has been highly effective in each of the waterfront revitalization districts. Overall, Oregon's CMP has been effective in promoting urban waterfront revitalization.

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

SUMMARY DATA FOR PENNSYLVANIA

POLICIES

Waterfront Revitalization

RevitalizationNo

Other CZM Goals

Public AccessYes

Water DependencyYes

Hist/Cultural Conservation Yes

Environmental Restoration Yes

Other PolicyNo

TOOLS

Designation	11
Financial Asst.	7
Technical Asst.	17
Guidance Documents	13
Education & Training	4
Partnering	3
SAMPs	0
Local Coastal Program Review	8
Project Review	9
Environmental Review	14
Other Tools	0

Tools Effectiveness: 2.15

Tools Score: 0.37

OUTCOMES

Funding ($000's)

CZM Funds: $3135.73

Total Funds: $3135.73

No. of Waterfront Districts

21

Stage of Development

Plan Underway	1
Plan Complete	17
Project Underway	1
Multiple Projects Underway	0
Infrastructure & Projects Complete	4
Revitalization Complete	1

Stage Score: 2.5

SCOPE OF DEVELOPMENT

Landside Development

Retail/Restaurant	5
Hotels	1
Marine Ind.	9
Tourist Centers	2
Other Landside	2

OUTCOMES

Other CZM Goals

Public Access

Parks	9
Plaza	3
Boardwalks	8
Viewing Towers	2
Signage	4
Other Access	1

Marine Activity

Guest Boating	3
Comml. Boating	5
Fishing Piers	6
Water Tours	2
Other Marine	0

Other

Historic/Cultural Conservation	3
Env. Cleanup/Restoration	2
Festivals & Events	3

Scope Score: 3.3

CONCLUSIONS

Waterfront revitalization continues to be a high priority for Pennsylvania's CZMP in order to keep pace with economic and technological demands. The closest thing to a specific urban waterfront revitalization policy encourages port activities and urban-based enhancement. The CMP has also relied on policy regarding Geographic Areas of Particular Concern to designate potential revitalization areas. An Urban Waterfront Action Group (UWAG), begun in 1980, has created partnerships with other state and local agencies. The use of 306 planning and construction grants has provided the necessary funding to get many revitalization projects off the ground. According to PCMP staff the combination of these CZM process and tools coupled with regulatory oversight has generally been of medium effectiveness in promoting revitalization. Given the necessity for revitalization along Pennsylvania's historic waterfront, and the degree to which the PCMP has taken a proactive role, we feel the PCMP has been moderately effective in contributing to the revitalization process.

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

SUMMARY DATA FOR PUERTO RICO

POLICIES

Waterfront Revitalization

RevitalizationNo

Other CZM Goals

Public Access Yes

Water Dependency Yes

Hist/Cultural Conservation Yes

Environmental Restoration Yes

Other Policy No

TOOLS

Designation No

Financial Asst. No

Technical Asst. Yes

Guidance Documents No

Education & Training No

Partnering No

SAMPs No

Local Coastal Program Review No

Project Review Yes

Environmental Review No

Other Tools No

Tools Effectiveness: Not determined

Tools Score: Not determined

OUTCOMES

Funding ($000's)

CZM Funds: Yes

Total Funds: $120.00

No. of Waterfront Districts

3

Stage of Development

Plan Underway 0

Plan Complete 3

Project Underway 2

Multiple Projects Underway 0

Infrastructure & Projects Complete 0

Revitalization Complete 1

Stage Score: 4.0

SCOPE OF DEVELOPMENT

Landside Development

Retail/Restaurant 2

Hotels 1

Marine Ind. 0

Tourist Centers 2

Other Landside 2

OUTCOMES

Other CZM Goals

Public Access

Parks 1

Plaza 2

Boardwalks 0

Viewing Towers 0

Signage 2

Other Access 0

Marine Activity

Guest Boating 1

Comml. Boating 0

Fishing Piers 0

Water Tours 1

Other Marine 0

Other

Historic/Cultural Conservation 3

Env. Cleanup/Restoration 3

Festivals & Events 1

Scope Score: 7.0

CONCLUSIONS

Waterfront revitalization is a low priority for the 's Coastal Management Program (PRCMP)—it's main focus has been on natural resource enhancement. The Puerto Rico Planning Board adopted the CZM program goals and policies as an element of the statewide land use plan and delegated responsibility for waterfront revitalization to the Puerto Rican Land Administration. Port zones are regulated by the Port Authority which is working with the municipalities of San Juan and Ponce to improve their waterfront areas, especially for the enhancement of the piers for cruise ships. Urban development policies, including objectives for redevelopment, are defined in the Planning Board Laws, which are networked into the CMP. The revitalization of Old San Juan and the cruise ship piers has been carried out with the involvement of numerous agencies; Some redevelopment of piers has occurred in San Juan's harbor with Port Administration involvement, but our information about CZM involvement is sketchy.

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

SUMMARY DATA FOR RHODE ISLAND

POLICIES

Waterfront Revitalization

Revitalization Yes

Other CZM Goals

Public Access Yes

Water Dependency Yes

Hist/Cultural Conservation Yes

Environmental Restoration Yes

Other Policy

TOOLS

Designation Yes

Financial Asst. Yes

Technical Asst. Yes

Guidance Documents Yes

Education & Training Yes

Partnering Yes

SAMPs Yes

Local Coastal Program Review No

Project Review Unk

Environmental Review Yes

Other Tools

Tools Effectiveness:
Not determined

Tools Score:
Not determined

OUTCOMES

Funding ($000's)

CZM Funds: Yes

Total Funds: $Unknown

No. of Waterfront Districts

0

Stage of Development

Plan Underway 0

Plan Complete 0

Project Underway 0

Multiple Projects Underway 0

Infrastructure & Projects Complete 0

Revitalization Complete 0

Stage Score: 0.0

SCOPE OF DEVELOPMENT

Landside Development

Retail/Restaurant 0

Hotels 0

Marine Ind. 0

Tourist Centers 0

Other Landside

OUTCOMES

Other CZM Goals

Public Access

Parks 0

Plaza 0

Boardwalks 0

Viewing Towers 0

Signage 0

Other Access 0

Marine Activity

Guest Boating 0

Comml. Boating 0

Fishing Piers 0

Water Tours 0

Other Marine 0

Other

Historic/Cultural Conservation 0

Env. Cleanup/Restoration 0

Festivals & Events 0

Scope Score: 0.0

CONCLUSIONS

No determination of effectiveness due to lack of data.

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

SUMMARY DATA FOR SOUTH CAROLINA

POLICIES

Waterfront Revitalization

RevitalizationNo

Other CZM Goals

Public AccessYes

Water DependencyYes

Hist/Cultural Conservation Yes

Environmental Restoration Yes

Other PolicyNo

TOOLS

Designation	0
Financial Asst.	0
Technical Asst.	0
Guidance Documents	0
Education & Training	0
Partnering	0
SAMPs	3
Local Coastal Program Review	0
Project Review	9
Environmental Review	0
Other Tools	0

Tools Effectiveness: Unknown

Tools Score: 0.08

OUTCOMES

Funding ($000's)

CZM Funds: Yes

Total Funds: $Unknown

No. of Waterfront Districts

9

Stage of Development

Plan Underway	2
Plan Complete	3
Project Underway	0
Multiple Projects Underway	4
Infrastructure & Projects Complete	0
Revitalization Complete	4

Stage Score: 3.6

SCOPE OF DEVELOPMENT

Landside Development

Retail/Restaurant	4
Hotels	2
Marine Ind.	3
Tourist Centers	7
Other Landside	0

OUTCOMES

Other CZM Goals

Public Access

Parks	4
Plaza	4
Boardwalks	5
Viewing Towers	6
Signage	5
Other Access	0

Marine Activity

Guest Boating	5
Comml. Boating	5
Fishing Piers	1
Water Tours	3
Other Marine	0

Other

Historic/Cultural Conservation	5
Env. Cleanup/Restoration	2
Festivals & Events	6

Scope Score: 7.4

CONCLUSIONS

The South Carolina Bureau of Ocean and Coastal Resources Management (BOCRM) has had a low level of involvement in the revitalization of urban waterfronts in South Carolina, except when other state and local agencies request assistance. State staff did not determine the issue importance. There is no explicit policy regarding waterfront revitalization. We have no record of CZM funds being used for waterfront planning or projects, except when waterfront revitalization is included in the larger SAMP process. The outcomes indicate that the BOCRM retains permitting authority over plans and projects and is not very active in promoting revitalization through financial or technical assistance. The profile lacks specific detail on the permitting authority exercised by the BOCRM as it relates to revitalization plans and projects and the partnering and networking the BOCRM may exercise in support of revitalization. The BOCRM has been very active in promoting Coastweeks events centered on the urban waterfront (see Outcomes above). Sole reliance on state compliance mechanisms does not indicate a very proactive role in revitalization plans and

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projects, and yet the identified revitalized districts have incorporated the broader CZM goals. It is our opinion that the BOCRM program has had a low effectiveness in promoting urban waterfront revitalization.

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

SUMMARY DATA FOR VIRGINIA

POLICIES

Waterfront Revitalization

RevitalizationNo

Other CZM Goals

Public Access	Yes
Water Dependency	Yes
Hist/Cultural Conservation	Yes
Environmental Restoration	No
Other Policy	No

TOOLS

Designation	Yes
Financial Asst.	Yes
Technical Asst.	No
Guidance Documents	No
Education & Training	Yes
Partnering	Yes
SAMPs	Yes
Local Coastal Program Review	No
Project Review	Yes
Environmental Review	Yes
Other Tools	No

Tools Effectiveness:
Not determined

Tools Score:
Not determined

OUTCOMES

Funding ($000's)

CZM Funds:	$276.80
Total Funds:	$475.30

No. of Waterfront Districts

12

Stage of Development

Plan Underway	5
Plan Complete	2
Project Underway	8
Multiple Projects Underway	0
Infrastructure & Projects Complete	0
Revitalization Complete	0
Stage Score:	1.4

SCOPE OF DEVELOPMENT

Landside Development

Retail/Restaurant	0
Hotels	0
Marine Ind.	0
Tourist Centers	0
Other Landside	0

CONCLUSIONS

OUTCOMES

Other CZM Goals

Public Access

Parks	2
Plaza	0
Boardwalks	3
Viewing Towers	0
Signage	1
Other Access	1

Marine Activity

Guest Boating	1
Comml. Boating	0
Fishing Piers	3
Water Tours	0
Other Marine	1

Other

Historic/Cultural Conservation	0
Env. Cleanup/Restoration	0
Festivals & Events	0
Scope Score:	1.7

No determination of effectiveness is offered. Virginia's Coastal Manangement Program (VICMP) is too severely staff-limited to adequately address the numerous urban waterfront areas in the state that have a potential for revitalization. There is a general policy concerning Areas of Particular concern, but this is not very specific to urban waterfront revitalization. Where the VICMP has been involved it has been through financial assistance, partnering and Special Area Management Planning.

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

SUMMARY DATA FOR VIRGIN ISLANDS

POLICIES

Waterfront Revitalization

RevitalizationNo

Other CZM Goals

Public Access	No
Water Dependency	Yes
Hist/Cultural Conservation	Yes
Environmental Restoration	No
Other Policy	

TOOLS

Designation	Unknown
Financial Asst.	Unk
Technical Asst.	Unk
Guidance Documents	Unk
Education & Training	No
Partnering	Unk
SAMPs	Yes
Local Coastal Program Review	Unk
Project Review	Unk
Environmental Review	Unk
Other Tools	

Tools Effectiveness:
Not determined

Tools Score:
Not determined

OUTCOMES

Funding ($000's)

CZM Funds: Yes

Total Funds: $Unknown

No. of Waterfront Districts

0

Stage of Development

Plan Underway	0
Plan Complete	0
Project Underway	0
Multiple Projects Underway	0
Infrastructure & Projects Complete	0
Revitalization Complete	0

Stage Score: 0.0

SCOPE OF DEVELOPMENT

Landside Development

Retail/Restaurant	0
Hotels	0
Marine Ind.	0
Tourist Centers	0
Other Landside	

CONCLUSIONS

No determination of effectiveness due to lack of data.

OUTCOMES

Other CZM Goals

Public Access

Parks	0
Plaza	0
Boardwalks	0
Viewing Towers	0
Signage	0
Other Access	0

Marine Activity

Guest Boating	0
Comml. Boating	0
Fishing Piers	0
Water Tours	0
Other Marine	0

Other

Historic/Cultural Conservation	0
Env. Cleanup/Restoration	0
Festivals & Events	0

Scope Score: 0.0

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

SUMMARY DATA FOR WASHINGTON

POLICIES

Waterfront Revitalization

Revitalization Yes

Other CZM Goals

Public Access Yes

Water Dependency Yes

Hist/Cultural Conservation Yes

Environmental Restoration Yes

Other Policy

TOOLS

Designation	0
Financial Asst.	28
Technical Asst.	28
Guidance Documents	28
Education & Training	28
Partnering	28
SAMPs	3
Local Coastal Program Review	23
Project Review	27
Environmental Review	27
Other Tools	0

Tools Effectiveness: 2.14

Tools Score: 0.75

OUTCOMES

Funding ($000's)

CZM Funds: $1670.22

Total Funds: $1630.12

No. of Waterfront Districts

28

Stage of Development

Plan Underway	1
Plan Complete	27
Project Underway	1
Multiple Projects Underway	3
Infrastructure & Projects Complete	12
Revitalization Complete	5

Stage Score: 4.2

SCOPE OF DEVELOPMENT

Landside Development

Retail/Restaurant	21
Hotels	7
Marine Ind.	17
Tourist Centers	9
Other Landside	11

OUTCOMES

Other CZM Goals

Public Access

Parks	14
Plaza	13
Boardwalks	15
Viewing Towers	15
Signage	17
Other Access	9

Marine Activity

Guest Boating	15
Comml. Boating	15
Fishing Piers	13
Water Tours	9
Other Marine	8

Other

Historic/Cultural Conservation	9
Env. Cleanup/Restoration	12
Festivals & Events	13

Scope Score: 9.8

CONCLUSIONS

Strong, detailed state waterfront development policies, coupled with the authority to enforce them, has given WDOE the opportunity to exert significant influence over waterfront plans and projects. From 1978, two years after the program received federal approval of its CMP and two years before the 1980 amendments to the FCZMA, WDOE was ready with financial and technical assistance to enter into partnership with cities and towns that were willing to undertake planning studies and to amend their SMPs. When 306(A) projects became available, WDOE, in many cases, assisted these communities develop "seed" projects on their waterfronts.

The state CMP also took proactive steps to encourage Washington's coastal communities to revitalize their waterfronts. Education and training programs were undertaken as early as 1978 and continued through the late 80s, often in partnership with sea grant or other university programs. Guidance documents were produced and distributed to local governments in the mid-80s.

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

Washington State's CMP has been, and continues to be, highly effective in promoting and sustaining waterfront revitalization. Every major coastal city and many of the smaller ones have undertaken waterfront plans and projects with funding or other forms of assistance from WDOE. The resulting waterfront improvements achieve multiple CZM goals including enhanced public access, protection of ports and water-dependent industry, restoration of degraded environments, historical/cultural conservation and local economic development.

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

SUMMARY DATA FOR WISCONSIN

POLICIES

Waterfront Revitalization

RevitalizationNo

Other CZM Goals

Public AccessYes

Water DependencyYes

Hist/Cultural Conservation Yes

Environmental Restoration Yes

Other PolicyNo

TOOLS

Designation	0
Financial Asst.	18
Technical Asst.	10
Guidance Documents	14
Education & Training	8
Partnering	18
SAMPs	1
Local Coastal Program Review	0
Project Review	18
Environmental Review	0
Other Tools	0

Tools Effectiveness: 3.00

Tools Score: 0.51

OUTCOMES

Funding ($000's)

CZM Funds: $1450.00

Total Funds: $1450.00

No. of Waterfront Districts

19

Stage of Development

Plan Underway	0
Plan Complete	19
Project Underway	1
Multiple Projects Underway	0
Infrastructure & Projects Complete	14
Revitalization Complete	4

Stage Score: 5.1

SCOPE OF DEVELOPMENT

Landside Development

Retail/Restaurant	0
Hotels	0
Marine Ind.	0
Tourist Centers	2
Other Landside	0

CONCLUSIONS

OUTCOMES

Other CZM Goals

Public Access

Parks	14
Plaza	0
Boardwalks	15
Viewing Towers	10
Signage	10
Other Access	7

Marine Activity

Guest Boating	4
Comml. Boating	3
Fishing Piers	11
Water Tours	0
Other Marine	0

Other

Historic/Cultural Conservation	8
Env. Cleanup/Restoration	4
Festivals & Events	1

Scope Score: 4.7

Following the decline in auto manufacturing along Wisconsin's waterfront, urban waterfront revitalization has emerged as a necessary and viable process to restore and enhance these coastal areas. The WCMP has recognized revitalization as a high priority for over 15 years. We found no evidence of specific policy language related to revitalization. Despite the lack of direct policy, the WCMP has been involved in revitalization planning and construction in almost every coastal urban center. Through the federal §306A grant program, partnering and project-by-project review, the WCMP has initiated, sponsored and ultimately helped to shape revitalization in these coastal communities. The City of Superior completed a Special Area Management Plan, currently under review, that addresses waterfront redevelopment and industry development. Given the proactive involvement in this issue area we feel the WCMP has been highly effective in promoting urban waterfront revitalization.

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

SUMMARY DATA FOR US TOTALS

POLICIES

Waterfront Revitalization

Revitalization 11

Other CZM Goals

Public Access 19

Water Dependency 19

Hist/Cultural Conservation 18

Environmental Restoration 13

Other Policy 3

TOOLS

Designation 49

Financial Asst. 208

Technical Asst. 168

Guidance Documents 74

Education & Training 53

Partnering 180

SAMPs 17

Local Coastal Program Review 83

Project Review 128

Environmental Review 103

Other Tools 2

Tools Effectiveness: 2.52

Tools Score: 0.37

OUTCOMES

Funding ($000's)

CZM Funds: $30099.22

Total Funds: $389783.75

No. of Waterfront Districts

304

Stage of Development

Plan Underway 42

Plan Complete 200

Project Underway 42

Multiple Projects Underway 43

Infrastructure & Projects Complete 112

Revitalization Complete 30

Stage Score: 3.5

SCOPE OF DEVELOPMENT

Landside Development

Retail/Restaurant 82

Hotels 33

Marine Ind. 64

Tourist Centers 55

Other Landside 33

CONCLUSIONS

OUTCOMES

Other CZM Goals

Public Access

Parks 163

Plaza 51

Boardwalks 127

Viewing Towers 79

Signage 86

Other Access 43

Marine Activity

Guest Boating 109

Comml. Boating 79

Fishing Piers 108

Water Tours 43

Other Marine 36

Other

Historic/Cultural Conservation 72

Env. Cleanup/Restoration 55

Festivals & Events 71

Scope Score: 5.0

This study has identified almost 300 districts in the nation's urban shorelines that have benefited from their state coastal management programs' commitment to revitalizing deteriorated urban waterfronts and ports. The real total is considerably higher, perhaps double this number. These districts range in size and complexity from small bayfront villages along Oregon's coastal estuaries to densely populated redevelopment areas abutting the metropolitan shores of the nation's largest cities. Revitalization is "complete" in only a small fraction (less than 10%) of these districts, but plans have been developed for two thirds of them. In almost half the waterfronts at least one redevelopment project is underway, and in more than one third, investments have been made to improve infrastructure and develop multiple projects. The most common improvements are those which enhance important national CZM goals, i.e. increasing public access, fostering water dependent uses and activities, conserving important cultural and historic resources, and restoring degraded urban coastal environments. Over half the revitalizing districts have developed shoreside parks: and more than one third have built fishing piers, boardwalks, or guest facilities for recreational boating activity. Viewing towers or interpretive signage to augment physical access to the

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

shore are installed in 25% of the districts; historic buildings and sites have been restored, conserved or protected in almost one quarter; and environmental cleanup has been undertaken at more than 50 sites.

Notes: Numbers in cells refer to the number of waterfront districts in which that tool has been used, that stage or scope of redevelopment achieved, or other CZM objective realized. Where district-specific tools data were unavailable a Yes/No entry indicates that tool was used by the CZM agency generally throughout the state.

Appendix B: Sample State Profile

NEW YORK CZM PROFILE
WATERFRONT REVITALIZATION

A. BACKGROUND AND CONTEXT

CHARACTERIZATION OF COASTAL ZONE AND URBAN WATERFRONT AREAS.

New York relies a well-funded voluntary partnership with local municipalities. Under provisions of the Waterfront Revitalization of Coastal Areas and Inland Waterways Act (Executive Law, Article 42) and its implementing regulations (6 NYCRR 601) each coastal community *has the option* to implement a Local Waterfront Revitalization Program (LWRP) to manage coastal development, whether the concern is protecting critical resources or revitalizing deteriorated waterfronts. Critical to the LWRP is the establishment of local land use regulations and other local laws to enforce State coastal policies. (Sec. 309 Strategy 1992) New York's municipalities have the primary authority for directly regulating land use. Legislation (Chpt. 366, L. 1986) expanded the LWRP to communities on the state's major inland waterways.

A state consistency process is used to ensure that permits for coastal development issued by other state agencies adhere to the policies of the NYCMP and are consistent with approved LWRPs.

New York State's coastal zone encompasses marine and freshwater shorelines up to 1,000 ft. inland on Lake Erie, along the St. Lawrence, Niagra and Hudson Rivers, and all of Long Island -- an area that accounts for 12% of the state's land mass. Over 12.6 million people (72% of New York State' population) and most of the state's heavy industry, are located in the 250 communities abutting these coastal waters, the largest of which are NYC, Buffalo, Rochester, Watertown, Niagra Falls, Dunkirk and Oswego. New York City alone has 587 miles of shoreline adjacent to the largest and most densely populated metropolis in N. America, and less than 5% of the shoreline remains undeveloped.

Waterfront activity has decreased with the exodus of people and business from older urban centers, leaving behind abandoned, derelict and underutilized areas. Poor infrastructure, outdated industrial buildings, and lack of capital have combined to make revitalization difficult. (Now & For the Future, 1991) New York's waterfronts have a great potential for renewed commercial, industrial, residential, and recreational activities. Currently the state is working to expand the local waterfront revitalization program to include the state's inland waterway communities (NYCMP Report 90).

