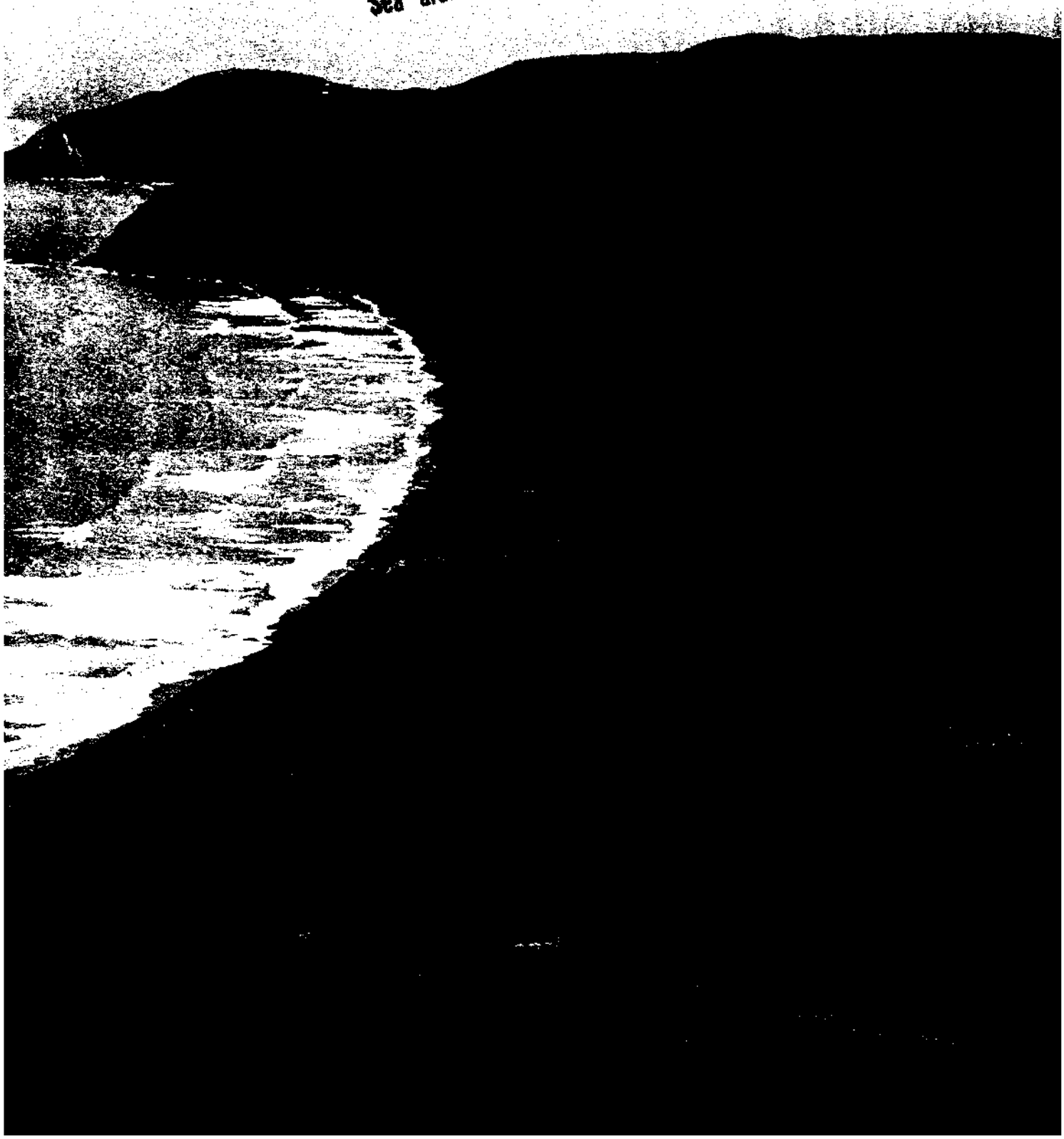
Marine Technology Society Journal



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SPECIAL ISSUE: FUTURE DIRECTIONS IN U.S. MARINE POLICY IN THE 1980s

Front Covers: View of Santa Cruz Island. (Photograph courtesy of Phyllis M. Grifman)

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INTRODUCTION

Future Directions in U.S. Marine Policy in the 1980s

Biliana Cicin-Sain
Guest Editor

Most of the papers contained in this special issue of the *Marine Technology Society Journal* were initially prepared for presentation at a symposium on FUTURE DIRECTIONS IN U.S. MARINE POLICY IN THE 1980s, held at the University of California at Santa Barbara (UCSB), on June 4-6, 1981. This effort was organized by the Marine Policy Program, Marine Science Institute at UCSB, and was co-sponsored by the Institute of Marine Resources (University of California at San Diego), and by the Robert M. Hutchins Center for the Study of Democratic Institutions.

In 1981, as we entered a new decade and welcomed to power a new Administration in Washington, D.C., it seemed a propitious time to begin reassessing current and future directions in marine policy, and to question: what directions are we *likely to see*? as well as what directions *would we like to see* in the coming decade? What challenges, both domestically and internationally, will marine decision-makers be facing in the next ten years?

To consider these challenges, we assembled together a small group of distinguished marine analysts—most with considerable experience in government, but not holding current government posts.[1] We did this intentionally to foster in our discussions the kind of candidness and "distance" in analytical perspective, which can most readily come when one is operating outside the constraints of current governmental roles. Discussion at the Santa Barbara symposium and in the papers in this issue focused on the opportunities and constraints that marine decision-makers and analysts will encounter in the 1980s, in view of three major developments: the implementation of the large body of marine law enacted by the Congress in the 1970s, current fiscal constraints, and the implications of the Law of the Sea agreement.

Implementation of the Marine Laws of the 1970s

The 1970s witnessed a veritable plethora of marine legislative activity, with Congressional enactment of a large body of marine laws separately regulating different aspects of the marine environment (examples are the Coastal Zone Management Act of 1972 (CZMA), the Marine Mammal Protection Act of 1972 (MMPA), the Magnuson Fishery Conservation and Management Act of 1976 (MFCMA), the Outer Continental Shelf Lands Act Amendments of 1978 (OCSLA)). Full implementation of this body of legislation in the 1980s, however, is increasingly becoming problematic. Some of these laws are at odds with one another, and their implementation involves a complex array of multiple government agencies at all levels of government, and a wide variety of public and private interests—agencies and interests whose actions often become conflictive.

Two papers in this issue explore these domestic implementation challenges. My paper, "Managing the Ocean Commons: U.S. Marine Programs in the Seventies and Eighties,"[2] characterizes the innovative aspects of this body of legislation and analyzes the political and administrative processes involved in its passage and implementation. My thesis is that the changes which were brought about in marine policy in the 1970s as a result of this legislation—the expansion of the federal role, the introduction of novel concepts of management, the mobilization of new interest groups, changes in administrative agencies, and growing intergovernmental complexity—have conspired to provoke profound changes in the relatively simple politics surrounding marine policy processes prior to the seventies.

The much more complex and less predictable political situation confronting marine policy makers in the 1980s will increasingly give rise to conflicts—among ocean users, agencies, and levels of government. How to manage such conflicts looms as one of our greatest challenges. In my view, the impetus for meeting this challenge, in the coming decade, will come from the *regional*, rather than the *national*, level; for it is at the regional level that users and agencies—inevitably interconnected with one another—must find ways of dealing with each other and of reckoning with a complex and fragmented regulatory framework.

Reflecting on his past experience as a high-level administrator at the National Oceanic and Atmospheric Administration (NOAA), Michael Glazer in "Implementing Marine Laws Enacted in the 1970s: Administrative Challenges," foresees two major challenges for marine policy in the 1980s: how agencies can obtain the relevant science to make wise management decisions and to meet statutory requirements, and how to resolve multiple use conflicts. These challenges will be difficult to meet, Glazer suggests, in the changing political climate of the 1980s—an era of perceived scarcity and budgetary constraints. A third paper on the role of Congress in the implementation of the marine legislation of

the 1970s was presented at the Santa Barbara symposium by Thomas R. Kitsos (U.S. House of Representatives). Mr. Kitsos' paper, "U.S. Ocean Policy and the Uncertainty of Implementation in the 1980s: A Legislative Perspective," has been published in a previous issue of the *MTSJ* (Vol. 15, No. 3, 1981).

Fiscal Constraints

As in all other areas of public policy, marine decision makers in the 1980s will be faced with a climate of fiscal constraint. Current fiscal uncertainties, in fact, make prediction of future U.S. positions toward the oceans and the coastal zone very difficult. On the one hand, the viability of a number of existing programs, such as Coastal Zone Management and Sea Grant is threatened; on the other hand, some U.S. marine programs, such as those related to defense and the U.S. Navy, are likely to be enhanced. One of the most obvious challenges for decision-makers in an era of budgetary reductions is, how to manage existing programs and to carry out existing legislative mandates with reduced resources? Other implications discussed at the Santa Barbara symposium and in the papers by Don Walsh and John R. Botzum in this issue are the following: What new (if any) legislative or administrative initiatives are we likely to see in the coming decade? What will be the relative roles of the public and private sectors? What aspects of marine policy are we likely to see stressed (e.g., conservation, development)? What impacts will potential future shifts in governmental philosophy have on existing programs?

Both of the speakers in this section—Don Walsh and John R. Botzum—underscored that the recent budget modifications put forth by the Reagan Administration will not have as profound an impact as some observers have suggested. In his "U.S. Ocean Policy in the 1980s: Finding and Funding the Future," Walsh points out that, in fact, the national ocean program structure was not in a particularly strong condition throughout the seventies, and that the high mark in real funding growth was reached in 1968, fourteen years ago. "Far more damage," Walsh holds, "was done to our ocean future by the benign neglect of the presidential administrations of the decade of the seventies than by the stepwise sudden reductions proposed by the Reagan Administration." Moreover, Walsh forsees that the budget reductions may have the unintended (and beneficial) effect of mobilizing the eclectic ocean community on behalf of ocean programs.

In his informal remarks, "Future Opportunities and Constraints," John R. Botzum questions the assumptions held by critics of the Reagan approach and suggests that "less money from the federal government is not necessarily a bad thing." Botzum criticizes the effectiveness of the major civilian oceans agency, NOAA, characterizing it as a "grab bag of agencies," separated from the mainstream of federal decision-making. Botzum calls attention to the positive steps that can be taken to counteract reductions in federal funding, such as the forging of joint ventures between industry and academia.

Implications of the Law of the Sea Agreement for U.S. Policy

In addition to extensive domestic legislative activity in the marine area, the 1970s also witnessed significant action on the international front. Throughout this period, the international community moved through a penurious and protracted process in drafting an international agreement whose culmination will mold international management regimes for years to come. At the time of the Santa Barbara conference (June 1981), the Law of the Sea (LOS) treaty was still under consideration, and the Reagan Administration had announced its decision to reevaluate the U.S. position. Comments on the likely fate of the treaty and its implications for U.S. interests by Arvid Pardo, Robert Friedheim, Roger Revelle and Stanley Anderson, were published in the March/April 1982 issue of *The Center Magazine* (Vol. XV, No. 2: 49-64).

In the interval, of course, in April of 1982, the Third United Nations Conference on the Law of the Sea voted to approve a new and comprehensive LOS Convention. The convention addresses the full range of ocean issues including rules for navigation through straits, archipelagoes and other waters; establishment of 200-mile exclusive economic zones; definition of the outer edge of continental shelves; the breadth of territorial seas; prevention of marine pollution; conservation of marine mammals, management of fisheries; conduct of marine scientific research; seabed mining beyond national jurisdictions; and the settlement of disputes. The LOS text was adopted by 130 nations in favor to 4 against, with 17 abstentions. Voting against were the United States, Israel, Turkey, and Venezuela.

Although the United States has decided not to approve the treaty, it is clear that the LOS Convention will be an important factor in molding U.S. ocean policy-making in the 1980s. For this reason, I am extremely grateful to Robert W. Knecht and Robert E. Bowen for agreeing to prepare, on short notice, a paper on "The Implications of the Law of the Sea Convention for U.S. Ocean Policy in the 1980s," for inclusion in this special issue.

In their paper, Knecht and Bowen discuss those aspects of the Convention which are in harmony with U.S. ocean policy and outline the policy issues and options raised by these positive aspects. Similarly, the authors consider those aspects of the Convention which are in conflict with existing U.S. policy and discuss the questions that will confront decision-makers in this connection. Knecht and Bowen also discuss difficulties, especially with regard to navigation, that the United States may encounter if the Convention (or important parts of it) is viewed as a kind of contract by signatory states—excluding non-signatory nations from the benefits of the Convention. The authors conclude by suggesting the convening of a Study Commission—patterned along the

lines of the Stratton Commission of 1969—to assess and review the implications of the LOS Convention for U.S. policy against the backdrop of existing U.S. ocean programs.

In the concluding paper to this special issue, Michael K. Orbach first reviews several questions discussed by participants in the Santa Barbara symposium relating to the coherence (or lack thereof) of U.S. policy; our ability to collect and interpret scientific data in support of ocean and coastal management; the domestic organization of authority and responsibility with regard to marine policy; and the representativeness of public input, and of scientific national policies.

In addition, Orbach reviews the social, cultural, and political forces which have shaped our ocean "ethos" in the past thirty years. In particular, Orbach reviews the impact of World War II, of television programming, and of personalities such as Jacques Cousteau in raising popular awareness about the oceans; and the role of specific American scientist/academic/bureaucratic politicians in molding our ocean programs. The challenge of the 1980s, in Orbach's view, lies in filling the void left by the passing of this generation of leaders, and in changing cultural influences. Who will be the new ocean leaders, and on which cultural influences will they be able to draw?

The 1980s: A Time for Reassessment

If any one theme runs through the diverse perspectives expressed in these papers, it is that the 1980s will be a time for reassessment—reassessment of the extensive body of marine law that is already in place, as well as of the implications of the changing international management regime. Most of the authors agree that the regulatory framework established by Congress in the 1970s is here to stay; and that the basic management tools for governing U.S. ocean resources are already in place. The 1980s will thus primarily be a time of tinkering, of readjusting, of coordinating, and of meshing these tools together into a more coherent whole.

Major domestic initiatives which we are likely to see in the 1980s include establishment of a 200-mile Exclusive Economic Zone (EEZ), and expansion of the territorial sea to twelve miles, in tune with recent LOS developments. Discussion of these two initiatives will provide an excellent opportunity to reconsider the relative roles of the state and federal governments in the existing territorial sea and in the three to two hundred mile zone, and to develop better methods of interconnecting the regulatory authorities that are already in place (e.g., MFCMA, MMPA, OCSLA).

While the 1970s saw a considerable centralization of the federal role in managing marine resources, the 1980s will be a time for forging new, creative partnerships among the variety of actors involved in using, protecting, and analyzing the ocean commons—local, state, and federal governments, industry, and academia. These "creative partnerships" might take a variety of forms—joint ventures (as Botzum suggests), or more effective policy analysis (as Walsh suggests), or regional approaches to conflict management involving public and private actors, aided by neutral third-parties (as suggested in my paper). A suitable vehicle for forging such partnerships and for reassessing existing ocean policies against the backdrop of new international developments, might well be the Study Commission suggested by Knecht and Bowen in this issue.

ACKNOWLEDGEMENTS

Many thanks are due to Professor Fred N. Spiess, Director, Institute of Marine Resources (IMR), University of California at San Diego, for providing IMR resources to support the Santa Barbara symposium and for facilitating the publication of this special issue. Dr. Michael K. Orbach (University of California at Santa Cruz) was very instrumental in the conference planning, and in synthesizing the symposium discussions. His editorial assistance in the preparation of this special issue is gratefully acknowledged. Thanks are due to Deborah Sills of the Robert M. Hutchins Center for the Study of Democratic Institutions for facilitating conference arrangements. The editorial work of Phyllis M. Grifman, Marine Policy Program, UCSB, is also much appreciated.

[1]In addition to the symposium participants whose papers are included in this issue, (i.e., Don Walsh (University of Southern California), Michael Glazer (former Assistant Administrator for Coastal Zone Management and Assistant Administrator for Policy and Planning in the National Oceanic and Atmospheric Administration), John R. Botzum (Nautilus Press), and Michael K. Orbach (University of California at Santa Cruz)), other participants at the Santa Barbara symposium included: Arvid Pardo (University of Southern California and former Ambassador of Malta to the United Nations), Thomas R. Kitsos (U.S. House of Representatives), Roger Revelle (University of California at San Diego), Robert L. Friedheim (University of Southern California), Judy B. Rosener (University of California at Irvine and California Coastal Commission), Naomi Schwartz (California Coastal Commission), Jens C. Sorensen (University of California at San Diego), John Armstrong (University of South Carolina), and Professors Henry W. Offen, Dean Mann, Haru Fukui, John E. Moore, Stanley Anderson, Walter H. Capps from the University of California at Santa Barbara.

[2]The ideas contained in this paper were first presented in the form of brief, introductory comments at the Santa Barbara symposium, and later formally presented in the form of a paper at the Annual Meeting of the American Society for Public Administration in March 1982 in Hawaii.

Managing the Ocean Commons: U.S. Marine Programs in the Seventies and Eighties

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INTRODUCTION

Instead of "ocean policy," U.S. governmental actions vis-a-vis the oceans can more accurately be described as a set of sectoral marine programs concerned with the management and regulation of separate aspects of the marine environment—such as commercial and recreational fisheries, offshore oil and gas production, marine transportation, protection of vulnerable species and critical habitats.

The origin of most of these sectoral programs is of relatively recent vintage. In contrast to the 1960s when U.S. governmental actions toward the marine environment were largely confined to the promotion of marine science and engineering on the domestic front, and, internationally, to the pursuit of the Law of the Sea negotiations (U.S. Dept. of Commerce, 1978), the decade of the 1970s witnessed a veritable plethora of new regulatory and management oriented actions by the U.S. Congress. In rapid succession, in the seventies, the Congress enacted a large number of far-reaching laws separately regulating different aspects of the marine environment —e.g., the Coastal Zone Management Act of 1972 (CZMA), the Marine Mammal Protection Act of 1972 (MMPA), the Endangered Species Act of 1973 (ESA),[1] The Magnuson Fishery Conservation and Management Act of 1976 (MFCMA, or the Magnuson Act), the Outer Continental Shelf Lands Act Amendments of 1978 (OCSLA).[2]

While these Acts do not add up to a coherent national approach toward management, utilization, and protection of U.S. oceanic resources, they represent a significant increase in governmental activity in a policy arena previously characterized by limited governmental involvement. These actions are reflective of the worldwide movement toward the "enclosure" of ocean space by nation states (Friedheim, 1979), and provide the basis for domestic management of U.S. oceanic resources in areas up to 200 miles offshore.

The national marine legislative framework provided by Congress in the 1970s is largely a partial framework that deals with and regulates different marine uses separately. It is also a framework marked by internal contradiction (with different laws reflecting different value priorities and political constituencies), by intergovernmental complexity, and by administrative innovation. In its burst of legislative activity vis-a-vis the oceans, Congress spoke with many voices. In some important pieces of legislation, such as the Marine Mammal Protection Act, for example, Congress sought to unilaterally protect a distinct aspect of the marine environment—marine mammals—while in other legislative actions, such as the Magnuson Act, Congress sought to promote and develop rival aspects of the ecosystem—fisheries.

The sectoral programs enacted by Congress in the seventies also represent an innovative framework whose implementation within a complex and segmented intergovernmental system has demanded extensive organizational adaptation and has been marked by jurisdictional disputes and intergovernmental tensions. These programs are implemented in the context of a highly complex intergovernmental framework; authority over marine resources, in most cases, represents a delicate, constantly shifting, and often conflictive, balance among federal, state, and local governments. Reflecting also a new concern with management and regulation and with ecological theories, the marine programs enacted in the seventies pioneered novel and more holistic concepts of management (such as "optimum yield" (OY) in fisheries management, and "optimum sustainable population" (OSP) in marine mammal management). These concepts have posed an implementation challenge to narrow-mission oriented agencies whose mandates have undergone significant change.

The purposes of this paper are threefold: (1) to characterize the innovative aspects of the body of marine legislation enacted in the seventies, and to analyze the political and administrative processes involved in its passage and initial implementation; (2) to describe major changes in these political and administrative processes as a result of implementation experiences to date, within the broader context of changes which are occurring in American national political processes; and (3) to suggest emergent political and administrative challenges these marine programs will face in the 1980s. One of our greatest challenges, I believe, will be how to manage conflicts over the use of the ocean commons—conflicts which are occurring, with increasing frequency, among ocean users, agencies, and levels of government.

ENACTMENT OF MARINE PROGRAMS IN THE SEVENTIES

Prior to the enactment of these marine laws in the seventies, the political subsystem governing the use of marine resources (here I am referring primarily to the fish and wildlife management area[3]), could be character-

ized as largely state-dominated, with the federal government playing a limited, primarily service oriented, role. Conceptions of "management" during this time were relatively narrow and rested primarily on biological considerations, such as "Maximum Sustainable Yield" (MSY) in fisheries management (which basically calls for consideration solely of the effects of a given harvest on the ability of a harvested species to replenish itself).

Relationships among entities in this political subsystem represented a relatively "closed system" of interactions among a narrow number of interests, linking state wildlife management agencies with federal agencies such as the National Marine Fisheries Service and the U.S. Fish and Wildlife Service, with the relevant congressional committees, and with interest groups such as fishing, hunting and wildlife management groups. These "subgovernments" (as political scientists describe them [Lowi, 1969]), operated relatively independently from one another—i.e., a particular subgovernment network existed for commercial fisheries, another for recreational fisheries, yet another for marine mammal management, and so on. These decision processes were largely insulated from external political forces, enjoying policy autonomy and control over their substantive areas of jurisdiction.

With the passage of the 1970s legislation, we witnessed considerable change in the structure and operation of these political subsystems. New interest groups became politically active, the relationship among levels of government underwent significant redefinition, and new management concepts were brought to the fore. The sections below first describe the major characteristics of the marine laws passed by Congress in the 1970s, and subsequently discuss the political forces providing the impetus for this legislative activity.

Major Characteristics

Four major themes characterize the marine laws enacted by Congress in the 1970s: (1) increase in the scope of governmental activity; (2) a sectoral orientation, or a use-by-use approach, (3) centralization of functions and enhancement of the federal role, and (4) the introduction of innovative management concepts and structures.

An Expanding Governmental Role

A number of the laws enacted in the 1970s represent significant increases in the scope of governmental activity—either by expanding existing governmental roles or by creating essentially new functions. The Magnuson Act, for example, created an entire new zone to be managed under U.S. control—the fishery conservation zone (FCZ) composing an area of over two million square nautical miles, within which are found 15 to 20 percent of the world's traditionally harvested marine fishery resources (U.S. Department of Commerce, 1981). Fisheries found in this area had previously been unmanaged or only partially managed by the states and by international organizations. The Coastal Zone Management Act, in effect, added a new function which had not been performed previously: planning for the coastal zone through federal assistance to the states. The Endangered Species Act enlarged the scope of governmental activity in the protection of endangered species by proclaiming the government's affirmative duty not only to protect these species, but to restore endangered species and their habitats to a healthy condition. The Marine Mammal Protection Act significantly increased the scope of governmental protection of marine mammals—which had previously been only partially protected by the states or by international treaties. In response to energy shortages in the early seventies, the Outer Continental Shelf Lands Act Amendments called for more aggressive management of U.S. outer continental shelf (OCS) resources through a more elaborate system of planning, increased industry competition, and tightened environmental controls.

A Sectoral Approach

This body of marine law is sectorally oriented and reflects a use-by-use approach.[4] Each marine resource or use (e.g., commercial fisheries, marine mammals, oil and gas operations) is managed under separate statutory authority by different agencies with specifically defined missions. This fragmented management approach is in contrast to the ocean system itself, which is marked by a high level of interaction among resources and processes—each resource dependent on another in the complex food chain web. Fisheries and marine mammals, to cite only one example, are naturally and inevitably interconnected with one another in the marine ecosystem as predator and prey.

Because such marine resources are inevitably interconnected, the laws which unilaterally regulate them (the MMPA, ESA, and MFCMA) are increasingly coming into conflict with one another as their implementation proceeds (Cicin-Sain, Grifman, and Richards, 1982). Yet, we find that these interconnections were largely ignored during the legislative passage of the three Acts. For example, with the exception of the tuna industry, fishing groups played a very limited role in MMPA and ESA deliberations. Similarly, environmental groups concerned with marine mammals and endangered species showed little interest in the passage of the Magnuson Act. Instead, in each area, a separate subset of actors played dominant roles (Cicin-Sain and Manning, forthcoming).

Enhancement of the Federal Role

The increased scope of governmental activity brought about by these Acts involved primarily an enhancement of the federal role, and a steady centralization of functions at the national level. The Magnuson Act established a new regional management structure, under federal control, to manage the new 200-mile zone. The Endangered Species Act and the Marine Mammal Protection Act (the latter in particular) wrested control away from the states and established federal supremacy in

the protection of marine mammals and endangered species, engendering intensive intergovernmental conflict in the process. Although oriented toward the states, the Coastal Zone Management Act nevertheless established a strong federal presence in the coastal zone by offering tangible incentives to the states to implement coastal zone planning goals established at the federal level. While the OCSLA strengthened the role of the states in the oil and gas leasing process, the basic thrust of these Amendments was to reaffirm and more carefully define the federal supremacy over OCS resources previously established by the Outer Continental Shelf Lands Act of 1953.

It is interesting to note that while Congress was strengthening the Federal role in the marine environment through the passage of these Acts, in other domestic policy areas an opposite trend was taking place—i.e., devolution of authority to state and local levels of government. The period that coincides with the passage of most of these marine acts (1972-76) corresponds to the period of Nixon's "New Federalism," marked by a significant reduction of the strong federal presence in the nation's cities established by the Great Society programs of the 1960s (Reagan and Sanzone, 1981).

As discussed later, the centralizing trend in the marine arena occurring within a general context of decentralization of domestic programs can partially be accounted for by the fact that ocean initiatives came from the Congress and not from the Presidency, which was the catalyst responsible for the decentralization thrust. The disjuncture between trends in the marine arena and dominant domestic trends, however, also suggest that the marine policy arena tends to "lag" behind other areas of policy, and that it catches up with dominant trends only after a certain "lag time" has elapsed. For example, it is only now, ten years later, under the second "New Federalism" (President Reagan's) that decentralization has become an important topic of concern among marine specialists.

Although the essential thrust of these marine laws was to centralize regulatory functions at the federal level through a use-by-use sectoral approach, most of these Acts also contained provisions delineating explicit roles for the states, as well as provisions which could be used to affect the operation of other marine sectors. The following are major examples of such provisions, in chronological order of enactment.

