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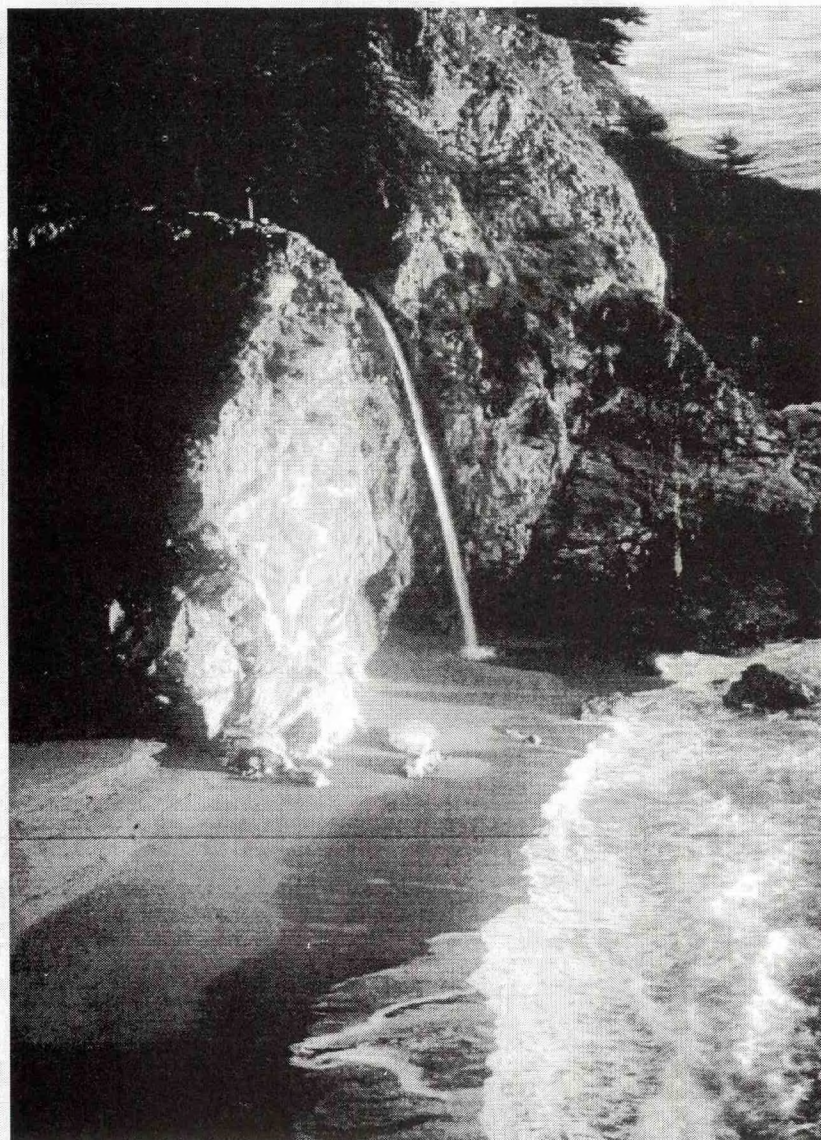
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Water Quality Protection Program for  
Monterey Bay National Marine Sanctuary

March 1996

## Action Plan II: Regional Monitoring, Data Access, and Interagency Coordination



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## Origin and Purpose of the Water Quality Protection Program

This document presents the second of several action plans of the Water Quality Protection Program for the Monterey Bay National Marine Sanctuary. The Water Quality Protection Program addresses a key provision of the Memorandum of Agreement (MOA) signed by eight Federal, State, and local agencies—that they work together to develop a water quality protection plan for the Sanctuary. The MOA was adopted in September 1992 when Congress and the President established the Monterey Bay National Marine Sanctuary. It was created in recognition of the need for an ecosystem-based watershed management program to ensure protection of the Sanctuary's unique resources.