By 2010, the state's coastal population will grow by 700,000 (Now & For the Future 1991). Increasing demands for residential, commercial, industrial, and recreational developments in coastal communities continue to adversely pressure the economic diversity and the environmental health of many areas of the State's coast. (Sec. 309 Strategy 1992). New York State's Coastal Zone Management Progam (NYCMP) was approved in 1982.

ISSUE IN THE STATE

Waterfront revitalization has always been a high priority for the NYCMP, and was occurring before the CZMP was developed and aproved in . (Manhattan's famous South St. Seaport and Battery Park City were undergoing re-development prior to adoption of the NYCMP and their revitalization had no direct connection to this program.) The 1980 amendments to the Federal CZMA played a part in placing urban waterfront revitalization a high priority in the formulation of the state's 1982 CZMP. This in turn influenced the formulation of Local Waterfront Revitalization Programs (LWRPs) to make waterfront revitalization a high priority. Today more state resources are available and dedicated to waterfront revitalization.

DESIGNATED WATERFRONT REVITALIZATION AREAS

The NYCMP did not designate specific waterfronts for revitalization, but encourages local municipalities to do so in preparing their LWRPs.

B. STATE CZM POLICIES ADDRESSING WATERFRONT REVITALIZATION

STATE LAWS &/OR POLICIES.

There are 44 policies established in the Waterfront Revitalization of Coastal Areas and Inland Waterways Act. In general, coastal policies promote the beneficial use of coastal resources by encouraging the siting of water dependent uses, expansion of ports and small harbors, revitalization of waterfronts, and expansion of access and

recreation opportunities (NYCMP Report 90). Specifically, five policies guide municipalities in addressing waterfront revitalization as defined in this study:—

Policy 1: Restore, revitalize, and redevelop deteriorated and underutilized waterfront areas for commercial, industrial, cultural, recreational and other compatible uses. (FEIS, p. 70)

Policy 2: Facilitate the siting of water-dependent uses and facilities on or adjacent to coastal waters.

Policy 4: Strengthen the economic base of smaller harbor areas by encouraging the development and enhancement of those activities which have provided such areas with a unique identity . . . (guidelines on p. 77).

Policy 5: Encourage the location of development in areas where public services and facilities essential to such development are adequate. (FEIS p. 78)

Policy 6: Expedite existing permit procedures in order to facilitate the siting of development activities at suitable locations (FEIS p. 79).

DEVELOPMENT OF POLICIES OR PERFORMANCE STANDARDS ADDRESSING MULTIPLE CZM GOALS.

TABLE 1. POLICIES OR PERFORAMANCE STANDARDS ADDRESSING MULTIPLE CZM GOALS.

CZM GOALS	POLICY OR PERMFORMANCE STANDARD?	COMMENTS
public access	YES	
protection of coastal dependent industries	YES	
historic, cultural conservation and interpretation	YES	
environmental restoration	YES	
other: scenic resources and visual quality	YES	used to regulate building heights and view corridors in Scenic Areas of Statewide Significance

POLICIES AND/OR PERFORMANCE STANDARDS

Public Access

Policy 19: Protect, maintain and increase the level and types of access to public water-related recreation resources. The Waterfront Revitalization Program will encourage mixed use areas and multiple use of facilities to improve access (FEIS p. 94).

Policy 20: Access to the publicly owned foreshore or water's edge, and to the publicly owned lands immediately adjacent to these areas shall be provided, and it shall be provided in a manner compatible with adjoining uses. To ensure that such lands remain available for public use, they will be retained in public ownership. For example - access would provide for walking along a beach or a city waterfront or to vantage points from which to view the seashore. (FEIS p. 96)

Protection of coastal dependent industries

Priority for Water-Dependent Uses- NYCMP seeks ways to maintain, promote, and enhance the water dependent uses of the waterfront in ways consistent with the long-term economic and environmental productivity of the coast (NYCMP Report 90). The following policies implement this program goal:

Policy 21: water dependent and water enhanced recreation will be encouraged and facilitated, and will be given priority over non water related uses along the coast. (FEIS p.98)

Policy 22: Development when located adjacent to the shore will provide for water related recreation activities whenever such recreational use is appropriate in light of reasonably anticipated demand for such activities, and the primary purpose of the development. (FEIS p. 102)

Historic, cultural conservation and interpretation
Policy 23: Protect, enhance, and restore structures, districts, areas or sites that are of significance in the history, architecture, archeology or culture of the state, its communities, or the nation. (FEIS p.104)

Environmental restoration
Policy 7: Significant coastal fish and wildlife habitats will be protected, preserved, and where practical, restored so as to maintain their viability as habitats.

Scenic resources and visual quality
Policy 24: Prevent significant impairment of scenic resources of statewide significance

Policy 25: Protect, restore or enhance natural and man-made resources which are not identified as being of statewide significance, but which contribute to the overall scenic quality of the coastal area.

C. CZM PROCESSES AND TOOLS USED TO PROMOTE WATERFRONT DEVELOPMENT

TABLE 2. PROCESSESS AND TOOLS USED TO PROMOTE WATERFRONT DEVELOPMENT - NEW YORK - SUMMARY TABLE.

PROCESSES & TOOLS	PROCESS/TOOL USED?	IMPORTANCE	RANK	COMMENTS
a. Designation of areas in CZ needing revitalization	YES	HIGH		See below
b. Financial assistance	YES	HIGH	3	
c. Technical assistance	YES	HIGH	1	
d. Guidance Documents/publications	NO	LOW		
e. Education and training	YES	MEDIUM		
f. Partnering	YES	HIGH	2	
g. SAMP's	NO	MEDIUM		See below
h. LCP amendment review	YES	HIGH	4	
i. project by project review	YES	HIGH		
j. review of impacts on critical resources/areas	YES	HIGH		
k. other—advocacy for W-R with other state agencies	YES	HIGH		

1. ASSISTANCE TO LOCAL GOVERNMENTS AND PORTS TO DEVELOP PLANS.

Assistance is provided to local governments through the local waterfront revitalization program which provides planning, preconstruction, small scale construction. (NYCMP Report 1990), regulate land and water uses, and ensure development does not adversely affect coastal resources.

a. DESIGNATION OF AREAS IN CZ NEEDING REVITALIZATION

While the state CZM program has not designated specific waterfronts for revitalization, local municipalities do so in their LWRPs.
In New York City Special Zoning Districts were established prior to CZM:

Special Battery Park City District - govern a large development in the business core of Lower Manhattan by requiring visual corridors, view of the water from upland areas and pooled open spaces; Special Sheepshead Bay District - encourages development that will strengthen and protect the neighborhood's unique waterfront and recreation character.

Special South Street Seaport District enacted to preserve and restore the Seaport's historic building by allowing transfer of development rights.

Special City Island District was enacted to promote the nautical and waterfront uses of City Island in a compatible way with the existing community. (FEIS p. 130)

The 1992 NYC Comprehensive Waterfront Plan, developed with financial assistance from NYCMP, identifies fifty-five "Redeveloping Waterfront" areas throughout the five NYC boroughs on shoreline lands deemed surplus to needs of maritime uses, water-dependent manufacturing and other industry. The needs of the City for the "Natural Waterfront", the "Public Waterfront" and the "Working Waterfront" were thoroughly analysed and addressed in the plan before allocating space for non-water dependent uses such as housing, retail, office and community organizations. In addition, public access requirements, and height and bulk limitations were imposed. Criteria used in selecting lands suitable for the "Redeveloping Waterfront" were:—.

- the absense of unique or significant natural features or, if present the potential for compatible development
- the presence of substantial vacant land or land occupied by less intensive uses
- the proximity of residential or commercial uses
- the potential for strengthening upland residential or commercial areas and for opening up the waterfront to the public
- the availability of neighborhood services, either on- or off-site, such as open space, community facilities and retail services; and
- the number of jobs potentially displaced balanced against the new opportunities created by redevelopment

Through its new Long Island Sound (Regional) Coastal Management Program the state will develop investment priorities to help steer growth to "Areas for Concentrated Development" identified in approved LWRPs. Thus, NYCMP will be designating areas for *implementing* revitalization through coordinated state actions.

b. FINANCIAL ASSISTANCE

During early to mid-eighties NYCMP awarded grants of federal CZM §306 funds to villages, towns and cities to develop LWRPs. Since 1991, monies from the state $100M "Environmental Protection Fund"—derived from a tax on real estate transfers and recycling fees for batteries and other hazardous materials—have been used for specific waterfront revitalization plans and projects. Purposes include planning and design, feasibility and marketing studies, and small construction projects. NYCMP staff also assists locals find other funding sources, e.g. ISTEA funds for shoreline walkways. (Peter Walsh, NYCMP). Other sources of funding for revitalization have been used, including: the Department of Economic Development; the Urban Development Corporation (Empire State Development Corporation, now defunct) which funded revitalization planning through the "Horizons Waterfront Commission" in Erie County (Buffalo); NY State Barge Canal Commission which funded revitalization in communities along canals.

c. TECHNICAL ASSISTANCE

Technical assistance is provided by NYCMP staff in the Dept. of State, Division of Coastal Resources and Waterfront Revitalization, to coastal villages, towns and cities for developing and implementing LWRPs. Staff are organized regionally, have specialized skills that include legal, environmental, urban and regional planning, and landscape architecture, and act as conduits to expertise in other agencies.

According to Waterfront & Open Space Planning Director Wilbur Woods, the NYCMP has brought "balance and diversity" to the NYC waterfronts. For example, the rejected Westway freeway project along 5 miles of the Hudson River shore of Manhattan evolved to become "the largest parks project in NYC since Central Park." Starting with a planning grant from the NYCMP, the freeway evolved into a six-lane boulevard set back from the shore with a 550 acre series of parks and continuous bike and jogging trail along the river, and mixed use developments upland.

In NYC, NYCMP staff assisted the City develop a "uniform land use review procedure" for project review/state consistency determination that involved the City Planning and Coastal Commissions holding joint public hearings, acting as a "designated coastal authority."

d. GUIDANCE DOCUMENTS/PUBLICATIONS

Dept. of State, Division of Coastal Resources and Waterfront Revitalization published a Guidance Manual for Preparation of Local Waterfront Revitalization Plans. Guidance for preparing Harbor Management Plans was included in this publication.

e. EDUCATION AND TRAINING

Little formal educational programming has been undertaken by NYCMP. NYCMP staff have provided advice to local communities on meeting various procedural requirements for project implementation, and the identification and determination of eligibility for possible project funds from other state and federal agencies. (NYCMP Report 90).

f. PARTNERING

Voluntary involvement in the LWRP of eligible local governments. The process of program preparation and the consistency of state actions with local policies serves to enhance state-local relations (NYCMP Report 90). The State CZMP is working in full partnership with the 250 coastal communities. One hundred fifteen municipalities are preparing local programs and all but two of the 26 coastal cities are participating. Approximately 45 villages, towns and cities undertaking LWRPs have significant waterfront deterioration (NYCMP staff interviews).

Local waterfront advisory committees, combined with community professional staffs, private consultants, Dept. of State Staff, and local elected officials are enabling participants to prepare and implement detailed development and preservation strategies (NYCMP Report 90, p. 10)

Horizons Waterfront Commission is working to redevelop and restore the Lake Erie waterfront.

Dept. of Economic Development, Environmental Conservation, State and Transportation, Offices of General Services and Parks, Recreation and Historic Preservation affect the coastal area.

The CZM program has partnered with NY State's Urban Cultural Parks Program to conserve and promote significant historical waterfront resources in several communities (e.g., City of Kingston).

With CZM funding and facilitation, a two-day workshop was held in October, 1995, in the city of Glen Cove, to address redevelopment of deteriorated areas and contaminated land parcels surrounding Glen Cove Creek on Long Island's North shore. As a result, federal, state, regional and local agencies and local citizen participants developed an action plan to address these issues and agreed to continue a process to ensure agency actions were consistent with the City's redevelopment goals for the area. (Glen Cove Creek Workshop, Executive Summary, p.ii)

g. SAMP's

NYCMP has not utilized SAMPs, but a similiar process is presently being undertaken through the preparation of regional plans in which prioirty areas, covering more than one municipality, are identified for increased planning, technical, and financial assistance.

3. MECHANISMS FOR ACHIEVING STATE COMPLIANCE

h. LCP AMENDMENT REVIEW

NYCMP staff review both initial LWRPs and any subsequent amendments for consistency with state policies under the Waterfront Revitalization of Coastal Areas and Inland Waterways Act.

i. PROJECT BY PROJECT REVIEW

Any waterfront development project requiring a state or federal permit or license is reviewed by NYCMP staff for consistency with the policies of the state's coastal program which includes all approved LWRPs. This review is seen as a highly important tool to affect changes in inappropriate development projects. For example, when the City of New York proposed to ease prison crowding by mooring prison barges in the East River, the NYCMP raised objections during state consistency review of the US Army Corps of Engineers permit based on the approved LWRP. An interim permit to moor the barges *temporarily* was approved; and, subsequently, when the crowding crisis had passed, the barges were removed. "The LWRP provides a vehicle for negotiations over controversial projects." (Wibur Woods, Director, Waterfront & Open Space Planning, NYC Dept. of City Planning, telephone interview.)

j. REVIEW OF IMPACTS ON CRITICAL RESOURCES/AREAS

Environmental impacts of waterfront development projects are reviewed under NY's State Environmental Quality Review Act (SEQRA) concurrently with state consistency review (see above).

K. OTHER—ADVOCACY (for Local Governments with Waterfront Revitalization Plans)

NYCMP staff have used advocacy as a tool for implementing LWRPs. (See case example, below.)

D. OUTCOME INDICATORS / PROGRAM RESULTS

NYCMP has helped 115 of the 250 municipalities—villages, towns and cities—in the state's coastal zone develop LWRPs, including 26 of the 27 cities (urban places with 20,000 or more population). Of the 115 municipalities active in the program, 45 are believed to have experienced significant waterfront deterioration or industrial abandonment and, therefore, qualify as communities undertaking waterfront revitalization as defined in this study. There may well be other towns and villages among the 135 municipalities not participating in the voluntary LWRP whose waterfronts are deteriorated, but their number is unknown.

Since NY State's program began, almost $5M of federal and state CZM funds have been invested in planning studies, and pre-construction and construction projects in 45 coastal communities where significant waterfront deterioration/delapidation existed. Concrete outcomes in the form of waterfront projects completed or underway are evident in half (23) these communities and the remainder have Local Waterfront Revitalization Programs (LWRPs) approved or approaching approval. Eighteen have developed multiple new projects with infrastructure improvements, and 2 of these communities are judged to be "completely revitalized." (See Table 3.) The scale of waterfront revitalization districts in which CZM has played a role ranges from small villages on Long Island Sound, through abandoned industrial tracts on Lake Erie, to huge swaths of Manhattan's Hudson River shoreline.

Out of 16 possible waterfront features, uses or activities, 10 communities had developed at least 8, eighteen had one or more, and 15 had not yet developed any (See Table 4). The most common features in NY's revitalizing waterfronts, specifically, were: parks (23 communities), guest boating facilities (18), fishing piers (16), boardwalks (12), waterfront festivals (11) and environmental clean-up/restoration sites (10). Marine industrial activities were integrated into some of the communities waterfronts: On the water, commercial fishing vessels were active in 9 harbors and, in the uplands other marine industries were found in 8.

An immediate benefit of the local waterfront revitalization program has been the focusing of community attention on the opportunities and constraints of their waterfronts. Communities are rediscovering their waterfronts. Enthusiasm and concern are being generated. The waterfront is being seen as a whole, interrelationships are more apparent, and the benefits of directing rather than reacting to development proposals are becoming clearer. (NYCMP Report '90, p. 10)

E. CASE EXAMPLES

CZM SUCCESS

State Coastal Program advocates for local municpalities with LWRPs

Two examples illustrate the effectiveness in the use of advocacy as a tool for implementing LWRPs. In the first, the NYCMP staff were able to advocate for the City of Oswego when a permit for a port facility was under state consistency review.

The Oswego Port Authority had proposed constructing a 75 ft. high potash storage dome which the City of Oswego argued would block significant upland views of their historic waterfront, violating a provision in the LWRP for protecting the viewshed. During a consistency appeal, the Port claimed the project was consistent; the City disagreed and the NYCMP cited the LWRP provision in support of the City. The Secretary of State ruled for the City and ordered the project be modified. The Port acquiesced and the dome was lowered.

In the second case, in North Tarrytown, a bedroom suburb for NYC, a General Motors assembly plant on the Hudson River closed, leaving the Village with a large, abandoned manufacturing facility. The Village passed a local ordinance requiring GM to:

1. leave the site environmentally safe, and
2. if GM could not find a tenant, it would be required to demolish the 3 million SF plant.

GM sued to challenge the ordinance, but was persuaded to join the Village at the negotiating table to work out how the plant would be closed. A detailed agreement was reached achieving contractually what couldn't have been achieved through the ordinance. Through the LWRP process, the NYCMP assisted the village reach a satisfactory vision for the future of its formerly industrial riverfront. The Local Waterfront Planning Committee declared the plant a non-conforming use and established a mixed use waterfront zone with requirements for public access and water-based activities, including marinas.

The Dept. of State played a significant advocacy role vis-à-vis other state agencies, especially the NY Dept. of Economic Development which had sought for two years to retain GM in North Tarrytown and failed, then solicited other auto manufacturers to locate in the plant; this initiative also failed. The Village was unsupportive of DEC's "blue-collar" employment goal.

City &/or District	CZM 306A $ Involved	Total Cost of Project	Plan Underway	Plan Completed	Project Underway	One or More Projects Underway	Infrastructure & Multiple Projects Developed	Completely Revitalized Waterfront
Albany	$32.00	$56.50		√			√	
Beacon	$12.00	$3.00		√		√		
Buffalo	$35.00	$35.00		√			√	
Cape Vincent	$6.00	$6.00		√			√	
Catskill	$2.00	$100.00		√			√	
Clayton	$76.10	$76.10		√			√	
Dexter	$3.40	$3.40		√			√	
Dunkirk	$21.00	$7.00		√			√	
Freeport	$6.00	$4.00						
Glen Cove	$16.00	$27.75		√				
Greenport	$101.00	$43.00		√			√	
Hempstead	$2.00	$83.00	√					
Hudson	$2.00	$25.00	√					
Huntington	$55.00	$55.00	√					
Islip	$87.50	$37.50	√					
Kingston	$24.00	$24.00		√			√	
Lackawanna	$5.00	$5.00		√		√		
Mamaroneck	$35.00	$35.00		√				
Manorhaven	$4.00	$4.00	√					
New Rochelle	$45.00	$45.00	√					
New York City (Bronx)				√				
New York City (Brooklyn)				√				
New York City (Manhattan: Hudson R. Conservancy Parkway)	$1,667.00	$1,725.00		√			√	
New York City (Queens: Flushing Bay Rehabilitation)				√			√	
New York City (Staten Island)				√			√	
Newfane	$49.00	$15.00		√		√		
Niagra Falls	$25.00	$25.00	√					
North Tonawanda	$52.75	$15.00		√			√	
Ogdensburg	$2.00	$2.00		√			√	
Oswego	$5.00	$25.00		√				√
Oyster Bay	$65.00	$65.00	√					
Patchogue	$3.00	$3.00	√					
Port Chester	$25.00	$65.00		√				
Port Jefferson	$1.00	$1.00	√					
Rensselaer	$22.50	$22.50		√	√			
Rochester	$6.00	$47.50		√			√	
Rye	$12.50	$12.50		√				√
Sackets Harbor	$26.00	$26.00		√				
Sag Harbor	$94.50	$94.50		√				
Smithtown	$21.00	$21.00		√				
Southampton	$4.00	$25.20	√					
Tonawanda (c)	$55.00	$19.50		√		√		
Tonawanda (t)	$15.00	$4.00		√				
Waddington	$15.00	$15.00		√			√	
Yonkers	$5.00	$75.00						

Table 3: NYCMP Waterfront Districts—Stage

City &/or District	Public Access						Incorporation Marine Activities					Historical & Cultural Preservation	Landside Economic Activity					Cleanup &/or Environmental Restoration	Festivals &/or Maritime Events
	Parks	Plaza	Boardwalks	Viewing Towers/Lookouts	Signage Program	Other	Guest Boating	Commercial Boating	Fishing Piers	Water Tours	Other		Retail/Restaurant	Hotels	Marine Industries	Tourist Centers	Other		
Albany	√		√		√		√	√		√			√					√	√
Beacon	√		√				√		√										
Buffalo	√		√	√	√		√	√	√	√		√	√		√			√	√
Cape Vincent	√						√		√		√								
Catskill	√			√			√		√				√		√				
Clayton	√		√		√		√	√	√	√		√	√						√
Dexter	√			√			√		√										√
Dunkirk	√	√	√				√							√					
Freeport																			
Glen Cove					√														
Greenport	√							√	√				√						√
Hempstead																			
Hudson																			
Huntington																			
Islip																			
Kingston	√	√	√	√	√		√	√	√	√	√	√			√			√	√
Lackawanna																			
Mamaroneck																			
Manorhaven																			
New Rochelle																			
New York City (Bronx)																			
New York City (Brooklyn)																			
New York City (Manhattan: Hudson R. Conservancy Parkway)	√			√	√	√	√	√	√	√	√	√	√		√	√	√	√	√
New York City (Queens: Flushing Bay Rehabilitation)	√		√	√	√		√	√										√	√
New York City (Staten Island)																			
Newfane							√		√										
Niagra Falls	√			√						√	√	√		√	√			√	√
North Tonawanda	√								√	√		√	√	√	√			√	
Ogdensburg	√		√	√			√		√			√	√	√	√		√	√	√
Oswego	√		√				√	√	√		√	√	√	√	√				
Oyster Bay																			
Patchogue			√																
Port Chester	√		√				√				√		√						
Port Jefferson																			
Rensselaer	√																		
Rochester	√	√	√	√			√		√				√						
Rye																			√
Sackets Harbor	√	√		√	√		√	√	√		√	√	√	√	√	√			
Sag Harbor	√											√							
Smithtown																			
Southampton																		√	
Tonawanda (c)	√			√														√	
Tonawanda (t)																			
Waddington	√			√			√		√		√								
Yonkers																			