The "consistency" provision of the Coastal Zone Management Act (Section 307) gave states leverage over federal activities within or affecting the coastal zone by requiring that certain types of federal actions be conducted in a manner which is consistent with the provisions of state coastal zone management plans approved by the Department of Commerce. While the Marine Mammal Protection Act preempted state management of marine mammals and gave the federal government protective control over these species, the MMPA also provided opportunities for states to regain authority taken from them under certain conditions. The ESA contained a "novel and initially little noticed provision" (Bean, 1977: 403) that ultimately proved to be its most potent weapon—Section 7, which called for other federal agencies and departments to insure that their actions do not jeopardize the continued existence and habitats of threatened or endangered species. While the Magnuson Act gave the federal government ultimate control over fishery resources, it also established a complex system of regional decision-making for fisheries management in which the states have extensive input. Although federal preemption of state fishery activities in the territorial sea (the area of state jurisdiction) is possible under Section 306(b)(1) of the Act, this is permitted only under certain, rather stringent, conditions. Through Section 19, the Outer Continental Shelf Lands Act Amendment provided for a variety of opportunities for state review of the OCS leasing process.

As we shall see, differing use of these provisions by state and federal implementing agencies and the courts have yielded different patterns of state-federal interactions in different marine sectors.

New Management Concepts and Structures

In contrast to previous government mandates in the ocean area which stressed a service, and not a regulatory role (i.e., the collection and dissemination of information such as fishery statistics), all five of the Acts mentioned (CZMA, MMPA, ESA, MFCMA, OCSLA) clearly represent *management* and *regulatory* actions. They establish procedures to regulate activities in the oceans and coastal zone and to affect the behavior of other parties (state governments, direct users, the public). In addition to this general management and regulatory orientation, a number of these laws reflect innovative management concepts and structures. The Magnuson Act, for example, called for a new mode or philosophy of management much broader than the biologically oriented theory of "maximum sustainable yield" (MSY) on which most fishery management practices had previously been based. In contrast to the narrow biological basis of MSY, implicit in the Magnuson Act is a more holistic view of management which considers the entire ecosystem, including the human system which is involved in the exploitation of fishery resources. For example, the Act calls for "managing stocks throughout their range," and for "multispecies management" (considering the ecological relationships among species). Concern with the human systems involved in the exploitation of fish stocks and with equity questions pervades the Act. The central concept of "optimum yield" (OY) for example, is meant to ". . . provide the greatest benefit to the nation . . ."; if allocations of fish need to be made, such allocations must be "fair and equitable to all (such) fishermen;" if limiting entry to a fishery is considered, the social, economic, and cultural implications must be taken into account. Resources, moreover, must be managed using the "best scientific data available," in a cost effective manner avoiding "unnecessary duplica-

tion," and which allows for "a multiplicity of options in regard to future use." In addition to pioneering a novel theoretical approach to management, the Magnuson Act ushered in innovative structures of management, in the form of regional fishery management councils involving state, federal, public, and user group involvement. These councils represent an unusual experiment in federalism, without easy analogue in other policy arenas (Rogalski, 1980).

A more holistic approach to management was also evidenced in the MMPA and ESA, both of which reflect strong ecosystemic orientations.[5] With these two Acts, the federal government moved from a smattering of ad hoc legislation on a species-by-species basis to comprehensive policies which protect entire categories of species (marine mammals under the MMPA, and threatened and endangered species under the ESA). In contrast to previous harvest-oriented management practices, which also utilized the management standard of "maximum sustainable population," these Acts stress multiple aesthetic, ethical and ecological values associated with wildlife resources. In particular, both Acts emphasize not only the health and stability of wildlife species, but more importantly, the healthy condition of the entire ecosystems of which these species form a part (Lund, 1980). The MMPA's major innovation lies in the concept of "Optimum Sustainable Population" (OSP) which implies that a well balanced ecosystem offers the greatest potential for good to the greatest variety of wildlife (Bean, 1977). The ecosystemic orientation of the ESA is reflected in the concept of "critical habitat," in which ecosystems critical for the health of endangered species are protected. While ecosystemic orientations are thus clearly evidenced in both the MMPA and the ESA, the concept of "ecosystem" in these two Acts, unlike that in the Magnuson Act, tends to exclude man as a participant in the system.

As discussed later, these novel management concepts were to pose major adaptation challenges to the narrow-mission oriented agencies charged with their implementation. Agencies such as the National Marine Fisheries Service and the U.S. Fish and Wildlife Service were to face significant changes in their agency mandates and roles.

The Initial Political and Administrative Context

Enactment of the marine legislation of the 1970s was embedded within a political and administrative context marked by an active Congress with a powerful subcommittee structure; little attention on the part of the Presidency; single-issue oriented groups organized according to marine sector; the rise of the environmental movement; administrative agencies with narrowly-defined missions and science-oriented personnel; and jurisdictional struggles between different agencies and levels of government.

The Roles of the Congress and of the Presidency

As Thomas R. Kitsos (1981) points out in a paper prepared for the Santa Barbara symposium, the body of marine legislation enacted in the seventies was spearheaded in the U.S. Congress, not in the executive branch, by a handful of congressional actors committed to the oceans. This was a period which witnessed a highly active and reform-minded Congress. During this time, Congress experienced a number of significant changes in its organization; perhaps most striking were the loss of traditional power for full committee chairmen, the growth in congressional subcommittees (which grew from 257 in 1970 to 299 in 1975) and the growth in staff (from about 5,000 to 7,000 for House members, for example), marking a great increase in the professional competence and expertise available to lawmakers (Patterson, 1978). Key members of Congress with an interest in the oceans (such as Stevens (Alaska), Pell (Rhode Island), Hollings (South Carolina), and Magnuson (Washington) in the Senate; and Dingell (Michigan), Murphy (New York), Breaux (Louisana), and Studds (Massachusetts) in the House); lent strong, substantive leadership to the ocean programs movement, with the assistance of highly committed and competent staff in such committees as the House Merchant Marine and Fisheries Committee and the Senate Committee on Commerce, Science, and Transportation.

In contrast, the Presidency provided little overall substantive direction. With the exception of federal reorganization efforts affecting ocean matters, the three Presidents during this time (Nixon, Ford, and Carter) reflected little substantive concern with ocean affairs, each predominantly preoccupied with other areas of policy—Nixon and Ford most prominently with foreign affairs and with the domestic devolution of federal functions to state and local governments; Carter with the forging of comprehensive urban and energy policies.

Kitsos (1981) attributes the sectoral or piecemeal nature of this legislation to "the proliferation of points of access that existed in the Congress" coupled with a variety of contextual factors external to the Congress—the growing power of environmental groups, the resource and energy crisis which led to strong pressures for domestic energy production, and the growing conflict between developmental and environmental values. In this context, single issue groups representing different value positions (some favoring development, others, conservation), utilized these "multiple points of access" and the growing number of congressional subcommittees to prevail in separate battles.

New Interest Groups

In this process, each marine sector witnessed a broadening of interest group participation. For example, in debates over the ESA and MMPA, ecologically oriented environmental interests such as Friends of the Earth, Defenders of Wildlife, Society for Animal Protective Legislation, Committee for Humane Legislation, and En-

vironmental Defense Fund participated in the legislative process, in addition to the more established, traditional wildlife management groups such as the National Wildlife Federation, World Wildlife Fund, Wildlife Society, and the Wildlife Management Institute (Cicin-Sain and Manning, forthcoming). The newer environmental groups—representative of the mushrooming environmental movement of the early seventies—added new concepts of ecology and of the aesthetic and moral value of wildlife resources to older notions of conservation held by hunting and sports-oriented groups (Lund, 1980). In the fisheries area, newly mobilized fishing organizations such as the National Federation of Fishermen, representing primarily coastal fishermen, joined in debate over the Magnuson Act with more established fishing groups such as the American Tunaboat Association and the National Shrimp Congress (Sloan, 1977).

While within each issue area, a broadening of outlook was taking place, there appeared to be little interaction among different marine sectors. As has already been mentioned, although marine mammals and fisheries are clearly intertwined and are now increasingly conflictive, there was little representation by fishing interests in debates over the Marine Mammal Protection Act and the Endangered Species Act. Similarly, although the energy industry is currently considerably hampered by the provisions of the ESA in its efforts to develop offshore resources, energy groups were "asleep at the switch" during the passage of the ESA, as one congressional source told us (Cicin-Sain and Manning, forthcoming).

The Fragmented Administrative Context

The federal administrative framework for implementation of these Acts was marked by frequent reshuffling of authority and jurisdiction between different Cabinet Departments, most notably, the Departments of Interior and Commerce; the creation, through reorganization in 1970, of a new civilian oceans agency, the National Oceanic and Atmospheric Administration (NOAA); and narrow mission orientations on the part of the agencies charged with implementation of several of these Acts (the MMPA, ESA, and MFCMA), most prominently, the National Marine Fisheries Service within the Department of Commerce, and the U.S. Fish and Wildlife Service within the Department of Interior.

Perennial jurisditional struggles between the Department of Interior and Commerce have characterized the organization of marine affairs in the twentieth century (Abel, 1981). The histories of the National Marine Fisheries Service and the Fish and Wildlife Service exemplify these constant shifts in jurisdiction. Since the establishment of both agencies over one hundred years ago (as the Bureau of Fisheries, an independent agency, and the Bureau of Biological Survey in the Department of Agriculture), both bureaus and their functions have been shuttled back and forth between the Departments of Commerce and Interior. By the early 1970s, the National Marine Fisheries Service (in the Department of Commerce) was primarily responsible for commercial fisheries, while the U.S. Fish and Wildlife Service (in the Department of Interior) was primarily responsible for inland and sports fisheries.

Under the MMPA and ESA, "turf fights" between the Department of Interior and Commerce were exacerbated further. The MMPA split jurisdiction between the two agencies—NMFS obtained management authority over porpoises, seals, sea lions, and whales, while the FWS obtained jurisdiction over polar bears, walruses, sea otters, and manatees. Under the ESA, while primary responsibility for implementation rests with the FWS, the National Marine Fisheries Service retains responsibility for conservation programs for endangered species over which it had previous management responsibility under other Acts (such as particular species of whales and seals, and fish such as the totoaba). Perhaps the most bizarre case of shared jurisdiction between the two agencies concerns the oft-quoted case of the endangered sea turtles; these animals are under NMFS jurisdiction when at sea, and under FWS jurisdiction when on land.

Throughout the sixties, marine affairs groups, through various reports and study commissions, clamored for the creation of an independent oceans agency. In 1970, with the creation of the National Oceanic and Atmospheric Administration and its location in the Department of Commerce (through President Nixon's Reorganization Plan No. 4), these demands were only partially fulfilled. Although a number of marine-oriented programs were transferred into the new NOAA from the Departments of Army, Navy, Interior, Commerce, and Transportation, and from the National Science Foundation, major marine programs (such as the Coast Guard) remained outside the agency's purview (Abel, 1981). NOAA's mission, according to the President's reorganization memorandum, was to be primarily concerned with "the exercise of leadership in developing a national oceanic and atmospheric program of research and development (U.S. Department of Commerce, 1978: ix-21).

Notwithstanding this primary mandate—narrowly defined in terms of *research* and *development*—throughout the seventies, the Congress, in its burst of legislative activity vis-a-vis the oceans, piled upon NOAA, like a "stack of bologna," responsibility for a large number of new *management* and *regulatory* programs—such as, the Coastal Zone Management Act, the Marine Protection, Research, and Sanctuaries Act, the Deepwater Ports Act, the Marine Mammal Protection Act, the Endangered Species Act, the Magnuson Fishery Conservation and Management Act. In the early seventies, then, NOAA, the agency charged with implementing a significant portion of the new marine legislation, could not at all be considered a coherent oceans agency, but, instead, it could more accurately be described as an amalgam of separate "fiefdoms," "populated with veterans from other agencies whose missions—fisheries productivity, coastal mapping, weather forecasting—were fairly narrowly defined in terms of environmental services and research" (King, 1978: 46).

The new marine legislation was to pose a particularly pronounced challenge for one of NOAA's "fiefdoms," the National Marine Fisheries Service, which received implementation responsibility for the MFCMA, the ESA, and the MMPA. Traditionally, prior to the MFCMA, the NMFS had primarily performed a service role or function —collecting and disseminating biological data and other fishery statistics and providing a variety of services (such as loans for vessel construction, seafood safety inspection) to a community of users, which included the fishing industry as well as state and local governments. The new responsibilities added to NMFS under the ESA, MMPA, and MFCMA hence posed the challenge of changing the agency from a service oriented organization to a management and regulatory agency (Cicin-Sain, 1979). With regards to NMFS' political constituencies, the enlarged regulatory responsibility of the agency posed a need to establish relationships with new groups concerned with the new 200-mile zone, as well as produced strains in the agency's relationships with established constituents (segments of the commercial fishing industry) who correctly perceived the agency as changing from a role of "facilitator" to a role of "bad-guy regulator."

The ESA and MMPA posed similar organizational challenges to NMFS' rival in the Department of Interior, the Fish and Wildlife Service. Prior to the passage of these Acts, the traditional mission of the FWS centered around service to the public to encourage the use of wildlife resources and research tasks associated with the maintenance of these resources for public use. Concomitantly, the traditional constituency groups of the FWS were such groups as the National Wildlife Federation, the American Wildlife Institute, and the Wildlife Management Institute (Grifman, 1981). In the words of a harsh critic of the FWS, Lewis Regenstein, "the Interior Department has no rivals in its role as the nation's most enthusiastic booster of sport hunting" (Regenstein, 1975: 44). In contrast to traditional FWS programs designed to provide recreational opportunities to the public, the agency's mandates under the ESA and MMPA to protect wildlife resources now often constrain public use and preclude recreational activities such as hunting and fishing. The FWS has thus been faced with the challenge of implementing the novel ecosystemic orientations contained in the ESA and MMPA, responding to new environmental constituencies which are often politically at odds with traditional sports and hunting clients.

CHANGES IN POLITICAL AND ADMINISTRATIVE PROCESSES THROUGH IMPLEMENTATION

Not much time has elapsed since the passage of the marine legislation of the 1970s. Nevertheless, we can discern some changes which are occurring as a result of implementation—changes which necessarily condition consideration of future challenges. Discussion of specific changes occurring in the marine policy arena also need to be embedded in the context of changes which have taken place in recent years in the American political system itself, particularly in the operation of Congress and the Presidency—changes which considerably influence implementation processes.

The Changing National Political Context

Congress was not only a major initiator of the marine programs of the seventies, it was also a major actor in the process of interpretation and implementation of this body of legislation, through its oversight, appropriations, and re-authorization capacities. In tune with the Congressional trends mentioned earlier (e.g., rise in the number of subcommittees and of congressional staffs), in the seventies, Congress spent an increased amount of time in oversight of administrative agencies—from 39 percent in the 91st Congress (1969-1970) to 54 percent in the 94th Congress (1975-1976) (Patterson, 1978). This oversight function was particularly evident in the marine area, which saw frequent oversight hearings on the implementation of these Acts, as well as significant amendments to several marine laws—such as to the Coastal Zone Management Act (in 1976), the Magnuson Act (in 1978), and the Endangered Species Act (in 1978). This oversight function was aided in the seventies by four congressional support agencies whose staffs and functions grew during this period—the Congressional Research Service, the General Accounting Office, the Congressional Budget Office and the Office of Technology Assessment—all of which frequently issued critical analytical reports on marine programs.

Several current developments may work to reduce the congressional role in the formulation and implementation of marine programs. First is the loss of a number of key congressional marine policy leaders such as Senator Magnuson from Washington (the author of the Magnuson Act), and Congressman Murphy from New York (former chair of the House Merchant Marine and Fisheries Committee). The second is the current application of the Congressional Budget and Impoundment Control Act of 1974 (P.L. 93-344), particularly its "reconciliation" provision. The 1974 Budget Act is being used by the Reagan Administration as a strong centralizing tool to counter the traditional power of authorizing committees to protect their programs. Reconciliation gives the budget committees in each chamber the power to pre-empt any authorizing committees that defy the budget ceilings established by the budget committees. Through the reconciliation process, marine authorizing committees are witnessing an erosion of their "substantive" authority, through significant cuts in such favorite programs as the Coast Guard and Public Health Service benefits to fishermen (Kitsos, 1981).

Changes in the functioning of the Presidency, too, have and will continue to affect the implementation of marine programs. As Greenstein reports, the rapid turnover in the Presidency since 1961 represents the most drastic and rapid alteration in the way this institution has functioned. While in the thirty-one years between 1930 and 1961, three formative presidents held office for the

equivalent of seven, four-year terms, in the twenty-one years since 1961, six presidents have been in the office for the equivalent of just over five, four-year terms (Greenstein, 1978). The instability of the Presidency, of course, brings instability and paralysis to the federal bureaucracies—as new political appointees are designated, installed, begin to learn about the functioning of their agencies, and, most likely, prepare to reorganize agency functions. This transition process generally takes approximately eighteen months, a time during which little more than routine functions take place in the bureaucracy—as civil servants inevitably take a wait-and-see attitude. During election years, moreover, one can expect bureaucratic paralysis to occur for six to twelve months before the election as political appointees hedge their bets on election outcomes.

The rapid turnover of the Presidency in the last decade has significantly affected the implementation of such marine laws as the Magnuson Act. In the six years since its enactment, in March 1976, implementation of the Act has been affected (and inevitably slowed down) by changes in two presidential administrations (Carter and Reagan) and by two extensive reorganizations of the implementing agency, NOAA. During the first go-around in the Carter Administration, new political leaders in the agency were not fully in place until approximately twenty-one months after President Carter took office. In the current go-around, a major reorganization plan for the agency was announced in February, 1982, thirteen months after President Reagan's inauguration (Ocean Science News, 1982).

Additional political changes which influence the implementation of these marine acts are the climate of fiscal uncertainty created by budget cuts proposed by the Reagan Administration, the Administration's new thrust in development of offshore energy resources, and its "'New' Federalism" proposals for returning program responsibilities to state and local levels of government. The battle of the budget for FY82 and FY83 has added turmoil and paralysis to marine bureaucracies, most prominently to NOAA, through proposals to significantly reduce CZMA, Sea Grant and fisheries budgets. Through the appointment of James G. Watt as Secretary of the Interior and its announcement in 1981 to accelerate inventory and development of hydrocarbon resources offshore, the Reagan Administration signaled its intent to give priority to developing one aspect of the marine environment: oil and gas production, in order "to reduce our dependence on uncertain and costly foreign energy supplies" (U.S. Dept. of the Interior, 1981). Finally, the Reagan Administration's proposals for returning functions to state and local authorities and for forging innovative relationships with the private sector under the New Federalism, call into question the steady centralization thrust which the marine policy arena witnessed in the seventies.

Changes Through Implementation

In the changing political and administrative context of the seventies and eighties, the implementation of marine programs has been accompanied by at least three major changes which structure and condition future challenges in this policy arena. First, the expansion of government's regulatory role over separate aspects of the marine environment and the challenge of innovative management theories is bringing about extensive changes in the operation of the science-oriented marine bureaucracies—organizational adaptations which are still very much in the process of evolution. Second, regulatory expansion also significantly increased the extent of inter-agency and intergovernmental contact, particularly at the regional level where marine uses actually intersect physically. Third, increased governmental regulation brought with it increased politicization of affected groups—heightened mobilization on the part of existing groups whose actions became subject to increased regulations, and on the part of new groups which mobilized to take advantage of new opportunities. Overall, all of these changes have meant a broadening of political and administrative processes in this area—from the narrow and predictable set of subgovernment relationships described earlier to wider, more diffuse, and more interconnected relationships among actors in different marine sectors. Each of these changes is briefly illustrated below.

Agencies "Coping"

Within the context of rapid administrative turnover and growing fiscal constraint, implementing agencies are coping with the challenges posed by the new marine legislation. Given space limitations, I will confine my observations here to major organizational challenges faced by NOAA in the implementation of new mandates under the Magnuson Act, the ESA and the MMPA. NOAA's major organizational challenges, in my view, were threefold: (1) how to create the complex new process of regional decision-making for fishery management, as called for in the Magnuson Act; (2) how to instill a new management orientation in its sub-agencies which were dominated by a scientific and service ethos; and (3) how to integrate its constituent "fiefdoms" into a coherent oceans organization. Much of the administrative burden for implementing these challenges initially fell on a new team of environmental attorneys which replaced most of the scientists at the higher levels of the bureaucratic hierarchy in the Carter Administration, who were, in turn, subsequently replaced by scientists under the Reagan Administration.

The challenge of creating the complex regional system called for in the Magnuson Act absorbed much of the agency's energy during the latter part of the seventies and, according to most estimations, proved to be a successful endeavor. Notwithstanding an arduous implementation course fraught with multiple interpretation decisions by multiple actors at multiple points in the system, approximately two years after enactment (1978), the new structural system had successfully been put into place. A new regional structure was operative and a new process of management and decision-making was

creating new modes of agency, interest group, and public interaction at the regional level (Orbach and Cicin-Sain, 1982).

In terms of the second challenge, instilling a new management orientation, here the agency faced a more difficult task. Taking the National Marine Fisheries Service as an example, at the time of the passage of the Magnuson Act, over half of the human resources of this largely decentralized organization were lodged in regional research centers and laboratories on the coasts. At these research centers, highly trained fishery biologists were predominantly engaged in research on fish population dynamics, and in experiments, model building, and predictive analysis. These scientists operated much like academics in a university setting, with the existing incentive structure rewarding specialized research and publication of articles in specialized journals. Among the small part of the national NMFS staff concerned with management, with some notable exceptions, a limited view of management prevailed. "Management" was construed largely as a regulatory regime which specifies "who gets to fish where and with what methods." Broader questions such as port development, availability of processing facilities, socio-economic impacts of fishery management decisions on fishermen and on coastal towns and communities, and habitat protection, were not, by and large, considered part of the "management" definition (Cicin-Sain, 1979).

The new leadership attempted, with varying degrees of success, to meet this organizational challenge through a variety of measures. First, through reorganization; fishery activities were reorganized and given a more prominent status within the parent organization. Similarly, new offices of Marine Mammals and Endangered Species and of Habitat Protection were created to give more prominence to these activities. A few social scientists were hired, primarily in the regions, to help interpret the new socio-economic requirements of the Act; several contracts for the collection of socio-economic data were let. Numerous meetings aimed at operationalizing such concepts as "optimum yield" and "limited entry" were held. New policy analysis offices were created in both NOAA and in the National Marine Fisheries Service.

The organizational style of the agency, however, continues to be in a process of evolution and role definition. While significant strides were made under the Carter Administration to change the character of the organization from a "service" mode to a "regulatory" mode, to correspond to its newly acquired management mandates, under the current Administration, the agency appears to be going back to a "service" orientation. In his recent announcement of NOAA's reorganization, the new scientific Administrator of the agency, John Byrne, stressed that NOAA was a "Service," rather than a "resource management," agency (Ocean Science News, 1982).

In terms of the third challenge, NOAA faced the task of blending the perspectives of its separate "fiefdoms" into a coherent oceans approach. A case illustrating such a challenge involved two NOAA elements, NMFS and the Office of Coastal Zone Management (OCZM, which implements the Coastal Zone Management Act). To fully implement the broad view of management implicit in the FCMA, the complementary perspectives of these organizations needed to be blended together. NMFS was basically a unipurpose agency (fish oriented), federal control oriented, and sea oriented. OCZM, on the other hand, was multipurpose (concerned with all uses of the marine environment), state oriented and, up until recently, oriented toward coastal lands planning, rather than coastal waters planning. To implement a broader view of management, NMFS needed to become oriented toward the nearshore and shoreside aspects of fishery management, while OCZM needed to become more sea oriented and to recognize the importance of fishing as one of the primary uses of the marine environment.

As is discussed in the concluding section of this paper, notwithstanding the expectations of reorganization advocates—who often assume that just putting agencies under the same organizational roof will result in the creation of a comprehensive "oceans" orientation—such a merger of perspectives is very difficult to attain because of significant differences which exist between agencies such as NMFS and OCZM in their bureaucratic ethos, in their constituencies, and in the characteristics of their personnel. Differences in personnel, in my view, presented the most difficulty in this case. The two organizations were staffed by very different types of professionals—posing an almost classic case of confrontation between the "specialist" and the "generalist." The prototypical fishery agency employee tends to be a specialist who has often gone up through the agency ranks (either at state or national levels) and who has intimate and highly expert knowledge of one aspect of the marine environment—fisheries. (This is due, in part, to the highly specialized and complex nature of the subject matter; fish management is not something that can generally be learned overnight). Coastal zone agencies, on the other hand, tend to be staffed by younger professionals, most of them generalists rather than specialists, many with an urban planning background who have transferred these skills to the marine area. These generalists tend to bring a broader view of the marine ecosystem, yet they also tend to lack intimate knowledge of any one of its parts (Cicin-Sain, 1979).

Such differences among sub-agencies within a parent agency such as NOAA pose serious obstacles to the formulation of a unified agency ethos. These differences must be understood, and fully addressed, by the top decision makers, as simple reorganization of agency functions will certainly not work as a panacea.

Growing Intergovernmental Complexity

As different federal agencies began to implement their

respective mandates over separate parts of the marine environment, these actions became increasingly connected at the regional level with the actions of other state and federal agencies implementing different legislative mandates over other marine resources. Hence, during the seventies and early eighties, interagency and intergovernmental interactions inevitably grew in extent and complexity.

As discussed earlier, these interactions were structured by a variety of factors: delicate state/federal relations as a result of the expansion in the federal role; federal agencies with legislative mandates giving priority to different aspects of the marine environment (e.g., energy vs. fisheries vs. marine mammals); limited jurisdiction on the part of most agencies (i.e., authority over only one marine sector); federal agencies with a history of jurisdictional disputes; and the availability of a number of mechanisms through which state and federal agencies within a single marine sector could influence each other, or in some cases, influence the operation of other marine sectors (e.g., CZMA's "consistency" provision, ESA's section 7, OCSLA's section 19). These increased intergovernmental interactions have resulted in different patterns of state/federal relations—ranging from what might be termed "Cooperative Federalism," to "Conflictive Federalism," to "Adversary Federalism."

"Cooperative Federalism"—which, as the name implies, denotes good working relationships between state and federal levels—generally characterizes fishery affairs and the implementation of the 200-mile limit. As discussed earlier, while the Magnuson Act centralized federal authority, it also provided for a considerable management role for the states through their direct involvement on the regional councils and as support agencies in the development of fishery management plans. NMFS, moreover, through such mechanisms as its State/Federal initiatives, and periodic policy meetings with state fish and wildlife directors, has consistently promoted good working relations with the states. The NMFS policy of enhancing state/federal relations is also evidenced by the fact that section 306(b) of the MFCMA (allowing for federal preemption of fisheries in state waters), has not, to my knowledge, ever been actually invoked.