Signatories to the Agreement are: the National Oceanic and Atmospheric Administration; the U.S. Environmental Protection Agency, Region IX; the California Environmental Protection Agency; the California State Water Resources Control Board; the San Francisco Regional Water Quality Control Board; the Central Coast Regional Water Quality Control Board; the California Coastal Commission; and the Association of Monterey Bay Area Governments.

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## About This Document

This document outlines a set of strategies proposed to address three themes that cut across all of the water quality issues for the Water Quality Protection Program -- regional monitoring, data access, and interagency coordination. This plan builds upon the first action plan for the WQPP, *Implementing Solutions to Urban Runoff*. References to institutions and their roles in implementing this plan are proposals put forth by the multi-agency planning team. Ultimate authority to proceed on and implement any of these proposed strategies remains with the institutions themselves.

This document was produced as part of a National Ocean Service Partnership Project between the Strategic Environmental Assessments (SEA) Division of the Office of Ocean Resources Conservation and Assessment, the Monterey Bay National Marine Sanctuary of the Office of Ocean and Coastal Resource Management, and the State of California. This partnership has brought together the SEA Division's expertise in integrated coastal management, the Sanctuary's special knowledge of management concerns, and the perspective of many State and local agencies, public and private groups on the need for more effective environmental management. This joint effort will forge a solid foundation for continuing stewardship of water quality in the Sanctuary region.

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## For More Information

For more information on the Water Quality Protection Program please contact:

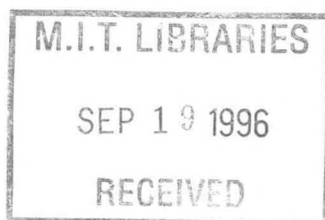
Water Quality Protection Program Director  
Monterey Bay National Marine Sanctuary  
299 Foam Street  
Suite D  
Monterey, CA 93940  
Tele: (408) 647-4247  
Fax: (408) 647-4250

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## **Agencies/ Organizations Cooperating to Develop the Water Quality Protection Pro- gram**

### **WQPP Committee**

#### **Federal**

U.S. Department of Commerce, National Oceanic and Atmospheric Administration  
U.S. Environmental Protection Agency, Region IX  
U.S. Department of Agriculture, Forest Service and  
Natural Resources Conservation Service  
U.S. Department of Transportation, U.S. Coast Guard  
U.S. Department of Defense, U.S. Army Corps of Engineers

#### **State of California**

California Coastal Commission  
California Environmental Protection Agency  
California Department of Fish and Game  
State Water Resources Control Board  
Central Coast Regional Water Quality Control Board  
San Francisco Regional Water Quality Control Board  
California Department of Parks and Recreation  
California Resources Agency  
Elkhorn Slough National Estuarine Research Reserve  
University of California Sea Grant Extension Program

#### **Local Agencies**

Association of Monterey Bay Area Governments  
Monterey County Agricultural Commissioner  
Monterey County Planning and Building Inspection  
San Luis Obispo County & Council of Governments  
San Mateo County Planning  
Santa Cruz County Planning  
Santa Cruz County Environmental Health Services  
Santa Cruz Port District

#### **Other Organizations**

Center for Marine Conservation  
Elkhorn Slough Foundation  
Monterey County Hospitality Association  
Monterey Fishermen's Marketing Association  
Pacific Gas & Electric

### **Additional Participants**

*The following agencies, public and private groups participated with WQPP Committee members in a series of workshops to develop the strategies in this plan.*

Bestor Engineers, Inc.  
Caltrans- District 5  
Fort Ord Restoration Advisory Board  
City of Carmel  
City of Monterey  
City of Salinas  
City of Santa Cruz  
City of Watsonville  
Monterey Peninsula Water Management District  
Pebble Beach Company  
San Francisco Estuary Institute  
Santa Clara Valley Water District  
Santa Cruz County Public Works  
Santa Cruz Water Quality Task Force  
Save Our Shores



## Executive Summary

### Program Overview

The Water Quality Protection Program (WQPP) for Monterey Bay National Marine Sanctuary is an interagency effort to develop a comprehensive program to enhance and protect the Sanctuary's physical, chemical and biological resources. The Program implements a key provision of the Memorandum of Agreement (MOA) signed by eight federal, state and local water quality agencies as part of Sanctuary designation in 1992—that they work together to develop a plan to protect the Sanctuary's unique resources.