Table 4: NYCMP Waterfront Revitalization Districts—Character

TABLE 5. Process/tool or combination of processes/tools linked to revitalization districts

	Processes/tools used											Effectiveness		
Name of waterfront	a	b	c	d	e	f	g	h	i	j	k	Hi	Med	Low
Albany		√	√			√		√	√	√				
Beacon		√	√			√		√	√	√				
Buffalo		√	√			√		√	√	√				
Cape Vincent		√	√			√		√	√	√				
Catskill		√	√			√		√	√	√				
Clayton		√	√			√		√	√	√				
Dexter		√	√			√		√	√	√				
Dunkirk		√	√			√		√	√	√				
Freeport		√	√			√								
Glen Cove		√	√			√		√						
Greenport		√	√			√		√	√	√				
Hempstead		√	√			√								
Hudson		√	√			√								
Huntington		√	√			√								
Islip		√	√			√								
Kingston		√	√			√		√	√	√				
Lackawanna		√	√			√		√	√	√				
Mamaroneck		√	√			√		√						
Manorhaven		√	√			√								
New Rochelle		√	√			√								
New York City (Bronx)		√	√			√		√						
New York City (Brooklyn)		√	√			√		√						
New York City (Manhattan: Hudson R. Conservancy Parkway)		√	√			√		√	√	√		√		
New York City (Queens: Flushing Bay Rehabilitation)		√	√			√		√	√	√		√		
New York City (Staten Island)		√	√			√		√	√	√				
Newfane		√	√			√		√	√	√				
Niagra Falls		√	√			√								
North Tonawanda		√	√			√		√	√	√				
Ogdensburg		√	√			√		√	√	√				
Oswego		√	√			√		√	√	√	√			
Oyster Bay		√	√			√								
Patchogue		√	√			√								
Port Chester		√	√			√		√						
Port Jefferson		√	√			√								
Rensselaer		√	√			√		√	√	√				
Rochester		√	√			√		√	√	√				
Rye		√	√			√		√						
Sackets Harbor		√	√			√		√						
Sag Harbor		√	√			√		√						
Smithtown		√	√			√		√						
Southampton		√	√			√								
Tonawanda (c)		√	√			√		√	√	√				
Tonawanda (t)		√	√			√		√						
Waddington		√	√			√		√	√	√				
Yonkers		√	√			√								

Proposed Regional Coastal Management Programs (RCMP)
The Task Force recommends updating and refining the Coastal Program for the marine coast surrounding Long Island, the urban harbor of New York City, the estuary of the Hudson River Valley, the St. Lawrence River Valley, and the major fresh water bodies of Lakes Erie and Ontario. This would create a new **Regional CMP**, which takes the place of the State CMP in each region; it would have all the enforcement powers plus the new authority proposed for centralized consistency . . . RCMP's will establish the criteria against which county coastal programs, new LWRPs, and revised LWRPs will be evaluated in the decision of the DOS whether to approve them. When a LWRP is approved, it will be a complete substitute for the RCMP in that municipality. (Sec. 309 Strategy, 1992 p. 5-6)

WHERE CZM HAS BEEN LESS EFFECTIVE IN PROMOTING WATERFRONT REDEVELOPMENT.
NY's coastal program relies on voluntary participation by local municipalities. Some 135 of these have not yet decided to undertake LWRPs. This study has been unable to determine which, if any, of these villages, towns and one city would benefit from undertaking waterfront revitalization. In the absense of an statewide inventory of, and condition report on, coastal communities' waterfronts, it is not possible to determine the *degree* of effectiveness of NY's coastla program in addressing waterfront revitalization.

Current planning in the various State agencies focuses on individual agency operations or programs, not on a system-wide view of coastal areas, coastal resources, or coastal economies. Gaps in the geographical coverage of LWRP's reduce the effectiveness of local government efforts to manage cumulative and secondary impacts (Sec. 309 Strategy, 1992).

There has not been enough funds available to coastal municipalities for the preparation and implementation of LWRPs. This has limited local participation in the LWRP process and has impaired effective management of coastal resources at the local level. This has also led to long delays by the State to manage coastal resources such as scenic areas, public access and recreation, ports and harbors. . .insufficient funds to purchase coastal lands, develop, improve and maintain public access and recreation facilities and the infrastructure for waterfront revitalization activities.

Impairment of effective coastal resource management related to historic preservation and aesthetics, due to lack of current technical capability in staff. (Sec. 309 Strategy, 1992).

CONCLUSIONS

NY State's CZMP is unique in the manner chosen to address waterfront revitalization: The statute from which the program derives its authority is titled *Waterfront Revitalization* of Coastal Areas and Inland Waterways Act (emphasis added) and is focussed on partnerships with villages, towns and cities in the coastal zone to achieve its goal. There are strong policies in place addressing each aspect of waterfront revitalization that this study assumes are important, and every LWRP must address each of them. The Dept. of State has employed tools selectively to implement its program, choosing technical and financial assistance, and partnering to help local communities develop LWRPs, and using its review authority to ensure those programs are approvable. Waterfront development projects are reviewed, where applicable, through state and federal consistency determinations which are triggered by applications for other agencies' permits. The NYCMP staff, in their dealings with other agencies, act as advocates for municipalities with approved plans when opportunities arise to promote LWRP implementation, or when circumstances appear to jeopardize it.

This is a robust, effective program with much already achieved and more promised. In the future, more program emphasis could be placed on developing guidance documents and on education and training. For example, there will be opportunities to document and evaluate successful waterfront revitalization efforts as well as those that so far are failing. This experience could be written up as case studies to be used at regional workshops, or statewide conferences and to guide communities that are still at early stages of plan implementation, or are among the 135 that have not yet joined the state's voluntary LWRP.

STATE CONTACTS

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Wibur (Bill) Woods, Director, Waterfront & Open Space Planning, Dept. of City Planning, City of NY

REFERENCES AND DATA SOURCES

FEIS NY City 1982
1992 Section 309 Report
Guidance Manual for Preparation of Local Waterfront Revitalization Plans. Dept. of State, Division of Coastal Resources and Waterfront Revitalization,
Now and for the Future: A Vision for New York's Coast Recommendations of The Governor's Task Force on Coastal Resources
New York City Waterfront Revitalization Program. Dept. of City Planning, New York City, 1982
Coastal Zone Boundary of New York City. Dept. of City Planning, New York City, 1986
New York City Comprehensive Waterfront Plan. Dept. of City Planning, New York City, 1992
Glen Cove Creek (NY) Workshop Summary, 23-24 Oct, 1995.
Poughkeepsie Journal. Thursday, August 12, 1993.

Appendix C: Survey Questionnaire

CZM Effectiveness Study

Research Question:

Has CZM assisted in the redevelopment of deteriorated and under-utilized urban waterfronts and ports?

State:

CZM Program:

Contact Person:

Please provide as much detailed information as you can, and use additional copies/paper as needed.

A. BACKGROUND & CONTEXT	
General Description of coastal zone in 1980 and Context of waterfront revitalization.	In 1980: Coastal cities and towns and industries with population numbers. Focus only on urban waterfront areas.
Issue Evolution	
1. At time of program approval, what priority did the state CZM program assign to waterfront revitalization?	High Medium Low
2. How did priority for waterfront revitalization change as a result of the 1980 amendments?	High Medium Low
3. What priority does the state CZM program assign to waterfront revitalization now?	High Medium Low

4. At time of CZM program approval what zones (distinct districts) within your state's coastal cities' waterfronts were designated as deteriorated and underutilized?	Please describe areas with amount of waterfront acreage if possible.
B. STATE CZM POLICIES	
1. What state laws or policies does CZM use to encourage or facilitate the redevelopment urban waterfronts?	
2. Has the state CZM agency developed policies or performance standards for achieving the following multiple CZM goals in urban waterfronts? • public access • protection of coastal dependent industries • historic, cultural conservation and interpretation • environmental restoration • other	
C. IMPLEMENTATION PROCESSES & TOOLS	
1. Has the state CZM agency assisted local governments and ports develop plans for waterfront revitalization through: (Use examples please)	
a) Financial assistance; what funding sources, (§306, 309) grants? —or project (§306A) grants?	

b) Technical assistance? Staff consultations, advice, other...	
c) guidance documents, publications and/or reports?	
d) education and training? (workshops, conferences short courses, seminars)	
e) partnership, cooperative arrangements with other federal, state, local and non-profit organizations?	
2. Have SAMP's undertaken by your state CZM agency addressed urban waterfront revitalization? Which one(s)? How?	
3. What mechanisms does the state CZM agency use to ensure local waterfront revitalization plans comply with the state's CZM program?	a) Local Coastal Program amendments review b) project by project review for compliance c) limited to review of impacts on critical resources/areas d) other?
D. Outcome Indicators	
1. Which of the waterfront areas/zones are now upgraded and/or fully utilized?	Please refer to the charts.

2. Are there examples of new urban waterfront activities attributable to CZM (festivals, events, education etc.)? Are there attendance figures (or best estimates) available? Has the economic impact of any of these activities been assessed?	Please use this table cell and refer to the charts.
E. Case Studies	
1. What revitalized urban waterfront in your state best achieves CZM's multiple goals in urban shorelines (e.g. public access; protection of coastal dependent industries; historic, cultural conservation and interpretation; etc.)? Which fell short, and why?	
F. Sources/documents we have consulted	FEIS, Section 309 Reports
G. Sources/Documents needed; and/or you recommend	
	Comments and Suggestions

Supplementary Questions for State CZMP Telephone Interviews

How *important* have the following processes and tools been for assisting local governments and/or ports revitalize deteriorated waterfronts in your state:

	Importance		
Process or tool used by state	**High**	**Med**	**Low**
a) Designation of areas in CZ needing revitalization			
b) Financial assistance			
c) Technical assistance			
d) Guidance documents/publications			
e) Education and training			
f) Partnering			
g) Special Area Management Plans (SAMPs)			
h) Review of local coastal program amendments			
i) Review of waterfront projects			
j) Review of project environmental impacts			
k) Other			

Is there a process/tool, or combination of processes/tools, that has been particularly *effective* in achieving successful waterfront revitalization in your state? Please rank the *three most effective* processes/tools or combinations of processes/tools

tool	a	b	c	d	e	f	g	h	i	j	l
rank											

Which waterfront(s) in your state has (have) benefited from the use of this process/tool or combination of processes/tools?

	Processes/tools used											Effectiveness		
Name of waterfront	a	b	c	d	e	f	g	h	i	j	l	Hi	Med	Low

Table 1 Revita ı Results

City, District, Project **	Public Access						Incorporation Marine Activities					Historical & Cultural Preservation	Landside Economic Activity					Cleanup &/or Environmental Restoration	Festivals &/or Maritime Events
Check off all facilities and activities that apply to the revitalized urban waterfronts in your state that coastal zone management has effected. Please make corrections and additions as needed.	Parks	Plaza	Boardwalks	Viewing Towers/Lookouts	Signage Program	Other	Guest Boating	Commercial Boating	Fishing Piers	Water Tours	Other		Retail/Restaurant	Hotels	Marine Industries	Tourist Centers	Other		

**Please concentrate only on revitalized waterfront areas that have involved coastal zone management policies, processes and tools. (Refer back to table sections B & C)

Table 2 Revitalization Projects

City &/or District**	CZM 306A $ Involved	Total Cost of Project	Plan Underway	Plan Completed	Project Underway	One or More Projects Underway	Infrastructure & Multiple Projects Developed	Completely Revitalized Waterfront
**Please concentrate only on revitalized waterfront areas that have involved coastal zone management policies, processes and tools.								
Refer to survey sections B & C								

Appendix D: Data Source and Quality Table

STATE	Program Structure/Policy Data		Process/Tool Data		Expenditure Data		Revitalization Projects & Plans		Revitalization Results		Tools linked to Outcomes		Source and Quality Total	
	Source	Quality	Source	Quality	Source	Quality	Source	Quality	Source	Quality	Source	Quality	Source	Quality
Alabama	1	1	2	2	0	0	0	0	0	0	0	0	**3**	**3**
Alaska	1	1	2	1	1	1	1	2	2	2	0	0	**7**	**7**
Am. Samoa	2	2	1	2	0	0	2	2	2	2	0	0	**7**	**8**
California	2	2	2	2	2	2	1	2	1	2	1	2	**9**	**12**
CN Mariana Islands	1	0	0	0	0	0	0	0	0	0	0	0	**1**	**0**
Connecticut	1	2	2	2	0	0	1	0	1	1	1	0	**6**	**4**
Delaware	1	0	1	1	0	0	0	0	0	0	0	0	**2**	**1**
Florida	1	2	2	2	0	0	1	0	1	0	1	0	**6**	**4**
Guam	2	2	2	1	0	0	0	0	0	0	0	0	**4**	**3**
Hawai'i	2	2	2	2	0	0	2	2	2	1	0	0	**8**	**7**
Louisiana	2	2	2	2	0	0	0	0	0	0	0	0	**4**	**4**
Maine	2	2	2	2	2	2	2	2	2	2	2	1	**12**	**11**
Maryland	2	2	2	2	1	1	2	2	2	2	2	2	**11**	**11**
Massachusetts	2	2	2	2	0	0	2	2	2	2	2	2	**10**	**10**
Michigan	2	2	1	1	2	2	2	2	2	2	2	2	**11**	**11**
Mississippi	2	2	2	2	1	1	2	2	2	2	2	2	**11**	**11**
New Hampshire	2	2	1	1	1	1	2	1	2	1	0	0	**8**	**6**
New Jersey	2	2	2	2	0	0	2	2	2	2	2	2	**10**	**10**
New York	2	2	2	2	2	2	2	2	2	2	1	1	**11**	**11**
North Carolina	1	1	2	1	0	0	1	0	2	1	0	0	**6**	**3**
Oregon	2	2	2	2	2	2	2	2	2	2	2	2	**12**	**12**
Pennsylvania	2	2	2	2	2	2	2	2	2	2	2	2	**12**	**12**
Puerto Rico	2	2	2	2	0	0	1	2	2	2	0	0	**7**	**8**
Rhode Island	1	0	1	1	0	0	0	0	0	0	0	0	**2**	**1**
South Carolina	1	1	1	1	2	2	2	2	2	2	0	0	**8**	**8**
Virginia	2	1	2	1	1	2	2	1	2	1	0	0	**8**	**6**
Virgin Islands	1	0	0	0	0	0	0	0	0	0	0	0	**1**	**0**
Washington	2	2	1	2	1	2	2	2	2	2	2	2	**10**	**12**
Wisconsin	1	2	2	2	1	2	2	2	2	2	2	2	**10**	**12**

APPENDIX D: DATA QUALITY TABLE

Key:

- 0 = No data / poor quality.
- 1 = Data from program documents, national data sources, researchers / marginal quality.
- 2 = Research data augmented by survey/interview data / good quality.

Appendix E: List of Revitalizing Waterfront Districts

State	Waterfront	Stage Score	Character Score	Tools Effect	Tools Score
AK	Anchorage-Ship Creek	3.0	7.0		
AK	AWCRSA-Unalaska Bay	4.0	5.0		
AK	City of Whittier	0.0	6.0		
AK	Cordova	1.0	0.0		
AK	Haines	5.0	1.0		0.20
AK	Juneau	5.0	1.0		0.30
AK	Ketchikan	0.0	9.0		
AK	Kodiak	1.0	0.0		
AK	Point MacKenzie	2.0	0.0		0.30
AK	Sitka	5.0	9.0		0.20
AK	Skagway	5.0	13.0		0.30
AK	Wrangell	0.0	0.0		
AK	Yakutak	1.0	0.0		0.20
AS	Pago Pago Harbor	4.0	5.0		
CA	Eureka Northern Waterfront	5.0	4.0	2.00	0.65
CA	Imperial Beach Pier Plaza	5.0	4.0	2.00	0.60
CA	Manhattan Beach Pier	3.0	2.0	3.00	0.50
CA	Morro Bay Waterfront	4.0	4.0		
CA	Moss Landing Harbor	5.0	3.0	2.00	0.60
CA	Oceanside Strand	5.0	3.0	3.00	0.70
CA	Pismo Beach Waterfront	5.0	1.0	2.00	0.50
CA	Point Arena Pier	3.0	1.0	3.00	0.45
CA	Port San Luis	4.0	1.0	3.00	0.60
CA	San Francisco Pier 45	1.0	6.0	1.50	0.60
CA	San Francisco Pier 7	3.0	3.0		
CA	Santa Barbara Stearns Wharf	3.0	6.0	3.00	0.45
CA	Santa Monica Pier	3.0	6.0	3.00	0.50
CA	Spud Point Marina	3.0	1.0	3.00	0.40
CA	Suisun City Waterfront	5.0		2.00	0.55
CA	Ventura Pier	3.0	3.0	3.00	0.55
CT	Bridgeport - Pleasure Beach	6.0	1.0	3.00	0.65
CT	Bridgeport - Steel Point	1.0	0.0	3.00	0.55
CT	Milford Head Of The Harbor	6.0	13.0	3.00	0.65
CT	New Haven - City Point	6.0	4.0	3.00	0.25
CT	New Haven - Long Wharf	6.0	8.0	3.00	0.35
CT	New London	5.0	5.0	3.00	0.65
CT	Norwalk	6.0	1.0	3.00	0.65
CT	Norwich	6.0	6.0	3.00	0.35
CT	Stamford Landing	6.0	7.0	3.00	0.45
FL	City of Hollywood Central Beach	5.0	1.0		0.20
FL	City of Tampa	3.0	4.0	2.50	0.25
FL	Fernandina				
FL	Ft. Lauderdale				
FL	Gulf Port-Waterfront Park	1.0	3.0		
FL	Jacksonville				
FL	Key West				
FL	Miami Area				
FL	Panama City - St. Andrews Area	1.0		2.50	0.20
FL	Pasacola Baylands City Harbor				
FL	Pensacola Baylen St.	5.0	4.0		0.20
FL	St. Augustine				
FL	St. Petersburg				

State	Waterfront	Stage Score	Character Score	Tools Effect	Tools Score
GUAM	Agana Bay	1.0	0.0		
HI	Honolulu	5.0	16.0		0.30
MA	Beverley	4.0	3.0	3.00	0.30
MA	Boston	5.0	8.0	3.00	0.30
MA	Chelsea	2.0	1.0		0.30
MA	Fall River	1.0	2.0	3.00	0.60
MA	Gloucester	4.0	2.0	3.00	0.60
MA	Hingham	4.0	2.0		
MA	Hull	1.0	2.0		0.30
MA	Lynn	3.0	3.0		
MA	New Bedford	4.0	5.0	3.00	0.65
MA	Newburyport	4.0	3.0	3.00	0.60
MA	Plymouth	0.0	2.0		0.20
MA	Quincy	3.0	2.0	3.00	0.30
MA	Salem	3.0	3.0	3.00	0.60
MD	Annapolis	2.0	5.0	2.00	0.30
MD	Baltimore City Promenade	6.0	13.0	3.00	0.30
MD	Betterton	6.0	9.0	3.00	0.30
MD	Cambridge	2.0	4.0	1.00	0.30
MD	Chesapeake Beach	2.0	2.0	3.00	0.30
MD	Chestertown	0.0	1.0		0.30
MD	Havre de Grace	0.0	3.0		0.30
MD	Ocean City	0.0	1.0		0.30
MD	Oxfora	2.0	2.0	3.00	0.30
MD	Pocomoke City	0.0	3.0	3.00	0.30
MD	Princess Anne	6.0	2.0	3.00	0.30
MD	Rock Hall	6.0	1.0	3.00	0.30
MD	Snow Hill	2.0	3.0	2.00	0.30
MD	St. Michaels	2.0	2.0		0.30
MD	Vienna	2.0	3.0		0.30
ME	Augusta	5.0	4.0		0.30
ME	Bangor	5.0	5.0		0.30
ME	Bath	2.0	4.0		0.30
ME	Belfast	5.0	5.0		0.30
ME	Biddeford	5.0	2.0		
ME	Brewer	2.0	0.0		0.30
ME	Bucksport	5.0	6.0		0.30
ME	Calais	5.0	2.0		0.30
ME	Eastport	2.0	3.0		0.30
ME	Gardiner	3.0	2.0		0.30
ME	Hallowell	2.0	2.0		0.30
ME	Jonesport	3.0	3.0		0.30
ME	Lubec	2.0	0.0		0.30
ME	Machias	5.0	1.0		0.30
ME	Portland	5.0	11.0		0.30
ME	Rockland	5.0	7.0		0.30
ME	Saco	1.0	5.0		0.30
ME	Searsport	3.0	1.0		0.30
ME	South Portland	5.0	3.0		0.30
MI	Alpena	5.0	6.0	3.00	0.40
MI	Bay City	5.0	10.0	3.00	0.50

State	Waterfront	Stage Score	Character Score	Tools Effect	Tools Score
MI cont	Detroit Riverfront Parks	6.0	9.0	2.00	0.50
MI	East Tawas/Tawas	4.0	4.0	3.00	0.50
MI	Elk Rapids	4.0	8.0	3.00	0.40
MI	Escanaba	3.0	0.0	3.00	0.40
MI	Essexville	6.0	1.0	2.00	0.40
MI	Frankfort	3.0	5.0	2.00	0.40
MI	Hancock	3.0	1.0		0.40
MI	Houghton	3.0	4.0	3.00	0.50
MI	Ludington	3.0	6.0	2.00	0.40
MI	Mackinaw	4.0	9.0	3.00	0.50
MI	Manistique		3.0		0.00
MI	Marine City	3.0	2.0	2.00	0.40
MI	Muskegon	3.0	10.0	3.00	0.40
MI	Petoskey	6.0	8.0	3.00	0.50
MI	Port Huron	3.0	0.0	1.00	
MI	Sault Ste. Marie	3.0	7.0	3.00	0.40
MI	St. Ignace Bird Walk	4.0	10.0	3.00	0.50
MI	Wyandotte - S. Works	5.0	1.0	3.00	0.50
MS	Bay St. Louis	2.0	3.0	1.00	0.50
MS	Biloxi	4.0	12.0	3.00	0.60
MS	Gulfport Harbor Square	4.0	5.0	2.00	0.50
MS	Long Beach-Harbor	2.0	2.0	2.00	0.50
MS	Moss Pt.	4.0	2.0	1.00	0.50
MS	Pascagoula	4.0	9.0	2.00	0.70
MS	Pass Christian	2.0	3.0	3.00	0.50
MS	Waveland	4.0	6.0	2.00	0.50
NC	Bayboro	1.0	4.0		
NC	Columbia	1.0	5.0		
NC	Elizabeth City	1.0	5.0		
NC	Hartford	1.0	4.0		
NC	Morehead City	1.0	5.0		
NC	Plymouth	1.0	4.0		
NC	Washington	1.0	4.0		
NC	Wilmington	5.0	7.0		
NH	City of Dover	4.0	4.0		
NH	City of Portsmouth	4.0	5.0		
NH	Durham	4.0	2.0		
NH	Hampton Beach	4.0			
NH	Newcastle Great Island Common	4.0			
NH	Piscataqua River Walk	0.0	3.0		
NH	Prescott Park	4.0			
NH	Town of Exeter Waterfront Park:	4.0	4.0		
NH	Newcastle Shoreline Walkway	4.0	2.0		
NH	Wentworth-Coolidge Mansion	4.0			
NJ	Atlantic City	3.0	12.0	2.50	0.80
NJ	Camden	3.0	6.0	2.00	0.75
NJ	Edgewater	3.0	6.0	2.00	0.60
NJ	Elizabeth			2.00	0.75
NJ	Hoboken	3.0	11.0	3.00	0.80
NJ	Jersey City	3.0	14.0	3.00	0.80
NJ	Weehawkin	3.0	1.0	3.00	0.80