"Conflictive Federalism," on the other hand, characterizes state/federal relations in the management of marine mammals and endangered species. As discussed earlier, the ESA and the MMPA (the latter, in particular) wrested management control over these species away from the states at a time when at least some of the states (such as California and Alaska) thought that they were already adequately protecting these species. This preemption of jurisdiction has resulted in continued conflict between the states and the federal government over issues involving the management of marine mammals and endangered species. While both California and Alaska petitioned for return of management control over specific marine mammal species under the MMPA, neither effort has yet been successful.

"Adversary Federalism" clearly characterizes federal/state/local relations as well as relations between federal agencies in the offshore energy development area. The accelerated leasing of offshore hydrocarbon resources by the Department of Interior has been met with opposition from other federal agencies (such as NOAA and the Fish and Wildlife Service), through the use of such mechanisms as Section 7 of the ESA and the "consistency" provision of the CZMA. More importantly, in some states such as California, the actions of the Department of the Interior have been met with concerted political opposition and legal challenge by a coalition composed of state government agencies, government officials from local coastal communities, and environmental groups. The hostile and litigious nature of these interactions is so pronounced that I fail to find suitable analogues in other policy arenas.

While a full discussion of the reasons for such divergent patterns of federalism interactions lies beyond the scope of this paper, it would appear that good state/federal relations within a single marine sector can best be attained when specific structures for achieving such intergovernmental cooperation are explicitly created, such as in the regional councils under the Magnuson Act. Even in such cases, however, agency personnel at both state and local levels express frustration at the limits of their jurisdictions, which prevent them from fully addressing management problems such as the management of salmon resources which span several governmental jurisdictions.

It appears that conflictual federalism interactions among marine sectors are inherent to the sectoral, use-by-use approach, in which no mechanisms for resolving conflicts among multiple uses are readily available. Unfortunately, the few mechanisms for inter-sector connection which are available (such as the "consistency" provision of the CZMA and ESA's section 7)—like "tentacles" spreading into other marine sectors—are inevitably cast in an adversary and litigious light. Such provisions are aimed at preempting other activities, not at constructive and cooperative intergovernmental action.

Increased Politicization

Implementation of marine laws in the seventies also witnessed increased political mobilization on the part of marine oriented groups. To cite only one example,[5] commercial fishermen in the last decade experienced a significant increase in political organization, participation in government decision-making (in agency meetings, public hearings, and the like), and a marked increase in political knowledge and sophistication.

Whereas prior to the seventies, coastal fishermen were largely unorganized or only partially organized on a port-specific basis, in the seventies, they became organized at regional and national levels. Debates over the 200-mile limit that led to the enactment of the Magnuson Act, for example, served to catalyze the organization of fishermen at the national level through the creation of a

new national lobby—the National Federation of Fishermen (Sloan, 1977). Once the regulatory regime was established, new regional organizations, such as the Pacific Coast Federation of Fishermen's Associations, Inc., arose to represent a coast-wide perspective to the new regional councils. Participation by fishermen in agency proceedings, public hearings, congressional hearings, grew correspondingly during this period (Holland, 1979).

Similarly, trade journals serving the fishing community, such as *National Fisherman* and *Fisherman's News* considerably changed the nature of their coverage: from a primary focus on industry-related items such as advances in gear development and boat building to a strong emphasis on industry-government relations and on evaluations of the new regulatory regime (Silva, 1982). New regional trade journals oriented to the analysis of public/private interactions, such as *Pacific Fishing*, were created. Newsletters covering current government and industry developments, such as *PCFFA's Friday* (the weekly newsletter of the Pacific Coast Federation of Fishermen's Associations, Inc.), *Seafood Chronicle* (the newsletter of the West Coast Fisheries Development Foundation, a newly formed development group), and the *Federal Fisheries Review* (covering *Federal Register* notices of interest to the fishing community), emerged.

The seventies witnessed not only increases in organization and in political participation on the part of commercial fishermen, but in their political knowledge and sophistication as well. This is clearly evident in longitudinal studies of the abalone fishery which we have conducted since 1975 in California.[6] Whereas at the outset of these studies, these fishing groups were only beginning to become organized through such organizations as the California Abalone Association (which enjoyed limited access and success in its efforts to influence government), the intervening years have witnessed remarkable political learning, and marked increases in political sophistication. This is quite evident in the current abilities of such organizations as the California Abalone Association and the Save Our Shellfish Group (an organization formed in 1980) to attract the attention of regional, state, and national decision-makers on the needs of their groups; to access national publications such as *Marine Mammal News;* to maximize sympathetic coverage in the local media; and to raise revenues from private sources. Similarly, while seven years ago, such groups looked askance at socio-economic research (such as our initial study), realizing government's reliance on research and policy studies, these groups are now, themselves, carrying out socio-economic studies.

Marine Politics in the 1980s: A Less Predictable Political Equation

All of the changes that we have discussed—the expansion in the governmental role, the introduction of more holistic management theories, the mobilization of new groups, changes in administrative agencies, and growing intergovernmental complexity—coupled with changes which are occurring in larger American political and administrative processes, have conspired to provoke profound changes in the relatively simple subgovernment interactions among interest groups, congressional committees, and administrative agencies which predominated in each marine sector prior to the 1970s. As a result of these developments, actors in each marine sector are now broadening their scope and are more frequently interacting with (as well as attempting to influence) the operation of other marine sectors. Interactions among the sectors are occurring with increasing frequency—most prominently at the regional, rather than at the national level, because it is at the regional level that users physically intersect and the regulatory framework inevitably clashes.

This broadening of outlook—which, in fact, has been forced on these actors by the superimposition of a federal sectoral management framework on an interactive marine environment—is multifaceted and difficult to document precisely. Yet, its manifestations are everywhere. Increased interconnections among marine sectors are becoming increasingly evident at many levels—in Congress, at regional hearings, in publications, in policy conferences. One can point, for example, to recent (1981) congressional oversight hearings on the Outer Continental Shelf Lands Act Amendments, in which groups representing many different marine sectors (fisheries, oil and gas development, marine recreation, protection of critical habitats) gave testimony, and compare this to the limited inter-sectoral participation that prevailed in congressional debates of marine Acts in the early seventies. One could also note the impressive coverage of oil and gas developments and mariculture and habitat enhancement affairs that permeates the newsletter of the Pacific Coast Federation of Fishermen's Associations, Inc., *PCFFA's Friday*, which at first was largely confined to regulatory commercial fishing actions. Or, similarly, one could observe the extensive coverage of oil and gas developments in *The Otter Raft*, the California publication devoted to sea otter protection. Finally, one could point to the 1982 annual meeting of the National Coalition for Marine Conservation (perhaps the major group representing sports fishermen at the national level) and note that—in contrast to previous years during which the conference theme was narrowly focused on the management of prized sports species, such as striped bass and sciaenid resources such as spotted seatrout—this year's theme was focused on "conflicts and controversies" among different uses of the marine environment.

This broadening of scope and increased interaction with other sectors creates a much more fluid, shifting, and less predictable political situation, in which different sectoral actors (predictable and stable actors in their own issue areas) move in and out as relevant actors in other marine issue areas, complicating the outcome calculus. Political outcomes will thus be less predictable and will be conditioned on the actions of a much broader

ange of participants. This unpredictability will exacerbate problems of governance, to which we now turn.

CHALLENGES FOR THE 1980s: THE PROBLEM OF GOVERNANCE

Looking ahead to challenges that marine programs will be facing in the 1980s, problems of governance loom most prominent. Notwithstanding changes in direction under the Reagan Administration, it appears that the regulatory framework established by Congress in the seventies will continue, in the eighties, to provide the basic tools for domestic management of U.S. oceanic resources up to 200 miles offshore. This regulatory framework, however, represents a limitied sectoral approach which operates in the context of a complex intergovernmental mosaic and of an increasingly politicized environment. As such, it is a framework increasingly marked by conflict—conflict among marine users, conflict among implementing agencies, and conflict among levels of government.

The current marine management framework resembles, in many ways, the management of people and land resources in urban areas through single purpose special districts. As is well known, tools for metropolitan governance (i.e., special districts) are noted for problems of fragmentation, overlapping jurisdictions, conflicts among units, political invisibility, and low political accountability. Management of the marine environment essentially through a series of overlapping special districts is particularly problematic, for a number of reasons related to the characteristics of marine resources. First, marine resources are highly interconnected and interactive. Certainly, anadromous fish that swim from inland waters to the high seas and back do not respect established divisions of governmental jurisdiction. Second, because marine resources are interconnected, so are the users of those resources. Direct uses (such as commercial fishing, recreation, transportation, energy production) interact with each other spatially. These interactions must be managed when they pose threats to public order and safety. Third, because most marine resources are common property, the rights of non-direct users also need to be taken into account in marine decision-making.

Assuming that the existing management framework is not likely to undergo significant change in the next decade, the most important challenges of governance, in my view, are twofold: (1) how to manage conflicts in the marine environment in the absence of a "general purpose" government, and (2) how to insure public accountability in the management of common property marine resources.

Under the current sectoral approach, conflicts among sectors are, unfortunately, increasingly being arbitrated only by the courts. To circumvent the growing trend of conflict resolution through lengthy and expensive adversarial proceedings, new methods of conflict management will need to be developed. This will require exploring and testing new methods of achieving inter-agency and intergovernmental cooperation, of public/private interface, and of third-party conflict resolution techniques, such as environmental mediation (Cicin-Sain, 1982).

With regard to political accountability, two major problems need addressing. First, while within each marine sector, opportunities for interest group and public input are generally available, the complexity of the intergovernmental framework and the overlap or lack of clarity in jurisdictional authority, can make it difficult for the public to understand and to access existing decision-making processes. Second, no opportunities exist for the public or for interest groups to make trade-off decisions *among* different marine uses. Because resources are managed on a case-by-case sectoral approach, few opportunities, if any, exist for debating overall priorities and goals.

Where will the impetus for addressing these challenges come from? In my view, solutions to these challenges in the coming decade are more likely to emerge at the regional level than at the national level. While Congress played the leadership role in formulating the original regulatory thrust, it is not likely that Congress will play a prominent role in forging new legislative approaches in the 1980s. Congress will, most likely, tinker with and refine existing sectoral policies. As discussed earlier, the Presidency is not likely to focus much attention on this arena of policy.

Although reorganization of federal agencies to cope with problems of governance and to coordinate sectoral policies is often viewed as a panacea, this approach offers only limited solutions. Even under the best (and highly unlikely) scenario of federal reorganization—creation of an independent oceans agency incorporating more ocean functions than are currently housed at NOAA—the same problems of attaining cooperation among agencies would still remain, although perhaps on a lesser scale. Coordination would still need to be forged with other state and federal agencies which no doubt would remain outside the purview of the "new oceans agency;" separate sub-agencies within the parent ocean agency would still need to be integrated.

The impetus for addressing these challenges in the near future, in my view, will emerge from the regional level, because it is at this level that resources and users are inevitably interconnected. It is at the *regional* level that users and actors must find ways of dealing with each other and of reckoning with the complex and fragmented regulatory framework. Necessity, after all, is the mother of invention. In the 1990s, no doubt, the national government, once again, will need to focus its attention on problems of variability, inter-regional disparities, and spill-overs which inevitably seem to accompany more local approaches to resource management.

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NOTES

1. Although the ESA is not explicitly oriented toward marine species and affords general protection to all endangered and threatened species (whether on land or at sea), this Act has had wide-reaching application to marine species such as whales, seals, and sea otters.

2. Other important marine legislative actions enacted during the seventies include the Federal Water Pollution Control Act Amendments of 1972, the Marine Protection, Research, and Sanctuaries Act of 1972, the Deepwater Ports Act of 1974, and the National Ocean Pollution Research and Development and Monitoring and Planning Act of 1978.

3. These observations of political and administrative dynamics are based primarily on study of the passage and implementation of the MFCMA, the ESA, and MMPA; hence, the fish and wildlife management sector is emphasized. My impression, though, is that the same patterns apply to other marine sectors, such as offshore energy operations.

4. The one exception to this general rule is the Marine Protection, Research, and Sanctuaries Act of 1972, which allows for multiple-use management of designated marine sanctuaries. This authority, however, has had only limited application as a multiple-use management tool.

5. While space limitations preclude discussion of other marine sectors, the environmental groups which had been involved in the original passage of the ESA and MMPA a decade ago, have also become more mobilized over time. A recent manifestation of this mobilization concerns the successful congressional reauthorization of the MMPA and ESA (in 1981 and in 1982, respectively)—thanks largely to the efforts of an impressive coalition of environmental groups. This lobbying is discussed in Cicin-Sain and Manning, forthcoming.

6. The baseline study is reported in Biliana Cicin-Sain, John E. Moore, and Alan J. Wyner, *Managing Marine Fisheries. The Case of California Abalone* (La Jolla: University of California Institute of Marine Resources, 1977), the follow-up study, by Biliana Cicin-Sain, Peter Lufkin, John E. Moore, and Maynard E. Silva, *Assessing the Effects of Limited Entry*, is in preparation.

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Implementing the Marine Laws Enacted in the 1970s: Administrative Challenges

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A vast array of domestic laws was enacted by Congress in the 1970s, an extraordinary burst of legislation that will continue to set the framework for United States ocean policy for many years to come. This paper covers two general aspects of the implementation of this legislation in the next decade—those issues inherent in the legislation itself and those relating to broad and changing national policies and priorities.

ADMINISTRATIVE PROBLEMS INHERENT IN THE LEGISLATION OF THE 1970s

Significant issues exist with respect to the implementation of our marine laws even in an unchanging domestic universe. The last five years have highlighted two major problems of our existing marine framework with which we have not yet successfully learned to cope.

Obtaining Relevant Science

One of those problems is how to administer in the 1980s laws that require substantial marine science input to function in the manner in which they were intended. The Magnuson Fishery Conservation and Management Act (MFCMA) and the Outer Continental Shelf Lands Act (OCSLA), for example, contain detailed procedural frameworks for making presumably enlightened decisions after full consideration of relevant factors. Many of those relevant factors require scientific input. The MFCMA, for example, is built around the central concept of the derivation of optimum yield of a fishery based on its maximum sustainable yield, a biological measure, as modified by relevant economic, social and ecological factors. The OCSLA legislation requires leasing decisions based on not only geologic information, but also on information regarding marine productivity and its sensitivity to chronic low-level pollution as well as large spills.

The problem in administering many of these laws is that the concepts developed by the Congress have far outrun the ability of the supporting science to carry them out. Government officials are required to make decisions about drilling in areas such as the Georges Bank, the Beaufort Sea, and the Flower Garden Banks without basic scientific consensus about the impact of oil and associated drilling substances on fish, marine mammals, and coral. They are trying to maintain healthy fish stocks by focusing on single stocks and ignoring known, significant multi-species interactions, because they cannot yet obtain reliable scientific information about those interactions. In some cases, they are not even sure which fish are the predators and which the prey. Many of the economic and social scientific aspects of those decisions are at even more primitive stages of understanding.

I do not want to imply that all government action must await perfect knowledge. Congress and the administrative agencies have sensibly provided a list of generally relevant factors in much of the marine legislation of the 1970s, with the assumption that as more is understood about the natural and social processes involved, the law can be more intelligently applied. What has been particularly discouraging, however, has been the vast difficulty of focusing the public and private scientific community on the need to identify in advance, and address in a timely manner, the issues to which we must have answers if our ambitious laws are really to work effectively.

Marine administrators have had to struggle to identify and obtain relevant marine science. To some extent, this reflects the difficulty of identifying scientific issues in advance, and a well-deserved cynicism that mission-oriented regulatory agencies will be willing to accept unpalatable results—particularly those coming from other agencies. In part, however, it also reflects the widely shared scientific perception that applied research is second-rate science, and that economics and the social sciences are not "real" science at all. In part, it reflects a natural human preference to do what one wants the way one always has done it—to take the money and run and to collect data whether or not it can be used—rather than to respond to someone else's agenda. And in part, it reflects the question of whether, in a task-oriented society, sufficient funds can ever be made available for basic research to further scientific understanding in the absence of immediate applications.

Thus, I believe that much of the administrative business of the 1980s will be to complete the unfinished task of correcting the balance and increasing the effectiveness

of the marine science funded by the federal government. This process is just beginning. For example, the National Marine Fisheries Service (NMFS) embarked on an ambitious planning and budgeting procedure to tie its regulatory needs more closely to the work in its laboratories. The National Marine Pollution Program Office of the National Oceanic and Atmospheric Administration (NOAA) has been cataloging and analyzing marine pollution research and development and monitoring programs across the federal government, to help the Office of Management and Budget focus on a coordinated approach to marine pollution. Joint meetings among representatives of NMFS, the Office of Coastal Zone Management and Sea Grant state program directors, aimed at analyzing the opportunities and impediments to better coordination of Sea Grant research with programmatic needs, are also a relatively recent phenomenon.

Unless the effort to match our scientific capabilities to our conceptual frameworks is successful in the 1980s, the credibility of the entire Congressional approach to management of marine resources will be in question.

Resolving Multiple Use Conflicts

The other broad administrative issue for the 1980s is how best to resolve conflicts among multiple marine laws and marine uses, partifcularly those that involve several public agencies. Some skepticism about the current magnitude of this problem, however, is warranted. While there have been some clear and dramatic examples of such conflicts (such as in the Georges Bank, the Santa Barbara Channel and the Beaufort Sea), I suspect that such conflicts will not represent a widespread problem until later in the decade—as we focus on ocean dumping, marine pollution, nuclear waste disposal, ocean thermal energy conversion (OTEC), and marine mining.

What stands out so far, however, is the unsatisfactory nature of our efforts to deal with such conflicts. There has been too much heat and too little light, as numerous single-purpose public agencies have each insisted (with the overt and covert support of single-purpose interests) that they alone can best take into account all the relevant factors. The issue of who decides has been as important as how the matter is decided, and vast energies have been expended in the federal bureaucracy's favorite sport of turf-fighting.

In the 1980s, one of the central issues will be finding an effective common forum or decision mechanism to resolve such conflicts. I leave to the political scientists the question of whether these conflicts are in any way unique in our political system, or whether in the end any better mechanism than bureaucratic intrigue and litigation can be created.

A few hopeful signs exist that we can at least improve our approach to such issues. For example, NOAA's Office of Ocean Resources Coordination and Assessment has issued an atlas prepared in response to energy facility siting issues in the coastal and ocean waters off the East Coast. The atlas contains over 130 maps showing wildlife concentrations, habitat information, economic activities and coastal county pollution discharge information. Atlases such as this should be a valuable tool for identifying marine areas off the East Coast where future problems will emerge, so that the groundwork for cooperative approaches to those problems can be laid well in advance.

To cite another example, for the last several years, NOAA has been working with the Army Corps of Engineers, EPA and other federal, state and local agencies on a "special area management plan" for Grays Harbor Estuary, Washington. This technique is a promising approach to the regulatory deadlocks that occur repeatedly in coastal bays and estuaries, where development requires dredging and fill in wetlands and intertidal areas—and where any project will almost automatically be subject to review by at least four different federal agencies under as many or more different laws.

I hope many other approaches will be explored as well. Unless we can create forums for resolution of conflicts in the 1980s that are widely perceived as legitimate, the results will be costly to the taxpayers—to those who wish to protect marine resources, as well as to those who wish to develop them.

CHALLENGES OF CHANGING GOVERNMENT PHILOSOPHY

In 1980, Richard Frank, the NOAA Administrator at the time, summarized many of the trends in government philosophy regarding the oceans as follows: "During the 1960s and early 1970s there was a pervasive sentiment that we Americans lived in an abundant society with a strong economy and that government programs could make a positive difference and were affordable . . . Ten years later our perception of the world has altered drastically. If the early 1970s was a period of perceived abundance, the next decade is surely a period of perceived scarcity. At the same time, the pressures to restrain the growth of government have become stronger now that they have been in contemporary history . . . In sum, the Executive Branch has an impressive agenda of ocean programs to implement but, at the same time, it must build its programs in the face of the general tide of fiscal austerity—an austerity that is not targeted at, but one that hits, newer and more fragile programs harder than well-entrenched ones" (Frank, 1980).

Since then, the change he foresaw has been accompanied by other changes that reflect not only skepticism about the size and validity of government activities, but which also stress the importance of private economic and industrial development, a strong balance of payments and the need for greater self-sufficiency in energy and strategic materials. All will impact administration of our marine laws in the 1980s.

Most obvious, of course, are the impacts of reduced federal budgets. In many areas, federal programs will simply have to operate more slowly. In the talk referred to above, Richard Frank cited as examples such areas as fishery development, remote satellite sensing and understanding the relation between oceans and climate. These are areas in which Congress has clearly indicated its belief that the nation has an important stake, and they are likely to suffer rather than expire.

We will, of course, pay a price for this slower pace of federal activity. Some of the costs are obvious—we will continue a large trade deficit in fish and fish products, and we stand a good chance of losing a competitive edge to foreign satellite ventures. In addition, in the process of starving some programs, their substance may be significantly altered. For instance, less funds to prepare adequate scientific underpinnings for fishery management plans will exacerbate the credibility problems of the MFCMA, and could, in the long run, result in changes in the law. Similarly, changes in funding prospects for the Coastal Zone Management Program clearly impact the incentive for participation by some states and the bargaining posture of the federal government with respect to the quality of new state programs and program amendments.

The hangman's noose does focus one's mind wonderfully, however. All change can be viewed as an opportunity, and this may turn out to be so in many ways. First, as Frank noted, federal agencies can seek other sources of funds. The wider application of user fees is a logical response to the continued provision of services to, or recovery of costs imposed by, identifiable groups. He mentioned charging marine polluters to fund pollution research as a logical extension of the liability and compensation schemes found in the Deepwater Ports Act, the OCSLA amendments, and the Superfund legislation. But the potential in the marine area is far wider—from marine weather information and charts to commercial fishing license fees.

As Frank also noted, federal agencies can, in addition, become more efficient. The National Marine Pollution Program model mentioned above was adopted for the Climate Program, and undoubtedly could be applied in other areas such as fishery research as well as extended to interface more thoroughly with private and state research. The Senior Executive Service reforms and mid-level civil service reforms have put into place some basic changes that will be quite productive. Although they leave ample room for bureaucratic gamesmanship, for the first time these reforms require every senior civil servant to commit to personal written objectives annually, and if Congress keeps its part of the bargain through adequate appropriations, they also provide a monetary incentive to give these objectives meaning. The widespread lack of funds may be enough to convince normally timid bureaucrats to voluntarily forego some peripheral programs—and to provide private recipients and their Congressional supporters with the perspective and humility not to unduly harass them for doing so.

A third mode of change will be increased delegation of current federal activities. In view of the widespread budgetary cutbacks, the Carter Administration's proposal to return funding of the Coastal Zone Management Program to the states over a period of years now looks much more attractive. It comports with the reality that the day-to day task of making sound coastal management decisions has to be performed on the state and local level. The states could also do much more with respect to fishery regulation in coastal waters, and it may even be time to think seriously about some of the more innovative suggestions for experimenting with private sector leasing and regulation of fish stocks. Reforms regarding federal insurance subsidies and post-disaster assistance in hazard-prone coastal areas—long discussed and economically impeccable—may also at last be in order.

I hope we can take advantage of these opportunities. Cynics—or perhaps what some would call realists—can easily envision bleaker alternatives for administration of domestic marine programs in the 1980s. Less funding could mean that science will not be done in a timely fashion to answer crucial questions. We may continue in ignorance of basic matters when forced to make decisions about offshore oil and gas leases and fishery management plans, and may continue to react to problems with too little information, too late. The focus on balance of payments and resource self-sufficiency could mean that requirements to consult with states and the scientific community in the outer continental shelf leasing process—which were given short shrift even under the Carter Administration—will be given only lip service in the 1980s. The decision-making forum may shift not to the states and to private ingenuity, but increasingly to the courts.

As Richard Frank also noted, "During the ocean policy decade, this country generally was prepared to delay development until risks were quantified. The history of disputes, in the new era of scarcity, suggests that continued uncertainty about the potential negative impacts of development is not a sufficient argument against development" (Frank, 1980). This kind of judgment—how much to do and when to do it—is one of the hardest for courts, academics and others not intimately involved in the process to intelligently second-guess at the time of a decision. It is the kind of vexing issue that forces lawyers and academics to focus on procedure rather than substance. It is at the heart of the matter. What I am afraid it means, however, is that a valid judgment about our administration of marine laws in the 1980s will be possible only in the 1990s. I hope—with an uncomfortable feeling that I am being a pollyanna—that we will be able to look back on a decade of significant progress.

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U.S. Ocean Policy in the 1980s: Finding and Funding the Future

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INTRODUCTION

An integrated national ocean policy, together with an implementing framework, provide both master plan and facilitation for developing orderly uses of ocean space. Unfortunately, the United States does not have a comprehensive national ocean policy structure. To be sure, there is an abundance of *sectoral policies* which govern the various national ocean use elements ranging from national defense at sea to coastal marine recreation. There is, however, little operational interconnection among different policymaking activities. At present, only a theoretical U.S. national ocean policy can be synthesized from diverse component elements. The "Ocean Policy of the 1980s" part of the title of this paper, then, must be viewed in light of the fact that a singular U.S. ocean policy does not actually exist.

With respect to the ". . . Finding and Funding the Future" part of the title, I do not intend to provide here a detailed analysis of the Reagan Administration's budget reductions at the half-way point in its term. The present situation is still in flux, and a major factor in this flux is the inability of the Administration and Congress to agree on annual budgets for the government. It is thus difficult to draw implications for the entire decade of the 1980s based solely on a two-year sample of the new Administration's term in office. It is possible, however, to estimate certain *general* directions for ocean activities, as stated by the Reagan team members prior to and after assumption of the presidential office. Finally as we consider challenges that lie ahead in the 1980s, it is equally important to review the general situation of the ocean community as the decade of the 1980s began. In other words, what was the Reagan inheritance?

TRENDS IN OCEAN SECTOR FUNDING

It is clear that the recent budget modifications put forth by the Reagan Administration (those in force as well as those proposed) have had impacts on national ocean programs, but these impacts may not be as profound as some might suggest. True, the first round of Reagan cuts of the Carter Administration's proposed budget for Fiscal Year 1981 called for significant reductions and/or elimination of a number of ocean programs—e.g., phasing out the National Sea Grant Program; terminating the Coastal Zone Management Program; deferring the National Ocean Satellite System (NOSS) and dropping the Coastal Energy Impact Program. These, and most of the other reductions in ocean program funding and personnel have mainly affected the National Oceanic and Atmospheric Administration (NOAA). Some secondary impacts are also being felt in marine programs due to broad programmatic reductions in other areas: for example, reduced grants for college student support; increased limitations on international scientific cooperation; and the cessation of other federally supported research work such as the ocean thermal energy conversion (OTEC) project.

The mainstream of basic ocean research activities, on the other hand, has felt little, if any, impacts from the budget reductions. While some subsequent reprogramming may occur within the National Science Foundation, the Office of Management and Budget's (OMB) proposals for this agency have essentially left intact the main core of support for basic science.