An ecosystem-based, watershed management program is being developed to address a number of issues that relate to Sanctuary water quality. These include urban runoff, marina and boating activities, agricultural activities, point sources, and water management. The Program is being developed using a knowledge-based, consensus process which brings together resource managers, scientists, businesses and public groups to identify problems and develop effective solutions (NOAA 1994). This document represents the second Action Plan for the Program—Regional Monitoring, Data Access, and Interagency Coordination. The first action plan addressed urban runoff concerns. Other issues will be undertaken in subsequent action plans.

### Problems Addressed in this Action Plan

This plan addresses the need for development of a coordinated regional monitoring program and data access system. Although there are a number of federal, state and local monitoring programs operating within the region, most of these programs are very limited operations, and they generally operate independently of other monitoring efforts. Similarly, although there are numerous databases which contain water quality data and related information, there is no system which allows easy access to data from multiple agencies. There is a strong need for coordinated monitoring and databases which can provide readily accessible and understandable information to characterize the health of the Sanctuary and its watersheds, and assist resource managers in monitoring the success of management activities.

Another problem which is addressed in this plan is the lack of a permanent framework for formal and continuous interagency coordination to share data, evaluate water quality problems, prioritize the use of staff and funding to address problems, and develop effective regional solutions. There are currently over 150 different Federal, State, and local management programs which address water quality in the Sanctuary and its watersheds. Although many agencies have been working together as part of the WQPP, there is currently no formal interagency framework in place to ensure implementation of strategies developed under the Program, evaluate the success of the strategies, and modify or develop new strategies as additional problems arise.

### Process for Developing Strategies

This document describes three priority strategies for addressing problems outlined above. These strategies were developed by an interagency Project Development Team for the WQPP with the assistance of a wide array of participants (Appendices A and B). The following are the major steps that were used in this process:

### Develop Background Information

- Various efforts to characterize water quality conditions in the region have been conducted during the process of plan development. Regional water quality problems were initially identified and prioritized at a 1994 WQPP workshop attended by approximately 120 of the region's water quality experts (NOAA 1994). Participants included representatives of federal, state and local government agencies, stakeholder groups, nonprofit organizations, and the scientific community.
- A second water quality conditions report (NOAA 1995a) was produced later in the process to compare results from the 1994 WQPP-sponsored workshop with State water quality information.

### Gather Recommendations

- Initial recommendations for addressing a variety of pollution sources were generated at the 1994 WQPP workshop. Many of these "strategies" were related to urban runoff, the prototype issue chosen by the planning team.



- Recommendations developed by two other recent planning efforts were also reviewed. The first was a Technical Advisory Committee convened by the State Water Resources Control Board and the California Coastal Commission to develop statewide strategies for addressing urban runoff to meet the requirements of the Coastal Zone Act Reauthorization Amendments Section 6217. Camp Dresser & McKee (1993) also developed recommendations for addressing urban runoff for AMBAG's Urban Runoff Water Quality Management Plan for the Monterey Bay Region.

## Review/Synthesize Recommendations

- Recommendations from all three of these sources were synthesized and compiled into a common format, resulting in 37 individual recommendations. The combined strategies and background information were then compiled into a 142-page document entitled Urban Runoff: Issues and Strategies (NOAA, 1995b).

## Prioritize Recommendations

- Thirty representatives from local, state and federal agencies, members of public and private groups, met in May 1995 to review the compiled information. Participants prioritized the strategies that either strengthened existing urban runoff programs or filled an unmet need in the Sanctuary region. Three general criteria were used: (1) socioeconomic impacts, (2) institutional feasibility, and (3) environmental benefits. This structured workshop resulted in the recommendation of ten priority strategies to refine for implementation. Seven of these dealt directly with urban runoff, while the other three were the general water quality strategies described in this action plan. Descriptions of the urban runoff strategies can be found in WQPP (1996).