State	Waterfront	Stage Score	Character Score	Tools Effect	Tools Score
NY cont	Albany	5.0	8.0		0.55
NY	Beacon	4.0	5.0		0.55
NY	Buffalo	5.0	13.0		0.55
NY	Cape Vincent	5.0	4.0		0.55
NY	Catskill	5.0	6.0		0.55
NY	Clayton	5.0	1.0		0.55
NY	Dexter	5.0	5.0		0.55
NY	Dunkirk	5.0	5.0		0.55
NY	Freeport				0.40
NY	Glen Cove	2.0	1.0		0.45
NY	Greenport	5.0	5.0		0.55
NY	Hempstead	1.0			0.40
NY	Hudson	1.0			0.40
NY	Huntington	1.0			0.40
NY	Islip	1.0			0.40
NY	Kingston	5.0	13.0		0.55
NY	Lackawanna	4.0	1.0		0.55
NY	Mamaroneck	2.0			0.45
NY	Manorhaven	1.0			0.40
NY	New Rochelle	1.0			0.40
NY	NYC (Bronx)	2.0			0.45
NY	NYC (Brooklyn)	2.0			0.45
NY	NYC (Hudson R. Parkway)	5.0	16.0		0.55
NY	NYC (Queens: Flushing Bay Rehab.)	5.0	8.0		0.55
NY	New York City (Staten Island)	5.0			0.55
NY	Newfane	4.0	2.0		0.55
NY	Niagra Falls	1.0	2.0		0.40
NY	North Tonawanda	5.0	8.0		0.55
NY	Ogdensburg	5.0	1.0		0.55
NY	Oswego	6.0	13.0		0.60
NY	Oyster Bay	1.0			0.40
NY	Patchogue	1.0	1.0		0.40
NY	Port Chester	2.0	5.0		0.45
NY	Port Jefferson	1.0			0.40
NY	Rensselaer	3.0	1.0		0.55
NY	Rochester	5.0	7.0		0.55
NY	Rye	2.0			0.45
NY	Sackets Harbor	6.0	14.0		0.45
NY	Sag Harbor	2.0	2.0		0.45
NY	Smithtown	2.0			0.45
NY	Southampton	1.0			0.40
NY	Tonawanda (City)	4.0	3.0		0.55
NY	Tonawanda (Town)	2.0	1.0		0.45
NY	Waddington	5.0	5.0		0.55
NY	Yonkers				0.40
OR	Astoria	5.0	14.0	3.00	0.40
OR	Bandon	2.0	1.0	3.00	0.35
OR	Coos Bay	5.0	13.0	3.00	0.40
OR	Florence	5.0	5.0	3.00	0.20
OR	Garibaldi	2.0	3.0	3.00	0.20
OR	Hammond	2.0	3.0	3.00	0.20
OR	Newport	2.0	3.0	3.00	0.20
OR	North Bend	4.0	5.0	3.00	0.20
OR	Reedsport	5.0	13.0	3.00	0.35

State	Waterfront	Stage Score	Character Score	Tools Effect	Tools Score
OR cont	Seaside	5.0	12.0	3.00	0.20
OR	Warrenton	4.0	6.0	1.00	0.60
PA	Airport Area	2.0	0.0		0.40
PA	Baldwin Industrial Park	2.0	1.0	2.00	0.45
PA	Chester	2.0	0.0	2.00	0.30
PA	Commodore Barry Bridge	5.0	3.0	3.00	0.50
PA	Cottman Ave.	2.0	2.0	2.00	0.30
PA	Dela. Co. Waterfront	2.0	0.0	2.00	0.30
PA	Delaware CZ Task Force	2.0	5.0	2.00	0.40
PA	Delaware Riverfront	2.0	6.0	2.00	0.35
PA	Erie Waterfront	6.0	15.0	2.41	0.75
PA	Integrated Development Strategy	2.0	2.0	2.00	0.35
PA	Marcus Hook	6.0	6.0	2.50	0.30
PA	Millcreek Twp.	1.0	0.0	3.00	0.50
PA	Money Island Area	2.0	3.0	2.00	0.35
PA	North Center City Area	0.0	3.0	2.00	0.55
PA	Philadelphia Downtown Waterfront	2.0	13.0	3.00	0.25
PA	Poquessing Creek	3.0	1.0	1.00	0.30
PA	Port Richmond -Tioga Terminal	2.0	2.0	2.00	0.25
PA	Radcliff St. Riverfront Park	5.0	2.0	2.00	0.30
PA	South Central Riverfront	0.0	0.0	2.00	0.15
PA	Turkey Hill-Van Sciver	2.0	3.0	2.00	0.10
PA	Washington Ave.	2.0	3.0	2.00	0.60
PR	San Juan Capitol Area Redevelopment	3.0	6.0		
PR	Old San Juan Waterfront	3.0	11.0		
PR	San Juan Tourism Piers	6.0	4.0		
SC	Beaufort Waterfront Park	4.0	11.0		0.05
SC	Charleston Aquarium	2.0	0.0		0.05
SC	Charleston Marina Revitalization	3.0	8.0		0.05
SC	Charleston Marine Center	2.0	8.0		0.05
SC	Charleston Peninsula Walkway	3.0	0.0		0.15
SC	Charleston Waterfront Park	6.0	13.0		0.15
SC	Conway Waterfront Park	6.0	8.0		0.05
SC	Georgetown Boardwalk	4.0	12.0		0.15
SC	Mt. Pleasant-Shem Creek	2.0	7.0		0.05
VA	Newport News	3.0	2.0		
VA	Suffolk: Bennett's Creek Pier	1.0	1.0		
VA	Charles City	1.0	2.0		
VA	Cape Charles	3.0			
VA	Isle of Wight: Jones Creek Ramp	1.0			
VA	Occoquan: River Walk	1.0	1.0		
VA	Portsmouth: Shoreline Access	1.0			
VA	Wachapreague Harbor Project	1.0	4.0		
VA	Potomac River Public Access	1.0			
VA	Richmond: Mayo's Island	1.0			
VA	Northhamton Co: Eco-industrial Park	1.0	1.0		
VA	Poquoson: White House Cove Pier	2.0	1.0		
WA	Bellingham-Central Waterfront	5.0	7.0	1.00	0.75
WA	Bellingham-Fairhaven	5.0	14.0	2.00	0.75
WA	Bellingham-Squalicum Hbr.	5.0	15.0	3.00	0.75

State	Waterfront	Stage Score	Character Score	Tools Effect	Tools Score
WA cont	Bremerton	5.0	15.0	3.00	0.75
WA	City of Aberdeen	5.0	14.0	2.00	0.85
WA	City of Blaine	2.0		1.00	0.75
WA	City of Edmonds	5.0	12.0	3.00	0.75
WA	City of Hoquiam	4.0	12.0	1.00	0.85
WA	City of Langley	5.0	5.0	2.00	0.70
WA	City of Oak Harbor	2.0		1.00	0.75
WA	City of Olympia	6.0	1.0	3.00	0.75
WA	City of Port Townsend	5.0	12.0	3.00	0.75
WA	City of Raymond	4.0	8.0	3.00	0.75
WA	Everett	5.0	8.0	3.00	0.75
WA	Nahcotta	4.0	4.0	1.00	0.70
WA	Port Angeles	6.0	15.0	3.00	0.75
WA	Port Orchard	2.0		1.00	0.75
WA	Poulsbo	5.0	12.0	2.00	0.75
WA	Seattle-Fisherman's Terminal	6.0	14.0	3.00	0.75
WA	Seattle-Harborfront	6.0	19.0	3.00	0.75
WA	Seattle-So. Lake Union	6.0	15.0	3.00	0.75
WA	Shelton	2.0		1.00	0.75
WA	Skamokawa	2.0	5.0	2.00	0.60
WA	Steilacoom	2.0		1.00	0.75
WA	Tacoma-Ruston Way	5.0	1.0	3.00	0.75
WA	Tacoma-Thea Foss Waterway	5.0	1.0	3.00	0.75
WA	Town of LaConner	3.0	6.0	2.00	0.70
WA	Westport	1.0		1.00	
WI	Ashland	5.0	7.0	3.00	0.65
WI	Bayfield	3.0	2.0	3.00	0.65
WI	Cornucopia	5.0	4.0		
WI	Egg Harbor	5.0	3.0	3.00	0.65
WI	Ephraim	5.0	3.0	3.00	0.65
WI	Green Bay	5.0	5.0	3.00	0.65
WI	Kenosha	6.0	9.0	3.00	0.55
WI	Kewaunee	6.0	9.0	3.00	0.65
WI	Madelin Island	5.0	1.0	3.00	0.65
WI	Manitowoc	5.0	7.0	3.00	0.35
WI	Marinette	5.0	3.0	3.00	0.45
WI	Oconto	5.0	3.0	3.00	0.55
WI	Port Washington	5.0	2.0	3.00	0.35
WI	Racine	6.0	6.0	3.00	0.45
WI	Saxon Harbor	5.0	2.0	3.00	0.65
WI	Sheboygan	6.0	7.0	3.00	0.35
WI	Sturgeon Bay	5.0	3.0	3.00	0.45
WI	Superior	5.0	7.0	3.00	0.55
WI	Two Rivers	5.0	6.0	3.00	0.35

Effectiveness of State Coastal Management Programs in Addressing Seaport Development: A National Overview

by

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SUMMARY

This study is one part of the National Coastal Zone Management Effectiveness study. The national study addressed how well state coastal management programs (CMP) were implementing various goals of the CZMA. Seaport development was chosen to illustrate how well the states were managing coastal dependent economic uses, one of the goals of the Act.

All of the approved coastal management programs in the US were surveyed to determine how they addressed seaport development. Although CMPs deal with all types and sizes of ports, for this study seaport development was defined as major commercial deepwater ports important to international trade. CMPs were asked to list their policies, management tools and program results. Interview data and a literature review supplemented the survey responses. From this information a general characterization of the response to this issue by all CMPs was developed.

Additionally, 12 state CMPs were selected for additional study because they were considered "port-active"; i.e., they gave port development a High rating in perceived importance relative to other issues, and they had a relatively active port sector in international trade. The specification of port policies and the facilitation of port development by these 12 CMPs is presented in some detail. Further, specific examples of outcomes in selected ports are described.

The concept of "organizational learning" is offered as a way to evaluate the performance of CMPs with respect to port development issues. This concept is chosen because the CZMA is a multi-objective statute and port development is promoted in conjunction with other goals such as wetlands protection. Accommodation is sought among the objectives. CMPs and port agencies must interact with each other to achieve an accommodation. It is assumed that if the organizations change their procedures or objectives as a result of their interaction, and changes are based on new knowledge acquired by key officials, then they are being effective in implementing the Act.

Conclusions. From a national perspective port development has been given significant attention by state CMPs, but at a general level. All states have policies promoting water dependent uses, and all states interact with ports through regulatory review (permits or consistency). Two-thirds of the states have specific policies about seaports, perceive the importance of port issues as High, and have some formal interactive mechanism such as a planning process, SAMP, or grants.

The number of states with more specific tools addressing ports is much lower. Less than half the states have actively identified where port development should take place and what kind of development is appropriate. Only 1/3 pay special attention to ports in the regulatory process through port-specific decision criteria or expedited permit processes.

These conclusions change dramatically when only the 12 "port-active" states are examined. Virtually all have policies specific to commercial seaports, including "no-sprawl" policies, and they delineate areas for port development. They employ a variety of strategies for guiding port development including regional plans, master planning, local zoning and port-specific environmental criteria. They are active in technical assistance including grants, staff assistance, and engineering/environmental support. Half or more have permit criteria specific to ports or expedited permit processes for port projects.

There are examples of organizational learning occurring in CMPs and port organizations as a result of the interaction of the two. Some of this learning results in changed objectives within the programs and in the ports, improving the process of finding accommodation among the multiple objectives being advanced through the CZMA. Leading examples include regional port planning, master planning/SAMPs, reduction of reserved port lands based on new information about port needs, wetland mitigation banking, beneficial use of spoils, and long-term dredging planning. These innovations improve the state of the art of port development in the context of the goals of CZM. To the extent that more detailed study confirms the preliminary evidence of organizational learning, we can conclude that the "port-active" states are not only "effective" in meeting statutory obligations but are also innovative in defining new objectives and methods for their work.

Recommendations. The way in which CMPs address port development should be monitored periodically. At selected intervals, perhaps every five years, there should be a review to determine what program changes have occurred in the way port development is addressed, why those changes occurred, and what change in outcomes occurred or is expected to occur because of the changes. The focus on "change" shows responsiveness to new situations (if any), and allows organizational learning to be highlighted. It also can identify innovative processes and outcomes that help find the accommodation sought in CZM programs among competing uses.

A special study is needed of how bulk cargo or specialized port installations are addressed in CMPs, to complement this study of major general cargo ports. Bulk cargo ports, such as those that are energy-related, can be very significant for CMPs. For example, many of these specialized bulk cargo port installations are combined with storage, processing and distribution facilities and thus raise additional land use and environmental issues. Further, some of them are located in rural areas where industrial use is uncommon raising the issue of port-sprawl. Many of them raise special navigational or transportation safety issues.

More study is needed on the issue of dredging and dredged material disposal and the particular role played by CMPs. Channels, turning basins, jetties, and other facilities are essential infrastructure in virtually every harbor in the country, and a central requirement for port development. Dredging and dredged material disposal are major national environmental issues, raising concerns about water quality, fish and wildlife habitat, and wetlands. Organizationally the issue is dominated by federal agencies. In some cases state CMPs, using federal consistency, land use controls and technical assistance, are influential players within this national system. Additional documentation of CMPs special niche would be particularly useful as regional and state-level "advanced planning" for future dredging and disposal occurs in harbors around the country.

1 Introduction

1.1 Purpose of the Study

This report is one part of the National Coastal Zone Management Effectiveness Study. The purpose of the national study is to determine the effectiveness of the national CZM program, as developed and implemented by the states, in addressing certain core objectives of the CZMA. Four key CZMA objectives were chosen for scrutiny: natural resource protection, public access, coastal-dependent development, and waterfront revitalization. Analysis of each objective included a study of management processes, or tools, used in state programs, and the program results, or outcomes flowing from the application of the tools. Additionally, program examples were given showing particularly innovative ways in which core objectives were met. The study concludes with suggestions for ways to improve the effectiveness of the national CZM program.

This report is one of five national summaries produced during the study. It deals specifically with seaports, one type of coastal dependent development. Other reports deal with protection of wetlands and estuaries, protection of beaches and dunes, provision of public access to the coast, and promoting waterfront revitalization.

Seaports were chosen for a number of reasons. They are a traditional and essential component of our international trading system and the nations commercial health. They are a prominent use in virtually every coastal bay and river area and port installations change rapidly because of technological and economic pressures. They are vitally dependent on access to coastal lands and waters and play a large role in local land use planning. Thus they are likely to play an important role in CZM programs. Further, ports are often represented by public agencies or authorities responsible for planning and financing new facilities. Many other coastal dependent uses are also important (fisheries, recreation, energy, and others) but time and resources required that one be chosen.

1.2 CZMA goals and policies for Seaports

The federal CZMA refers to ports in a number of sections:

-Congress found that the competing demands on the lands and waters of the coastal zone include demands from transportation and navigation facilities (1451(c)).

-Congress declared a national policy that state coastal management programs should provide for "priority consideration being given to coastal dependent uses and orderly processes for siting major facilities related to national defense, energy, fisheries development, recreation, *ports and transportation*, and the location, to the maximum extent practicable, of new commercial and industrial developments in or adjacent to areas where such development already exists" (1452(2)(D)) (emphasis supplied).

-Congress found that state programs should assist in the redevelopment of deteriorating ports (1452(2)(F)) and that special area management plans should provide increased specificity for reasonable coastal-dependent economic growth (1452 (3)(c).

-Congress required states to give port authorities the opportunity for full participation in the development and adoption of a management program (1455(a)(d)(1).

-Resource Management Improvement grants may be awarded by states for the redevelopment of deteriorating and underused urban waterfronts and ports so long as those areas are designated "areas of particular concern" and provide increased public use including compatible commercial activity (1455a(b) and (c)).

-Coastal Zone Enhancement grants may be given to a state for the adoption of procedures and enforceable policies to facilitate the siting of ... government facilities ....and activities which may be of greater than local significance (1456b(a)(8)).

Additionally, the federal consistency provisions of 1456 are particularly important policies of the CZMA affecting port development. The USACOE provides navigational resources within the coastal zone of a state and their activities and projects must be consistent to the maximum extent practicable with enforceable policies of the state's approved coastal management program (1456(c)(1) and (2)). Further, most port development projects require federal permits issued by the USACOE and the CZMA requires that applicants for those permits comply with the enforceable policies of the state's approved coastal management program and that the project be conducted in a manner consistent with the program (1456(c)(3)(A)). These federal consistency provisions do not directly address ports, but in practice they provide states a critical role in port development because of the power over COE project and permit activities.

1.3 Approach to the study

The first stage of the study was to determine what state coastal management programs do with respect to ports and port development. A five state pilot inquiry was undertaken based on program literature and a phone interview with a key state official (OR, PA, LA, RI, SC). This exercise allowed us to design a questionnaire about the port issue that was then sent to all states. The responses to the questionnaire, combined with a program literature review and follow-up phone interviews with a state CZM and port official, resulted in 30 state profiles (App.B contains a profile outline). The profiles are on file with OCRM.

The second stage was a study of the profiles to characterize the approach of all coastal management programs to this issue. Tabular information was developed about the importance of the issue to state programs and to the nation (Section 4.1 and Table 1), and about the management tools and program results achieved. A general summary of state activity is described in Sections 4.2 to 4.4.

It became apparent in stage 2 of the project that some states rated port issues low in importance relative to other issues their program addresses, and another set of states had a relatively low level of commercial port activity. By eliminating those states (as well as a few for which data was too thin) we found 12 state coastal programs that best illustrate the approach of CZM programs to port development. These are labeled "port-active" programs because of both a High importance rating and relatively active port sector.

Stage three is a more detailed description of the 12 port-active CZM programs. App. A summarizes each of the programs by stating how port policies are specified in each program and how the coastal programs facilitate port development. Three measures are used for "specification" and three are used for "facilitation". Sections 4.5.1 to 4.5.6 summarizes each of the measures for the 12 port-active states.

Finally, examples are presented of the results of the measures when applied to specific ports. These examples are drawn from the port-active states and are described at Section 4.6.

2 Background and Context

2.1 Description of Seaports in the US

2.1.1 National Context

In the post WW II era the US has become increasingly dependent on international trade for its goods and services. This has put great demand on the transportation infrastructure of the country and has spurred enormous growth. Seaports, harbors and waterways have been a crucial part of this growth. Foreign waterborne commerce today constitutes almost 25% of GDP.

This growth has been in kind as well as size. Ships have gotten much bigger, and require larger berths and deeper channels. And because the ships and maritime labor are expensive there has been a movement toward "load centering" which increases economies of scale, reduces the turn-around time for ships, and greatly speeds the movement of cargo from ship to rail or road. This trend has occurred with respect to specialized bulk cargoes such as oil, coal, LNG/LPG, ore, etc., as well as with general cargo, most of which travels in containers on specialized containerships.

The face of the seaport has changed from one of many small piers and wharves handling scores of smaller ships to fewer huge terminals that require considerable back-up space on land, large berths, and efficient sea and land access. The smaller piers were abandoned and became available for redevelopment for non-port purposes.

The transformation of the seaport has come about because of powerful institutional forces as well as market forces. The planning by the US Army Corps of Engineers and the financing by Congress of so many harbor improvement and maintenance projects has hastened the remake of harbors. At the local level the public port authorities have used municipal bond financing to underwrite enormous investment in landslide facilities to compete for cargo-related business.

Thus when the CZM programs began development in the mid-1970s the revolution in ship size and port infrastructure was well underway. Channels were being deepened and widened and new lands for port terminals were being created. The partnership between local port agencies, the Corps of Engineers and Congressional delegations was powerful. Obsolete port facilities were beginning to be re-used for various purposes.