In contrast to proposed cuts in civilian ocean programs, defense budgets are being dramatically increased. Almost all of the initial increases in defense budgets will go to replenish drawn-down inventories of operational weapons systems which have resulted from several years of reduced defense budgets. In addition, there is the procurement of added numbers of *new* systems in order to increase the overall size of our armed forces. Significant impact on the ocean research and development (R&D) area related to these systems may not occur immediately, but it will happen. In the future, a proportion of these increases could go to the marine studies area, as needed to support expanded defense requirements. The Department of Defense (DOD), after all, has always been the largest national supporter of the U.S. science and technology base. This situation will now improve even more. The Navy's Office of Naval Research (ONR) was the major support agency for marine research until the mid-1960s. The new Reagan budgets could help restore ONR to the role of a major force in this area. A projected twenty-five percent increase in the size of the Navy, together with the need for more sophisticated undersea weapons systems, point to greater ocean R&D activities to support these advances.

It is important to remember two things about DOD sponsored, "out-of-house" research. First, as little of this work is classified it is therefore attractive to the investigator in academia. Second, DOD (as well as other federal government) rulings of recent years have mandated that

an increasing amount of DOD sponsored research be done outside government laboratories. Any increase in DOD research and development budgets will be of direct benefit to non-government research activities.

The proposed reductions in funding of marine programs which we have witnessed in recent years have worked to unify the eclectic ocean community. This community, often characterized as not having much influence with the national government, has been able to present a convincing case to Congress for, among other things, a retention of the National Sea Grant Program; an orderly phaseout (over two to three years) of the coastal zone program; proposals that some of the NOSS oceanographic sensors be installed in satellites that are approved for other uses; and the reconsideration of the premature termination of government support for OTEC.

The fact that Congress chose not to blindly follow administration-proposed budget reductions is nothing new. It is expected. In the current case, however, there is an interesting difference. In the past two years Congress has become enthusiastic about seeking budget cuts as a general principle. In some sectors, budget reduction proposals were made that even exceeded those proposed by the President. Despite party lines, and stripping away posturing before the press, they often came close to agreeing with the specifics of Mr. Reagan's proposed cuts. In this context, active congressional support for restoring or mitigating some of the Administration's proposed cuts in ocean programs is worth noting. It is interesting to speculate that perhaps there is a resistance level at which further significant reduction of the national ocean effort will not occur.

A recent, significant congressional initiative has been a new proposal to share federal revenues from outer continental shelf (OCS) oil and gas activities with the coastal states. This represents a significant new development in that it could provide a major new source of capital for the support of marine and coastal management, associated research and education, and impact mitigation for coastal states. There are several proposed bills in the Senate and House suggesting revenues in the order of $300,000,000 a year as the annual pool for the coastal states. Thus, despite the Reagan Administration's proposals to cut many ocean programs, there is evidence of strong congressional support for a contrary course of action.

Now, let us put all of this into a relative context and consider what the real damage might be if one took the worst case and accepted that *all* of the proposed ocean program budget cuts were sustained. The loss would be on the order of ten per cent of the Federal Ocean Program budget. Note that the Federal Ocean Program budget estimate is a somewhat artificial concept. Essentially, this is the title given to a bureaucratically-defined composite of all the ocean program budgets of the eleven or so federal agencies having ocean responsibilities. At present, this synthetic "budget" is at the level of about $1.2 billion, depending on how present budget cuts are finally resolved.

This budget composite, however, does not include many activities that one could argue are legitimate federal ocean activities. For example, the Army Corps of Engineer's dredging and beach restoration programs, the Navy's classified marine research, and intelligence agency ocean activities, are not counted for various reasons. If one were to add to this, programs found outside the federal government (such as ocean programs supported by state and local governments, by industry —both directly and indirectly—and through private philanthropy) this entire effort could add up to a multi-billion dollar "national" ocean program. In this context, even the full weight of the Reagan budget cuts does not seem to be that onerous. Intuitively, I believe that 10 percent or more could be strained out of any government-supported activity without serious damage. (Of course, if that 10 percent is 100 percent of one's program, it's a bit harder to be objective.)

Reviewing the funding situation for ocean programs under the Reagan Administration, undoubtedly some program areas have been wrongly hit by the budget reduction "axe." This situation, however, can be rectified in subsequent fiscal year budgetary processes which no doubt can be conducted in a slower and more orderly manner. The initial policies and goals for a certain level of federal budget reductions, after all, were established fairly early in the new Administration. It is quite probable that subsequent year cuts will be negotiated in a more precise, deliberate fashion. Of course, much of this will depend on the effect that the continued combination of budget cuts (except for defense), tax reductions and high interest rates will have on the state of the national economy. When economic indicators do show the beginning of a turnaround, then maneuvering room will be available for the surgical approach to further budget reductions.

How have, then, national ocean programs fared in the past several years while facing the multiple forces of inflation, recession, and anemic levels of federal funding? It should be noted that the high mark in real funding growth for ocean programs appears to have been reached in 1968, fourteen years ago. Since that time, these programs have fallen behind due to inflation pressures. Little real growth has been experienced since the late 1960s. To be sure, dollar amounts have gone up using our standard index, the "Federal Ocean Program Budget," but real buying power has decreased.

The point is this: the national ocean program structure was not in a particularly strong condition throughout the 1970s. The reduction in efficiency and activity was gradual rather than traumatic, thus not too apparent at any given moment. Far more damage was done to our ocean future by the benign neglect of the presidential administrations of the decade of the seventies than by the stepwise, sudden reductions proposed by the Reagan Administration. On balance, reviewing the funding situation for ocean programs under the Reagan Administration, I would say that the ocean community has been treated reasonably well, compared to other sec-

tors, and that the future looks even better. More reductions and realignments are in store, but it also appears that future negotiating latitude will be more rational.

Moreover, the most useful residual outcome that may come from the Reagan reductions is the activation of the ocean community to organize and articulate its interests in a very competitive environment. The gradual erosion of program effectiveness in the 1970s did not provide the collective "triggering impulse" to do this. The budget actions of the last two years, on the other hand, may well prove to be an unintended blessing for this constituency.

NATIONAL POLICY AND OCEAN PROGRAMS

The foregoing discussion largely has been to establish where we are now as a point of departure for the main theme, "Finding and Funding the Future." Let us now consider the present ocean policy context as a key to the future. As noted earlier, within the United States a national ocean policy probably can be synthesized from sets of existing sectoral policies. Some examples are: the policies which establish the roles and missions of the Navy; the various acts and regulations that govern the construction and operation of our merchant marine; the fisheries acts and treaties. There is, however, little real interconnection among the sectoral policy areas. Yet each of these seagoing activities represents an important national use of ocean space.

The present sub-optimal means for making national ocean decisions reflects the uncoordinated and unconnected means by which some eleven federal agencies approach their assigned ocean responsibilities. There is no "conspiracy of confusion," to be sure, and each agency does its job as best it can. Often, however, there is mutually disruptive competition among these agencies for resources and policy support from both the Administration and the Congress. The opportunities for duplication, waste and inefficiency are abundant.

It this is so, then why hasn't this fundamental problem been recognized and rectified? There are several probable explanations. First, there are few senior policy people in the federal government who move across more than one or two of these areas. This is true even in such obviously fraternal areas as the Navy and Merchant Marine. The Merchant Marine Act of 1936 is quite specific about national defense responsibilities, but in the past there have been formidable difficulties in getting the Secretary of the Navy and the head of the Maritime Administration into the same room on a regular basis to discuss issues of defense coordination as charged by the Act. Thus, it is somewhat optimistic to expect that such ocean users as offshore gas and oil operators, fishermen, and ocean miners, would seek active coordination with each other and with other parts of the marine community. A lack of broad-gauge people to work across "party lines" has led to an increasingly segregated set of ocean use activities. In most cases, there is serious dialogue between the elements only when they come into direct conflict in some area. An example would be offshore oil and gas platforms obstructing a marine transportation navigational fairway and fishing operations, or where military training operations restrict commercial activities.

A principal source for creating an integrated and viable national ocean policy should be the academic community. On the theoretical plane, academic inquiry here seems very reasonable and appropriate. Observations of the present situation (the ways things are) would lead most of us to conclude that this is a complex, confused way of doing business. Then why doesn't the scholarly community make its contributions? I think it's because the whole logic of the system is quite circular. That is, since government has never had an integrated national ocean policy mechanism together with its implementing organizational structure, therefore, it must not be needed. Thus, research support resources, which fuel the academic system, are not made available.

To have an active ocean policy for the 1980s, first there must be the will to have such a policy. I am somewhat skeptical that this may happen in the next two to three years, although this is not a very good argument against making a best effort to try to *make* something happen. It is a fact that actual national ocean activities of the late 1980s and the early 1990s will result from sectoral ocean policies that are either in place or are currently being formulated. Many otherwise educated people do not appreciate the tremendous "planning wedge" required to establish modern ocean use activities. For example, a new Navy ship class takes from seven to ten years to bring into being from the time the initial policy decision is made to proceed. Offshore gas and oil fields take up to a decade to bring into full production from the time the first drilling permit is acquired. Even less complex activities can require several years lead time. Consider the time constant involved in the federal budget cycle and its translation to real world activities, add interaction with foreign governments, and the planning wedge gets even longer. The current United Nations Law of the Sea negotiations, now in their tenth year, are an example of this.

A formal ocean policy framework permits comparative analysis in and among competing ocean programs. From this analysis, one can make logical, effective, and intelligent choices. It also facilitates both continuity and consistency. Without such a framework, one faces the present situation where competition and conflict among national ocean uses are treated as *ad hoc* issues undergoing significant changes in direction as Congresses and Administrations come and go.

Front-end policy analysis of sea power options can present an efficient, cost-effective means for making choices and assigning priorities in an era of limited resources. And since such an era of limits will always be with us, this suggests an imperative for continuing analysis. There is nothing magic or profound about

these observations. Such analytical processes represent standard operating procedure in most major operational sectors of our government. Why they have not been systematically applied to national uses of the sea is a bit of a mystery.

With a national ocean program budget that is in the billions of dollars, I would estimate that sponsored research of ocean policy studies is much less than one-tenth of one percent of that figure. Yet, the contemporary, analytical and mechanical (e.g., computers) tools of modern policy research are refined and advanced. Application of these policy analysis resources offers opportunities for improved efficiency and better choices for government. Yet, the scholarly community has been largely unable to convince the government that such work is needed. Meanwhile, within the government's ocean programming activities, the lack of people trained in these techniques tends to dampen any "autogenous impulse" leading to the formation of a national ocean policy framework. How to break the circle of limited external research coupled with little internal interest in order to force the system to assume some positive vector direction remains the critical issue.

To some perceptible degree, small changes are now taking place. A small number of young social scientists and graduate students from various backgrounds are being attracted to academic schools in the U.S. to do and to be trained in this kind of policy analysis and development. Subsequently, some are finding their way into the government. Nevertheless, the "first generation" of ocean policy trained professionals are now going into government, and they will make a difference.

The principal force making national sea power operable is government's internal and external allocation of resources in terms of funding, people, policies, and programs. Certainly, the U.S. will evolve toward a better ocean future in the 1980s, but if this evolution occurs without a national ocean policy framework the path will continue to be tortuous, uneven and wasteful.

Furthermore, uses of ocean space by other nations have become more extensive, complex and competitive. We can forecast several, mostly external, factors that will make the United States ocean future more complicated:

- The continued growth, exercise and challenge of Soviet sea power (naval, fishing, research and merchant fleets) to U.S. interest throughout the world.
- The emergence of third world coastal states (numbering about eighty-five per cent of the world's coastal nations) using the sea as "micro sea powers," especially through regional and nationalistic coalitions.
- The acceptance and implementation of the presently evolving United Nations Law of the Sea accords as the treaty is ratified.
- International conflicts between ocean environmental protection and waste disposal.
- New uses of ocean space not now operational such as ocean mining, ocean thermal energy development and harvest of non-traditional living resources. Many of these uses may conflict with present activities and with each other.
- Development of marine resources of the polar regions.
- Vastly increased sea trade of raw materials and finished goods resulting in increased numbers of ships and port facilities. This trade will be stimulated by the accelerated development of third world coastal states.
- Increasing size and movement of populations to coastal areas resulting in increased multiple use conflicts.
- "Creeping jurisdiction" over ocean space by other coastal nations through increasing control and restrictions for a diverse variety of seemingly "noble" reasons such as environmental protection and living resource conservation.

This is not an exclusive catalog but it should serve to illustrate the point that the ocean world of the future will be much more complex than it is today. If the United States is to swim in that ocean, it will need all the advantages that it can muster. An organized, carefully constructed national ocean policy which can weld together the decision process for all national uses of the sea is a most important objective.

Much has been written about proposed models for the execution of national ocean policy; that is, what kinds of organizations are needed. It is outside the scope of this paper to go into these models and their designs. This, in fact, should be the subject of policy analysis in and of itself. One can observe simply that maintaining the *status quo* will not do. The means, however, can be established after the basic principle of the national need for a unified ocean policy is recognized. Certainly, the U.S. can efficiently invest about one per cent of its national ocean budget in studying how to best conduct this work and to develop options for meeting future challenges. Approximately ten million dollars a year devoted to diverse ocean policy studies and analyses would provide enormous future advantage to the U.S. in the 1980s. This investment must begin now. Policy analysis and implementation in the oceans are long lead time activities. There will be no easy answers, just hard questions. The product of such ocean policy analysis will not mean much for several years until a critical mass of experts, scholars, and analysts can have some working experience with the government (the customer), their findings and each other.

CONCLUSION

In conclusion, I would like to give my view as to what I think I have seen and heard with respect to the Reagan Administration's general intentions and specific ocean interests. As noted earlier, it is difficult to characterize the shape of an entire decade based on a two-year sample of a new presidential administration. However, there are a few principles expressed by this Administration that might give us some helpful insight. In addition, it

appears that the actions of the past twenty-four months indicate an intent to carry out the promises made during the election campaign. *If* this determination and consistency are maintained, and *if* significant congressional support can be enlisted, then the following might have significant ocean policy impacts in this decade:

• Strong national defense capability at sea as part of dramatic increases in defense budgets. This will also have a major, positive impact on the national shipbuilding base.

• Positive support for a strong marine transportation system that is less reliant on foreign carriers. This will entail rebuilding our U.S. flag merchant fleet, the related shipbuilding base, and upgrading our ports.

• Resolution of Law of the Sea negotiations and the U.S. declaration that it will not sign the treaty.

• The exclusion of fundamental/basic science research support from the first round of budget cuts.

• Maintenance of a properly funded U.S. Coast Guard through the imposition of user fees for routine services. This will permit increased Coast Guard budgets without increased costs to the present federal budget.

• The Army Corps of Engineers will face a situation similar to that of the Coast Guard, charging user fees for its work in harbor and coastal development and maintenance. Significantly, costly improvements in most of the U.S. major ports are badly required now. The user fee mode will help achieve these improvements with little extra demand on the federal budget.

• While past presidential administrations and congresses have talked about reorganization of federal ocean activity management (e.g., President Carter's proposed Department of Natural Resources) little progress has occurred. The Reagan Administration seems to be quietly making some of these changes. In 1982, for example, it shifted the Maritime Administration from the Commerce Department to the Department of Transportation.

• The Administration's stated intent to transfer to the private sector those activities which are best performed outside the government may be sound theoretically, but it remains to be seen if this can be done extensively in practice. However, this notion combined with tax reduction and deregulation measures promised by Mr. Reagan may generate greater investment and development in private sector ocean activities.

• Gas and oil deregulation, together with the Interior Department's more vigorous leasing policy for offshore lands will greatly spur capital and operating investments in exploratory drilling along the U.S. coastlines. The impact of the present "oil glut" has, however, moderated this activity to some extent.

• The Reagan Administration's pro-development policies will be the target of much criticism from those who see development as the absolute antithesis of conservation. But development and conservation do not have to be mutually exclusive, and this will be a challenge for those of us in the ocean community. Rational use of the oceans' resources for the well being of our nation is a laudable goal. With our national dependence on so many overseas sources of raw materials (even fish), we must learn to use what we have within our own boundaries to reduce such dependence in the name of national security.

The Reagan Administration has brought to the White House a rather different philosophy of governance than had prevailed there in recent years. Good or bad, this philosophy, combined with the phenomena of a Republican-controlled Senate and a weakened liberal majority in the House, put President Reagan in a strong position to effect significant changes. If the attention of the President's top policy makers can now be brought to bear on sea power/ocean policy issues, then significant progress can be made to alleviate the problems set forth in this paper.

It is unfortunate that severe troubles in the national economy and the resultant strife between the Administration and the Congress have, so far, left little time for the kind of ocean "strategic planning" discussed here. In an environment where even the budgets to run the government have not really been fixed for nearly two fiscal years in a row, it is discouraging to consider when ocean issues might get a fair consideration. In the next two years, most of the changes we will see may simply be the result of ocean issues getting entrained in larger governmental policies (e.g., deregulation, tax relief, emphasis on the private sector, not signing the LOS treaty).

The gap between theory and practice is often great and often unbridgeable. We all must wait to see how the promise of this new Administration works out. At present, there seems to be no other choice.

This paper has been offered as more of an essay, containing a large measure of guesswork, rather than as an erudite study of contemporary ocean politics. It is intended to provoke comment and response since few of us would have guessed the present state of events two years ago. But, uncertainty is no reason not to give opinion and to see reaction.

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Future Opportunities and Constraints

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I will first discuss several ocean policy issues, then summarize the actions of the Reagan Administration on the federal ocean budget, and the reaction of the ocean community and the Congress to the Administration's cuts. I've used the phrase "ocean community" for the first time in these remarks and I will admit that I am not sure I know what the "ocean community" is, but, I think, by the end of these remarks, I may know a little bit more. I would like to briefly discuss the reasons for the Reagan Administration's budget action, particularly the emphasis on states and on the "New Federalism." They are not really as surprising as some of us might think.

A good deal of what I will be talking about will relate directly to the National Oceanic and Atmospheric Administration (NOAA) which is supposedly the nation's ocean agency. It is just over ten years old now. I suggest that NOAA is a little bit like Rodney Dangerfield. In Washington, NOAA "don't get no respect," or very little. Maybe that has something to do with our problems in the ocean community; or, maybe the community is the one without the clout. I think that there are some real opportunities which can emanate from the Reagan Administration's actions. Underlying much of the discussion regarding the current fiscal situation is the assumption that less money from the federal government is a bad thing. I am not so sure that that is true—either for the oceans or for any other area, for that matter. Let me get a particular bias of my own out into the open and suggest to you that the growth of NOAA—in terms of dollars, not in terms of people (employment at NOAA has only increased approximately two percent in ten years)—is not necessarily a good thing. It seems to me it is a classic example of liberal politicians throwing money at a problem, and not very often coming up with any solution.

The election of Ronald Reagan is resulting in profound changes in the way the federal government is looking at ocean policy and ocean budgets. I suggest (although I am no expert in political science) that the election of President Reagan reflects a change in politics in this country which is basically representative of a middle-class ideology. Obviously, many people, other than members of the middle class voted for Reagan, but a vote for Reagan was a vote for a middle-class attitude toward life. This represents a profound change, in the sense that we have had the "Flipper" generation with us for some time (most evident in the environmental movement), and now it has gone—the middle class is back in charge, and its attitude towards life is dominant. Reagan's election, I would say, was akin to a national Proposition 13 (the California anti-tax movement), and I believe that it is going to affect the oceans profoundly.

The revolt is long lasting; it has been going on longer than some of us recognize. Many people in Washington have been very unhappy with the way the federal bureaucracy functions. When I say people, I am speaking of those who drive the machine, the staffers as well as the congressmen on the Hill, and those executives downtown who do some thinking. The situation that has come about as the result of the election probably won't change through this decade, or at least before 1988; and there seems little chance of the Senate going Democratic before 1984. But, as I said, the Reagan philosophy and the Reagan approach to ocean programs is not all that new. The Office of Management and Budget (OMB) which, as we all know, is the real driving force in Washington, has, for a long time, been extremely disturbed by the variety of ocean programs which have been created by a generous Congress, and it has been trying to get control of those programs. We can all think of examples where that attempt was thwarted, always by the Democrats in Congress. Now, with a Republican Senate, OMB will have a chance to be in charge and do some managing. A previous speaker suggested earlier that OMB has not been doing much managing—well, that was because it couldn't. Congress took on that job for itself.

Further, the figures available from the Reagan Administration, looking five years ahead, and on an admittedly preliminary basis, show that NOAA is not going to grow at all in terms of real dollars and could even decline. This raises the question immediately, if NOAA is not going to grow, and even has to take some real cuts, is it not time to choose our priorities in the oceans and decide which ones we want to save, and convey that message to Capitol Hill? For once, we need to address the question of priorities rationally, instead of in terms of what is politically popular.

President Jimmy Carter left a big package of one billion dollars for NOAA for fiscal year 1982, the year that

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began in October 1981. That would have given NOAA more clout than it has ever had before and would have identified it on the Washington scene as an agency with big bucks to spend. But the Reagan people came in and immediately cut that back to eight hundred million dollars, a 25 per cent cut, and further cuts are planned. Certainly the Fiscal Year (FY) '83 budget, which is over a year away, will incorporate more reductions. By the same token, the Reagan people eliminated the funding for the ocean energy program in the Department of Energy, cut back the ocean satellite programs; and within NOAA in particular, cut back the National Sea Grant College Program, the coastal zone management program, fisheries programs, and others. The reaction to these cuts has been a great hew and cry by persons whose programs are being gored who are coming to Washington in attempts to save their budgets. Already, they have succeeded in preserving half of the Sea Grant program—that is, originally it would have been thirty-six or thirty-eight million dollars, and they will probably be able to keep a minimum of eighteen million, some believe much more. Similarly, if the conference report on the FY '81 budget holds, a two-year phase-out of the coastal zone management program will probably take place instead of it being eliminated outright. Fisheries are very important to a large number of congressmen; so the fisheries budgets are being returned in some areas to their states under the Carter Administration, although overall, it is likely that fisheries programs are going to have to endure budget cuts in the range of fifteen to twenty per cent.

The reaction of the public to all of this was, of course, non-existent, as the public knows little about ocean programs, or ocean budgets.

The conventional wisdom is that re-organization per se does not accomplish anything, and it has been said that the battle that was fought in the Carter Administration over the creation of a Department of Natural Resources (which would have included NOAA) was a waste of time and effort. To the contrary, I would suggest that NOAA is a disaster as a federal agency, separated as it often is from the mainstream of federal decision-making. Hence, the Reagan Administration's budget cutting gives us an opportunity to re-consider what was accepted without question in the late 1960s following the Stratton Commission report: that a federal ocean agency would be a good thing. I think it is time to re-think that proposition. I don't propose another Stratton Commission, but the convening of forums such as this one represents a first step in the re-thinking, and possibly re-shaping of our ocean governmental structures.

My contention that NOAA is a disaster is a little hard to defend because how can one tell a success from a disaster in the federal government? Agencies all look the same. If one considers NOAA's history, however, it was created by merging a variety of existing federal bureaus and agencies which had little to do with one another. Both the National Weather Service, on one end of the spectrum, and the Bureau of Commercial Fisheries, on the other end, were brought into NOAA. During the 1970s we have had projects and programs added to NOAA, as if the agency were a Christmas tree: we invent coastal management, let's give that to NOAA; we write a Marine Mammal Protection Act, let's give that to NOAA, and so on. There is very little formal connection among these many parts of NOAA so it is almost impossible to come up with one philosophy for running the agency. Only the oceans hold them together. To state the obvious, a fisheries program should be a developmental program; a coastal zone management program, in terms of the law at least, is essentially enhancement of the coast as well as, to some extent, protection and preservation.

NOAA, then, represents a "grab bag" of agencies. And, on top of that, the "grab bag" was given to the Department of Commerce—the most insignificant cabinet-level department in Washington. As some of you know, President Nixon was in the White House and reorganized these agencies into a NOAA, intending that NOAA would be part of the Department of Interior; but Nixon became so infuriated at Interior Secretary Hickel that he didn't give NOAA to him. He gave the new agency, instead, to his friend Maurice Stans, the Secretary of Commerce.

Thinking about the creation of NOAA, we might wonder where NOAA would be today if it were part of the Department of the Interior? It could have changed the whole development of our ocean policy, and of our ocean programs. I realize that some are critical of the Department of Interior, but at least it has clout, and wields the kind of power throughout the nation, not just Washington that could have given us an ocean policy that is a lot more thorough and maybe more rational. NOAA's inadequacy, it seems to me, is symbolized by its relationship to the oil industry—NOAA has never conducted a study, has never come up with a conclusive report on the impact, long and short term, of oil on the marine environment. This is an agency which has been dealing with marine affairs for over ten years, which should have a close relationship with the Department of Interior. Today, at the request of the White House (the previous Administration), the National Academy of Sciences has finally begun a study on the effects of oil on the marine environment. Thus, we have an agency with close to eight hundred million dollars in resources that hasn't done its job.

The cuts in ocean programs that Reagan has proposed may not be as significant as they look, because they may represent a shifting of funds from one agency to another. Some people cite the Navy as a source of new funding for ocean projects, but I am not so sure that those are the same programs that are being cut back in NOAA. At the very least, the shifts give us the opportunity, I think, to do some hard thinking and to do some good work in reorganizing the federal ocean effort.

The thing that we can live with comfortably even in a Reagan world, is that opportunities for utilizing ocean

resources are growing. What Reagan economics can do by cutting back on regulation and cutting back on federal programs, is to give industry a reasonable chance to exploit the resources of the ocean. I would like to suggest that industry is not all bad; that there are many, many business executives who have consciences, just like the rest of us, and that we may even get better ocean programs by encouraging industry and the free enterprise system to operate. Remember that one of the basic premises of the National Sea Grant program was to link academia to industry. While some such joint programs were implemented, NOAA has certainly never emphasized the opportunity for linking the academic and industrial worlds. The few projects that NOAA has encouraged are, for the most part, in fisheries, but obviously the agency could explore other areas. Joint ventures between the academic and scientific communities, and industry, make sense in the oceans because the oceans do require a special sort of technology—largely interdisciplinary and expensive.

On a very large scale, the ocean-margin drilling program, which the Reagan Administration seems willing to support, is an example of a joint venture that is already working. Ten oil companies have become involved, contributing matching funds so that if a ten or twelve million dollar ocean margin drilling program is undertaken (the first year of a ten-year program) next year half of that money will come from the oil companies. Each company is participating in terms of its domestic sales, and Exxon is the biggest contributor. Obviously, there is self-interest here. The oil companies want to get in on the ground floor of what may be a brand new science; and while they will say that they do not expect to find oil in the ocean margins, certainly they will be looking for oil in the deeper oceans. [The oil companies have now pulled out of programs sponsored by the National Science Foundation because of economic conditions. JRB]

The concept of joint venture is one way of solving some of the problems. There is also another way open to us—user charges. One of the major concerns expressed regarding the buget cuts has been the future of the Coastal Zone Management Program. But there are alternatives. Marc Herschman, of the University of Washington, for example, has developed an idea for a system of user charges in the coastal zone, so that individual states could finance the preservation, enhancement, and the amenities (as we like to call them) of the coast.

In conclusion, I will note that the policies and proposals of the Reagan Administration are being interpreted very simply. We have discussed the possibility of the Reagan Administration moving ocean programs from the federal level to the state level, and have described this as a major departure in policy. We should recall that all of the ocean legislation of the 1970s had a significant amount of state content; ocean legislation is not just federal in intent by any means. The Congress, in its wisdom, and its necessity to achieve compromises in order to achieve legislation, has had to give the states and the concept of states' rights considerable attention. This is clearly evident in the Coastal Zone Management Act, and in other Acts as well. The Outer Continental Shelf Lands Act Amendments of 1978 a so recognized the needs of the states; even the Marine Mammal Protection Act of 1972 recognized state concerns. In fact, Alaska is well on its way to winning its argument and regaining jurisdiction over its marine mammal populations. The other prime example of states' rights and interests is the Fishery Conservation and Management Act of 1976, where, for all intents and purposes, our national fisheries programs are run by eight regional councils whose members are chosen on a state-by-state basis (although the fishery management plans have to be signed off by the Secretary of Commerce).

Thus, I conclude, that more federal spending is not necessarily good, and less federal spending is not necessarily bad. President Reagan has aptly reminded us that just because things have gone one way for some time does not mean that they cannot change. I suggest that it is going to be very expensive to get into the ocean, and stay in the ocean, and that the people who have the capability in skills and the money to do that are mostly in private industry, not the federal government. The Federal role in the oceans ought to be thoroughly reassessed.

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Nautilus Press is unique among Washington publishing ventures in that it follows a balanced editorial policy on politics, but openly stands for the greater national recognition of the importance of the oceans to the United States. In that way, the publishing company has come to be described as the "voice" of the marine community—a communications link among all the elements of that community, which range from conservative ocean miners and offshore oilmen to liberal environmental protectionists and conservationists.

Botzum himself has been a Washington reporter since 1957. He has covered every President from Eisenhower to Reagan—traveling with Kennedy and spending two weeks at the Johnson ranch following the assassination, when Lyndon Johnson virtually reconstructed the American government into what was to become the "Great Society."

Ohio-born, Botzum is a graduate of the University of Akron, and attended Ohio State University, the University of Connecticut, and St. Andrews University in Scotland. He served as an enlisted military man in two wars, and went to sea as a merchant seaman at the age of 17 in World War II. He has two sons. A life-long reader, he is fascinated by one writer only—the greatest sea writer of them all, he says, Joseph Conrad. When he is not tied down to his job of running a publishing company, covering congressional hearings, and meeting with the marine community, he has been known to sail, do a bit of ocean fishing, or just plain beachcomb. He claims to be an old-fashioned romantic about the sea, and would advise anyone to learn to understand it, if he feels the need to understand mankind.

Implications of the Law of the Sea Convention for U.S. Ocean Policy in the 1980s

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INTRODUCTION

In April of 1982, the Third United Nations Conference on the Law of the Sea (LOS) concluded nine years of negotiations and voted to approve a new and comprehensive LOS Convention. The Convention addresses the full range of ocean issues including rules for navigation through straits, archipelagoes and other waters; establishment of 200-mile exclusive economic zones; definition of the outer edge of continental shelves; the breadth of territorial seas; prevention of marine pollution; conservation of marine mammals; management of fisheries; conduct of marine scientific research; seabed mining beyond national jurisdictions; and the settlement of disputes. Although the United States joined 3 other nations (Israel, Turkey and Venezuela) in voting against approval and 17 other nations abstained, 130 nations voted for the adoption of the Convention. A Preparatory Commission will begin work on treaty rules and regulations when 50 nations have formally signed the new treaty; the treaty will enter into force for adhering nations when 60 nations have ratified it. It will be opened for signature in Jamaica in December 1982.

Observers close to the process say that the negotiations just completed were the most complex ever attempted by an international body of this kind. The Convention's 320 articles and 9 annexes far surpass in length and sophistication the provisions that make up the four Conventions agreed to at the 1958 Geneva LOS Conference, the last major successful effort of this kind.

It should be clear to most observers that the Convention on the Law of the Sea will be an important factor in U.S. ocean policy-making in the 1980s. It seems likely that the treaty will serve as an important guiding force in the future development of international legal norms for the oceans. The United States will not be able to isolate itself from the impacts of the significant changes in marine law and practice that the next few years will witness. The likely entry into force of the treaty by the end of the decade and the actions of individual nations leading up to that event, will require a broad range of responses by the United States regardless of the status of the treaty in the United States. For purposes of the analysis in this paper, it has been assumed that the U.S. will not sign or ratify the Convention in the foreseeable future.

Parts of the Convention are consistent with U.S. interests and would, in fact, contribute to the advancement of those interests. Other provisions run contrary to U.S. interests as articulated by the present Administration. To attempt to capitalize on the positive aspects of the Convention while at the same time defending against the adverse impacts of other portions, will not be an easy task. It is virtually certain that the U.S., as a result, will find it desirable and/or necessary to adjust important parts of its existing system of ocean law and policy during the coming years. The purposes of this paper are to discuss the ways in which the provisions of the Law of the Sea Convention will affect U.S. ocean interests, and to outline some of the resulting policy questions that the nation most likely will have to confront in the next half dozen years or so.

To accomplish these objectives, we first discuss those aspects of the Convention which appear to be in harmony with U.S. ocean policy and outline the policy issues and options raised by the positive aspects. Next, we consider those aspects of the Convention which are in conflict with existing U.S. policy and discuss the questions which will need to be confronted in this connection. A final portion of the paper deals with difficulties, especially with regard to navigation, that may arise if the Convention (or important portions of it) is viewed as a kind of contract by signatory states. We conclude by suggesting a policy-making approach which may assist the affected ocean interests in arriving at a national consensus on a set of rational changes to be made in U.S. ocean policy as a result of the LOS Convention and related developments.

TREATY PROVISIONS GENERALLY IN HARMONY WITH U.S. OCEAN INTERESTS

The impact of the LOS agreement on a coastal nation will depend, of course, on the nature of its particular ocean "situation." A nation with a long shoreline and extensive continental shelves such as the United States, will be directly and significantly affected by the provisions which, taken together, expand both the geographical extent and the functional nature of the states' jurisdiction. A maritime nation with substantial military and merchant fleets will be vitally concerned with the provisions of the treaty dealing with navigation in or near other nations' coastal waters and through straits and archipelagoes. Nations having important fishing grounds within 200 miles of their coasts will be concerned with the provisions of the fisheries articles that deal with the rights of other nations to fish in their zone. Nations with

significant distant water marine science will be directly affected by the marine scientific research provisions of the Convention. And nations with industrial economies and a lack of land-based minerals will be interested in the provisions of the LOS Convention dealing with the exploitation of minerals from the deep sea floor.

Only a handful of nations have ocean interests spanning the full range of the treaty's provisions, and the U.S. is clearly one of them. In fact, a case can be made that the magnitude and breadth of U.S. ocean interests surpass those of any other nation with the possible exception of the Soviet Union. As a nation, therefore, we must be concerned with the LOS Convention and the extent to which its provisions, directly or indirectly, may ultimately set new norms in international ocean law.

The Convention contains a number of provisions which are consistent with U.S. national interests and policy. They pertain to our interests as a sea power and maritime nation, as one of the most richly endowed coastal states, and as a nation concerned with reducing pollution in the maritime environment and protecting marine mammals. These aspects and their implications are reviewed below.

U.S. Interests as a Sea Power and Maritime Nation

As a developed state, a maritime nation, and a trading nation reliant on waterborne commerce, the U.S. is very aware of its dependence on the unimpeded passage of its ocean commerce and of its security needs for freedom of naval navigation and overflight throughout the oceans. A substantial fraction of the U.S. annual GNP depends upon foreign trade, and most of this trade is ocean-borne. Significant amounts of the foreign oil that we import flow through choke points that are susceptible to interruption in the absence of a satisfactory navigational regime. The ability to project our military forces to any part of the world on short notice involves using key straits when necessary, and is crucial to our military preparedness. Freedom of navigation was being threatened by the trend toward expanded jurisdiction by coastal states. For example, more than 100 of the world's straits will be overlapped by 12-mile territorial seas.

Three parts of the Convention are consistent with U.S. navigational interests. They involve transit passage through straits used for international navigation, passage by means of archipelagic sealanes, and an improved definition of innocent passage through territorial seas. Two other provisions, one dealing with navigation in exclusive economic zones and the other with the breadth of the territorial sea, are also susceptible to interpretations favorable to U.S. navigational interests.

Transit Passage Through Straits Used for International Navigation

With the introduction of the concept of transit passage, the Convention defines a new navigational regime for passage through international straits. The 1958 Convention on the Territorial Sea and Contiguous Zone allows for innocent passage in the territorial sea. The traditional doctrine of innocent passage was defined as passage that is not prejudicial to the "peace, good order or security" of the coastal state, and, importantly, did not allow for submerged transit by submarines or for overflight. The acceptability of that doctrine by the United States was premised on a narrow territorial sea. The Convention, recognizing the uniqueness and importance of straits used for international navigation as well as the needs of maritime states, establishes the right of transit passage. Such passage allows for both submerged transit and for overflight and generally emphasizes the rights of transiting states over the rights of coastal states to control transit.

Passage Through Archipelagic Waters

While allowing for sovereign jurisdiction within archipelagic baselines, the Convention limits the expression of state sovereignty by guaranteeing the right of navigation and overflight in transit.

Innocent Passage Better Defined

The right of innocent passage of all ships through a coastal state's territorial sea is the single exception to complete sovereignty in these waters. In the 1958 Geneva Convention on the Territorial Sea and the Contiguous Zone, the determination of what is "innocent" passage is left largely to individual coastal states. The new Convention much more clearly establishes and limits the ability of the coastal state to interrupt innocent passage.

Navigation in the Exclusive Economic Zone (EEZ)

Though it does not go unchallenged, most observers feel that the character of the navigational regime in the EEZ in qualitatively and quantitatively the same as that of the high seas. Safeguards have been included in the Convention that appear to be adequate substitutes for explicit high seas status for this zone.

Limitation of 12 Nautical Miles on the Breadth of the Territorial Sea

Given the trend by coastal states to "enclose" increasing amounts of the adjacent ocean, it can be argued that the provision in the Convention allowing territorial seas of no more than 12 miles will be helpful as far as U.S. navigational interests are concerned. Indeed, the new provision should put pressure on the coastal states that now claim 200-mile territorial seas to reduce their claims.

Policy Issues

Given the decision not to accept the treaty, the navigational issues may be potentially among the most difficult facing the U.S., since a number of new elements are contained in the LOS Convention. These include transit

passage through straits, passage through archipelagic sealanes, and navigation in exclusive economic zones. Will the navigational benefits contained in these provisions be available to all nations, or will some states take the position that benefits such as these only accrue to those states that become parties to the Convention? A discussion of the broader aspects of this problem is contained in a subsequent section of this paper. In any event, it would seem that the following kinds of questions concerning navigation will be raised for the U.S. by the Convention:

- Are modern weapons systems reducing the importance of unrestricted navigation through straits?
- How important to U.S. interests is unrestricted navigation in the EEZs of other nations? Through archipelagic waters?
- Will the U.S. position as one of the great powers allow it to continue to navigate at will as it has in the past, without undue regard for the new jurisdictions contained in the LOS Convention?
- Are there important navigational benefits that states may want to obtain from the U.S. (such as unrestricted navigation in a U.S. EEZ) that would help the U.S. to obtain reciprocal benefits?
- Are bilateral agreements with key strait and archipelagic states a viable alternative to participation in the LOS Convention?

U.S. Interests as a Large Coastal State

As a large coastal state with broad continental shelves and rich fisheries grounds, U.S. interests lie in insuring its access to the economically important living and non-living ocean resources adjacent to its shoreline. Our offshore fisheries zones presently produce fifteen percent or more of the world's marine fish catches, and our hydrocarbon deposits represent a significant fraction of the world's offshore oil and gas. Two major provisions strengthen the position of coastal states, including the U.S., in this regard. They involve the authorization of 200-mile exclusive economic zones and an expansive definition of the outer extent of a nation's continental shelf.

Exclusive Economic Zone

Under the Convention, coastal states are given sovereign rights to the exploration and exploitation of the natural resources, both living and non-living, as well as jurisdiction over the conduct of marine scientific research, the protection and preservation of the marine environment, and the establishment and use of artificial islands, installations, and structures in 200-mile zones adjacent to the coasts. Jurisdiction of this type can afford the United States exclusive competence over fisheries resources, the placement of ocean thermal energy conversion (OTEC) units, and the management of deepwater port facilities outside the territorial sea, as well as over a broad range of other activities.

The Continental Shelf

A new definition of the outer edge of the continental margin will expand the national seabed resource jurisdictions of many nations considerably beyond the 200-mile limits of the EEZ. The Convention identifies the continental shelf as comprising the submerged prolongation of the land mass of the coastal state out to the edge of the continental margin or to a distance of 200 nautical miles from the territorial sea baselines, whichever is farther. Where the edge of the margin extends beyond 200 miles, the state must establish the seaward extent of the margin by either a thickness of sediment or change in gradient criteria. The delimitation of the continental shelf is then determined by a line drawn on the margin 350 miles from the baseline of the territorial sea or one drawn 100 miles seaward of the 2500 meter isobath. It would appear that these provisions, if applied to our continental shelf north of Alaska, could lead to a U.S. continental shelf whose outer extent, in certain locations, is 500 miles or more from the nearest shoreline.

Policy Issues

Clearly it is in the economic interest of the U.S. to attempt to ensure domestic access to as much of our coastal resource base as possible. But in doing this we will want to protect the concept that essentially free seas exist beyond the territorial sea. In fact, a U.S. EEZ could be constructed and implemented in such a way as to be a model in this regard. Congressman John Breaux of Louisiana introduced legislation to this effect in October. (An appropriately worded proclamation by the President could probably accomplish the same purpose.) Similarly, we might seriously consider the expansion of our territorial sea to 12 miles as a move which would result in a pattern of practice that could strengthen the view that 12 miles *and no more* is now the norm under international law. It would appear that the following kinds of policy options and issues will confront the U.S. in this area in the near future.

- Do we unilaterally adopt legislation creating a 200-mile EEZ? When? Would a presidential proclamation also serve a useful role?
- Can we really obtain the benefits of a 200-mile EEZ without endangering important navigational freedoms?
- Do we attempt to partially solve the problems now faced by our distant water oceanographers by including a scientific research element in EEZ legislation which would be a *de facto* counterpart to the treaty requirements that other nations will wish to place on us? Would this help in establishing reciprocal understandings?
- How do we achieve the freedom of navigation goals in our EEZ legislation, in a manner that is also responsive to our legitimate pollution and traffic safety objectives?
- Will the creation of a U.S. EEZ help in insuring access to newly discovered polymetallic sulfide deposits in the northeast Pacific?

• Should we move to redefine the outer edge of the U.S. continental shelf, especially in places where it will make an important difference? When? How?

• What process do we use in working with Canada and the Soviet Union on the complex resource boundary problems that the new shelf definition will create in the Arctic?

• Will new physiographic or other geologic data on the nature of our shelves be required before we can adopt a new outer limit?

• Will declaration of an EEZ by the U.S. trigger further extensions by other nations?

U.S. Interests as a Nation Concerned with Environmental Quality and Conservation

As a nation concerned with environmental quality and conservation, the U.S. wants to reduce vessel-source pollution and other contamination of the oceans as much as possible. In addition, the U.S. promotes the implementation, worldwide, of measures for the protection of marine mammals. In recent years, the U.S. has been a leader in the quest to end exploitation of the world's remaining whale populations and of other endangered species. In tune with these environmental concerns, two new provisions in the Convention go beyond anything existing in earlier treaty law.

Marine Pollution

There are several aspects of the Convention's treatment of the prevention of marine pollution that are in harmony with the interests of the United States. Consistent with the interests of the U.S. as a major maritime power, the Convention provides that the central authority for the prevention of vessel-source pollution within either the territorial sea or the exclusive economic zone remains with the flag state. The coastal state does have limited jurisdictional control; however, that control is primarily restricted to ice-covered areas and areas of particular environmental vulnerability. Consistent with U.S. interest in environmental protection, the Convention affords port-state control over the investigation and enforcement of violations of international standards by ships voluntarily within a port or at an offshore terminal of a coastal state. Thus, the Convention would seem not to prohibit such pollution prevention programs as those called for in the U.S. Port and Tanker Safety Act.

Marine Mammals

For the first time in a general treaty of this sort, a duty is placed on states to work with existing international organizations towards the conservation of marine mammals.

Policy Issues

For many years the United States has been one of the most vigorous supporters of measures to reduce marine pollution and protect marine mammals. Are there other international steps that the U.S. should take to seek to consolidate the gains made in these areas in the treaty?

• Will we want to see changes in the International Maritime Organization (formerly IMCO) procedures to deal with marine pollution issues?

• Will we want to urge other international organizations (such as the U.N. Environmental Program) to begin to deal more systematically with problems of land-based pollution of the oceans?

• Will we want to change our tactics in working through the International Whaling Commission? For example, should we consider moves aimed at eventually bringing all cetaceans under international management?

TREATY PROVISIONS IN CONFLICT WITH EXISTING U.S. OCEAN POLICY

In explaining the U.S. decision to refuse to sign the Convention, President Reagan commented on the degree to which the majority of treaty provisions were consistent with the marine interests of the United States. "Those extensive parts dealing with navigation and overflight and most other provisions of the Convention are consistent with United States interests and, in our view, serve well the interests of all nations. That is an important achievement and signifies the benefits of working together and effectively balancing numerous interests" (Reagan, 1982). However, the President went on to state that the deep seabed mining provisions of the Convention did not meet U.S. objectives and because the United States could not support a deep seabed regime with such major problems, U.S. participation in the remaining conference process would be limited to the technical level.

While the emphasis to date understandably has been on the seabed provisions, a number of other parts of the Convention also pose difficulties for the U.S. in one way or another. Included here are provisions pertaining to marine scientific research, certain aspects of the fisheries provisions, and certain aspects related to the breadth of the territorial sea. Below, we review these areas of apparent conflict and discuss attendant policy implications.

Seabed Mining

As the Administration has made clear, the LOS Convention does not meet its policy objectives in the seabed mining area. The aspects which apparently have given the Reagan Administration the most difficulty include the following:

• Access to seafloor minerals for private firms is not adequately assured;

• Key mining technology must be transferred to the International Seabed Authority and, in certain instances, to individual developing countries;

• Limits on seabed minerals production are included;

• The U.S. and its allies would be in a relatively weak decision-making role;

• The system is tilted in favor of the internationally run "Enterprise;"

• Financial benefits from seabed mining could go to national liberation movements;

• Binding changes in the seabed provisions of the treaty could be made by a Review Conference without the approval of the U.S.

While observers differ on the "workability" of the treaty's seabed mining regime, it is clear that at least the present U.S. Administration is not going to agree to work under this portion of the treaty. That decision raises a number of policy issues for the U.S. in the 1980s.

Policy Issues

As early as 1971, the U.S. was working on a strategy for the creation of an adequate legal framework for deep seabed mining that did not necessarily involve agreement on a comprehensive LOS treaty. Rather, the approach involved the licensing of U.S. firms under special national legislation that would have, as its legal foundation, the 1958 Geneva Convention on the High Seas. Seabed mining would be viewed as a high seas freedom subject to the usual rule that other legitimate uses of the high seas were not unreasonably affected.

When U.S. seabed mining legislation was finally enacted in 1980, it contained a provision that commercial recovery of nodules under the program could not begin until January 1, 1988. This provision was added at the request of the Carter Administration, to allow time for an acceptable LOS treaty to come into force with respect to the United States. The Administration and its chief LOS negotiator, Elliot Richardson, saw the legislation as *interim*—as providing a temporary legal framework that would bridge the six to eight year gap that inevitably would occur before a treaty could be adopted and formally ratified by a sufficient number of nations to enter into force. Others, less sanguine about the evolving treaty, saw the legislation as an *alternative* to an LOS Convention. Even pro-treaty interests viewed the passage of the legislation as potentially strengthening the hand of U.S. negotiators and ultimately leading to a more acceptable treaty. However, the election of a new Administration in the fall of 1980, in effect, changed the definition of acceptability; the LOS Convention was found wanting and was rejected. [Some well-placed observers believe that it would have been possible to obtain changes that would have made the treaty's seabed mining regime minimally acceptable if a different, more flexible negotiating strategy had been used by the U.S. in New York during the Spring of 1982 (Ratiner, 1982).]

Assuming that the U.S. government wishes to see U.S. mining companies engaged in seabed mining under the U.S. flag, what options remain available? Assuming that the outlook for future metal prices improves considerably and that private firms would want to move more aggressively into seabed mining, could U.S. firms go forward under the U.S. domestic legislation alone? What policy issues will be raised for the U.S. in the years ahead in connection with this set of issues?

In our judgment, the efficacy of the approach using U.S. legislation will depend very much upon what our seabed mining "allies" do with regard to the LOS Convention. If the United Kingdom, The Federal Republic of Germany, and France (nations that have also enacted national seabed mining legislation) sign the Convention this December when it is open for signature, they will be acknowledging the fact that a new legal regime, expressly for deep seabed mining, has been created. This would, in our opinion, seriously circumscribe the extent to which they could participate with the U.S. in fashioning a different legal framework under an alternative view of international law. If, on the other hand, some or all of these nations and a few others (e.g., Belgium, Italy, the Netherlands—also countries with existing seabed mining interests) do not sign, and, instead work with the U.S. on completing the construction of a seabed legal regime based on interlocking reciprocal arrangements under national legislation, then the situation could be more promising.

For the purposes of the present analysis we will take what we consider the most likely situation—that the other seabed nations will, in fact, sign the Convention. In this case, the U.S. would be faced with the following:

• How important is it for the U.S. to have a seabed mining industry operating under the U.S. flag? Does the U.S. need direct access to seabed minerals or can it rely on others? Can we adequately cover supply disruptions of these strategic metals by diversifying our sources of supply? Can more effort on developing substitutes (i.e. for cobalt) adequately reduce our vulnerability?

• If we must have a U.S. flag industry, how will our seabed legislation have to be amended to adapt it to the new international situation? What will investors/banks require? Will loan guarantees and/or subsidies by the government be required? What will we need to do to insure that U.S. licenses and permits are legally sufficient against those to be issued by the treaty-created International Seabed Authority?

• What are the implications for other U.S. interests (i.e., navigation, foreign relations, overseas investments) of U.S. seabed mining activity outside the framework of a widely recognized LOS treaty? Will legal action be brought against the U.S.? Will it succeed? Will reprisals by third world nations result? What will the costs of seabed mining outside of the Convention be?

• As insurance against a changed situation in the future, should the U.S., in cooperation with others, actively work to obtain the best possible seabed mining rules and regulations from the Preparatory Commission? Would active participation in the Preparatory Commission jeopardize our legal position regarding an alternative regime?

There are undoubtedly other policy issues in the seabed mining area that the U.S. will be facing in the 1980s. The list above should be considered as indicative of only the most immediately obvious of these.

Marine Scientific Research

Although many oceanographers argue that the marine scientific research provisions contained in the Convention are better than nothing because of the chaos and uncertainty that had surrounded this area, all would probably agree that the treaty puts in place a potentially time consuming and burdensome system. "Consent" would be required for any ocean research in a nation's 200-mile EEZ although permission is meant to be more or less automatic if the planned research does not directly relate to the utilization of resources, and is not dangerous. The principal problem for the U.S. distant water oceanographer, however, relates to the difference in ocean jurisdictions claimed by the U.S. and those claimed by most other coastal nations, and is triggered by the process of requesting permission from other countries through our State Department. Naturally, the U.S. Government is not inclined to ask permission to conduct research in foreign jurisdictional zones that it does not recognize nor claim for itself. We continue to claim only a three-mile territorial sea and a continental shelf and fisheries regime limited in their functions and scope. Thus with the extended zones of the new Convention, our scientists anticipate that they will face even more difficulties in obtaining the necessary governmental permissions. Policy options regarding this dilemma are discussed below.

Policy Issues

There are several ways in which U.S. distant water marine science could be significantly affected by the LOS Convention. This is an activity that requires long lead times for both planning and funding purposes. By withholding consent or imposing endless requirements, nations could effectively prevent U.S. scientists from conducting research in their waters. Specific policy questions such as those listed below will arise:

- Will U.S. marine scientists have to continue the practice of scheduling a station within three miles of a coastal state's shoreline in order for the U.S. Department of State to formally request permission for work in more distant coastal waters?
- Should the U.S. create a marine science consent regime off its own coast?
- Will it be possible for U.S. scientists and scientific institutions to build informal ties (i.e., without government involvement) to foreign institutions as a way of easing consent problems?
- What effect will the continental shelf extension provision (and actions taken by other nations under it) have on U.S. marine science?
- Will the provisions of the Convention force greater costs on U.S. scientific institutions? Will such costs, if incurred, lead to an overall de-emphasis of U.S. distant water science?

Fisheries Management

There exists a good deal of disagreement concerning the forecasted impacts of the Law of the Sea Convention on U.S. fisheries interests. A spokeswoman for the National Federation of Fishermen has expressed concern over those treaty provisions involving potential foreign access to surplus stocks within U.S. jurisdiction as well as provisions addressing highly migratory and anadromous stocks. The point has been made that under the treaty the United States will be forced to allocate surplus stocks to foreign interests and that it will not be able to treat such underutilized stocks as reserves (as is currently allowed under the Fishery Conservation and Management Act). Further, it has been argued that treaty provisions describing allocations to less developed countries in a region or subregion could further complicate our allocation process. These concerns, along with long-standing disagreements over the Convention's treatment of highly migratory and anadromous stocks, serve as the focus for the fishing industry's opposition to the LOS treaty. It should be noted, however, that support for these concerns, even in the industry, is not universal. Some have argued that the realities of international fisheries politics and important linkages between domestic fisheries management and other international issues will significantly lessen any differences that might exist between activities carried on either inside or outside of the provisions of the treaty.