2.1.2 Importance of Seaports in US

MARAD measures the economic impact of US ports in a number of ways. In 1994 the port industry itself (defined by MARAD as economic activity directly needed for the movement of waterborne cargo) generated 400,000 direct jobs, a figure which jumped to over 1,600,000 jobs when indirect and induced jobs are added. The industry also produced $43.7 billion in direct sales, or $151.3 billion with the addition of indirect and induced sales. (MARAD 1996)

Another way to show the economic importance of ports is to calculate the value of businesses that make significant use of the port system for shipping or receiving goods. Since about 95% by weight of all US foreign trade moves through US ports, the figures are impressive. The total number of jobs generated by port users is 14.3 million, with sales revenues in excess of $1.469 trillion. (MARAD 1996)

Overall national economic impact can be calculated by adding the above categories. The US. port industry is an essential component in a sizable sector of the US economy. This

includes 15.9 million jobs, $515.1 billion income, $1.623 trillion sales, a $783 billion contribution to the Nation's GDP and $210 billion in taxes for all levels of government. The manufacturing sector is the primary beneficiary of US port activity, followed closely by the service and retail industries. (MARAD 1996)

The figures above include domestic and foreign waterborne commerce, inland and coastal ports, and deep draft and shallow draft ports. Thus for coastal deepwater ports involved in foreign commerce, the primary subject of this study, the economic impact figures would be lower, but still significant. (MARAD 1996)

Capital expenditure for new facilities is particularly important for CZM programs. The public port industry, a subset of all US ports, contributes to the economy through capital expenditures for construction and modernization of terminals and channels. For 1994 the public port capital expenditures totaled $686.6 million. The economic impact of these expenditures translated into a total of 28,200 jobs and $2.2 billion in sales (indirect and induced included). (MARAD 1996) Figures are not available on capital expenditures for all US ports (public and private).

2.1.3 Seaports and navigational resources

Dredging and the disposal of dredged material has been a contentious issue in the US. Seaports are dependent on deep channels and have relied on the USACOE for harbor and channel dredging services for virtually all of their needs. Environmental concerns including wildlife impacts, water quality, and contaminated sediments have dominated the dredging issue. Federal agencies such as EPA, FWS and NMFS play important roles in this process to ensure environmental protection. The provisions of these services is often critical to the competitive posture of the ports. Thus, time and costs in dredging is of central concern to most ports in the US.

Dredging is primarily a federal responsibility. State and local governments, including port authorities and CZM programs, participate in a variety of ways. Ports are local sponsors of dredging projects and bear the costs of finding suitable disposal sites for dredged materials. As ultimate project beneficiaries they play a catalytic role in trying to keep the process moving. CZM programs are concerned with controlling land and water uses in the coastal zone and influence the dredging process through zoning or permit decisions, or through commentary on environmental documents. Further, through their federal consistency powers, state coastal agencies have the authority to review and require modifications to the federal decisions on dredging and disposal projects. The role of these non-federal players will vary state-to-state but their actions directly affect the provision of navigational resources and hence indirectly affect port development.

A recent "Action Plan" for improving the dredging process has been published by the federal government (USDOT, 1994). The Plan calls upon federal agencies to take action to improve planning, coordination, funding and research about dredging. Parts of the plan call for better regional and local planning for dredged materials management, improved coordination with watershed planners, and pre-application conferences among all relevant agencies prior to initiating a dredging project. The implementation of this action plan is just underway and the role of CZM agencies in dredging may be enhanced as a result of initiatives under the plan. There is considerable emphasis on advanced planning and coordination among all agencies and stakeholders, a function at the heart of the CZM process.

2.2 Seaports and CZM

The seaport industry is studied extensively by a variety of federal agencies and boards, by an active industry association, and by academics. The Corps of Engineers and Maritime Administration maintain extensive records and publish periodic reports on the physical and economic condition of the industry. For example the COE publishes the series "Waterborne Commerce of the US" and MARAD issues a biennial "Report to Congress on the Status of

Public Ports". The Marine Board and Transportation Research Board of the National Research Council have been commissioned on numerous occasions to perform special studies of problems or opportunities facing the industry (e.g., Dredging Coastal Ports, 1985 and Landslide Access to US Ports, 1993). The American Association of Port Authorities publishes results of member surveys on a wide range of issues including actual and proposed capital expenditures, port finances, and dredging issues. Academic scholars have taken an interest in port studies (Hayuth, 1987; Kagan, 1991).

Coastal Zone Management has been getting increasing attention in the literature. There are textbooks and numerous policy studies as well as journals with hundreds of technical papers. A recent bibliography found a very large international literature dealing with models for CZM (Meltzer Research and Consulting, 1996).

There are relatively few studies that bring seaports and CZM together. One of the first was published in 1978 (Hershman, et al.) a few years after the US CZM program got underway. That study analyzed six ports and the CZM program(s) in the state or region covering the port. From this study the investigators identified ten leading land and water use issues facing port development in the coastal zone and recommended steps that coastal management programs might take to address these issues. Other studies linking seaports and CZM have dealt with discrete issues such as dredging and mitigation (e.g. Kagan, 1991), waterfront revitalization (Goodwin, 1988), and harbor management (Rothenburg and Rocque, 1986).

This study is the first since the 1978 analysis mentioned above to address how coastal management programs have performed with respect to port development. At this time no attempt was made to compare the results of the 1978 study with the results of this study. Such a comparison might prove interesting but it should be noted that the CZM programs were very young in 1978 and presumably much has developed in the intervening 18+ years.

3 Methodology

The overall purpose of the study was to determine the effectiveness of state programs in meeting the selected core objectives of the CZMA noted in Section 1 above. The first step in developing an appropriate methodology is to better define the objective Congress and the implementing agency intended with respect to port development issues. The more that is known about the objective, the greater the confidence in the measures chosen to determine effectiveness.

Language in the CZMA provides some modest policy guidance. States are to give 1) "priority consideration" for coastal dependent uses (ports being one), 2) provide "orderly processes" for siting major facilities (many port projects are large scale and could be considered major), and 3) site new facilities adjacent to existing ones to the maximum extent practicable. These are useful starting points. The first two stress processes over outcomes. The third provides a potential outcome measure but hedges the requirement by noting "to the maximum extent practicable". Even with this third policy, the process followed is important because Congress recognized that the policy might not be achievable in all cases. The CZMA does not specify how states are to implement these policies; rather they give states considerable latitude in determining how to address them through the management programs they set up.

But, it is important to read specific statutory language in the context of the entire statute, not in isolation. As will be brought out later, the CZMA is a multi-objective statute and the port-related provisions have to be read in conjunction with other statutory language regarding additional coastal issues such as resource protection and public access.

In addition to statutory language, other factors are important in determining the basis for determining effectiveness.

The first observation is that *state* programs determine the suite of coastal zone problems and issues that are important to them. This involves selecting a limited number of coastal issues based on political, economic and efficiency factors. Seaports may not be considered as important as other issues in some states and for that reason given far less attention. For those states, measuring effectiveness is not a fair measure of program performance because they never chose to give seaports significant attention.

Second, "seaport" is a term encompassing a wide range of shoreland and marine uses. For example, it can refer to large container shipping centers such as Los Angeles, industrial complexes such as along the Delaware River, or smaller commercial waterfront areas in New England harbors. In each case port development means something else: expansion of container moving capacity, renovation and modernization of older industries, revitalization for recreation and tourist related businesses, respectively. Specific objectives for port development, therefore, can vary widely. Hence a definition of "seaport" is needed (discussed below).

Third, the CZMA and state programs are multi-objective, striving to find the right accommodation among diverse uses competing for limited space in coastal areas. Seaport development policies rarely are isolated from others. Typically, port development is encouraged but only if done in an environmentally sensitive manner, minimizing impacts on wetlands, and fish and wildlife resources, for example. Because there are many objectives the decisions made are a blending of factors often arrived at through negotiation and compromise. Whether or not an objective has been achieved is a judgment call and dependent on the context.

Fourth, whether or not a port project is proposed in the first place is determined by broader market and financial forces. Thus the ultimate outcome -- construction of a port project -- is a poor measure of the role of CZM. For this reason quantifying the port projects completed in a state's coastal zone would not be an outcome of the application of CZM policies.

However, CZM can assist or influence aspects of port development such as the determination of need, location, design, and impacts. These are primarily process tools used by the CZM program to aid decision making. Isolating the feature of the outcome that resulted because of the CZM process requires an in-depth analysis on a project-by-project basis. It would also require an assessment of what might have occurred had the CZM process or tool not been in place (Leschine, 1996). (Such an analysis was beyond the scope of this project but is an indication of the steps needed to perform an in-depth effectiveness analysis based on outcomes.)

Fifth, state or local CZM programs tend to deal with public port agencies on a continuing basis to address port development. Because of this pairing of organizations around a single issue the concept of "organizational learning" can be used to help determine effectiveness. The assumption is that evidence of organizations (i.e. CZM programs and Port agencies) learning and adapting in order to improve implementation is a measure of effectiveness.

May (1992) identifies two types of organizational learning. The first is called "instrumental" learning and it occurs when an organization improves its performance in reaching already established goals through improved knowledge of relevant parameters or better understanding of how to implement policy. The second is "societal" learning and it occurs when an organization redefines its policy goals based on new understanding about the

nature of the problem or about implementation tools. This second is considered a more important type of learning. To document these forms of learning requires evidence of the redesign of management tools, increased knowledge or understanding of policy effectiveness, or change in policy objectives due to changes in the causal beliefs of key players.

Leschine (1996) suggests an expansion of this model to include the concept of "induced" learning. Induced learning is the occurrence of organizational learning of either of the two types noted above that is traceable to the activities of another organizational entity.

This approach to measuring effectiveness requires in-depth study of the behavior of two organizations in each state over time. This level of analysis was beyond our scope in this study but in some instances there is initial evidence of organizational learning. The categories where information is collected and described here could form the basis of a comprehensive study of instrumental and societal learning on a state-by-state basis. For example, CZM programs might be credited with bringing about a major strengthening of the environmental planning function within port agencies (see the Washington example in Sect. 4.6.10, below), and port agencies may be responsible for building greater awareness in CZM agencies of competition and technological change as key factors in port economic development (see the CA-BCDC example in Sect. 4.6.3, below).

By combining the statutory requirements, the contextual factors, and the desire to identify organizational learning, a number of guidelines for the study were developed.

- Seaports should be defined narrowly so that similar phenomena are compared among the states. Our definition limits seaports to major commercial deepwater ports important to international trade. Because of data limits seaports within public port districts received primary attention. (CMPs deal with all types of seaports -- large, small, and specialized. Additional study is needed using an expanded definition of "seaport". See Recommendations, below.)

- Only states assigning a high priority and with significant seaport activity should be reviewed closely to gain a national picture of management tools and examples of outcomes.

- Process factors must weigh heavily in making an initial determination of effectiveness. Outcomes for particular objectives in a multi-objective statute are context-specific and require project-level analysis.

- Process and outcome factors that suggest organizational learning by CZM and port agencies are measures of effectiveness; those creating "societal" learning among the CZM and port agencies are considered the most effective.

Information was collected from the 30 CMPs using the following headings, which provided the raw data for the study. The results are in "state profiles" on file with OCRM.

Perceived Importance to the state of its coastal seaports

Number and type of port resources
Perception of importance by CZM program

Importance to the nation of Seaports in the state's coastal zone

Port(s) location on the top 30 lists (container, tonnage and value)
Capital expenditure for port development
Number of federal navigational resource development projects in the state

Specificity of CZM program policies on Seaports

Policies on water dependent development
Policies specifically addressing seaport development
Decision criteria specifically addressing seaports

Management tools used to promote seaport use

Designating or reserving sites for port development and/or expansion
Funds for multiple, single, or specialized port planning
Regulatory program (permits or consistency) covering port development
Criteria for regulatory decisions specific to seaports

Port industry and CZM participation in each others processes

Port role in CZM process (planning or regulating)
CZM participation in port planning and development
Organizational arrangements for continuing interaction

Port development since CZM program implementation in the state's key port

Type, size, location, etc.

Examples of CZM management tools used in port development

Siting, funding, planning and/or regulatory requirements, etc.
Examples: mitigation, public access, co-location, multiple use, project design, etc.

As noted in Section 1.3 above (approach to the study) data from the profiles was used to provide a general characterization for all 30 CZM programs. Next, 12 port-active states were selected to illustrate how CZM programs specified policies and facilitated port development. Six indicators (selected from the above list and modified in part) are used to describe the approach of the 12 states. Further, examples of the application of the tools to particular port projects is provided. Detail for these steps is provided in the discussion of the research findings.

4 Research Findings

4.1 Importance of Port Issue (Table 1)

Table 1 presents three different ways to indicate the importance of the port issue to CZM at the national and state levels. (These three measures were used to select the 12 port-active state CMP's for closer analysis.)

Perceived importance by the state CZM program is the first measure of importance. With scarce resources and many large issues to address, CZM programs must choose where to put their effort. The survey asked what importance the state put on ports at the time of program approval, as well as at present, relative to the other issues the program addresses. Table 1 shows whether the state currently considers seaport issues High (H), Medium (M) or Low (L). (Only four states indicated that the ratings changed over time, three showing a reduction. For example ME reduced the rating from H to L because environmental issues were considered more important than port development at present.)

Table 1. Relative importance of seaports among the states measured by perceived importance, economic ranking, and past and proposed public port expenditure.

	Alabama	Alaska	American Samoa	California[1] CCC	California BCDC	Commonwealth of N. Mariana Islands	Connecticut	Delaware	Florida	Guam	Hawaii	Louisiana	Maine	Maryland	Massachusetes	Michigan	Mississippi	New Hampshire	New Jersey	New York	North Carolina	Oregon	Pennsylvania	Puerto Rico	Rhode Island	South Carolina	Virginia
Perceived importance to CMP[2]	M	H	H	M	H	H	H	H	L	L	H	H	L	L	H	L	H	M	H	H		L	H	H	H	H	
National Economic Significance[3]	M	L	L	H	H	L	L	H	H	L	L	H	L	H	M	L	L	L	H	H	M	L	H	H	L	M	H
Public Capital Expenditure '92-'99[4]	M	L		H	H	L		M	H	L		H	M	L	L		M	M	H	H	M	L	L	M	L	L	H

Note: A blank indicates that no information was available.

[1] California's coastal management program has two components, the California Coastal Commission (CA-CCC) and the California San Francisco Bay Conservation and Development Commission (CA-BCDC), each with separate port complexes.

[2] State significance is based on the state's response to a survey question on the importance the coastal zone management program currently places on seaports. (H) = High, (M) = Medium, (L) = Low. A blank indicates no response from the state. The results of the entire survey are summarized in the individual *State Profiles Promoting Water-Dependent Activities - Seaports*, on file with OCRM. (URL:)

[3] National economic significance was determined from the top 30 ranked ports in the U.S. coastal zone based on three categories; total TEU throughput, cargo volume (short tons), and total cargo value in dollars for foreign commerce only (AAPA, 1996).

H = indicates that a port, or a combination of ports, in the state ranked among the top 30 for all three economic categories.

M = indicates that at least one port, or a combination of ports, in the state was ranked in the top 30 for two of the three categories.

L = indicates that ports in the state existed in only one of the top 30 categories or that the state had no ports ranked in the top 30 for any category.

[4] The classification of High (H), Medium (M), or Low (L) is based on a relative ranking of the total past and proposed public capital expenditure from 1992-'99.

H= a total expenditure ranging from $2,800 to $290 million.

M = a total expenditure ranging from $110 to $26 million.

L = 0 expenditure.

Data from AAPA survey of public port officials summarized by region (MARAD, 1996).

National economic significance is the second measure of importance. Since an objective of the study is to determine effectiveness of the CZM program nationally, we explored whether a state contained a port or ports in their coastal zone which is "nationally significant". Presumably, if the states containing the nations larger ports had CZM programs with active port components and high 'importance-perception' ratings, then we could conclude that CZM was addressing a resource issue with national dimensions.

Economic significance was measured using standard "top 30" lists published by the American Association of Port Authorities (AAPA, 1996). These lists show the 30 largest ports in gross tonnage, cargo value, and container movements. Cargo value and tonnage was based on foreign commerce only. Again, H, M and L ratings were assigned to the states depending on whether they had a port or ports in all three, only two, or just one or none of the lists. There are obvious weaknesses in these measures. Large ports located outside of the coastal zone as defined by the state CMP are eliminated (Portland, OR). Large ports in domestic commerce are not included (Valdez, AK). And using only the top 30 is somewhat arbitrary. Nevertheless, these measures make a rough distinction between port-rich and port-poor states.

A third measure of importance is public capital expenditures. Information from AAPA surveys of public port agencies show the amount of money spent on capital improvements between 1992 and 1994, and what the ports expect to spend between 1995 and 1999. These figures are aggregated to give a general estimate of the level of capital expenditures by that port. A rating of H, M or L is assigned based on the clustering of the data. This is a crude measure of the amount of physical development which could require greater demands from the coastal management program. This measure also has weaknesses. Public port outlays are only part of the costs of port development. There are navigational improvement expenditures as well as private port investments. Navigational improvement costs were difficult to recover because the USACOE data is by project, not state (see Recommendations, Section 6), and there are no secondary sources for private expenditure data.

General findings from Table 1 can be stated. Twenty-one states, over two-thirds, perceived the port development issue as H or M.

Twelve states ranked H in economic measures. In only two of those states did the state rank the perceived importance of the port issue as L relative to other issues (FL and MD). In one state (VA) with a H economic rating, there was no information about the perceived importance. Thus, over 80% of the states with the most economically important ports for international trade give port development a high priority.

Interestingly, in the 10 states (AK, AS, CNMI, CT, HI, MA, MS, RI, SC, VI) that received a L or M rating for economic ranking and capital expenditures, the state perceived the port issue as H. This suggests that even if the port sector is not of national significance and port capital expenditure is low, the state can still perceive the port as an important sector for CZM purposes. Either the projects they do undertake need CZM attention regardless of scale, or perhaps the state wishes to improve the lot of its ports.

4.2 Policies of state programs regarding ports (Table 2)

The occurrence of seaport related policies within state coastal management programs is depicted in Table 2. These policies have been classified into 5 categories based on the information from survey interviews and research of CMP documentation. These categories include general polices that address water-dependency and commercial seaports. Three additional categories of policies specific to commercial seaports were also identified as

Table 2. Occurrence of seaport related policies within state coastal management programs.

	Alabama	Alaska	American Samoa	California CCC[1]	California BCDC	Commonwealth of N. Mariana Is.	Connecticut	Delaware	Florida	Guam	Hawaii	Louisiana	Maine	Maryland	Massachusetts	Michigan	Mississippi	New Hampshire	New Jersey	New York	North Carolina	Oregon	Pennsylvania	Puerto Rico	Rhode Island	South Carolina	Virginia	US Virgin Islands	Washington	Wisconsin
Water Dependency[2]	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Policies addressing commercial seaports[3]	√	√	√	√	√		√	√			√	√	√	√	√		√	√	√	n/d	√	√	√		√	√		√	√	
No-Sprawl Port Policy[4]				√	√			√				√		√	√		√		√	n/d						√			√	
Promote Economic Growth[5]								√					√	√	√		√	√		√	√		√		√					
Specialized Port Facility Policy[6]				√	√							√							√	n/d					√				√	

Note: "n/d" indicates that no data is available

[1] California's coastal management program has two components, the California Coastal Commission (California CCC) and the California San Francisco Bay Conservation and Development Commission (California BCDC). They have separate port complexes.

[2] Policies indicating a preference for water-dependent uses in shoreland locations.

[3] Deep water cargo handling ports as opposed to marina or recreational facilities.

[4] Policies prohibiting or discouraging seaport development in areas not already used for port or industrial purposes.

[5] A goal of the CZMP is to improve competitiveness and economic performance of port sector.

[6] Policies addressing the development and siting of specific-purpose marine facilities (e.g., offshore oil terminals, energy facilities, and other bulk terminals)

important measures of a CMP's interaction with seaports. These include policies that discourage port development in nonport areas (i.e., no-sprawl policy), encourage economic growth, and address specialized port facilities. These categories represent the most commonly identified policies related to seaport development and encompass all relevant policies used by CMP to manage commercial seaports.

From Table 2, it is apparent that all state CMPs have policies relating to water-dependent activities and over 2/3 of the CMPs in the nation have polices specific to commercial seaport development. Only 7 CMPs (CNMI, FL, GU, MI, PR, VA, and WI) do not have specific policies that address seaports. Roughly one third of the CMPs have adopted policies that seek to confine port expansion to areas already designated for port and industrial uses. This no-sprawl policy, however, relates to the physical expansion of ports and does not preclude that state CMP from wanting to improve the competitiveness and economic performance of the port sector. In fact, of the 10 states that have a policy to promote the economic growth of the port, 4 of those states also wish to contain the physical expansion of the port in the coastal zone. Six CMPs have developed polices to address specialized port facilities including the development and siting of offshore oil terminals, energy facilities, and other bulk terminals. In section 4.5.1, the seaport related policies are discussed more fully based on examples of policies used by the 12 port-active coastal management programs. Section 4.6 details examples of outcomes from the implementation of these policies.

4.3 Planning tools used to address port development (Table 3)

Table 3 depicts the occurrence of coordination and planning tools affecting seaports within state coastal management programs. We have classified the forms of coordination into two categories: formal and informal. Formalized coordination occurs in the presence of common organizational affiliations or agreements (i.e., planning requirements, MOU/MOA) between the port entity and state CMP that are used to discuss planning and port development. These forms of formal interaction have been established by 19 of the state CMP nationwide. The states without some form of formalized coordination are states with little interaction or involvement in port development and planning.

Informal coordination is defined as general consultation between the state CMP and port authority. Examples include informal discussions that allow for advanced review of project proposals and information requests from project proponents that can be used to guide project development. From the data available in Table 3, it can be seen that with the exception of FL and PR, who have virtually no interaction with port development interests, all state CMPs utilize this method of coordination.

Thus, formal and informal coordination between CMPs and port agencies is considerable. This coordination could result in changed behavior, some of which may show organizational learning. Some examples are shown in Section 4.6.

Additional coordination/planning tools in use by state CMPs include awarding of grants and technical assistance. Grants are primarily awarded on a competitive basis and have local match requirements. Grants from state CMPs to local governments for a port-related study, or to a port authority, have been issued in 17 different programs. State CMPs, such as MI's, that have little interaction with port development, or are not considered to have ports with a high level of national economic significance, have used grants as an effective method for providing planning opportunities for local communities for port purposes. Technical assistance includes "in-kind" services such as providing consultants in engineering and planning or providing training services. Eighteen of the state CMPs provide some form of technical assistance to the port.

Table 3. The occurrence of coordination and planning tools affecting seaports within state coastal management programs.