Policy Issues

Given the economic importance of U.S. decisions regarding fisheries management, both at regional and national levels, it is clear that the impacts of international law on the fishing industry will be given particular consideration. We anticipate that a number of questions will arise during these deliberations, and among them are:

- What criteria should be used in the identification of surplus stocks within U.S. jurisdiction? Abundance, maximum sustainable yield (MSY) estimates, seasonal availability? What time scales are appropriate? Whose data should be used?
- Could the United States periodically place certain surpluses into "reserve" in order to stimulate the development of a domestic fishing industry for underutilized stocks? Should it?
- Should the U.S. continue the policy of manipulating the allocation of suplus stocks for political reasons as did President Carter over the Russian invasion of Afghanistan, and as did President Reagan over the suppression of the Solidarity trade union in Poland?
- What recourse, if any, should be open to other countries in appealing U.S. decisions with regard to the setting of surplus stock levels?

• What fisheries questions are likely to arise if the U.S. territorial sea is expanded to 12 miles?

• Should our current fishery policies and legislation be adjusted in light of the international trend to place highly migratory stocks within coastal state jurisdiction?

Territorial Sea Breadth

The LOS Conference reached early agreement on a 12-mile breadth for the territorial sea, although for many maritime states, including the U.S., the acceptability of this provision was tied directly to obtaining a satisfactory straits transit passage provision (which was subsequently incorporated into the Convention). After the failure to agree in 1958 and 1960, achieving a consensus on the maximum breadth of the territorial sea was a major objective of a number of states. Now the U.S. is faced with a decision concerning its own territorial sea. Since Thomas Jefferson, as Secretary of State first announced that the U.S. recognized a 3-mile territorial sea in 1793, we have steadfastly held to the view that the narrowest possible territorial sea was most consistent with our interests. Now the international situation has markedly changed. Triggered in part by the Truman Proclamation in 1945, wherein we proclaimed jurisdiction over the resources of our continental shelves, other coastal nations have been steadily increasing the breadth of their territorial seas to the point where 104 of 137 coastal nations now have territorial seas of 12 miles or more (compared to 11 of 80 in 1958). Hence, the Convention provision of 12 miles and most national practice are now at odds with the present 3-mile U.S. territorial sea. We believe that forces will develop which will make it desirable to consider increasing the U.S. territorial sea to 12 miles in the near future.

Policy Issues

As the 12-mile territorial sea becomes virtually universally accepted, continuing to claim only a 3-mile territorial sea for the U.S. will create an increasing number of problems related to reciprocity and consistency with other countries. U.S. attempts to maintain, through naval and aircraft movements, the fiction that international law continues to restrict the breadth of territorial seas to only 3 miles, will become increasingly expensive, time consuming, and diplomatically costly to defend with few, if any, tangible benefits. Given this situation, it would seem that the U.S. will soon have to consider the policy implications of increasing its territorial sea to 12 miles. While by no means exhaustive, the list below indicates the types of issues that presumably will need to be confronted. A more extensive discussion of the domestic implications of this issue is available in Knecht and Westermeyer (1982).

• If the U.S. increases its territorial sea to 12 miles, will such an action encourage other nations to go to even broader territorial seas or will it help crystalize international law at "no more than 12 miles"?

• If we increase the limit to 12 miles (and remain outside of the treaty), do we take the risk of increasing the potential problems that we could face in transiting straits of less than 24 miles in width?

• Assuming that the U.S. decides to broaden its territorial sea, what factors should guide the timing of such a move?

• What domestic issues will be raised by an expanded U.S. territorial sea?

• Would such a move automatically trigger demands on the part of coastal states in the U.S. for an increase in state control over ocean resources?

• Is some increase in state as opposed to federal control of ocean resources desirable?

• Should some form of joint federal/state management be considered for the new 3 to 12 mile zone?

• Is a modest increase in state control and ownership of ocean resources one way to meet present state demands for sharing of federal OCS oil and gas revenues? (Note that a pooling of a fraction of such new *state* revenues would be necessary if coastal states with little or no oil and gas reserves in their 3- to 12-mile zones were also to benefit.)

In the sections above we have described a number of the provisions of the LOS Convention that could potentially affect U.S. interests. The extent to which any particular aspect of the treaty actually affects non-signatories like the U.S. (in a positive or negative way) will depend on the legal basis of that provision. We now turn to an examination of the legal nature of the several types of provisions contained in the treaty.

THE NATURE OF THE LOS CONVENTION AND ITS PROVISIONS

As we consider the impact of the Convention on the U.S., it is useful to note that the treaty contains three different types of provisions. First, there are those that merely codify what has become the cutomary practice of nations. One might also include in this category provisions of earlier treaties that have been carried over into the new Convention. A widely used example is the freedoms allowed in the high seas. Obviously, to the extent that provisions such as these have become customary international law, they apply to all nations including the U.S., whether or not they specifically sign or ratify the new Law of the Sea Convention. A second category of provisions contains concepts (for example, those dealing with passage through archipelagic waters), which clearly cannot yet be said to reflect customary international law. The future behavior of both the archipelagic states and the nations transiting their waters will largely determine if and when these provisions become customary international law and therefore applicable to all nations. Finally, there are provisions in the Convention that would appear to require

specific adherence by nations wishing to take advantage of them. Many of the dispute settlement provisions are of this nature and, arguably, many of the provisions of Part XI dealing with the seabed mining regime are of this type. In these cases, the benefits of these provisions of the Convention clearly apply only to those who have formally agreed to the arrangements.

The problem of a nation using to its benefit aspects of the treaty it supports while rejecting other portions stems from the widely perceived notion that the treaty was negotiated as a "package deal." This implies, and many nations on many occasions were very explicit about this, that nations compromised certain of their interests in one part of the treaty in order to obtain benefits in other portions. The navigational provisions crucial to continued relatively free use of the seas, for example, were said to have been offered by certain developing countries in exchange for a functioning (and funded) international seabed authority. Will nations controlling important straits attempt to restrict application of the treaty provisions that allow unimpeded transit passage only to states adhering to the treaty? Obviously, those provisions in which the benefits can be obtained through unilateral domestic action will not present this kind of problem. Other new provisions, particularly the one pertaining to the EEZ, clearly now represent existing international practice; hence, coastal states in and outside of the treaty framework have essentially total freedom to take conforming unilateral domestic action to achieve the benefits that might be associated with these provisions.

It follows then that the potential problems for non-signatory states will be associated with those provisions that contain new principles and procedures, especially in cases where the novel provisions grant perceived or real benefits to those who would take advantage of them.

In refusing to sign the LOS treaty the United States will certainly avoid the contractual obligations and limitations established by the treaty; and, the U.S. may freely act outside its provisions as long as such activities fall within the parameters of customary international law or other treaties to which the U.S. is party. This position is not however, as privileged as it might seem at first. One must also take into consideration that along with its duties the treaty also creates numerous rights for the contracting parties, and provides for uniformity in unsettled areas of international law, such as the limits of the territorial sea, and passage through international straits, archipelagic waters, the territorial sea and exclusive economic zones.

As a non-signatory, the United States is not favored by the application of the rule *pacta sunt servanta* (the rule that treaty parties have no obligation to confer treaty benefits on non-signatories), hence opening our nationals to the possibility of arbitrary action by treaty members. For a voluntary outsider it can be argued that the rule of law will be almost as uncertain as it was prior to the LOS negotiations. This brings several important questions to the fore.

- Could a coastal state legally attempt to force the surface transit of U.S. submarines through an international strait, as allowed for under the 1958 Convention on the Territorial Sea and Contiguous Zone? (Art. 14:6 "Submarines are required to navigate on the surface and to show their flag.")

- Could a coastal state refuse U.S. aircraft the right of overflight over its territorial sea for the same reason?

- Could a coastal state place prohibitively restrictive pollution control requirements on U.S. vessels transiting its waters?

- Could U.S. marine scientists, again because of overly stringent coastal state regulations, be excluded from working in important ocean areas?

Some support for a positive response to these questions can be drawn from a rather unexpected source—the United States Fifth Circuit Court of Appeals. The case in question, *United States vs. Cadena* (585 F.2d 1252, 1978), concerns the arrest and subsequent conviction of thirteen Colombian nationals for conspiracy to import and distribute marijuana in the U.S. The arrests, by the U.S. Coast Guard, were made in international waters and, according to the defendants, in violation of freedom of the high seas. However, the court ruled that because Colombia had not yet ratified the 1958 Convention on the High Seas, and, since that Convention, according to the court, was not intended to confer rights on non-member nations, the high seas convention was not applicable to the vessel in question. Further, in addressing the question of the status of high seas freedoms in customary international law, the court concluded that Colombia, by not ratifying the Convention, had rejected these fundamental principles and that it was inappropriate for the U.S. judicial system to unilaterally apply those right to Colombian citizens. The court concluded that, "indeed, such unilateral enforcement of the terms of the treaty with respect to non-member nations might ultimately undermine its effectiveness by reducing the incentive for ratification."

We are not suggesting that these questions are in any way settled, even in U.S. domestic law. However, it is clear that these issues must be given serious consideration in any comprehensive evaluation of potential U.S. responses to the treaty's entry into force.

AN APPROACH TO POLICY-MAKING: A SUGGESTION

The discussion above underscores both the interdependency of the issues raised for the United States by the LOS Convention and the complexity of those issues. Further complicating the matter is the fact that there already exists a number of important domestic ocean management issues that also need attention. These include conflicts, often expressed as litigation,

between a number of coastal states and the federal government over the question of offshore oil and gas development. Tensions also exist among some coastal states, regional organizations, and the federal government concerning how to best manage and allocate fisheries resources. Other ocean management problems are related to the fact that our present ocean management system consists of a loose amalgamation of uncoordinated single purpose laws and programs. The policies of the present Administration toward deregulation, turning more authority over to state governments and reducing federal expenditures, also have significant implications for domestic coastal and ocean management.

Clearly, the issues being triggered by the LOS Convention need to be considered against the backdrop of existing domestic problems. It would appear that a careful study of both the present coastal and ocean management problems and those that are emerging in connection with the LOS treaty is needed. The nation, faced with a set of similar needs nearly two decades ago, chose a legislatively mandated commission as a vehicle for developing options and recommendations. The report by the commission, the so-called Stratton Commission (Report of the Commission on Marine Science, Engineering and Resources, 1969), was judged to be an excellent one when it was issued in 1969. It served as a valuable blueprint during a formative period in the development of the nation's ocean and coastal programs. We believe that a new commission, patterned along the lines of the earlier Stratton Commission, should be constituted to review existing programs and to explore the general implications of the LOS Convention as well as the specific actions that the Preparatory Commission and other coastal nations may take in the near future. Ideally, such a commission should have a clear congressional mandate and a carefully worded charge and be staffed and funded for a period of at least two years. The staff would receive balanced policy guidance from a high level group of commissioners representing important ocean users, government, academia, and the public at large. The report and recommendations of the commission would be transmitted both to the appropriate congressional committees and to the executive branch upon completion of the study.

CONCLUSIONS

Our discussion of the implications of the LOS Convention for U.S. ocean policy in the 1980s has led us to the following conclusions:

- Given the magnitude and diversity of U.S. ocean interests, the U.S. will be significantly affected by a widely accepted LOS Convention even if it does not become a party to such a convention in the foreseeable future.

- Over time, the Convention will have its most important impact on international law (and consequently, on the U.S.) to the extent that its provisions serve as the authoritative guide to a consistent and uniform practice of coastal states.

- Domestic action, probably involving legislation in most cases, will be required to take advantage of parts of the Convention consistent with our interests, for example, establishment of an EEZ.

- The U.S. will also find it necessary to take action to mitigate the adverse effects of certain other LOS provisions, such as those dealing with marine scientific research and seabed mining.

- Reviewing and deciding upon appropriate courses of action in connection with these issues will be a major preoccupation of ocean interests in the 1980s.

- Such reviews must take into account the status of the LOS Convention in international law and the possible reation of other countries to U.S. non-participation in the treaty.

- Given that certain of the LOS-triggered issues are politically volatile and co-mingled with existing coastal and ocean management problems (e.g., the expansion of the U.S. territorial sea), the creation of a "study commission," is a means of reaching a national consensus on these issues.

In addition to the LOS-generated influences, we feel that the ocean policy agenda for the next decade will also be affected by a variety of other factors. These include an even bigger push to win important resources from the sea, especially hard minerals (of course, the current emphasis on increasing offshore hydrocarbon development and boosting U.S. fisheries catches will continue); more aggressive government-funded foreign competition in ocean resources development (in seabed mining, OTEC, and other new technologies); and more vigorous involvement in the development and conservation of ocean resources by certain U.S. coastal states (e.g., California and Alaska) stimulated by the accelerated OCS leasing program and the void being left by the federal government in coastal programs.

While much of the original U.S. ocean policy thinking may have been done in the 60s, and much of the supporting legislation passed in the 70s, the 80s also hold a major challenge—that of adjusting and refining our rather haphazardly developed body of ocean law and policy to fit the emerging realities, both at home and, especially, abroad. And we believe that the LOS Convention is one of those realities.

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United States Ocean Policy and the Oceans Ethos

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INTRODUCTION

Volumes have been written about marine affairs and marine policy. From Edward Wenk, Jr.'s *The Politics of the Ocean* in 1972 to Ann Hollick's *U.S. Foreign Policy and the Law of the Sea* in 1981 we have seen the documentation of our contemporary, collective struggle to come to grips with our relationship to the oceans. These discussions have encompassed technology, geology, chemistry, politics, economics, biology, oceanography, and many other subjects. What has been missing, however, is consideration of the basic underlying social forces behind our concern with the oceans here in the United States; forces which in some sense lie in our collective consciousness, but more importantly, which are exhibited in a much wider range of thought, behavior, and interaction than that which is addressed in works such as those above. When looked at from this broader perspective, many of the topical issues of United States ocean policy take on a different appearance.

This paper explores these different appearances in two ways. First, we present a discussion of four subjects which were raised at the seminar in Santa Barbara from which most of the papers in this issue were generated, and which are integral to most current ocean policy discussions: 1) Whether the United States has what one might call a coherent ocean policy, and in what sense; 2) Our ability to collect and interpret scientific data in support of coastal and ocean management; 3) The domestic organization of authority and responsibility with respect to marine policy in general; and 4) The representativeness of public input, and of scientific national policies. Second, we briefly examine the recent social history of the United States and the oceans—in particular what we term our "oceans ethos."

A COHERENT OCEAN POLICY?

During the seminar in Santa Barbara, Robert Friedheim (University of Southern California) noted that one of the conclusions of his recently completed study of Japan's ocean policy was that the Japanese perceived of the United States as having a much more coherent set of ocean-related laws, policies and activities than Japan. Professor Friedheim responded that his impression was just the opposite; that Japanese ocean policy was much more coherent and orderly than that of the United States. In a recent paper Friedheim concludes that although Japan's ocean policy is rent with much more conflict and disorder than meets the eye, its actions in the aggregate have been remarkably effective (Friedheim, 1982).

Is coherence in the eye of the beholder? To a certain extent, yes. But beyond these perceptual differences, which may be due to value or goal differences, partial information or other factors, of what does a coherent ocean policy consist, and of what advantage—assuming there is an advantage—is it?

What we appear to have had in the U.S. in the last 30 years is a situation where various constituencies in the broadest sense—some formal such as the United States ocean shipping industry and its federal mentor the United States Maritime Administration (MARAD), the National Oceanic and Atmospheric Administration (NOAA), or the Sierra Club, and some informal such as the voting public or participants in letter-writing campaigns—have, as a result of the confluence of social movements, economic pressures or cultural biases, joined in public expressions of support for ocean-related issues. The social, technological and economic conditions of post-World War II America made these public expressions more effective as change agents and funding-generators than they otherwise might have been.

There are a number of organizational forms which have served as conduits for these expressions of support, but the relative effectiveness of each is open to question. For example, public and political support for the oceans must be translated into meaningful action through the administrative agencies, and such agencies may be put together in myriad ways. Did it make sense to form NOAA at all? To put the National Weather Service with the Bureau of Commercial Fisheries? To put NOAA under the Department of Commerce rather than under the Department of Interior (a move which occurred, according to some, as a result of a *conflict-a-trois* between then-President Richard Nixon, Interior Secretary Walter Hickel and Commerce Secretary Maurice Stans)? Would it not make sense for fisheries, after all a primary form of food production, to be under the Department of Agriculture rather than under the Department of Commerce?

To each of these questions, some answer yes and others answer no. One is tempted to say that in the long run it really doesn't matter *as long as the range of*

issues and their constituencies have an adequate forum for consideration. Beyond this, it is easy to expect too much of one form of administrative organization or another. Recent research on the national marine policy development process has borne out this viewpoint with the discovery that, at least in the post-National Environmental Policy Act (NEPA) era, the primary concern of policy-makers at the Assistant Administrator level and above in NOAA has been with *process*: Has the political process, in the broadest sense, worked and worked fairly (Orbach and Cicin-Sain, 1982)? In this, the managerial decision-making sense, besides some potential for overlap and duplication, it really doesn't matter whether fisheries is under Commerce or Agriculture. The policy *process*, properly carried out, should be essentially the same in either instance.

Does the United States have a coherent ocean policy? In that actions pursuant to the values and goals of various constituencies in the United States have evidently created the impression on the part of some other nations that our policies are coherent, the answer is yes. But, have these actions been the result of what political scientists would call a "policy" as opposed to a "program," the former being more desirable and coherent than the latter? Perhaps not. Finally, have our actions gone forward as far as or in the coordinated manner in which some particular constituencies might have wished? The answer to this last question is, clearly, no!

IS THERE A THERE THERE?

In his presentation at the Santa Barbara seminar Michael Glazer (former NOAA Assistant Administrator for Policy and Planning) borrowed Gertrude Stein's comment about her visit to Los Angeles: "There is no there there." His point was that much of what we need in order to develop rational marine policy is data and information which, for one reason or another, either does not exist or does not enter into the policy process in a usable form.

At the outset there was a question, raised by Professor Friedheim, as to whether the problem was the lack of data or the lack of theoretical frameworks within which to integrate the data. Data do not speak by themselves; to become usable information they must be organized and analysed according to one theory or another which prescribes a particular interpretation for a given configuration of information. These interpretations may be scientific; for example, whether a reduction in fish population is due in its ecological context to overfishing or habitat degradation. They may also be clear examples of value judgments, as in the case of whether a given reduction in net income for a fisherman as a result of resource rebuilding measures is deemed acceptable. Interpretations, scientific and otherwise, are judgmental. To make rational judgments, we must have both data and theories.

There are, or course, many situations where we simply do not have the answers due to a lack of data to confirm or deny our theories. There tend to be two polar reactions to this situation. One is the scientific reductionist: If we are not sure what our data tell us, or we have no data, we cannot responsibly make judgments. The other extreme is that of the motivated decision-maker: If we don't have the data, but there are pressures to act, we do the best we can.

There is no airtight argument for either of these positions, and in fact, the vast majority of policy behavior falls somewhere in between. The "risk model" used in environment impact analysis for Outer Continental Shelf (OCS) petroleum development is one such middle-of-the-road policy tool. It says, "Our best guess is that there is X probability of Y happening under Z conditions." If you read the environmental impact statements associated with OCS activities carefully, they do not pretend to say more than "given certain assumptions and a particular set of data (the infamous "best scientific information available"), statistical analysis suggests a certain outcome."

The other problematic situation is one where both data and theories do exist, but they are not available to or are not used by policymakers. With ocean policy, I would suggest that this situation usually arises from two very different causes: One is the *lack* of time or resources under the constraints of the policy process to gather or analyse data; the other is that *too much* time and attention is devoted to gathering and disseminating data, to the exclusion of its careful analysis. Once again, a balance must be struck.

It is unfortunate that in discussions of this type we focus more often on completing voluminous data sets than on the thoughtfulness or elegance of our analytical capabilities. Daniel Goodman of Scripps Institution of Oceanography has developed a method for monitoring porpoise populations whereby one does not need to know every detail about the entire population, but rather only the *direction* of movement in certain key indices (Goodman, 1981). I would like to think that this is where the answer to many of our "Is There a There There" questions lie: In careful, elegant analysis as opposed to pavement-pounding data. We have paid too little attention to the former, and we may no longer be able to afford the latter.

THE INTERNAL FACE OF U.S. MARINE POLICY

Ocean, or marine policy involves not only the external face of the United States as a whole with respect to the oceans but also the internal, domestic machinations of the policy process. Coastal zone management, port and harbor developments, multiple-use conflicts, fisheries development, marine mammal management; all these and more are the domestic arenas of marine policy.

There are several general questions in these, the internal affairs of U.S. marine policy. What is the fiduciary responsibility of coastal states to the landlocked ones,

a question as salient within the United States as it is to the United Nations Conference on Law of the Sea (UNCLOS) discussions as a whole? What level of government is best equipped to handle marine resource management—localities, states, regions or the federal government? What is the role of citizen participation at any of these levels, and how effective has this participation been in the thirteen years since the passage of the NEPA in 1969? Comprehensive answers to these questions—if answers in fact exist—are beyond the scope of this paper. There were, however, several points made at the Santa Barbara seminar which bear repeating here.

The issue of fiduciary responsibility lies at the heart of almost all natural resource policy. Since Garrett Hardin first popularized the notion of the tragedy of the commons (Hardin, 1968)—essentially the question of absolute fiduciary responsibility—resource managers and the public alike have gone around and around in a guessing game concerning mankind's collective intentions. Hardin's impact was not so much in raising the issue of common property resources; most societies have had experience in one way or another with specific common property questions. It was rather that he broadcast, in the expansive yet Malthus-conscious 1960s, the message that mankind was inherently not to be trusted.

Hardin's admonition carries over into the discussion of which level of government is the correct one to deal with certain kinds of resource management issues. One line of reasoning, for example, holds that marine resource management naturally falls under the province of the federal government because localities and even states have too many vested interests in exploiting local resources. Under this scenario, the federal government is the savior of the marine environment; state and local governments are not to be trusted. The opposite line of reasoning, however, is that the higher levels of government are either ignorant of the real resource conservation needs or that they unfairly impose national priorities on local situations, a case in point being OCS development off California; the federal government is not to be trusted. At issue here is the perception by individuals at one level of government of the motives and goals of individuals at the other levels. The empirical evidence suggests that with respect to conservation objectives the record is mixed: Sometimes the states are more conservation-oriented than the federal government (as is evidenced, for example, in the case of California with its early passage of coastal zone legislation and differences with the federal government over offshore petroleum leases), and sometimes they are less conservation-oriented (as is the case in many states dependent on heavy industry for jobs and economic support). What is clear is that no single level of government or kind of entity is consistently more conservation-oriented than another.

There is another, more instrumental sense of fiduciary responsibility which has to do with practicality or feasibility of policy implementation. Just as in the international case of highly migratory species such as tuna where several countries must cooperate for a management regime to be effective, in many instances domestic marine resource management situations require at least coordination and often supra-state authority for their proper consideration. Anadromous fish species, toxic wastes, and navigation are all such situations which require authority beyond the single state for their proper management. In these cases, absent extraordinary examples of cooperation among the states, a federal authority is often required. This can, of course, be implemented with state and regional input as in the case of the Regional Fishery Management Councils created under the Magnuson Fishery Conservation and Management Act of 1976.

PUBLIC INPUT AND PUBLIC POLICY

Although clearly bolstered by NEPA and much of the subsequent state and federal legislation of the 1970s, the issue of the effectiveness and representativeness of citizen participation is still a muddled one. On the one hand, the *opportunity* for citizen involvement is solidly established in state and federal mandates. The extent to which the general citizenry avail themselves of this opportunity is another question. Public hearings are most often attended by a less-than-representative portion of the population. Often the expense and delay which the government incurs to hold extensive sets of hearings do not appear to be recompensed by the level of attendance and fresh insight attained in the hearings themselves. It is clear that the citizen participation mechanism has fostered the development of new interest groups and the consolidation of new constituencies, but is the new set of interests truly more representative —and of what—than the old?

The creation of the opportunity for input and the increased range of interest groups alone seem to justify the costs of the system. Still, there are puzzling situations which arise. Largely on the basis of an apparent groundswell of public opinion and through the lobbying of a very competent set of interest groups, a U.S. policy on commercial whaling has developed which calls for the cessation of all commercial whaling. Yet, when a survey was taken among a representative sample of 3,000 U.S. citizens asking them, among other questions, whether they thought commercial whaling would be acceptable if the product were fully utilized and there was no danger to the species, 77 percent of the sample answered "yes" (Kellert, 1979). Richard Frank, the then-Administration of NOAA and head of the U.S. delegation to the International Whaling Commission (IWC), would probably not have found that survey very supportive in discussions of the U.S. policy position before the IWC.

The question of representativeness, however, has more to do with the progression of social movements and preferences than with the goodness or effectiveness of public participation in policy development. But it does, once again, deal with the issue of motives and intentions. For all of the laws that were passed and all of the

money that was spent on marine resource issues in the last thirty years, we would not have progressed half as far as we have if in fact the intent of a broad spectrum of citizens, politicians, bureaucrats, scientists and others had not been basically behind the idea of the need for conservation and rational management of the world's marine resources. The interesting part, as we shall see presently, is that the major portion of the build-up of public support for oceans activity began two decades before NEPA sanctified the public voice.

THE OCEANS ETHOS

> Ethos deals with qualities that pervade the whole (human) culture—like a flavor—as contrasted with the aggregate of separable constituencies that make up its formal appearance. . . . The ethos includes the direction in which a culture is oriented, the things it aims at, prizes, and endorses, and more or less achieves (Kroeber, 1948:294).

In my own perspective, the most inportant forces in our contemporary U.S. *oceans ethos*—and by implication in our ocean policy—are two television programs, one personality, a war, and a handful of scientist/academician/bureaucrat/politicians. The television programs are "Flipper" and "Sea Hunt;" the personality is Jacques Cousteau; the war is World War II; and the "handful" includes Donald McKernan, Robert White, Elliot Richardson, Edward Wenk, and Sidney Holt, among others. Let me explain.

I define "policy" as a set of principles used by a group of people to make decisions. In this sense a policy principle is an element of "culture," with culture defined as the beliefs, values and preferences shared by that group of people (Orbach, 1982). It is by definition that in a representative democracy the aggregate cultural preferences of the people are expressed in their governmental, or public policies (Maiolo and Orbach, 1982).

Marine policy—that set of principles which concern the marine environment—is one of the more culturally eclectic arenas of behavioral principle. It is, in part, the adventure of Joseph Conrad, Herman Melville and Jack London. It is, in part, the pleasurable experiences of Club Med or Cape Cod. It is, in part, symbolic reflection of the tale of Jonah and the whale, or the dark connotation of the phrase "murky depths." It is also the emotional environmentalism of Greenpeace and the frolicking sea otter and playful porpoise. And, of course, the marine policy arena also has the connotation of savior—fish protein concentrate, petroleum, wave energy, minerals, algae and other items to feed, cloth and otherwise supply a hungry world.

Because of the eclectic nature of its policy environs, the character of the oceans constituency, to the extent that such a constituency exists, is equally eclectic. It is not only scientists, legislators, bureaucrats, and special interests groups who have brought marine policy subjects to the fore in the last thirty years. It is, rather, a complex amalgam of forces at play -- the oceans ethos, if you will —of the American public as a whole.

Two Television Programs, A Personality And A War

World War II (WWII) marked one of the most historically significant points in the history of man's relationship to the oceans. Before 1945, the use of the oceans for commerce, military purposes and fishing had been circumscribed by "the military-diplomatic relations of the great states" from the eighteenth and nineteenth centuries (Osgood et al, 1976). After WWII, these uses and their place in the public consciousness expanded exponentially.

Some of this expanded significance was technological, and involved the entire U.S. science establishment. WWII bolstered the technological research establishment in a multitude of areas from sonar to exotic metals to thermodynamics. The impetus provided by WWII leapfrogged into the mid-fifties and Sputnik, Russia's first satellite. "With one countdown," observed Edward Wenk in his *Politics of the Ocean*, "science was launched from the quiet and seclusion of the laboratory into the orbit of national policy" (Wenk, 1972:41). Specifically with respect to the oceans, characteristics such as the funding base for ocean science also changed. Before WWII, the primary financial stimulii for oceanography had come from the private sector; after WWII, oceanography accelerated as an enterprise through federal government support (Abel, 1981).

Aside from the specialized arenas of the military and the science establishment, however, after WWII a profound change also occurred in the way the American public conceived of and related to the oceans. The War had gotten hundred of thousands of Americans out on and across the oceans, many for the first and last time. They felt the sway of the troopship's deck; they rejoiced at the sight of sunrise at sea, and of landfall; they lounged, and fought, under the fabled palms of the South Seas. They finally had something with which to connect Melville, Conrad and London. Regardless of the conditions under which they encountered these experiences, they were all *oceanic* experiences, felt and remembered by the better part of an entire generation of American males.

The fifties and sixties were also the glory growth years for television, clearly one of the most important and pervasive societal forces of this century. The direction and power of the television media was inculcated through its programming, and in the fifties and sixties a significant portion of that programming involved the sea. Extremely popular programs such as "Sea Hunt," "Flipper," and in a somewhat narrower sense, "Victory at Sea," both reflected and determined attitudes toward and support for ocean-related activity in the mind of the American public. Television programming as a cultural force contributed to the enactment of the popular envi-

ronmental legislation of the 1970s, such as the Coastal Zone Management Act and the Marine Mammal Protection Act, it was in large measure the increased use and awareness of ocean environments, generated and strongly reinforced through the mass media, which spurred the development and success of such legislation.

It was also in the 1950s that the role of individual personalities became critical in ocean awareness. Almost singlehandedly, Jacques Cousteau became and has remained the most ubiquitous and eloquent world educator and spokesman for the oceans. The importance of Cousteau's work on marine policy in the U.S. was recently underscored by Robert Abel, the former Director of the Department of Commerce's Office of Sea Grant: "In fact, if there is a marine focus of national attention, it is more likely Jacques Cousteau, a Frenchman, than any of the invisible but polictically potent individuals or agencies in Washington, D.C." (Abel, 1981:48).

Irrespective of the "focus of national attention," there were other personalities whose influence was also enormous in the post-War marine policy arena. The most influential of these were people who crossed the lines of university, agency or industry—individuals such as Don McKernan, Elliot Richardson, Edward Wenk, Robert White. These were individuals who possessed both competence and vision, and who were willing and able to criss-cross the ocean policy sectors and create the intricate web of relationships to which we now refer as our "ocean community." To whatever extent we believe this community exists, it was consolidated—with the broad support of the American oceans ethos and key legislators such as Warren Magnuson, Samuel Eastland, Claiborne Pell, and Lowell Weiker—by those individuals and others like them.

All of these factors—mass public participation in events such as WWII, pervasive national phenomena such as media programming, and human circumstances such as the presence or absence of individual personalities—must take their place alongside such amorphous notions as policy trends, agency positions or economic conditions as indicative of the ways in which the U.S. as a whole has been, and will be, involved in the oceans.

The Broader View Of Ocean Policy

At an entirely different level, much of the character of our interaction with the oceans has nothing to do with the ocean *qua* ocean, but with the ocean as a faceless portion of the space and resources of our planet as a whole.

Roger Revelle wrote in 1969 that, "Recognition of the new opportunities in the ocean has brought a widening realization that the organization of human society into national states, which works, however imperfectly, on the land, is not well suited to the optimum utilization of the sea," and that the extension of national control over the seabed is "ominous," and the consequences "appalling" (Revelle, 1969:65). These thoughts are generally reflected in the concept of the oceans as "the common heritage of mankind," a concept elucidated by Arvid Pardo before the United Nations in 1967 and largely incorporated in the documents of the three United Nations Law of the Sea Conferences.

But let us stop and think. Why should the oceans, as a physical space and resource repository ever more accessible to man, be considered differently from other physical spaces on or off this planet? Technologically, there are some valid arguments for separate consideration. As John Isaacs wrote:

> Fisheries management, domestic and nuclear waste disposal, undersea structural design, marine mammal politics, food web concepts, coastal and estuarine processes, and a host of other marine elements are all largely perceived as only small perturbations on the terrestrial experience with little discernment of the unique nature of the problems that the sea presents or of the unique solutions that the sea requires and provides (Isaacs, 1978:2).

With respect to the legal and other human institutions concerned with the sea, does this same reasoning hold? Are the oceans different because they are the most largely unexplored portion of the earth? By that logic, the western hemisphere could have been declared the "common heritage of mankind" by Europe in the seventeenth century. Is it because the oceans are our "last frontier," representing the true limits to our growth on this planet, and therefore should be managed in common? The worldwide historical experience with commonly-managed resources in the absence of clear-cut responsibility and authority and, in most instances, *ownership* in some sense has not been a good one. Why should we think the record will be any better with the oceans?

We are currently developing the ability to colonize other planets, essentially as well as we could colonize the bottom of the deep ocean. Rather than the "common heritage" prognostication, why is it not more reasonable, more practical, and more desirable to consider the oceans and the near planets fair game for the same kinds of territoriality, ownership, usufruct, and so on as the land mass of the earth? Do we believe in the technological possibilities of our age, or don't we? As Whitehead said:

> Here we are with our finite beings and physical senses in the presence of a universe whose possibilities are infinite, and even though we may not comprehend them, those infinite possibilities are actualities (Whitehead, Quoted in Isaacs, 1978:10).

If we do believe in infinite possibilities, why do we think that human nature will be configured differently under

future technological conditions than it is under our present one?

Part of the answer to this may be that the same cultural presences that have for the last century expanded our concept of man's relationship to the non-*homo sapien* world have paradoxically restricted our concepts of the range of possibilities within those relationships. As neonates in the ocean, we wish it to be mysterious and different in the same sense that my two-year-old son nods his head when I assure him after a scary story that giant ogres are "pretend" and then, with an anxious but cunning smile, he says, "Let's go *find* one." We also, at this point in history, wish the ocean to be a noble experiment in what some of us wish humanity and human-nature relationships *could* be. It is one of mankind's most historically documented paradoxes that we continue to hold these wishes in counterpoint to most of our actual behavior, which is one of the more accurate measures of our values and desires. We love the ocean, we are mystified by it (at least in 1982), we are sometimes terrified by it, and we cannot yet use or control it. These situations make us desirous, and, up until now able, to wish upon our relationship with the ocean a status we have not attained on the land.

What does this have to do with marine policy in the 1980s? Everything. Twenty years ago military strategies pointed out the rapidly approaching, obsolescense of conventional naval surface vessels. In 1982 this issue finally made the headlines of a major newsweekly, as a result of the obvious truth of this phenomenon in the Falkland Islands war. It will take another twenty years, however, before we begin to stop spending billions of dollars every year constructing these obsolescent items of technology. Cousteau predicts that oceanic research vessels will eventually be replaced with oceanic buoys and unmanned stations; why do we, in 1982 when we have the technological capability to construct and site many more of these stations than we presently have, continue to feud within the scientific and governmental community about funding for, space on, and distribution of oceanographic research vessels? Why not spend more of that effort lobbying for funding for satellites and buoys?

Part of the answer is that the items of technology with which we busy ourselves at the moment are the best we have and that they are of some, if not optimal, use. Some things can only be done with ships. But the major reason for these "time-lag" phenomena lies in the nature of social process—our ability and inclination, or inability and disinclination, to match our human, social (and here I include political and cultural) capabilities to those of our technological tools. We are still satisfied with our war/research ship technology and tradition, even if there appear to be technologically superior alternatives. Even beyond this, our status as scientists, managers and other kinds of experts are most often based on our work with particular technological forms.

In proposing the creation of a center to study such phenomena, the late John Isaacs borrowed the term "impedance mismatch" from electrical engineering and applied it to the relationship between technology, knowledge and social process. This notion accurately describes much of what we see in the recent history of ocean policy in the United States. MARAD develops an archaic bureaucracy in the attempt to keep an ever-less-competitive United States merchant marine afloat, and in the end threatens to become an impediment to the eventual survival of the very industry it was meant to bolster. Huge warships are built on the basis of a 1940s war mentality, and it comes as a surprise to the public mind in 1982 that this mentality is out of date. The initial UNCLOS negotiations generated fiery debate over issues involving ship passage through a handful of straits, but then, in the third conference, shifted away from transportation issues to issues of resource control and exploitation.

Now in 1982, there are signs that the discussion may be shifting back to commerce and transportation (Revelle, 1982). Our own federal government, after thirty years of watching the USSR, Poland, Japan, Korea and other countries far outstrip the development of new fish harvesting and processing capabilities of the U.S., decides in the mid-1970s that fisheries development should receive more attention. What do these pendular swings in action and reaction tell us?

They do not tell us that any of the individuals or organizations involved in oceans activity were ignorant, ill-intentioned or misguided. The benefit of hindsight is always great. They do tell us a lot about large-scale systems of values, perceptions and information and how those systems undulate over time. These undulations produce the paradigms and their anomalies which Thomas Kuhn (1970) explicated so forcefully for the history of science, and which apply in an analogous way to the history of policy and technology. In the history of shipping, labor and energy costs have created anomalies; in the history of the UNCLOS negotiations, technological development has produced anomalies; in the history of fish harvesting, value systems which traded off space technology for sea technology have created anomalies. We do our best to deal with these situations, to eventually shift our paradigms. The trick of elegant and effective policy analysis is to recognize these anomalies early on and to address the characteristics of the paradigm which have fostered them, however difficult this may be to do in given economic or political climates.

THE FUTURE

Just as "Flipper," "Sea Hunt," Jacques Cousteau, World War II and a handful of scientist/academician/bureaucrats launched us into our present ocean era, so have they and the forces which created and were created by them in an odd sense held us back. The progression of events in the ocean policy world is a wonderful example of surges and ebbs, the pendular swings of technology, ecology, culture and social structure which

create what John Isaacs called "impedance mismatch." We are like an electronic circuit which turns itself on and off with huge capacitors, relays, and circuit breakers, regulating the interplay of our social process, our physical condition, and our technological repertoire. And this is when ocean policy, as we presently envision it from our tiny cubicle in time and space, comes in.

Robert Abel, writing in a recent book about the formation of United States ocean policy, posed the following question:

> The decade of the 70s has witnessed passage of at least a dozen landmark acts accelerating, encouraging and generally beefing up the oceans program. How then to account for the paradox wherein the early 60s appeared to bear the most vibrant and closely coordinated ocean movement in the executive branch of government, in the absence of the least material legislative action, whereas now, bolstered by strong and diverse statutes, the federal machine appears to be lumbering along without any particular sense of direction (Abel, 1981:47)?

How indeed? We could add, as Don Walsh pointed out earlier in this issue, that funding for ocean sector activities in real terms peaked in 1968. In his own answer to this question, Abel points to congressional lack of control over marine policy; the overwhelming nature of the conflicts in the marine sector; and the fact that the legislation which initially reinforced oceans activity now acts, through the administrative agencies set up to implement that legislation, to restrict rather than reinforce. These are all contributing factors. But my own answer is somewhat different, and has to do with our ever-changing oceans ethos.

Many of the assumptions about the world which have guided us through our marine policy machinations of the last thirty years have gone by the wayside, or are currently being called into question. World fish catches leveled off around 1970. At the same time, projections of world population growth are being revised downward—from 7.5 billion to 6.1 billion in the year 2000—as the result of changing material conditions and social and cultural values worldwide (Christian Science Monitor, 1982). We no longer feel the exhilarating burden of the 1950s of feeding the world from the ocean. Even our anticipation of mineral riches from the oceans is faltering, although the political forces persist in the face of technological and economic discouragements. As Roger Revelle commented concerning the technical difficulty and economic inefficacy of deep-sea mining, "The emphasis on deep-sea mining is entirely ideological, and has almost nothing to do with reality" (Revelle, 1982:53).

The crucial personages of the post-War era—with the exception of Cousteau, who may live forever—are largely gone or are in or nearing the *emeritus* phases of their careers. They were of a generation, and generations pass. Who are the ocean leaders of the next generation, and on what will they rely for popular support now that WWII is rusting hulks in Truk Lagoon and "CHIPS," "Family Feud," "Dallas" and "Dukes of Hazard" have replaced "Flipper" and "Sea Hunt" in the living rooms of America?

Whoever they are, they will inherit an oceans ethos on the part of the United States and the world much different from that inherited by the first generation of post-WWII ocean professionals. In the United States today there is a muted popular preoccupation with the oceans, textured primarily by recreation, marine mammals and environmental protection. There are more domestic laws, but also more bureaucracy. In the international arena, President Reagan's recent qualms about the UNCLOS agreements will probably have less effect than is commonly imagined because of the vast repertoire of relationships which has built up among those nations concerned with the oceans over the last thirty years. Like the United States tuna fleet, which protests the inclusion of tunas under 200-mile resource management regimes but continues to buy licenses to fish from many such regimes, those countries and firms with ocean interest will continue to act upon those relationships which have been forged through UNCLOS even in the absence of a formal, signed agreement.

To some extent our challenge lies in not "colonizing," to adopt Meg Greenfield's phrase, the problems and issues we face in the oceans. In pointing out the problem of "colonization" in ocean discharge policy, ocean energy development policy and marine mammal management policy, John Isaacs offered the observation that,

> ...throngs of research scientists, politicians, agencies, administrators and subsidized industries have migrated to and colonized the problem that we daren't penetrate very deeply lest it sink. In fact, much effort is spent in cultivation and refurbishment of the problem so that it continues to appear fresh, important and worthy (Isaacs, 1978:10).

This does not mean that we should turn our attention away from the oceans; it does mean that we should take fresh looks at our approaches to fisheries, the military, energy and other aspects of ocean use to ensure that those uses are not only feasible, effective and responsible but that they also truly reflect our desires as a nation with respect to our evolving oceans ethos. To fall back one final time to Professor Isaacs,

> New sciences and novel technologies emerging from exploration, inquiries, and utilization of the sea, can lead or force us into enlarged and evolving cognition of ourselves and of the problems of our relationship with the planet, but only if these views and the guidance that they provide are imbued with continuing fresh, unbiased and profound reappraisals, foresight, and midcourse corrections of our policies, sciences and technologies (Isaacs, 1978:2).

It is the business of marine policy in the 1980s and beyond to provide those reappraisals and corrections; to reevaluate, reconstruct—and recognize—our oceans ethos.

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NOTES AND COMMENTS

The Sea and the Shore

The Black Sea is warm and caressing—it is hospitable—and with its blue skies, beautiful coastal landscapes and bountiful sunshine, it is a place to rest, gain strength and health. During the past season more than six million people visited the Black Sea coast of the Georgian republic. However, the sea can also be stern and menacing, for Neptune frequently becomes angry—and how!

It was a memorable January (1969) in Pitsunda. The morning sun shone brightly; there as no wind, it was warm and some soon-to-depart visitors were bathing in the sea, rejoicing in the blue which ran across the waves and in the sparkle of the beach pebbles.

Then, suddenly, as if swelling and rearing upward, the sea blotted out the horizon. With a roar, waves began rolling toward the shore, grew to form a wall and ferociously fell upon the beach, washing it away. Powerful currents smashed the wave-repelling wall, flooding also the grove of trees on the embankment. The storm's high waters assaulted the beautiful 15-story health resort and threatened the Kolkhida and Amra holiday hotels. Waves scoured the foundations and threatened to cause collapse of the buildings.

Telegrams of alarm flashed to various locations. People set to work to save the buildings. Heavy duty dump trucks dropped "hedgehogs," tetrapods, rocks. In a way this was payment of tribute to the sea. Why? For having disrupted the natural regime. As specialists maintain, the reason for that which took place was that insufficient attention had been given to conforming with natural processes. At the time, the builders had treated Neptune's domain in an off-handed manner; having built a wave-repelling wall, they utilized a part of the beach for the building. Thus the waves were deprived of their opportunity to "play" along the beach and to expend their colossal energy on the shifting of alluvia. In the new circumstances this energy was spent in blows on the structures which had been built there—and demolished them.

Formation and development of the republic's Black Sea coast has its specific peculiarities. The stability of the shores and beaches depends entirely on the volumes of sand and gravel brought by the rivers and on their displacement along the shore by waves and coastal currents. In this way beaches are systematically enriched by material and regenerate themselves with the alluvia. Artificial structures which block or weaken this natural process unquestionably influence the formation of the beach zones.

In the case of the Georgian Black Sea, a large part of the coastal areas—Novaya Gagra, Pitsunda, Sukhumi, Batumi, Poti and others—consists of beach deposits. With an abundance of alluvia the dry land advanced seaward. In recent times the situation has been different. A shortage of these alluvia appeared in the shore zone. Why? Basically the shortages are associated with the construction of dams on the rivers, piers, wave-damping structures for protecting individual sections of beach, and the utilization of river and shore alluvia in construction. Naturally the sea strives to reestablish its previous boundaries. It "consumes" the shore, independently, of course, of whether or not grapes are ripening or health resorts stand there.

How can this be prevented? Continue building concrete defenses? This doesn't eliminate the cause of the scouring; the more substantially the above-water seashore is strengthened the more intensively the steepening of the below-water shore slope. In the Georgian case, you know, the scouring extends to a depth of 18-20 meters. Clearly the foundations of any concrete reinforcements will in time be destroyed.

This is what occurred in Poti's port where the waves, having demolished the dike, flooded the adjacent structures. Triple walls in Gagra, Ochamchire and Kabuleti, and buildings of the Ukraine sanitarium were destroyed in like manner. A miracle saved Energetik, a new, high holiday-residences building. Piles of concrete fragments still lie on the ground before it. While constructing the health center the designers ignored the voices of the scientific workers. Instead of a spacious beach in front of the building, dikes and concrete walls were built and piles of rocks heaped up. The Commission, officially accepting the health center, noted approvingly: "It has been built to last for many decades!" but it wasn't long after that that Moscow received a telegram: "Energetik is in peril. A storm broke up the dikes and protective walls, and waves are nearing the building. . . ."

Shore-strengthening work is being done by various departments (agencies)—more than 40 of them. Each concerns itself with its own interests, constructs its "own" reinforcements and in so doing often damages its neighbors, disrupting the natural shore-formation process. A composite approach is needed, integrated

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work throughout the whole region taking into consideration the principles of the shore-and-sea relationship.

We walked and drove from the village of Sarp on the frontier with Turkey to the Abkhazian Leselidze. We saw with our own eyes the "unhealthy" state of the beaches. Everywhere they were the same. Of the republic's 306 kilometers long coastline, 220 are experiencing intensive scouring and destruction. Tens of millions of rubles have been spent on shore-strengthening in recent years. But the situation continued to deteriorate. Many beaches have totally disappeared. They look like seaside strips at the Makhindzhaur, Kabuleti, Gantiadi and Poti health resorts. At Gagra we looked, with aching hearts, at the narrow strip between the sea and coast: at what remained of the once celebrated beach. It is being displaced by the sea. Are any measures being taken? Yes. Millions of rubles are being spent to that end. The beach is filled with pieces of concrete, hedgehogs, broken up lengths of iron, sharp rocks—vestiges of the battle against the sea's forces, "food" won from the shore. Just imagine: during a storm when waves attain a height of 7 meters, the kilometer-long beach at Gagra is subjected to million horsepower blows!

Soviet scientists and naturalists—Professor F.F. Davitaya, Academician of the Georgian SSR's Academy of Sciences, Professors V.P. Zenkovich and P.A. Kaplin, Candidates of Sciences A.G. Kiknadze, V.V. Sakvarelidze, F.G. Meladze, V.M. Peshkov and others—have in light of the conditions which have been established, urgently recommended immediately setting to work to reestablish the earlier-eroded beaches and undertaking their systematic "replenishment" by means of brought-in loose soil and this in volumes that previously came by natural routes, via steadfast river currents. In such case, as the scientists point out, the waves will perform the creative work—distribute the alluvia along the shore for tens of kilometers. Thus the shore will protect itself.

Having carefully analyzed the situation on protecting the sea's shores the Georgian Communist Party's Central Committee came to the conclusion that urgent measures must be adopted. The government and the Academy of Sciences of the republic worked out a scientifically based, concrete plan of reinforcement and of management of the landscape of the Black Sea coast. In 1981 the country's first interdepartmental protection-of-nature agency, combining science and production, was established. The entire cycle of the work—from investigation of the processes of dynamics of the sea coast to combatting onset of the sea—was assigned (for implementation) to the Scientific and Production Association, Gruzmorberegozashchita, under the Council of Ministers of the Georgian SSR.

Under the leadership of A.G. Kiknadze, an experienced specialist and organizer of science, the new association took up the work carefully and energetically. Scientific, design, construction, and maintenance sections came into being. Utilizing previous research and having organized a systematic study of the entire sea coast, the enthusiasts, jointly divided the phenomena into an intricate network on which the behavior of the shore depends. Thematic laboratories were established and too, six regime-investigation stations. Projects are being set up, maps and diagrams drawn, and essentially an encyclopedia of the sea coast is being created.

And what is important is that scientific workers of the association are not only carrying on observations of the sea, studying the shore zone, and working out practical solutions but also emerging as clients of production operations and organizers of implementation of their recommendations. They are carrying out a unified technical policy in the matter in which tens of departments and institutions are participants. In the course of working out measures they began more deeply to take account of the natural processes which take place in the region. Work has unfolded on a large scale to recreate the eroded beaches.

We came to the sea station in Gagra three days in a row and saw that the undermined building was being "strengthened," that the strip of beach was growing rapidly here. Indeed, with the help of local party and Soviet organizations, the builders had opened a quarry from which they extract beach-forming material to be dumped at needed points. The sea itself redistributes the sand and gravel along the coast. As though right out of the sea "foam," golden beaches are growing in Gagra and Pitzunda.

What have statistics shown? The cost of protecting one linear kilometer of shore by creating beaches is two-fifths that for the construction of hydrotechnical structures. And the original landscape is preserved.

It was noted at the recent session of the Georgian Communist Party's Central Committee that the necessity for creating the Gruzmorberegozashchita Scientific and Production Association was dictated by life itself and that its work must be promoted and supported with all resources. It goes without saying—the program set by the Association is extensive. Measures are directed toward nature-preservation in the interests of sanatoria and health resort affairs and of implementation of the Foodstuffs Program. This includes providing for the stability of and good management of the whole coast, draining large land areas, including among them the Kolkhid Lowland, and the regulation of rivers.

And still more. A health city . . . in the sea. The Myussers have the most healthful microclimate. But the landscapes are beautiful here; it's a pity, simply painful to fell even a single tree. How could a health resort be built? Over the water, the structures linked by air to the coast. A fantasy? Maybe, but draftsmen are already putting it on paper.

The Association's plans are important, and economically advantageous. But, unfortunately, Gruzmorberegozashchita lacks the strength and means to implement them in an intergrated or composite fashion and on a broad scale.

The machinery and means for these purposes have been provided for in the eleventh, five-year plan. In the meantime, a number of Union and republic ministries and departments are not rendering adequate assistance to Gruzmorberegozashchita, the newly organized science and production association, and to reinforcement of its material and technological base. Allocations of special machinery, heavy duty dump trucks, and associated equipment and apparatus to the coastal service also are being dragged out. Slowly being resolved too is the question of the respective shares of the ministries, departments and institutions which have holiday, health, and other facilities on the Georgian republic's Black Sea coast.

Truly, one must not sit at the seashore and wait for the weather. A unique nature preserve and an All Union health resort call for more careful consideration. Why by the year 2000 the health resort complex here will have grown manyfold. Gruzmorberegozashchita's enthusiasts have discovered the key to the solution of an important problem. And of course they must receive every possible assistance in the work of protecting, regenerating, and rational use of the natural resources of the Georgian republic's Black Sea coast.

Scripps Marine Laboratory Named National Historic Landmark

George H. Scripps Memorial Marine Laboratory in La Jolla, California, has been designated a National Historic Landmark by the U.S. Department of the Interior. The building, completed in 1910, is the oldest structure at Scripps Institution of Oceanography of the University of California, San Diego, and the oldest marine laboratory building in the western hemisphere.

The marine laboratory is San Diego's fifth national landmark, along with the Hotel Del Coronado, Mission Dam, the San Diego Old Town Historic District, and the *Star of India*. Such a designation is rare. There is now a total of only 60 landmarks in the State of California.

A bronze plaque and certificate describing the importance of the facility will be presented at a formal ceremony at Scripps at a later date.

The laboratory was designated San Diego Historical Landmark 119 and listed in the National Register of Historic Places in 1977, the same year it was scheduled to be demolished. But, through the efforts of a group at Scripps Institution, most of the needed restoration funds have been obtained through donations from corporations, foundations, and individuals, along with $75,000 of matching grant Federal Historic Preservation Funds.

Professor Fred N. Spiess of Scripps, who was appointed chairman of the committee to save the two-story structure, now affectionately called "Old Scripps Building," said, "Nearly seven decades of historic biology and oceanography had taken place in the old laboratory, including planning of expeditions and new programs. Eleven members of the National Academy of Sciences worked in 'Old Scripps,' and the institution's first three directors had their offices there. The building is also historically significant because it was designed by the early San Diego architect Irving Gill," said Spiess.

Concern for seismic safety had been UCSD's chief reason for removing the old structure. When the original plans of the building were located in the archives of the Art Department at the University of California, Santa Barbara, it was discovered that Gill has used Kahn Trussed Bar steel reinforcing, developed by Julius and Albert Kahn of Detroit in 1903. After the plans were located, engineering studies showed that the building was stronger than had been realized, and that major structural changes would not be required to meet modern seismic safety standards.

The funds needed to put Old Scripps Building back into use were estimated at about $400,000. Budgetary constraints precluded securing funds from the University of California, so the committee appealed to individuals, foundations, and corporations. The response generated enough funds to apply for and receive $75,000 of matching grant Federal Historic Preservation Funds.