	Alabama	Alaska	American Samoa	California CCC[1]	California BCDC	Commonwealth of N. Mariana Is.	Connecticut	Delaware	Florida	Guam	Hawaii	Louisiana	Maine	Maryland	Massachusettes	Michigan	Mississippi	New Hampshire	New Jersey	New York	North Carolina	Oregon	Pennsylvania	Puerto Rico	Rhode Island	South Carolina	Virginia	US Virgin Islans	Washington	Wisconsin
Formalized coordination[2]			√	√	√	√	√			√		√	√		√		√		√	√	√	√	√		√	√	n/d		√	√
Informal Consultation[3]	n/d	√	√	√	√	√	√	√		√	√	√	√	√	√	√	√	√	√	√	√	√	√		√	√	n/d	√	√	√
CMP grants for port projects[4]	√		√						√	√	√		√	√	√	√	√	√	√			√	√		√		n/d		√	√
Technical Assistance[5]	√		√		√	√	√				√		√	√	√	√	√	√	√		√	√			√		n/d	√		√
Port Planning[6]				√	√	√				√	√						√				√	√			√		n/d		√	
Port Specific Zoning and/or Special Area Designation[7]	√	√	√	√	√	√		√			√				√		√					√	√		√	√			√	

Note: "n/d" indicates that no data is available

[1] California's coastal management program has two components, the California Coastal Commission (CA-CCC) and the California San Francisco Bay Conservation and Development Commission (CA-BCDC), each with separate port complexes.

[2] Existence of an organizational linkage between port authority and state CZMP through MOUs, mutual planning requirement, or other arrangement.

[3] Includes advanced review of project proposals, informal discussion about proposed projects, and/or coordination of review process.

[4] Competitive grants with local match requirements.

[5] Services or assistance in engineering, planning and/or training.

[6] State CMP requires port planning by port agency or local governments.

[7] When the CZMP identifies and delineates specific areas for port development and/or creates Special Area Management Plans (SAMP) or Geographic Areas of Particular Concern (GAPC) for port regions.

The most significant planning tools affecting seaport development are the requirement to develop port plans, and/or the delineation of geographic areas specific for port development. Presently, 10 state CMPs require either the port authority or local governments to develop plans for port development and 15 of the state CMPs have delineated specific areas for port development, or developed special area designations for port areas such as SAMP or GAPC. Six CMPs require both port planning and have specifically designated areas as port zones to guide planning efforts. Section 4.5.2 discusses the coordination and planning tools more fully based on examples from the 12 port-active coastal management programs, and section 4.6 details examples of outcomes from the implementation of these efforts.

4.4 Regulatory tools used to address port issues (Table 4)

Table 4 depicts the occurrence of regulatory tools used by state coastal management programs to manage port development. The table highlights whether a state CMP issues coastal permits, provides federal and/or state consistency review, has a modified permitting process that expedites port development, and if the state CMP has identified specific criteria for evaluating seaport development. The basis for selecting these four categories was that these tools (i.e., permitting requirements) were commonly identified by the states as being the most important regulatory mechanisms for influencing port development.

Over half of the state CMPs issue a coastal permit for any activity within the coastal zone, and all of the CMPs utilize their federal consistency review powers. Across the nation, 8 CMPs have developed a permit process that expedites port development and 12 have developed permitting criteria specific to seaports. In section 4.5.3 the use of regulatory tools is discussed more fully based on examples from the 12 port-active coastal management programs, and section 4.5.7 details examples of outcomes from the use of these tools.

4.5 Seaport policy and tools in 12 Port-active CMPs (App. A)

Table 1 was used to choose 12 port-active CZM programs. The purpose of choosing a sub-set of all the CZM programs was to more closely describe the activities of the states in addressing port development problems. Only states that perceived the port issue as H were initially selected. It was felt that a fair representation of CZM efforts should only reflect state programs that had assigned ports a priority. Second, in order to capture CZM efforts affecting the more economically significant ports and those where development activity was being undertaken, states with a H on perceived importance were dropped if they did not rate as H or M in at least one of the other categories. This adds a factor of "port-significance" to the selection. States also were dropped if there was insufficient information. Thus, AK, CT, HI, and VI ranked H on port perception but were L in both additional categories. For VA, HI, NY, NC, RI there was insufficient information. Three special cases should be noted. CA-CCC ranked perceived importance as M, but because of the scale of port activity in southern CA and the unique approach of the CA-CCC to port issues, the program was included in the 12. PR gave a H on perceived importance and is H on economic measures, but the program acknowledged long-standing communication difficulties with the port agency and for this reason we felt they should be excluded. AS and CNMI are small island economies that perceived ports H but not surprisingly were L in both other categories. They were included because of the central importance of the port to the island, where relative economic size of ports compared to other US states seemed irrelevant.

Table 4. The occurrence of regulatory tools used by state coastal management programs to manage port development.

	Alabama	Alaska	American Samoa	California CCC[1]	California BCDC	Commonwealth of N. Mariana Is.	Connecticut	Delaware	Florida	Guam	Hawaii	Louisiana	Maine	Maryland	Massachusetts	Michigan	Mississippi	New Hampshire	New Jersey	New York	North Carolina	Oregon	Pennsylvania	Puerto Rico	Rhode Island	South Carolina	Virginia	US Virgin Islands	Washington	Wisconsin
Coastal permits[2]	√		√	√	√	√						√					√	√	√	√	√	√			√	√		√	√	
Consistency[3]	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√		√	√	√	√	√	√	√	√	√	√		√	√	
Expedited or modified permitting for ports				√	√			√			√	√			√		√			√										
Criteria specific to seaports[4]			√	√	√		√				√	√			√		√		√			√				√				

[1] California's coastal management program has two components, the California Coastal Commission (California CCC) and the California San Francisco Bay Conservation and Development Commission (California BCDC). They have separate port complexes.

[2] Permits issued directly by coastal management program or local government pursuant to coastal statutes.

[3] Federal consistency under the federal Coastal Zone Management Act and state consistency when applicable.

[4] Regulatory criteria specifically developed to guide seaport development.

The 12 port-active CZM programs are: AS, CA-CCC, CA-BCDC, CNMI, DE, LA, MA, MS, NJ, PA, SC, WA. A brief summary of their policies, processes and tools, drawn from the profiles, is in App. A.

The 12 state CMPs were selected to describe the policies and tools of CMPs more closely and to show examples of the application of the tools for specific port development activities. The categories of policies and tools are shown in two groups labeled "specifying port policies" and "facilitating port development", respectively. The first group brought together information from the profiles that identified future intentions of the CMP with respect to ports: general policies, geographic area designations, and planning and regulatory criteria. The second group identified practices and/or behavior of the CMP designed to directly influence port development projects: ongoing coordination, permit processes, and funding or technical assistance. These are each discussed in the following sections. Section 4.6 provides examples of the use of the tools in specific port projects in ten of the 12 states (where data was available).

Specifying Port Policies

4.5.1 General policies addressing seaports

General CMP policies are policies that could directly or indirectly effect port development. These would include polices specific to seaport development, as well as policies that address industrial development, zoning, or water-dependent/water related uses. In most cases these policies address the physical and economic expansion of ports and how the goals of port development fit with the other objectives of the CMP. Although the policies among the 12 CMPs vary, there are also some similarities in the policies.

All of the 12 port-active states have water-dependent policies for coastal zone development. These statements of water-dependency are primarily general policy statements that require coastal development to be water-dependent. More specific statements on water-dependency, such as in SC, allow for water-related or non-water dependent uses that do not reduce the flexibility of the port to develop water-dependent uses.

Of the 12 CMPs, all but CNMI have policies that specifically address commercial seaports. Pennsylvania's commitment to promoting the revitalization of deteriorating ports is an example of a long-range view of port development as is New Jersey's goal of avoiding construction of port facilities which could soon become obsolete. CA-CCC specifically places priority for port uses on the existing land base in established harbors.

In 9 of the 12 CMPs a "no-sprawl" policy exists that specifically encourages port development in areas historically designated as port or industrial areas. Three CMPs, AS, CNMI, and PA, do not have a stated policy restricting port development in nonport areas. New Jersey has actually begun to reduce the areas dedicated strictly for port development after determining that some port facilities, such as breakbulk operations, are no longer needed.

Presently, NJ, PA, DE, MS, MA, CA-BCDC have goals to promote the economic competitiveness of the port sector. MS, for example, is dedicated to protecting coastal areas for water dependent industrial development and PA is clearly interested in promoting the revitalization and competitiveness of the Delaware River ports. Similarly, CA-BCDC wishes to increase the competitiveness of the region's ports. Though the other states do not specifically address economic growth, Louisiana's "hands off" approach through an expedited process for review of deep water port projects implies a commitment to promoting economic competitiveness.

MA is the most aggressive in promoting port development through the new Seaport Action Plan and Bond Issue, and in the encouragement of plans for Designated Port Areas.

4.5.2 Delineating geographic areas for port development

All of the port-active states except New Jersey delineate or specify areas for port development in some manner. Eight of the states have some form of special area designation such as a SAMP, GAPC, SMA, or as in Massachusetts, Designated Port Area (DPA).

Other methods besides special area designations are used. The CA-CCC recognized the four existing commercial port districts and encouraged development within these areas. CA-BCDC designates port priority use areas for the six ports in the region. Washington State CMP does not delineate port areas, but requires local authorities to designate shoreline use areas for port purposes (urban, maritime, etc.) in the development of their Master Programs.

Louisiana is unique in that it does not directly participate in zoning or site designation but has categorized the coastal ports into three types: shallow draft ports, deep draft ports, and offshore oil ports. Louisiana has also designated the Louisiana Offshore Oil Port (LOOP) as a Special Management Area. Activities within LOOP's jurisdiction are managed by a separate entity established for that purpose rather than the state's CMP.

Half of the 12 CMPs have some form of specific zoning for ports. This would include Washington's requirement that local coastal programs designate port and industrial use areas in local shoreline master programs and MA definition of boundaries for their 12 DPA. Both MS and SC addressed site designation for ports at the inception of their coastal management programs. These states (in conjunction with local port authorities) identified all sites suitable for water-dependent development and designated areas suitable for port development.

An important method of delineating geographic areas for port development is reserving areas for port development. Currently, MA, CA-BCDC, and SC have areas reserved long-term for port development. Often an interim use policy exists to allow temporary use that can be displaced once port use is needed.

Some state CMPs contain mechanisms for reviewing and reevaluating the designation of sites for ports. NJ, MA, CA-BCDC periodically review their current delineation of port areas. For example, CA-BCDC reviewed port priority use areas in 1996 and substantially reduced the total acreage in that classification.

4.5.3 Planning and regulatory criteria specific to ports

Within the 12 CMPs there are six approaches to specifying criteria guiding port development. The first is through a regional seaport plan applicable to many ports and terminals within one geographic area. The example is CA-BCDC. For all six ports in the San Francisco Bay, criteria for terminal expansion, size, alignment and fill are guided by a single regional seaport plan. Two other programs consider regional issues but in a less direct way: MA attempts to balance port development statewide in allocating capital funds, and PA has promoted the three ports in the Delaware Valley through planning grants.

Second, port master planning is a strategy in two programs -- CA-CCC and MA. In CA-CCC the port master plan must specify land and water uses, projected design of land and water areas, impacts expected and mitigation plans. Each master plan amendment goes

through an extensive review process. MA is similar but master planning is not mandatory as it is in CA-CCC.

Third, WA state is an example of specifying port development in local coastal programs, where mandatory local shoreline master programs can identify priority port uses in zoned areas in local jurisdictions. Typically these zones list the preferred and excluded uses, special environmental considerations, special design factors, and others.

Fourth, a few states have promoted economic growth, development and revitalization of ports through special port promotion strategies, typically grants to ports or local governments for economic planning. PA encourages long-range comprehensive planning for attracting, enhancing and developing water dependent activities and has given more individual grants for port planning than any other state observed. MA has developed a model planning process for port development and MS has spent considerable sums on port and industrial park planning to promote their economy.

Fifth, six CMPs (CA-BCDC, CA-CCC, DE, MA, MS, LA) have indirectly encouraged port development through regulatory incentives such as reducing the burden of regulation. Savings in time and review requirements can be critical in the highly competitive port development business. CA-CCC allows ports to issue development permits within their district once the master plan is certified. DE prohibits new bulk transfer facilities in the coastal zone but excludes the Port of Delaware from the prohibition, creating an opportunity for greater development in the existing port. LA excludes the Port of New Orleans and other deep draft ports from the coastal permit process; however, port projects are reviewed by the LA coastal program through the federal consistency process using the same criteria as the coastal permit process but with fewer procedural requirements.

Finally, four CMPs do not fit in any of the above categories (AS, CNMI, NJ, SC). Each lists port specific environmental impact criteria that are used in reviewing port projects. In the two small Island economies, AS and CNMI, special environmental criteria are used to review port projects in the main harbor of each. In NJ and SC special criteria emphasize preferences for using existing lands for port expansion, proximity to existing navigation channels, non-disturbance of wetlands, and minimizing dredge and fill requirements.

Facilitating Port Development

4.5.4 Collaboration between CMPs and port entities

An additional measure of the attention CZM gives to the port sector is the ways in which there is ongoing collaboration, if any, between CZM and ports. Because the port sector is often represented by a port authority or transportation agency, the inter-relationship can be easier since one entity represents a set of players. Four different types of collaboration have been observed.

Two states have established state-wide or regional organizations that give regular attention to port development and CZM issues. In CA -BCDC the Seaport Planning Advisory Committee (SPAC) is a standing organization established by BCDC and the regional Metropolitan Transportation Commission to generate, oversee and periodically recommend revisions to the Seaport Plan. All the ports and many public agencies and interest groups are represented. The SPAC meets regularly and, after a 1996 amendment, now can approve change of use of specific terminals under specified conditions. In MA, the MCZM is a key participant in the Governor's Seaport Advisory Council. That entity oversees statewide port development through a Seaport Action Plan that addresses port planning, dredging and DMD planning, and allocation of a $280 million Seaport Bond issue.

Two other states have established memoranda of agreement or understanding (MOA/MOU) that specify the working relationship between ports and the CZM program. In SC the state port agency and the CZM office have a MOA for coordinating port development issues. In Louisiana the Port of New Orleans and the CZM office have a MOU specifying mutual responsibilities for consistency reviews: The Port reviews projects of third parties on port property and reports back to the CZM office; CZM informs the Port of project proposals within the port district.

In six states (MA, CA-CCC, CA-BCDC, MS, WA, PA) collaboration between CZM and ports occurs through a planning process. For example, in CA-CCC the ports were required to develop a port master plan that met the policies of the state Coastal Act. The initial approval of the Master Plan, and each of the many subsequent amendments, required considerable collaboration between the ports and the state CZM office. A different planning process occurred in MS. The state CZM office worked with the port authorities and local communities to design Area Development, Dredging and Mitigation Plans to facilitate port and industrial park development in three large tracts where economic development was needed.

All of the port-active states collaborate with the ports during project review. Much of this is characterized as informal, issue-specific interaction to insure that regulatory requirements are being met. For example, in WA port projects require substantial development permits and extensive interaction occurs between local governments, the project proponent, and state and federal agencies over details of project design and management. A more elaborate project review process is followed in CNMI where a detailed Environmental Protection Plan specifying mitigation details must be prepared before a project can begin.

DE, LA, SC coastal management programs each facilitate monthly meetings that address coastal zone permitting issues. These meetings are intended to address issues and permitting processes that potentially impact port development.

4.5.5 CMP technical assistance for port planning and development

Technical assistance from CMPs on behalf of ports can take a variety of forms. In the 12 states reviewed there were five types of assistance. PA was the one state that gave out grants to port agencies to plan for economic enhancement and/or revitalization of port business per se. This form of assistance can be distinguished from grants that assist in the physical planning needs of ports (MA, MS). Although the physical planning can help port development, it often involves environmental constraints and strives to accommodate a variety of objectives.

Three states reported providing technical assistance by CZM staff in overseeing master planning by the port sector (CA-CCC, CA-BCDC, AS). The most notable example is CA-BCDC which consumed 3.0 person years (between 1994 and 1996) for the development of the 1996 version of the Seaport Plan. CA-CCC has a full-time staff person committed to port plan amendments as well as review of appealable permits from the port district.

The fourth approach to technical assistance relates to environmental and engineering support for port plans and projects (MS, CNMI, NJ). CNMI reports engineering training as a service in connection with harbor improvement projects. MS and NJ have spent funds to assist in technical aspects of dredging and DMD, such as developing sampling methods and identifying disposal sites. (It is presumed that virtually every CMP plays some type of role in dredging and DMD because of the statutory federal consistency review responsibility. This topic is worthy of a special inquiry. See Recommendations, Section 6)

Finally, in many states the potential impacts from new energy facility development (oil monobuoys, coal export, LNG/LPG terminals, and offshore oil development projects), consumed considerable time of the CMP especially in the early years of program implementation. These proposed projects included port and marine transportation features. Many coastal programs spent funds to study the impact of these projects, and to determine sites where they might be accommodated (NJ, WA). (An historical review of CZM's role in energy-related port development would probably show that the programs played a lead role in reviewing siting and environmental impact factors in the 1970s and 1980s. See Recommendations, Section 6)

4.5.6 Applying permit processes to port projects

All of the 12 coastal programs have some form of permitting requirements, whether it be coastal permits, or permit programs within other state environmental/land-use programs in their network. Nine (AS, CA-BCDC, CA-CCC, CNMI, LA, MS, NJ, SC, and WA) have specific coastal permitting programs.

All state CMPs review permit applications based on whether the requested project is consistent with the goals and policies of state coastal management program. Eight of the 12 states (AS, CA-CCC, CA-BCDC, LA, MA, MS, NJ, SC) have permitting criteria that are specific to seaport development. Examples are: BCDC's requirement that proposed marine terminal development be closely linked to projected regional need for new facilities based upon projected cargo volumes; LA's criteria that dredge spoil should be used beneficially to improve productivity or create new habitat and that existing spoil disposal areas should be used to their fullest extent before creating new disposal areas; NJ's requirement that a dredge material disposal plan be developed prior to permitting activities which require dredging; CNMI which requires a detailed environmental protection plan that outlines mitigation procedures before permitting a project; and MA, MS, SC whose master plans or SAMPs guide permit decisions.

Six CMPs (CA-CCC, CA-BCDC, DE, LA, MA, and MS) use some form of expedited or modified permitting system for port development. Modified permit systems that promote port development include exemptions from coastal permits. For example, LA exempts deep draft ports from requiring coastal permits but does issue a consistency review for new construction within the port. MS uses general permits for some port areas. State CMPs have also facilitated the permit process by eliminating duplicative permitting processes. For instance, the DE CMP processes ACOE permits along with the relevant state permits. Finally, the CA-CCC has authorized the port to issue permits within port areas after approving Port Master Plans.

All the states have consistency review powers over federal projects. Some state CMPs also have a consistency review process for state issued permits, such as PA and SC.

4.6 Examples of outcomes from the application of port policies and tools

4.6.1 Commonwealth of the Northern Marianas Islands
Tool used: Mitigation planning assistance

The Commonwealth of the Northern Marianas Islands (CNMI) required an Environmental Protection Plan (EPP) prior to permit approval for the Saipan Seaport expansion project. The project, scheduled for completion in early 1997, consists of dredging approximately 30,000 cubic yard of sand, gravel, and coralline limestone between Rota and Anjota Island, the

relocation and repair of existing boat slips on Anjota Island, and the construction of a new groin north of the relocated boat slips. The EPP serves as the primary tool for regulating and providing oversight to port development and allows the Coastal Resources Management Office (CRMO) to assist in designing mitigation requirements.

The permit is conditioned on the premise that the EPP will be completed before work begins, and the EPP details the standards that must be achieved. The EPP must describe what will be done to meet the environmental standards. The plan specifically addresses issues applicable to the project under consideration. Ultimately, the EPP is meant to achieve project completion while protecting the water quality, marine habitats and historic resources in the project area. The plan benefits authorities by informing them of how the environmental and historic requirements will be met. The plan also benefits the contractors by predetermining how these requirements can most feasibly be reached with the minimum amount of on-site decision making. The plans can also be used for training the contractor's employees and assigning individuals with responsibility for implementing various sections of the plan.

4.6.2 California - CCC

Tool: Master Planning and project review.

The four ports under the jurisdiction of the California Coastal Commission (CCC) are required to develop individual port master plans which are then to be incorporated by local jurisdictions into their local coastal programs (LCP). Once a port plan is certified, the port governing body has the authority to issue permits for development. At the Port of Los Angeles a Port Master Plan was certified in 1980. Between 1980 and 1995, fourteen plan amendments were reviewed by CCC. This periodic review and consistent participation in port planning by the CCC allows the CCC to evaluate proposed projects and changes against the policies relating to: (1) the protection of wildlife, habitat, and human health; (2) the protection against the petroleum spills; (3) the encouragement of multi-company use of tanker facilities; (4) the maintenance of the existing space available for commercial fishing; (5) proper dredging, diking, and filling of coastal areas; (6) the proper siting of facilities to minimize substantial adverse environmental impacts and traffic conflicts between vessels, and (7) the encouragement of rail service to port areas.

The CCC's involvement in the Pier 300/400 project resulted in an agreement by the POLA to allow phased review by the CCC of the 582 acre landfill and to provide that mitigation for landfill would be limited to the restoration of coastal subtidal water and wetlands (not the construction of artificial reefs or other as-yet unproven mitigation alternatives). Also, the POLA agreed not to request CCC's approval of landfill phases until adequate mitigation for marine habitat and resource losses arising from the landfill was available.

4.6.3 California - BCDC

Tool: Regional Planning and collaboration

A Seaport Planning Advisory Committee, with members jointly appointed by the CA-BCDC and the Metropolitan Transportation Commission, was established to develop and update the San Francisco Bay Area Seaport Plan. The Committee and Plan have resulted in the only example of regional review of port development in the US. The plan designates port priority areas and requires that proposed marine terminal development be justified in reference to regional needs. Likewise, for requests for removal of sites from port use, including designated future terminal sites, the applicant must demonstrate that deletion will not detract from the regional capability to meet the projected growth in cargo.

The Seaport Plan has been recently revised to reduce fill in the Bay allowed for future port development while meeting cargo forecast for 2020. It also reduced land area reserved for

port development, based on a revised capability forecast. The revisions released the majority of land at closing military bases from port designation, allowing local reuse planning to proceed.

California-BCDC collaborative planning efforts have also led to a joint effort with the Port of San Francisco to examine existing BCDC plans and policies regulating development along the San Francisco waterfront, which will result in a Waterfront Land Use Plan that is consistent with the McAteer-Petris Act. Similarly, the Long Term Management Strategy (LTMS) for dredging and dredged material disposal is a coordinated state / federal approach to managing disposal of millions of cubic yards of material that must be dredged from the Bay's channels and ports. The Commission participates in the management of the overall LTMS effort, and is the lead agency on the upland disposal studies.

4.6.4 Louisiana

Tool used: Facilitated permitting process; beneficial use of dredged spoils

Louisiana's facilitated permit process exempts deep draft ports from obtaining Coastal Use Permits (CUP). Deep draft ports must submit an application for a Consistency Determination and this is evaluated under the same standards and requirements of a CUP. The differences between the two applications are minor, but the allowed exemption does facilitate port development because the consistency process is more streamlined. The Louisiana CMP has undertaken approximately 67 consistency reviews for the Port of New Orleans since 1982. All the projects were eventually found to be consistent.

Louisiana requires that dredged spoils should be used beneficially to improve productivity or create new habitat, and that existing spoil disposal areas should be used to their fullest before creating new ones. For example, the Port of Iberia was required to build wetland containment cells as part of their beneficial use project.

4.6.5 Massachusetts

Tool: Designating areas for port development; technical assistance for master planning

Massachusetts CZM has the responsibility for designating sites for port development and established twelve Designated Port Areas (DPA) in 1978. MCZM assists in planning and provides technical assistance for the DPAs. Two examples are provided:

New Bedford: scope of work for port plan (and model scope for other ports) developed with CZM grant of $26K, matched 1:1. $375K expected from Seaport Bond for plan development/management. $475K funding from Coastal Facilities Improvement Program for pier and terminal improvements. $28.7KK earmarked under Seaport Bond for variety of port improvement projects.

Fore River Staging Area: Development Plan completed - implementation underway for a revived shipbuilding industry, maritime technology center, and U.S. Navy Shipbuilding Museum

Leadership from MCZM resulted in a Seaport Action Plan and passage of a $280 million Seaport Bond to fund capital investment. It also led to the creation of a state Seaport Advisory Council to provide for ongoing coordinated decision making on port issues by representatives from a variety of stakeholder groups. The Seaport Bond and interaction of the Seaport Advisory Council has been effective in creating a DPA Dredging Planning Program that integrates dredging planning with port planning and resolves the statewide problems of dredge spoils management.

4.6.6 Mississippi

Tool used: Special Area Management Plan (SAMP)

Mississippi developed a Special Area Management Plan (SAMP) for the Port of Pascagoula to address the conflicting resource development and protection issues of the Port and its surrounding area. The Plan identified both areas that were appropriate for water-use development and areas that needed to be protected and left in their natural state. The CZM sponsored, multi-agency SAMP allowed for the Port of Pascagoula to prepare a port development plan that met the CMP goals and expedited permit approval time for the Navy Homeport project at Singing River Island.

Mississippi has also provided $1,000,000 in direct funding for planning at Port of Bienville.

4.6.7 New Jersey

Tools used: Permitting criteria, technical assistance, and land-use planning studies.

The New Jersey CMP provides technical assistance to ports on dredging issues and requests for dredging must be accompanied by a disposal plan that designates where disposal will take place. Also, dredged sediment must be tested to determine the contaminants present and to help identify the best disposal sites.

Development interests in the mid 1980s were seeking to convert traditional port areas (i.e. railroad marshaling yards) along the Hudson River to non-water dependent uses. The NJ CMP commissioned a special study that evaluated the need for breakbulk uses along the Hudson River. The study concluded that changing transportation technologies meant that these breakbulk areas at the terminus of old railroads were no longer needed. The NJ CMP relaxed its policy of not allowing port uses to be eliminated for non-water dependent uses by allowing these areas along the Hudson River to be converted to commercial and recreational uses.

4.6.8 Pennsylvania

Tools used: Direct funding for port development studies.

Between 1980-1995 $434,833.00 of federal funds have been spent on 11 planning projects for the Port of Philadelphia. The federal funds leveraged an additional $286,822. These studies include market analyses, port development plans, and evaluation of infrastructure and transportation upgrades.

4.6.9 South Carolina

Tools used: Ongoing collaboration and applying permit criteria

A Memorandum of Agreement exists between the Bureau of Ocean and Coastal Resource Management (OCRM) and the South Carolina Port Authority (SCPA) to coordinate efforts and to plan and cooperate in implementing coastal zone development. OCRM assists in single port planning primarily through meetings and establishing communications, working relationships, and plans.

In the development of Wando Terminal, the SCPA initially had planned on developing 18 acres of tidal marsh. Through mitigation, and after following the sequencing process required by OCRM, the port authority redesigned the project so that only 14 acres of tidal wetland would be impacted. OCRM wanted the lost acreage to be mitigated at a 2-1 ratio, but accepted

a 1-1 ratio along with an agreement form the SCPA to undertake a study to evaluate sites for wetlands mitigation banking.

4.6.10 Washington

Tool used: Port Development in Local Coastal Programs

In 1994 a special "S-10 Port Industrial Shoreline District" was negotiated as part of the revision to the shoreline master program for the city of Tacoma. This followed after extensive collaboration between local shoreline administrators and port personnel. The port's early input into the planning process generated a plan that met port development needs and met the city's development and environmental regulations. The plan met very little resistance when reviewed for approval by Washington State officials. The consistent and open collaboration has also altered the way the port plans and designs projects. All port development is done in recognition of the regulations and requirements of the shoreline master program.

5 Findings, Conclusions and Recommendations

5.1 Summary of Major Findings for all 30 programs

Twenty-one states, over two-thirds, perceived the port development issue as H or M. This group included 9 of the 11 states with the most economically important ports for international trade purposes. It also included 10 states that received a L or M rating for economic ranking and capital expenditures. Thus, most states perceive the port issue as H regardless of the size or development activity of the port sector.

All state CMPs have policies promoting water-dependent activities and over 2/3 of the CMPs have polices specific to commercial seaport development. One third of the CMP have specific "no sprawl" policies that seek to confine port development to areas already designated for port and industrial uses (but other program policies might have the same effect through stringent standards on proposals for ports in non-port areas).

All state CMPs informally coordinate with ports over project review, with only two exceptions. Formal interaction with ports through planning, grants, MOUs, or SAMPs has been established by 19 of the state CMPs.

Grants from state CMP to local governments or port authorities have been issued in 17 different programs for port and/or other related purposes.

Fifteen of the state CMPs have delineated specific areas for port development, or developed special area designations for port areas such as SAMP or GAPC. Ten state CMP require either the port authority or local governments to develop plans for port development. Thus less than half the states have actively identified where and what kind of port development should take place.

All of the CMPs utilize their federal consistency review powers in conjunction with port projects. Over half of the state CMPs issue a coastal permit for any activity within the coastal zone, including port development. However, only 12 have developed permitting criteria specific to seaports. Eight CMPs have developed a permit process that expedites port development. Thus, all programs regulate port development but only a third pay special attention to ports within those regulatory programs.

5.2 Summary of Major Findings for the 12 Port-active CMPs.

Specifying port policies

General Policies addressing Seaports. Eleven of the 12 have policies specific to commercial seaports, and 9 have "no-sprawl" policies. Half of the CMPs have policies to promote the economic competitiveness of their ports often in conjunction with other port policies.

Delineating geographic areas for port development. Eleven of the 12 identify port areas but use different techniques -- GAPC, SAMP, SMA, DPA, Port Priority Use areas, etc. Some states have elaborated this to include specific zoning for ports, areas reserved long-term for ports (with interim use guidelines), and periodic review to "de-designate" when port use is no longer needed.

Planning and Regulatory Criteria Specific to Ports. The 12 programs are using six techniques to guide port development: regional seaport plan, port master planning, specifying port development in local coastal programs, port promotion strategies, regulatory incentives, and port-specific environmental criteria. Often these are found in combination in CMP programs.

Facilitating port development

Collaboration between CMP and port entities. All states collaborate with ports over specific projects. This is done through regularly scheduled meetings in 3 cases. In 4 CMPs there is either an organization set up for port-CZM interaction or a MOU specifying the relationship and roles of each. Collaboration in 6 CMPs comes about through the planning process, such as Master plans or SAMPs.

CMP technical assistance for port planning and development. Ten of the 12 states report technical assistance in four different ways. Three states give out grants for economic enhancement or physical planning. Three CMPs provide staff technical assistance in the development of port plans. Three provide engineering and environmental support especially in dredging issues. Finally, at least three states studied new energy-related port proposals and associated environmental siting issues in the early years of the CMP.

Applying permit processes to port projects. All 12 programs are involved in the permitting of port projects and 9 of the programs have their own coastal permits. Eight states have permit criteria specific for ports. Six of the state CMPs have an expedited process for ports such as permit exemptions, general permits, or delegation of permit functions to the port agency.

5.3 Summary of Outcomes and their contribution to organizational learning

The ten examples of program outcomes listed above begin to identify how CMPs and port agencies, as organizations, learn as a result of their interaction. Organizational learning results when changes occur in agency policy and performance that improves the way in which port development goals are defined and achieved in CMPs. Learning can occur in two ways. Learning can be "instrumental" such as when management tools are redesigned to improve how existing objectives can be achieved and there is evidence that key members of the organization have gained increased knowledge/understanding of policy effectiveness. Learning can be "societal" such as when policy objectives are redesigned based on new understanding about the nature of the problem or about implementation tools, and there is

evidence of change in the causal beliefs of key groups in the policy subsystem. (May, 1992) Further, learning can be induced through the interaction of the CMP and the port agency (Leschine, 1996).

Not all policy change constitutes evidence of learning. Policy change could be symbolic "designed to appease previously disaffected groups, rather than a result of improved understanding of a policy problem or needs" (May, 1992). Thus, evidence of learning requires demonstrating that key individuals increased their knowledge or understanding of the problem and its solutions.

Because the objectives in the CZMA regarding port development are process oriented, and mixed with many other objectives such as environmental protection and public access, an organizational learning approach to measuring the quality of performance is reasonable. What is the "right" amount, type and location of port development will always be driven by the context. Factors such as economic needs, environmental sensitivity, and political/cultural dimensions will be determinative. But if the conclusion can be reached that the CMP and port organizations sought better ways to reach a accommodate among the objectives, and this can be demonstrated by showing that key individuals or subgroups learned as a result of their interaction and changed their methods or objectives based on that learning, then we assume that the CMP is being effective in meeting the goals of the CZMA. Additionally it is building capacity for more knowledgeable, and better informed interaction in the future. This approach assumes that finding the best "accommodation" is the ultimate objective of the CZMA.

The discussion that follows is very preliminary and should be viewed only as an illustration of how an organizational learning analysis would proceed. More data is needed on agency behavior and outcomes over time for each state before definitive conclusions can be reached.

CA-BCDC is the clearest example of "societal" learning by both the CMP and the ports. Port growth based on regional trade needs determined by a third party rather than the port, is a major, perhaps revolutionary, change from prior practice. Prior to the introduction of the Seaport Plan in 1978 port agencies made their own determination of need, site, scale and design. CA-BCDC also has been central in "instrumental learning" through participation in the design of a Long Term Dredging plan, in reserving waterfront lands for long-term port development, and in revising port designations to reduce the amount of land for port priority use when justified by regional needs. Much of this work has been accomplished through the Seaport Plan and the Seaport Planning Advisory Committee, a forum set up for direct interaction between ports, the regulators, and the CZM agency. The guidelines in the Seaport Plan are developed after new information is generated about projected cargo flows, port and ship technologies, and dredging and disposal impacts and mitigation.

CA-CCC, MA, MS and WA mandate or encourage special area plans for port development. Different tools are used (master plans, SAMP, environmental designations) but in each case the interaction between the CZM and port interests is direct and ongoing and the goals are multiple - defining port development and environmental goals in particular areas. Examples from the four states (Los Angeles, New Bedford, Pascagoula, Tacoma) suggest that organizational learning has occurred but this is based on limited interviews or survey responses. For example the Port and city of Tacoma renegotiated the Port Industrial District designation in Tacoma's shoreline master program in 1994, which received rapid state approval. The Port of Los Angeles Master Plan has gone through 14 amendments between 1980 and 1995; with each amendment there is a fresh opportunity to review port development needs compared to broader coastal management goals. Organizational learning occurs to the extent these reviews are based on improved knowledge/understanding of policy effectiveness by the parties involved.

CNMI and SC are CMPs which emphasize the environmental review of proposed port projects. SC's experience in reviewing Wando Terminal expansion illustrates probable organizational learning on the part of the port agency. The negotiation to review environmental impacts resulted in the port agreeing to redesign the project to reduce wetland loss and to evaluate sites for wetland mitigation banking. Should the port become a wetlands mitigation "banker" this would be evidence of "societal" learning -- a restatement of policy goals based on a new understanding of the nature of the problem and implementation tools.

NJ's experience in redesignating traditional port areas along the Hudson River waterfront for non-water dependent uses suggests "societal" learning. A study they conducted showed that the areas previously used for breakbulk cargo would no longer be needed because of shifts to containerized shipping. NJ changed their policies so that the areas could now be used for commercial and recreational purposes.

LA's exemption of deep draft ports from the coastal permit process may reduce the amount of "induced" learning that occurs between the Port of New Orleans and the state's CMP. But the consistency review process substitutes in part, and offers opportunities for organizational learning in connection with particular project reviews. LA's tight requirements on dredge spoil disposal (fill existing disposal sites first and provide beneficial uses of dredged material) is clear evidence of "societal" learning since it changes previous practice dramatically.

PA has provided 11 planning grants to assist ports along the Delaware River (primarily the Port of Philadelphia) improve economic competitiveness. These funds have been used for market analyses, development plans and evaluation of infrastructure and transportation upgrades. Instrumental and induced learning will have occurred in PA if, for example, it is demonstrated that knowledge from previous studies (or other sources) is used to determine the scope and objectives of new funding projects.

It is evident from the above that there are examples of organizational learning occurring in selected states. In some cases the learning is "societal" in that new policy objectives have been stated based on improved knowledge. Examples include regional planning for ports, conversion of port areas to non-water dependent uses where appropriate, and beneficial use of dredged materials. In other cases the learning is instrumental in that performance is improved in reaching established goals. Examples include master plans/SAMPs, economic planning grants, and environmental mitigation requirements.

5.4 Conclusions

From a national perspective port development has been given significant attention by state CMPs, but at a general level. All states have policies promoting water dependent uses, and all states interact with ports through regulatory review (permits or consistency). Two-thirds of the states have specific policies about seaports, perceive the port issue as H, and have some formal interactive mechanism such as a planning process, SAMP, or grants.

The number of states with more specific tools addressing ports is much lower. Less than half the states have actively identified where port development should take place and what kind of development is appropriate. Only 1/3 pay special attention to ports in the regulatory process through port-specific decision criteria or expedited permit processes.

A quite different set of conclusions is apparent when only the 12 "port-active" states are examined. These are states that have ranked port issues H, and who have significant port

activity relating to international trade. Virtually all have policies specific to commercial seaports, including "no-sprawl" policies, and they delineate areas for port development. They employ a variety of strategies for guiding port development including regional plans, master planning, local zoning and port-specific environmental criteria. They are active in technical assistance including grants, staff assistance, and engineering/environmental support. Half or more have permit criteria specific to ports or expedited permit processes for port projects.

There are examples of organizational learning occurring in CMPs and port organizations as a result of the interaction of the two. Some of this learning results in changed objectives within the programs and in the ports, improving the process of finding an accommodation among the multiple objectives being advanced through the CZMA. Leading examples include regional port planning, master planning/SAMPs, reduction of reserved port lands based on new information about port needs, wetland mitigation banking, beneficial use of spoils, and long-term dredging planning. These innovations improve the state of the art of port development in the context of the goals of CZM. To the extent that more detailed study confirms the preliminary evidence of organizational learning, we can conclude that the "port-active" states are not only "effective" in meeting statutory obligations but are also innovative in defining new objectives and methods for their work.

5.5 Recommendations

The way in which CMPs address port development should be monitored periodically. This study has begun to establish a baseline of CMP information that is related to port development. At selected intervals, perhaps every five years, there should be a review to determine what program changes have occurred in the way port development is addressed, why those changes occurred, and what change in outcomes occurred or is expected to occur because of the changes. The focus on "change" shows responsiveness to new situations (if any), and allows organizational learning to be highlighted. It also can identify innovative processes and outcomes that help find the accommodation sought in CZM programs.

The changes would be identified using the six-part classification from Section 5.2 above:

Specifying port policies
- General Policies Addressing Seaports
- Delineating Geographic Areas for port development
- Planning and regulatory criteria specific to ports

Facilitating port development
- Collaboration between CMPs and port entities
- CMP technical assistance for port planning and development
- Applying permit processes to port projects

Further there is a need for two additional studies. The first would address bulk cargo or specialized port installations. As noted at the outset "seaport" was limited to major deepwater commercial ports involved in international trade. Because of study limitations, the focus often was on publicly owned general cargo ports (container ports for the most part) because data was more readily available for them and there is normally a single public agency interacting with the CMP over a set of issues. This excluded a set of bulk cargo ports (energy-related, grain, etc.) which can be very significant for CMPs. For example, many of these specialized bulk cargo port installations are combined with storage or processing facilities and thus raise additional land use and environmental issues. Further, some of them are located in rural areas where industrial use is uncommon raising the issue of port-sprawl. Many of them

raise special safety issues. Thus, an additional study of CMP activities in regard to these specialized port facilities is needed.

Second, dredging and dredged material disposal needs its own study. As noted in Section 2.1.3 the provision of navigational resources such as channels, turning basins, and breakwaters is essential infrastructure in virtually every harbor in the country, and a central requirement for port development. Dredging and dredged material disposal also is a major national environmental issue, raising concerns about water quality from contaminated sediments, damage to fish and wildlife habitat, loss of wetlands and nearshore environments, among others. Organizationally the issue is dominated by federal agencies such as the Corps of Engineers, EPA, FWS and NMFS. State and local agencies play important roles within this federal system on such issues as water quality standards and identification/acquisition of disposal sites. State CMPs, through their federal consistency, land use and environmental review powers, can be influential players within this system. Further, as noted in 2.1.3 above, with the recent initiation of a national "Action Plan", including regional and state participation in advanced planning, describing how state CMPs participate in the process, and ways in which CMPs can be most effective, is timely.

A CZM - oriented dredging study needs a national as well as a state-level component. At the national level the focus should be on providing better information for state and local planning purposes. This requires translating national data that is collected in conjunction with nationally funded projects, into information aggregated to serve state and local planning jurisdictions. Information about dredging needs and timing, sediment quantity and quality, and disposal site locations and capacity is collected for particular navigation projects. The projects have different time frames and cross state, local and watershed boundaries. NOAA and the COE should develop area-based data as a service to the state and local planning community, as well as regional federal offices.

At the state level the role of CMPs in the dredging process needs better description and analysis. This study identified some of the ways in which states participate in the dredging process: requiring dredged material disposal plans to accompany project proposals (NJ), participating in Long-term Disposal Strategies (CA-BCDC), requiring linkage between port planning and dredging planning (MA), mandating beneficial use of dredged materials (LA), specifying preferences in dredging technology (PA), and identifying upland sites for long-term dredging disposal needs (MS). State CMPs are "niche players" in this national scale issue but the role they play is critical, and could become more important in the future because of their federal consistency powers. Innovations are evident in recent accommodations reached for major harbors such as New York, San Francisco, and Boston. These experiences should be documented and monitored closely since this national issue will be with us for a long time but the solutions are likely to be locally generated.

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APPENDIX A: Results for the 12 Port-Active States.

	AMERICAN SAMOA
SPECIFYING PORT POLICIES	
1. General CMP policies addressing seaports	Water dependent major facilities will be accommodated throug planning; environmental and social impacts must be minimized
2. Delineating geographic areas for port development	Pago Pago harbor is designated a Special Management Are (SMA); Nine objectives/priorities apply to the siting of specific por projects; Siting is done by the port administration.
3. Planning and regulatory criteria specific to ports	Pago Pago harbor objectives/criteria include: Protecting workin port and natural resources; giving water-dependent uses highes priority followed by water-related and recreational use. Por projects must meet long term economic and social goals; recogniz limited land resource; protect natural beauty; improv infrastructure; minimize shoreline frontage used; prevent advers impacts outside ports and others.
FACILITATING PORT DEVELOPMENT	
1. Ongoing collaboration between CMP and port agency	American Samoa's CMP assists with planning needs and land us permit review.
2. Applying the permit process to port projects	ASCMP reviews environmental impact potential and mitigation a part of land use permit system.
3. Funding, technical, and planning assistance from the CMP.	Five port-related plans have been produced including a master an physical plan dealing with use attainability, design, and commercia port management. Technical assistance for planning and impac assessment is provided. Special projects on beach revetment an trash collection in the harbor have been funded and completed wit the assistance of the CMP.

	COMMONWEALTH OF THE NORTHERN MARIANAS ISLANDS
SPECIFYING PORT POLICIES	
1. General CMP policies addressing seaports	Water-dependency.
2. Delineating geographic areas for port development	Each port area is considered an Area of Special Concern.
3. Planning and regulatory criteria specific to ports	N/A
FACILITATING PORT DEVELOPMENT	
1. Ongoing collaboration between CMP and port agency	CRMO works closely with the US ACOE and project proponents i developing an environmental protection plan required for por development.
2. Applying the permit process to port projects	The CZM agency (CRMO) is the principal regulatory authority fo port expansion and approves all coastal permit decisions. A Environmental Protection Plan (EPP) that details mitigation effort is required before a project begins. The EPP is very detailed an enforceable, and serves as the primary tool in managing por development.
3. Funding, technical, and planning assistance from the CMP.	CZM assists in planning through coordination and consultation o mitigation requirements. Engineering assistance and training i provided. There is no direct funding of port development.