The first phase of restoration was done in 1979, after many hours of volunteer preparatory work, with an estimated savings of $15,000. Restoration plans were prepared by architects John Henderson and Greg Brown of Macy, Henderson, and Cole of San Diego, and John Kariotis, structural engineer of Kariotis, Kessler, and Ailys of Pasadena. E.F. Couvrette of San Diego was the general contractor. This first phase of restoration included structural strengthening for seismic safety, reroofing, new skylights, a second staircase, window repair, external concrete repair, and exterior painting.

Note: Two other national landmarks were named along with the Scripps laboratory—U.S.S. *Nautilus*, now at Mare Island near San Francisco, but scheduled for permanent berthing at Groton, Connecticut; and Little Rock High School, for its importance in the history of school desegregation. For more information on national historic landmarks, call: Mr. James Charlton, historian, Division of History, National Park Service, Department of the Interior, Code 404, Washington, D.C. 20240, (202) 523-5164/5165 and (703) 920-0732.

The committee has continued its fund-raising efforts, to provide for later phases of restoration. When completed, the building will be used for research offices and a classroom for Scripps Institution. One laboratory will be restored with turn-of-the-century furnishings, including cabinets from the building that were carefully saved by the volunteer work parties and will be reinstalled.

"We hope to give the building functional space with the ambience it once enjoyed," said Prof. Spiess, "and this should be accomplished by the end of the institution's 80th anniversary year, in 1983, if we receive the remaining funds that are required."

The George H. Scripps Memorial Laboratory was built for the Marine Biological Association of San Diego, the predecessor of Scripps Institution of Oceanography. Perl Acton Company was the prime contractor. In 1909 the original building committee required that the structure should be sturdy, but inexpensive, functional, and make use of natural daylight for microscope work.

For several years the building housed the entire marine station. Director William E. Ritter, then professor at the University of California, Berkeley, and founder of the station, and his wife lived on the second floor of the new building for its first three years. Ellen Browning Scripps and Edward W. Scripps were major contributors to the marine station. Miss Scripps requested that the building be named in memory of her deceased older brother.

Now "Old Scripps" represents a "landmark" in the lives of many who have worked there over the years. Thanks to the $75,000 of federal matching funds and major donations from Ametek Corporation, Kelco, J.W. Kieckhefer Foundation, Robert Scripps, and Scripps Industrial Associates, as well as significant contributions from many others, the building will serve future generations of students and scientists.

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Deepwater Oil Production and Manned Underwater Structures; Michael E. Jones, a review of deepwater technology for oil exploitation; a survey of existing and proposed production systems in relation to water depth; a detailed study of manned underwater systems for subsea production. Crane, Russak & Company, Inc., 3 East 44th Street, New York, New York 10017. 245 pages. $59.50.

Solar Collectors Storage; T.N. Veziroglu, Ann Arbor Science Publishers, 10 Tower Office Park, Woburn, Massachusetts 01801, 429 pages. $85.00.

Marine Birds and Mammals of Puget Sound; Tony Angell, Kenneth C. Balcomb III, Washington Sea Grant, 3716 Brooklyn Avenue N.W., Seattle, Washington 98105, 145 pages. $14.50.

The Dynamic Environment of the Ocean Floor; Kent A. Fanning, Frank T. Manheim, Lexington Books, D.C. Heath and Company, 125 Spring Street, Lexington, Massachusetts 02173. 502 pages. $39.95.

Georges Bank: Past, Present, and Future of a Marine Environment; Guy C. McLeod and John H. Prescott, Westview Press, 5500 Central Avenue, Boulder, Colorado 80301, 196 pages. $27.50.

The Blight of the Big Apple; Donald F. Squires, New York Sea Grant Institute, State University of York and Cornell University, 411 State Street, Albany New York 12246. 84 pages.

Military Law, 3rd Edition; Edward Byrne, Marketing Department, U.S. Naval Institute, Annapolis, Maryland 21402. 790. $21.00.

Subsea Manned Engineering; Gerhard Haux, Best Publishing Company, P.O. Box 1978, San Pedro, California 90732, 538 pages. $42.00.

Ecology of Coastal Waters: A Systems Approach; K.H. Mann, University of California Press, 2223 Fulton Street, Berkeley, California 94720, 322 pages. $36.00 cloth and $18.00 paperback.

Tidal Energy; Roger Henri Charlier, Van Nostrand Reinhold Company, Inc., 135 West 50th Street, New York, New York 10020, 351 pages. $28.00.

The Yankee Mariner & Sea Power (America's Challenge of Ocean Space); 15 noted sea specialists examine the diversity of American uses of the earth's oceans; Foreword by Don Walsh; Introduction by Athelstan Spilhaus. Joyce J. Bartell, Editor. Center for Study of the American Experience, The Annenberg School of Communications, University of Southern California, Los Angeles 90007. Order through Transaction Books, Rutgers University, New Brunswick, New Jersey 08903. $20.00.

Note: Please order all books from the publisher, not from MTS.

PROCEEDINGS, REPORTS, DIRECTORIES

DIVETECH '81: The Way Ahead in Diving Technology; Proceedings of a Conference held 24-26 November 1981 in London by the Society for Underwater Technology.

	SUT Members	Non-members
Volume 1	£25.00	£30.00
Volume 2	£35.00	£40.00
Volume 3	£35.00	£40.00
Volume 4	£35.00	£40.00
Reduced rate for full set (Volumes 1-4)	£120.00	£140.00

Prices are inclusive of surface post and packing. **Please add £4.00 per volume for air mail.** Order from the Society for Underwater Technology, 1 Birdcage Walk, London SW1H 9JJ, England.

Options for Scientific Ocean Drilling, the Final Report of the Committee on Ocean Drilling, Geological Sciences Board; Commission on Physical Sciences, Mathematics and Resources, National Research Council. Available from Office of Scientific Ocean Drilling, National Science Foundation, Washington, D.C. 20550.

Reducing Fuel Consumption for Liquid Cargo Heating Systems, by George E. Ponton, member of the Society of Naval Architects and Marine Engineering, Hampton Roads Section. Copies of this 52-page engineering report are available free from IMO Pump Division, Transamerica Delaval Inc., P.O. Box 447, Monroe, North Carolina 28110.

Survey of Existing and Promising New Methods of Surface Preparation, a newly published study released by the Steel Structures Painting Council, sponsored by the Maritime Administration in cooperation with Avondale Shipyards. Available from the Steel Structures Painting Council, 4400 Fifth Avenue, Pittsburgh, Pennsylvania 15213. $40.00.

U.S. Directory of Marine Scientists: 1982; prepared by the Ocean Science Board; Commission on Physical Sciences, Mathematics and Resources, National Research Council. Available from National Academy Press, National Academy of Sciences. 2101 Constitution Avenue, Washington, D.C. 20418, 229 pages. $12.25 (ISBN 0-309-03281-4).

Elsevier's Mineral and Rock Table, compiled by P. Lof., a wall chart featuring 127 rock-forming and ore minerals commonly encountered in thin and polished sections, as well as 22 classification diagrams of all major rock types. Full-color, high-quality photographs, accompanied by descriptions of the most important optical and physical characteristics of minerals. (Size 71x135 cm; 28"x53".) 10 copies, Dfl. 185,00/US $78.75; 20 copies Dfl. 295,00/US $125.50. Single copies available only from the Amsterdam address; price: Dfl. 40.00. Orders from USA and Canada to: Elsevier Science Publishing Co., Inc., 52 Vanderbilt Avenue, New York, New York 10017. In the rest of the world: Elsevier Scientific Publishing Co., P.O. Box 211, 1000 AE Amsterdam, The Netherlands.

SALE

PUBLICATIONS OF THE MARINE TECHNOLOGY SOCIETY

(It's inventory time again, so we are offering an unusual opportunity to our members and readers to purchase MTS books at a greatly reduced rate. The new prices listed here reflect a 50% reduction on all publications issued prior to 1980.)

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10.	*MTS Journal*, Special Diving Issue (Vol. 11, no. 4)	2.00
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12.	International Safety Standard Guidelines for the Operation of Undersea Vehicles, 1979	10.00
13.	Proceedings of the International Symposium on Marine Salvage, 1980	50.00

CONFERENCE REPORTS

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L.	1977: Oceans '77 Conference Record (MTS-IEEE Joint Annual Conference, Los Angeles)	18.00
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N.	1979: Marine Technology '79 Conference Record (MTS Annual Conference, New Orleans)	18.00
O.	1979: Forefronts of Ocean Technology (Short Course in Conjunction with Conference)	6.00
P.	1980: Marine Technology '80—Proceedings (MTS Annual Conference, Washington, D.C.)	75.00
Q.	1981: Oceans '81 Conference Record (MTS-IEEE Joint Annual Conference, Boston)	90.00
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The Department of Civil Engineering at Texas A&M University invites applications for tenure track positions in the areas of ocean engineering, hydraulics, and water resources. Applicants should have an earned doctorate or extensive applicable experience. Rank will be commensurate with the applicant's qualifications. Responsibilities include undergraduate and graduate teaching and research. Part-time lectureships are also available for persons pursuing advanced degrees. Interested persons should submit a resume and a list of three references to Dr. Donald McDonald, Head, Department of Civil Engineering, Texas A&M University, College Station, Texas 77843. Texas A&M University is an equal opportunity/affirmative action employer.

MARINE TECHNOLOGY SOCIETY

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☐ MEMBER—Any person with active professional interest in the marine field or a closely related field who has an academic degree or professional/technical experience is eligible for membership. **$35.**

☐ ASSOCIATE—Any person with an interest in the marine field and supporting MTS objectives—**$35.**

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☐ CORPORATE—Any corporation endorsing the objects, policies and activities of the Society. Annual membership—**$400.** (Those listed in *Fortune 500*—**$650.**)

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I, _____, hereby apply for membership in the Marine Technology Society and enclose $_____ as my membership dues for the year _____. $4.00 of which is for a subscription to the Marine Technology Society Journal for one year.

CALL FOR PAPERS

OCEANS '83

MTS-IEEE CONFERENCE & EXPOSITION

Oceans '83 P.O. Box 70970 Sunnyvale, California 94086

"EFFECTIVE USE OF THE SEA—AN UPDATE"

CALL FOR PAPERS The Marine Technology Society (MTS) and the Institute of Electrical and Electronic Engineers (IEEE) Council on Oceanic Engineering (COE) invite papers from all interested authors for the OCEANS '83 Conference and Exposition. Each accepted paper will be presented by the author(s) at the conference in San Francisco, California, which will be held at the Hilton Hotel, 29 August through 1 September 1983. All accepted papers will be published in the Proceedings and mailed to the participants at the conclusion of the conference.

The theme of OCEANS '83 is "Effective Use of the Sea—An Update". This theme serves to underscore the objectives of marine science and technology to explore, conquer, develop, and utilize ocean resources for the benefit of all mankind. The goal of the conference will be to identify the current and future technology, knowledge, and programs needed to achieve these objectives by the year 2000.

Papers are requested which:

- Highlight technological advances in the understanding, use, and recovery of marine resources.
- Identify/suggest other technologies that could be used to advance marine science and engineering.

OCEANS '83 will be international in scope and will focus on the science and technology required for the utilization of five major ocean resource areas: MINERAL RESOURCES and ENERGY, NON-MINERAL RESOURCES, TRANSPORTATION, OCEAN SCIENCE, and MILITARY OCEAN ENGINEERING. The emphasis in each of these areas will be on critical technologies, technology assessment, application, and programs. Papers that address other important developments applicable to marine science and technology will also receive consideration.

BACKGROUND Controversy arose in 1965 concerning the adequacy of our national effort to explore, understand, and develop the ocean. The President's Scientific Advisory Committee (PSAC) formed a Panel on Oceanography in May 1965 to address this controversy. In June 1966 the PSAC report, titled after their proposed national objective "Effective Use of the Sea", was issued.

After extensive hearings, Congress enacted the Marine Resource and Engineering Development Act of 1966. This Act expressed the conviction that serious and systematic attention should be given to the marine environment. It took steps to stimulate marine exploration, science, technology, and financial investment on an augmented scale. The Act also established a Commission, which became known as the Stratton Commission after its chairman, J. A. Stratton. This Commission examined the nation's need for development, utilization, and preservation of the marine environment. It also reviewed contemplated marine activities to assess their adequacy to achieve the national goal. The Commission report, entitled "Our Nation and the Sea, A Plan for National Action", was issued in 1969.

During this same period, the National Academy of Engineering was asked to assist and advise various government activities with their marine programs. The Academy formed an advisory committee, the Committee on Ocean Engineering (which later became the Marine Board), to carry out these tasks. The Committee, and later the Board, undertook a study of ocean technology, and what would be required to fulfill the national goals established by the PSAC and Commission reports. The results of this study were released in a Marine Board report in 1972 entitled, "Towards Fulfillment of a National Commitment".

Much has happened in the ocean affairs arena in the decade since these reports were issued. The goals of the OCEANS '83 technical program are to evaluate the progress towards achieving the objectives of these historic reports, assess the present state of technology, and describe programs that will make "Effective Use of the Sea" by the year 2000.

DEADLINE.....11 February 1983

PAPERS ARE REQUESTED IN THE FOLLOWING CATEGORIES

- Ocean Engineering • Physical, Chemical, Biological Oceanography
- Marine Geophysics & Geology • Hydrography
- Vessels, Instruments & Platforms • Underwater Construction & Habitats
- Remote Sensing • Robotics • Ocean Data Management
- Other Ocean-Related Topics

CONFERENCE FORMAT OCEANS '83 will feature two plenary sessions. A beginning session will review our increased knowledge of the ocean, developments in marine affairs, and the use of marine resources over the last decade. A session in cooperation with the Marine Board of the National Academy of Science/Engineering will conclude the conference. This session will update the progress that has been made in The Effective Use of the Sea over the last decade and provide a critical assessment of the present and future status of ocean technologies and programs.

There will be numerous technical sessions comprised from this Call for Papers. Many of the sessions will begin with invited speakers who will address focal programs, and the issues, requirements, and political aspects of Marine Science and Technology. Technical papers identifying critical technologies and/or describing activities in the marine environment are invited. The working language of the Conference will be English.

SUBMITTAL OF ABSTRACTS & PAPERS Abstracts should be submitted no later than 11 February 1983, on the form provided in this announcement. Authors of papers selected for presentation at the OCEANS '83 Conference will be notified by mail in April 1983. Detailed instructions for the preparation of final manuscripts will be provided with the notification of selection.

Final manuscripts and camera-ready illustrations must be received no later than 1 August 1983. Papers not received by this deadline cannot be published in the Proceedings. Abstracts and final manuscripts should be sent to:

OCEANS '83 Technical Program Chairman
P.O. Box 71030
Sunnyvale, CA 94806

EVALUATION OF ABSTRACTS Each abstract received will be reviewed by the Technical Program Committee. To guide the Committee, authors should indicate on the submittal form which of the five major ocean resource areas they feel are most appropriate to their subject matter.

PRESENTATION OF PAPERS The Technical Program Committee will make the final determination of the sessions and organization of papers after the selections are made. Technology papers will be limited to 15 to 20 minutes, with 5 minutes for questions and discussion.

EXPENSES Authors are responsible for all expenses incurred including writing and preparation of camera-ready manuscripts and illustrations, travel to the conference, and conference registration fees.

POSTER SESSIONS Poster sessions will be an important part of the OCEANS '83 program. They afford the author(s) an opportunity to communicate the results of their work to the conference participants in a more relaxed environment than the formal paper sessions. Authors wishing to participate in the poster sessions will be provided with format and style guidelines and with instructions for the preparation of manuscripts for publication in the Proceedings, with the notification of selection.

EXHIBITS An extensive exhibit of marine products and services is planned as part of the OCEANS '83 Conference and Exposition. For further information, please contact the Exhibits Chairman at the following address:

OCEANS '83 Exhibits Chairman
P.O. Box 70970
Sunnyvale, CA 94086

DEADLINE..... 11 February 1983

San Francisco, California Hilton Hotel 29 August-1 September 1983

OCEANS '83

MTS-IEEE
CONFERENCE
& EXPOSITION

All information requested below *and* on the reverse side of this form must be included to the considered by the OCEANS '83 Technical Program Committee. Deadline for submission of abstracts is 11 February 1983. Abstracts should be mailed to:

OCEANS '83 Technical Program Chairman
P.O. Box 71030
Sunnyvale, CA 94086

Paper Title _____

Summarize the nature and scope of the information to be presented and indicate relation to theme topics. Be clear and complete, yet succinct. Abstracts should be limited to 250 words, but authors may submit longer abstracts if they feel more detailed information is required for Technical Program Committee deliberation.

SUPPLEMENTARY INFORMATION

State specific conclusions of work and describe how it differs from previous work

Suggest ocean resource area most appropriate for this paper
I would like to participate in the following sessions (check one):

- ☐ Poster
- ☐ Formal
- ☐ Either

(Fold In)

Recommendation of Technical Program Committee (Do *not* write here)

- ☐ Paper accepted
- ☐ Include in formal sessions
- ☐ Overview or Focal Program
- ☐ Paper not accepted
- ☐ Include in Poster Session
- ☐ Technology

AUTHOR INFORMATION

From:

Author — Title
Business Address
Telephone Number ( )

Co-Author — Title
Business Address
Telephone Number ( )

Co-Author — Title
Business Address
Telephone Number ( )

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OCEANS '83
Technical Program Chairman
P.O. Box 71030
Sunnyvale, CA 94086

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To:

CALENDAR

JANUARY

10-14—*12th Dredging Engineering Short Course*, Texas A&M University, with co-sponsors National Sea Grant Program and Center for Dredging Studies of Texas Engineering Experiment Station. (Contact: John B. Herbich, Director, DCS, Sept. of Civil Engineering, Texas A&M University, College Station, Texas 77843.)

17-20—*Short Course on Modeling of Sound Propagation in the Ocean*, Catholic University of America. (Contact: Catholic University, Washington, D.C. 20064; 202/635-5256.)

31—Call for Papers, *International Symposium on Ship Hydrodynamics and Energy Saving.* Canal de Experiencias Hidrodinamicas, El Pardo, Madrid, Spain (to be held September 6-9, 1983). (Contact: Rear Adm. Pascual O'Dogherty, Canal de Experiencias Hidrodinamicas, El Pardo Madrid, Spain; tel. 34-1/7360200.)

FEBRUARY

7-9—*International Diving Symposium '83.* Association of Diving Contractors, Hyatt Regency Hotel, New Orleans, Louisiana. (Contact: Assn. of Diving Contractors, 1799 Stumpf Blvd., Suite 4, Gretna, Louisiana 70053; 504/362-0074.)

11-12—*6th Annual Meeting & Banquet, Institute of Diving*, International Diving Museum, Panama City, Florida. (Contact: Thomas W. James, Institute of Diving, P.O. Box 876, Panama City, Florida 32401; 904/769-7544.)

15-18—*1983 Annual Workshop in Technical and Professional Writing*, sponsored jointly by the Energy Laboratory and the Graduate Program in English of the University of Houston and the Institute of Environmental Sciences (featuring 31 seminars), Continuing Education Center on the Central Campus of the University of Houston. (Contact: Institute of Environmental Sciences, 940 East Northwest Highway, Mount Prospect, Illinois 60056; 312/255-1561 or 713/749-4861 at the Univ. of Houston.)

28-March 3—*1983 Oil Spill Conference* (Prevention, Behavior, Control, Cleanup), sponsored by EPA, API, USCG, San Antonio Convention Center, San Antonio, Texas. (Contact: 1983 Oil Spill Conference, Suite 700, 1629 K Street, N.W., Washington, D.C. 20006; 202/296-7262.)

MARCH

2-4—***Arctic Technology: An Assessment and Review for the Next Decade,*** Annual Sea Grant Lecture and Seminar Series, Massachusetts Institute of Technology. (Contact: Elizabeth Harding, MIT Sea Grant Information Office, 77 Massachusetts Avenue, Cambridge, Massachusetts 02139; 617/253-3461.)

14-17—*ROV '83, Remotely Operated Vehicle Conference and Exposition.* Sponsored by the Marine Technology Society, San Diego Section; University of California; Institute of Marine Resources; and the MTS Undersea Vehicle Committee. (The first of a series of international meetings between developers of remotely operated vehicles and supporting technologies and their users.) Holiday Inn at the Embarcadero, San Diego, California. (Contact: ROV '83, P.O. Box 82253, San Diego, California 92138.)

19-24—*International Symposium-Workshop on Renewable Energy Sources.* Presented by: Clean Energy Research Institute, University of Miami; hosted by: Pakistan Council of Scientific and Industrial Research; sponsored by: National Science Foundation, Washington, D.C. and the Ministry of Science and Technology, Islamabad, Pakistan; in cooperation with: International Association for Hydrogen Energy. To be held in Lahore, Pakistan. (Contact: T. Nejat Veziroglu, Clean Energy Research Institute, University of Miami, P.O. Box 248294, Coral Gables Florida 33124.)

20-24—*1983 Joint Thermal Engineering Conference,* sponsored by the American Society of Mechanical Engineers and the Japan Society of Mechanical Engineers, to be held at the Hawaiian Regent Hotel in Honolulu, Hawaii. (Contact: Walter Mockert, Meetings Manager, ASME, 345 East 47th Street, New York, New York 10017; 212/705-7057.)

21-23—*Ports '83 Conference*, New Orleans, Lousisana. Sponsored by the Ports and Harbors Committee of the American Society of Civil Engineering. Theme: Port Modernization, Upgrading and Repairs. (Contact: Elizabeth Yee, Manager, Conference Services, American Society of Civil Engineers, 345 East 47 Street, New York, New York 10017; 212/644-7545.)

APRIL

5-8—*Canadian Hydrographic Service Centennial Conference*, sponsored by the Canadian Hydrographic Service and the Canadian Hydrographers' Association, to be held in the Canadian Government Conference Centre, Ottawa, Ontario. (Contact: Sheila Acheson, Conference Secretary, Canadian Hydrographic Service Centennial Conference, Room 337, 615 Booth Street, Ottawa, Ontario K1A 0E6, Canada; 613/995-6179.)

MTS/NDBO

1983 SYMPOSIUM ON BUOY TECHNOLOGY

NOTICE OF MEETING
AND
CALL FOR ABSTRACTS

The Gulf Coast Section of the Marine Technology Society together with the NOAA Data Buoy Office is planning a Symposium on Buoy Technology to be held in New Orleans on **April 27, 28, and 29, 1983.** The symposium will be organized into two separate technical programs -- Moored Buoys and Drifting Buoys -- and will concentrate on issues of both scientific and engineering importance. Possible topics under these two program headings include the following:

Hulls	Moorings
Sensors	Power Systems
Instrumentation	Mathematical Modeling
Data Collection/Reporting Systems	Scientific and Engineering Use of Buoy Systems (future requirements)
Buoy Environment (air-sea interface, Lagrangian current measurement)	Operational Uses
	Other Buoy Related Subjects

You are hereby invited to submit an abstract should you intend to present a paper at the symposium. The abstract should be typed and be less than 1000 words in length. Sufficient detail should be incorporated in order to allow the papers committees to select papers for presentation. Title and author/co-author names, positions, addresses, and telephone numbers should be clearly indicated.

Abstracts must be received by **January 1, 1983.** Following notification of selection, you will be required to deliver a final copy of your paper by **March 1, 1983.**

Abstracts should be mailed to the symposium chairman, Bill Rainnie, at the following address:

1983 Buoy Technology Symposium
NOAA Data Buoy Office
National Space Technology Laboratories
NSTL Station, Mississippi 39529

(601)688-2822 (FTS 494-2822)

STATEMENT OF OWNERSHIP, MANAGEMENT AND CIRCULATION

(Act of August 12, 1970, Section 4369, Title 39, United States Code)

Date of Filing: 20 October 1982

Title of Publication: *Marine Technology Society Journal*

Publisher: Marine Technology Society, Inc.
1730 M St., N.W.
Washington, D.C. 20036

Editor: Rita R. Colwell

Owner Marine Technology Society, Inc.

The purpose, function, and nonprofit status of this organization and the exempt status for Federal income tax purposes have not changed during the preceding 12 months.

Extent & Nature of Circulation	Average no. of copies each issue during preceding 12 months	Actual no. of copies of single issue published nearest to filing date
Total no. copies printed (net press run)	3200	6000
Paid circulation sales through office	N/A	1600
Mail subscription	3013	2655
Total paid circulation	3013	4255
Free distribution by mail, carrier or other means, samples, complimentary, and other free copies	50	50
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Instructions For Authors

Papers accepted by the *Marine Technology Society Journal* should generally fall into two size categories: Papers and Technical Notes. All major papers should be no more than 4000 words in length, which is approximately 16 double-spaced pages. Short technical notes should be less than 1500 words long.

Submissions should be sophisticated but of general, interdisciplinary interest in keeping with the membership of the Society. Authors should aim to inform those outside their fields of interest about new work. The scope of the articles or reports is unlimited, from significant technological findings to the relationship of marine research and public policy concerns.

Authors should keep in mind that manuscript reviewers are asked to assess whether a paper should be included in the *Journal* or in a more specialized publication, whether it is of broad interest to the marine community or several significant portions thereof and how the work ranks within the particular field discussed.

Editorial Policy: All papers submitted are given equal consideration. Papers are accepted with the understanding that they have not been published elsewhere. However, in exceptional cases, previously published papers of special significance may be used where original publication was directed to a very limited audience. It is incumbent upon the authors to secure proper clearance. Authors will be notified within eight weeks whether a paper has been accepted, rejected or needs revision. All papers will be sent to at least two independent reviewers.

Papers are subject to editing to conform to the style of the *Journal* and, where necessary, to meet space requirements. Editing may also be necessary to improve clarity and eliminate ambiguities. When editing is extensive, a paper will be returned to the author to assure that the meaning has not been changed.

Style: The *Journal* has readers from many disciplines. Avoidance of jargon or laboratory talk, shorthand language and unnecessary details is important. Necessary technical terms should be explained.

Manuscripts: Processing of submitted papers will be more expeditious if the following procedures are observed. Send an original and two copies of your paper. Please give the full name and title of the author(s). Also supply the names of at least two persons not connected with the authors who can provide an objective review.

The entire document should be double-spaced. Subheads are desirable; two or three words will suffice. Number all pages and identify accompanying tables with the name(s) of the author(s). It is essential to send original illustrations, either clear black and white glossy photographs or sharp tables using ink. Be sure to identify the top of each photograph. Snapshots or color photos are not suitable.

Each illustration should be accompanied by a caption which will appear beneath the photo. List all captions on a separate sheet. Because of space requirements, the number of illustrations should be kept to a minimum. In particular, short technical notes are limited to a maximum of two. Good quality photographs will be considered for use on the cover, with acknowledgement.

Each table should be prepared on a separate sheet, should be numbered and titled, and should be referenced in the text. Every effort will be made to print the table near its reference point. Identify all units of measure in full in the heading of each table.

References and notes should begin on a separate sheet. List references to books and periodicals, numbering each in the sequence in which it appears in the article.

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