	CALIFORNIA COASTAL COMMISSION (CCC)
SPECIFYING PORT POLICIES	
1. General CMP policies addressing seaports	Port Districts have planning and regulatory responsibilities. CCC include a "No Sprawl" policy; desire to protect existing commercia harbor space, priority for port use of existing land base in harbors, en rail service to ports and multi-company use of facilities.
2. Delineating geographic areas for port development	Four established commercial port districts have been identified. Dev is encouraged within the four.
3. Planning and regulatory criteria specific to ports	A Port Master Plan is required; the plan, and amendments, require cer by CCC. After the plan receives certification, the port issues dev permits in its district. A Port Master Plan includes: proposed land a uses; projected design and location of land/water areas; esti environmental impacts and mitigation plans; criteria for dredging. diking; criteria for tanker terminals. Appealable port developments in and gas projects, waste water treatment, and non-port facilities.
FACILITATING PORT DEVELOPMENT	
1. Ongoing collaboration between CMP and port agency	CCC staff reviews/comments on Master Plan amendments, a permits, and environmental impact reports. Informal collaborat negotiation between CCC and port staff occurs on proposed project and ports participate in multi-agency meetings.
2. Applying the permit process to port projects	Coastal permits are issued and port projects are evaluated throug established under Chapter 8 of the Coastal Act and/or the Port Master
3. Funding, technical, and planning assistance from the CMP.	Port of Los Angeles: Master Plan certified in 1980. Fourte amendments have been reviewed by CCC through 1995. Te established for diverse uses; zones range from 88 to 762 acres and tc acres. An example of planning assistance can be found in the revi Amendment 12. Based on the CCC staff review, this amendment "other uses" on Pier 300 project to accommodate near-dock rail announced intent to add 582 acres to Terminal Island (Pier 400 an corridor), and dredge 48KK cu. yds. for container, rail, and hazardo bulk cargo facilities.

	CALIFORNIA BAY CONSERVATION AND DEVELOPMENT COMMISSIO
SPECIFYING PORT POLICIES	
1. General CMP policies addressing seaports	The Seaport Plan employs land use designations and enforceable pc meet Bay Plan requirements, and to guide regulatory/consistency decisic goals of Seaport Plan are: to ensure continuation of Bay ports as si economic contributors; maintain or improve environmental quality; prc efficient use of terminals through 2020; provide for integrated transportation; reserve shoreline areas for future growth.
2. Delineating geographic areas for port development	The Bay Plan must designate adequate and suitable locations for seaj Seaport Plan designates port priority use areas and individual future terminal sites for the six ports in the region. Port of Oakland: entire port is designated port priority use area inclu Naval Supply Center. The 1996 amendments to Seaport Plan reduced fi than 1/2 of what it was, released land at closing bases to allow non-p reduced land area reserved for port development while meeting cargo for 2020.
3. Planning and regulatory criteria specific to ports	Proposed marine terminal development must be justified in reference to needs for new terminals, based on projected cargo volumes. requirements are set for new terminals based on capability levels fc Terminal realignments and fill requirements specified. Interim uses p so long as displacement for port development is possible. Fill allowed ports if no upland alternative exists and harmful affects minimized. Re port site possible if regional capability to meet cargo growth is not i Seaport Planning Advisory Committee (SPAC) can authorize changes terminal if regional capability not impaired.
FACILITATING PORT DEVELOPMENT	
1. Ongoing collaboration between CMP and port agency	SPAC develops, updates Seaport Plan. Has been in existence sinc Recommends to BCDC and MTC. SPAC includes all ports, other regio and federal transportation agencies and organizations. Meets bi-monthl technical work: Roundtable to review cargo forecasts; study feasibility of NAS for containers; review cargo flow monitoring.
2. Applying the permit process to port projects	BCDC permit review is based on the applicable policies and criteri Seaport Plan and Bay Plan, particularly as they relate to fill in the Bay development. The Seaport Plan identifies a limited number of sites specified amount of fill may be allowed for new terminal deve Permitted activities are also reviewed in regards to port needs based on p cargo volumes for 2020.
3. Funding, technical, and planning assistance from the CMP.	BCDC staff expended 3.0 person years between 1/94 and 8/96 for analytical work on Plan. MTC hired consultants for 3 studies. No CZ given to ports.

	DELAWARE
SPECIFYING PORT POLICIES	
1. General CMP policies addressing seaports	Water-dependency, "no-sprawl" port policy that encourages por development in areas historically designated for port or industria uses.
2. Delineating geographic areas for port development	Port of Wilmington is designated an Area of Special Concern
3. Planning and regulatory criteria specific to ports	The CZM program prohibits the development of new bulk transfe terminals, but the Port of Delaware is excluded from the prohibitio because of its economic importance and designation as an Area o Particular Concern. Regions have been designated as Areas o Particular Concern in hopes of enhancing their management.
FACILITATING PORT DEVELOPMENT	
1. Ongoing collaboration between CMP and port agency	As long as environmental concerns are met Delaware's CMP doe not involve itself with port development projects.
2. Applying the permit process to port projects	Working with the ACOE, Delaware's CZM program has reduce duplicate development permit requirements. Now, the ACOE' general permits are jointly processed with relevant state permi requirements. This is handled through a monthly joint permi processing meeting with the COE and the permit applicants.
3. Funding, technical, and planning assistance from the CMP.	N/A

	LOUISIANA
SPECIFYING PORT POLICIES	
1. General CMP policies addressing seaports	Water-dependency and "no-sprawl" port policy that restricts por development in nonport areas. Port activities are reviewed fo consistency with LA Coastal Use Guidelines, and conducted t minimize impacts to coastal wetlands while promoting appropriat development. The LCRP also has guidelines for dredge spoi deposition -- spoil should be used for creating new habitat an current disposal areas should be used to fullest extent.
2. Delineating geographic areas for port development	The LCRP recognizes three categories of ports: shallow and dee draft, and offshore terminals. Each is treated differently in th program. The Louisiana Offshore Oil Port (LOOP) has bee designated as a Special Management Area.
3. Planning and regulatory criteria specific to ports	N/A
FACILITATING PORT DEVELOPMENT	
1. Ongoing collaboration between CMP and port agency	A Memorandum of Understanding (MOU) between the deep drai ports and CMP is used to ensure coordination of the consistenc review process. The MOU requires the state to notify the por authority of all Coastal Use Permit applications in the vicinity of th port. The port also reviews activities of third parties on por property and communicates with LCRP through a joint publi notice coordinator.
2. Applying the permit process to port projects	Deep draft ports are exempt from obtaining Coastal Use Permit (CUP) but their activities still must be consistent with LCRP Consistency determination is made by the LCRP for new construction projects in deep water ports. The exemption fron obtaining a CUP facilitates port development by eliminating th requirement that projects must be initiated within a strict time fram after date of issuance.
3. Funding, technical, and planning assistance from the CMP.	N/A

	MISSISSIPPI
SPECIFYING PORT POLICIES	
1. General CMP policies addressing seaports	Mississippi places a high priority on port and industria development, and protection of the coastal zone for wate dependent uses.
2. Delineating geographic areas for port development	The Mississippi CMP identified sites suitable for water-depender development within the three coastal counties at the inception of it CMP. Port areas were designated Special Management Area (SMA).
3. Planning and regulatory criteria specific to ports	Port planning is the result of the combined efforts of the loca community, port authority, and Mississippi CMP. Port plans ar required by the Department of Marine Resources (DMR). Eac industrial or port area plan has three major elements. 1. An Area Development Plan that determines the limits o development, and establishes guidelines for development. 2. A Dredge Material Plan that details the location of spoil areas. 3. A Mitigation Program that addresses issues such as wetland restoration and protection. SAMP have also been developed and used to manage/plan activitie in port areas. The adoption of a SAMP is voluntary and distinc from port development plans.
FACILITATING PORT DEVELOPMENT	
1. Ongoing collaboration between CMP and port agency	Port planning is the result of the combined efforts of loca community, port authority, and CZM agency.
2. Applying the permit process to port projects	Permitting was established to deter non-water dependent industrie from locating on waterfront sites and to deter water dependen industry from occupying more waterfront than necessary. Genera permits can be granted for port activities and the development o water dependent industry within a special management area (as th Ports are) will be guided by the provisions of the SAMP in lieu o other siting criteria. The adoption of a SAMP does not substitut for permitting, nor does it constitute a general permit. Having a approved SAMP does ease the permit process.
3. Funding, technical, and planning assistance from the CMP.	CZM does assist in single port planning with funding, developmen of SAMP, and CZM also provides some engineering/technica support. The Mississippi Coastal Program is helping municipalitie analyze dredge disposal options that ensure the integrity of th environment. The Department of Marine Resources commissione a study that recommended over 1000 acres of upland sites t handle the anticipated dredged disposal needs for the next 30 years Mississippi's CZM program funded special area management plan for each of the three major ports.

	NEW JERSEY
SPECIFYING PORT POLICIES	
1. General CMP policies addressing seaports	There are eight coastal policy objectives for land and water us decision making in the coastal zone. One of these policies directl addresses ports in that a goal of the NJ CMP is to maintain activ port and industrial facilities and provide for necessary expansion i adjacent sites. Water-dependency and "no-sprawl" port policies restrict poi development in nonport areas. The CMP policies seek to avoid construction of a facility whic meets the needs of today but could become obsolete tomorrow.
2. Delineating geographic areas for port development	N/A
3. Planning and regulatory criteria specific to ports	Port planning is mainly the responsibility of NY/NJ Port Authorit and Corps of Engineers, but CZM has done port planning fo specific projects (i.e. energy facility siting). New Jersey CZM formulated a detailed state policy addressing how to develo offshore oil reserves and onshore facilities. New port development will only be acceptable when there is a clea demonstration of need and when suitable land or water area is no available in, or adjacent to, an existing port. New, expanded, o redeveloped facilities must have direct access to navigation channel with minimal dredge and fill requirements, and provide fo maximum open space and visual and physical access to th waterfront. New or expanded ports must not interfere with parks o wildlife refuges.
FACILITATING PORT DEVELOPMENT	
1. Ongoing collaboration between CMP and port agency	A dredge material plan is in the process of being developed by N CMP in conjunction with the NY/NJ Port Authority. This plan i expected to provide solutions to the maintenance dredgin problems and resolve the issue of how to handle contaminate sediments.
2. Applying the permit process to port projects	Coastal permits are a requirement of three different pieces o legislation: the Coastal Area Facility Review Act (CAFRA), th Wetlands Act, the Waterfront Development Act. Project proponent may be required to obtain a separate permit for each act dependin on where in the coastal zone the development will take place an the type of project. These laws were in existence before th enactment of the NJ CMP, but have since been networked into th NJ CMP. Any request for dredging projects must be accompanied by disposal plan indicating where disposal will take place.
3. Funding, technical, and planning assistance from the CMP.	Technical assistance to ports is provided on dredging issues such a sampling methods for dredge spoil. NJCMP serves as clearinghouse for information from other state environmenta programs.

	MASSACHUSETTS
SPECIFYING PORT POLICIES	
1. General CMP policies addressing seaports	Encourage location of maritime commerce and development in wa designated as port areas. Prevent the exclusion of maritime-dependent i uses. Encourage, through technical and financial assistance, expansion dependent uses in designated ports and developed harbors.
2. Delineating geographic areas for port development	Twelve Designated Port Areas (DPA) established in 1978. Regulations specify process for modifying boundaries, establishing new DPA's designating existing locations. One DPA boundary has been substantially.
3. Planning and regulatory criteria specific to ports	Regulations specify how DPA master plans and municipal harbor p developed and approved. MCZM assists in developing model scope consultant selection, plan review. Plans are not mandatory, but incentives and greater use flexibility in licensing, are available. MCZM is active in promoting statewide Seaport Action Plan, Seaport Council, and $280 KK Seaport Bond issue. Bond dollars support planning, dredging-port planning linkages, consultants for initiati planning, and statewide balance in port development. MCZM developed waterway regulations and comments on project MEPA. Port projects must meet port-specific criteria including compatibility with surrounding areas, land and water circulation, dev feasibility, cost and feasibility of public improvements, fiscal and e effects, and compatibility with regulatory requirements.
FACILITATING PORT DEVELOPMENT	
1. Ongoing collaboration between CMP and port agency	MCZM is on Governor's Seaport Advisory Council addressing statewi MCZM works one-on-one with local government on DPA master plan harbor planning.
2. Applying the permit process to port projects	Coastal permits required but relaxed wetlands regulations in DPA facili development as does aggressive stance on preventing conversion of port nonport activities.
3. Funding, technical, and planning assistance from the CMP.	DPA master plan and harbor planning grants ($26K example, below). T assistance for model scope for port plans and consultant selection. grants provided under Coastal Facilities Improvement Program.

	PENNSYLVANIA
SPECIFYING PORT POLICIES	
1. General CMP policies addressing seaports	Port-related economic development activities have been promoted thr designation of GAPC and Development Opportunity Areas (DC encouraging long-range planning for future growth and economic va Primary goal of CMP is redevelopment of deteriorating ports.
2. Delineating geographic areas for port development	Example of a port-related GAPC is Presque Isle Bay, Lake Erie, wh development is high priority. 17 DOA's have been identified, rangi 64 to 2100 acres in size and totaling 8396 acres.
3. Planning and regulatiorycriteria specific to ports	Long-range comprehensive planning is used to promote port e development and to encourage, attract, and enhance water-d activities. Port projects are regulated by other state agencies in tl network; specific CZM criteria applies to dredging technology and consistency review undertaken where federal permits/assistance occur.
FACILITATING PORT DEVELOPMENT	
1. Ongoing collaboration between CMP and port agency	State CZM office not directly involved; regional entities (Delaware Val and Erie County) interact more regularly with ports.
2. Applying the permit process to port projects	Coastal permits are required and the Pennsylvania CMP provides fe state consistency review. Dredge material disposal sites must regulatory requirements of the Department of Environmental Protectio
3. Funding, technical, and planning assistance from the CMP.	Funds have been provided for studies/plans to enhance current e activities, attract new economic activities, and improve infrastructure. Four studies, with a combined total of $135,000 of federal money, an analysis on port activities throughout the state. Eleven additiona were commissioned specifically for the Port of Philadelphia and tota $600,000 including federal dollars and state match.

	SOUTH CAROLINA
SPECIFYING PORT POLICIES	
1. General CMP policies addressing seaports	Through permitting and participation in planning efforts Sout Carolina's Bureau of Ocean and Coastal Resources (OCRM ensures that port activities are carried out in a manner tha minimizes negative environmental consequences. Use prioritie specific to activities in seaport areas are: 1) Water-dependent use 2) Water related uses, and 3) Non water-dependent uses which allo for flexibility of the port to develop water-dependent uses.
2. Delineating geographic areas for port development	The S.C. CZMA required the S.C. Ports Authority to develop a pla indicating locations for all sites suitable for port development. A existing ports were designated as Geographic Areas of Particula Concern (GAPC). The lower Savannah River SAMP details zone for port and industrial development and dredge disposal sites.
3. Planning and regulatory criteria specific to ports	The ports were mandated by the S. C. CZMA of 1977 to prepar port management plans for harbor facilities and navigatio channels. Review and approval of permit applications for po development are based on approved port plans and the followin summary of policies: 1) New port development should take place i existing industrialized areas, occur in non-wetland areas, and locat on existing channels to minimize need for dredging. 2) Dredg disposal that is environmentally acceptable should be identified. 3 Port areas must provide for the handling of hazardous wast Dredging polices have also been established to require the lea environmental impact.
FACILITATING PORT DEVELOPMENT	
1. Ongoing collaboration between CMP and port agency	A Memorandum of Agreement exists between OCRM and th South Carolina Port Authority (SCPA) to coordinate efforts and t plan and cooperate in implementing coastal zone developmen OCRM does assist in single port planning through meetings an establishing communications, working relationships, and plans SCPA has a role as a "certifying agency" to OCRM, and provide review of coastal permits as it may affect navigational safety. SAMP was developed for the lower Savannah River by the Sout Carolina Coastal Council and the SCPA. The study evaluated th conditions present in the Savannah River for future po development.
2. Applying the permit process to port projects	OCRM issues permits for activities within the coastal zone an reviews permits based on 10 general guidelines for development i critical areas (i.e., coastal waters and tidelands). These guideline not specific to port development, review environmental impacts an the need for economic development. OCRM does impos performance standards for port projects and has specific permi requirements that must be met for port development (these ar listed above).
3. Funding, technical, and planning assistance from the CMP	N/A

	WASHINGTON
SPECIFYING PORT POLICIES	
1. General CMP policies addressing seaports	Water-dependency and "no-sprawl" port policy that restricts por development in nonport areas. Port facilities should be designed t permit viewing of harbor areas; provide for the cooperative use o docking, parking, and cargo handling; and be located so that lan transportation and utility corridors can be located upland to reduc pressures for the use of waterfront sites. Prior to allocatin shorelands for port uses, local governments should conside statewide needs and coordinate planning with other jurisdictions t avoid wasteful duplication of port services within port-servic regions.
2. Delineating geographic areas for port development	Local governments establish local master programs that ar approved by the Department of Ecology - the lead agency fo Washington's CMP. Shoreline use zones are delineated in th Master Programs, some of which are port related.
3. Planning and regulatory criteria specific to ports	State law requires the port to develop a comprehensive plan. Thi law predates the adoption of the SMA and is not related to th State's coastal management program or the SMA. However, sinc the inception of SMA the periodic updates and reviews of th comprehensive plan have incorporated SMP policies into the plar There are no regulations/criteria specific to seaports.
FACILITATING PORT DEVELOPMENT	
1. Ongoing collaboration between CMP and port agency	The Port and local governments work together very closely i developing Shoreline Master Programs (SMP). Recognition o rules and policies of SMP have altered the way the Port plans an designs projects. Port plans and projects incorporate local SM regulations and requirements.
2. Applying the permit process to port projects	The local governments have the authority to issue or den "substantial development" permits in the coastal zone. The Stat Department of Ecology (DOE) provides a review of all shorelin development permits and a consistency determination for federall granted permits. Local permits can be appealed to the state. Th state Shorelines Hearing Board provides a de novo review o appealed permits.
3. Funding, technical, and planning assistance from the CMP.	The state's Shoreline Management Guidebook is a reference sourc for the development community, including ports. The most recen and largest grant ever given directly to a port was an approximatel $30,000 grant to the Port of Wahkiakum for a public access project

APPENDIX B: Profile Outline.

STATE CZM PROFILE
PROMOTING WATER-DEPENDENT ACTIVITIES - SEAPORTS

A. BACKGROUND

This section consists of a general description of state coastal management program.

1. CONTEXT

a. Overview of information on port issues in the state and relationship of port and industrial/water-dependent development activities with the state coastal management program.

b. Table 1. CHARACTERIZATION OF PORTS.

Name of Port	Location	Approximate Size (in acres, berths)	Cargo and related commercial or industrial activities

c. Most important port from a CZM perspective:

As identified by survey resondent.

Table 2. COMMERCE AND NAVIGATIONAL RESOURCES DATA FOR [STATE X] SEAPORTS*.

Container Throughput (TEUs)	
Cargo Value (000's omitted)	
Cargo Volume (Short tons, 000's omitted)	
Total federally sponsored navigation projects	
Public port capital expenditure from '92 to '94 (000s omitted)	
Proposed public port capital expenditure for '95-'99 (000s omitted)	

* Commerce data is based on total exports and imports of foreign commerce of top 30 ranked U.S. ports for that category in 1995 (AAPA Advisory April and June 1996). Transport of cargo domestically between U.S. ports is not included. Navigation projects was determined from a U.S. Army Corp of Engineers, Institute of Water Resources Unpublished Report and is based on all authorized projects from 1890 to 1995, including projects for which no work has been performed for 20 or more years. Proposed expenditure data is based on AAPA survey of the expectations of port officials.

2. ISSUE IN THE STATE

a. At time of CZM approval

As indicated by survey resondent

b. Evolution of issue to present

As indicated by survey resondent

B. KEY COASTAL AND WATER DEPENDENT USE POLICIES & SPECIFIC SEAPORT DEVELOPMENT POLICIES AND PLANNING

This section provides overview of policies and planning efforts directly or indirectly related to seaports.

C. SELECTED MANAGEMENT TOOLS EMPLOYED TO PROMOTE SEAPORTS

State CZM authorities and policies are implemented through a variety of management tools. For port development, these tools are categorized as follows: ***Delegating Port Planning, Designating Sites for Seaports; Planning Assistance for Ports; Regulation of Seaport Projects;*** The set of tools under each category and their applicability to [STATE X] CMP are presented in Table 3 below.

Table 3. MANAGEMENT TOOLS EMPLOYED TO PROMOTE SEAPORTS -- STATE SUMMARY TABLE

MANAGEMENT TOOLS	TOOLS USED	COMMENTS
A. Delegating port planning to port and transportation authorities		
B. Designating sites for seaports		
1) By statute or reg.		
2) Through local CZM programs		
3) Through SAMP / GAPC / Other		
C. Planning Assistance to Ports		
1) Regional Planning (Multiple Ports)		
a) Required?		
b) CZM Funding		
c) Other (i.e. Technical assistance)		
2) Single Port Planning		
a) Required?		
b) CZM Funding		
c) Other (i.e. Technical assistance)		
D. Regulation of Seaport Projects		
1) Coastal Permits		
2) Permits from other state agencies		
3) Consistency Review (State or Federal)		
E. Criteria for evaluating port projects		
F. Published guidance documents		

DESCRIPTION OF TOOLS EMPLOYED TO PROMOTE SEAPORTS

A. DELEGATING PORT PLANNING TO PORT AND TRANSPORTATION AUTHORITIES
B. DESIGNATING SITES FOR SEAPORTS
C. PLANNING ASSISTANCE TO PORTS
D. REGULATION OF SEAPORT PROJECTS
E. CRITERIA FOR EVALUATING PORT PROJECTS
F. PUBLISHED GUIDANCE DOCUMENTS

D. "ON-THE-GROUND" OUTCOMES OF COASTAL MANAGEMENT POLICIES AND TOOLS THAT PROMOTE SEAPORTS

State CZM program implementation, using seaport promotion tools described above, can be tracked "on-the-ground" by monitoring selected 'outcome indicators' where data is available. This section of the profile contains outcome indicators associated with the following management tools for the Port of Charleston.

RESULTS FOR PORT OF [X]

PORT PLANS
TYPE OF PLANNING (REGIONAL, STRATEGIC, MASTER PLANNING, IMPACT ASSESSMENT)
CZM MONEY SPENT ON PLANNING
ZONING FOR MARITIME OR INDUSTRIAL DEVELOPMENT
NEW FACILITIES
PERFORMANCE STANDARDS ARE EXERCISED

E. CASE EXAMPLES OF TOOLS OR RESULTS

F. STATE CONTACTS

G. REFERENCES AND DATA SOURCES