## Revise/Add Detail to Recommendations

- Following the May workshop, meetings and "write-up sessions" were held with experts in the fields covered by the proposed strategies. These sessions, held during the summer of 1995, also included participation of affected user groups. These sessions identified the detailed steps required to implement each strategy, institutional requirements, estimated costs of implementation, and potential funding sources.

## Recommended Strategies

### Program-Wide Strategies

The three program-wide strategies identified in the workshop process are described in this document. Their scope extends across each of the areas of focus of the Water Quality Protection Program — urban runoff, marinas and boating, agriculture, point sources, and water management.

The Regional Monitoring Strategy will coordinate and build upon existing federal, state and local monitoring activities within the Sanctuary and its watersheds. The goal of the strategy is to provide comprehensive information regarding existing water quality conditions, long-term trends, and the success of pollution management efforts.

The Data Access Strategy will provide local, state and federal agencies with easy access to existing database systems containing water quality and related information. The goal of this strategy is to provide resource managers with readily understandable information they need to evaluate environmental problems and make effective management decisions.

The Interagency Coordination Strategy will establish a framework for the continuous interagency coordination on water quality issues and watershed management, including funding priorities, education, technical assistance, monitoring and data exchange, permit review, and enforcement. A Water Quality Council would be established to ensure implementation of WQPP strategies, modify strategies as needed, and address new problems as they arise.

## Projected Costs and Timetables

An approximate schedule and set of estimated implementation costs are included in the Overview of the Actions section. In addition, projected costs associated with implementing the strategies and potential funding sources are provided in more detail in the individual strategy discussions.

Substantial progress on the regional monitoring strategy has already been made (NOAA 1995c, Tetra Tech, Inc. 1995). However, further commitments of the time and resources of participating agencies and the support of the public will be needed to fully implement these strategies and the rest of the program.



The cost information indicates that almost all money would be spent on labor and services as opposed to capital expenditures. Estimated total costs of implementing this component of the WQPP range from approximately \$200,000 to about \$700,000 dollars per year. These estimates have been developed to provide an order of magnitude cost assessment of the strategies. These initial estimates, however, will likely be modified as the strategies undergo further review during the implementation phase.

### **Continuous Management**

It is clear that some details will be revised as the proposed lead and supporting agencies for each strategy actually begin to carry out the work. Steps to implementation may be altered or added, variations for different geographic areas or jurisdictions may be needed, and alternative funding sources may need to be identified. These ongoing modifications underscore the need for continuous interagency management of the Program.

Establishment of the management structure necessary to continue implementation of the WQPP is a priority for the Program in 1996. Such a structure will have to take into account many considerations:

- How to make the best use of existing resources and knowledge to achieve the goals of the Program.
- The type of review (frequency, level of detail, etc.) necessary to see how well strategies are moving the Program toward its goals.
- How to arrive at Program priorities.
- How to finance the WQPP as a whole and individual strategies.
- The degree of formality and authority the Program will seek.
- The role of the public in formulating and implementing solutions.

There are many other issues the continuous management structure will have to deal with. The issue of ongoing WQPP management is addressed as a separate strategy in this action plan.



## Introduction

*This action plan describes strategies that can be used to develop and implement regional monitoring, improved data access, and continuous interagency coordination on water quality issues. The plan represents the efforts of an interagency Project Development Team and many other participants. Implementation of these strategies will require funding and staff support. The costs associated with implementing each strategy, potential funding sources and lead agencies are identified in each of the sections within this document.*

## The Sanctuary

The Monterey Bay National Marine Sanctuary (MBNMS) was designated by Congress in September 1992. It encompasses approximately 4,000 square nautical miles of coastal and ocean waters along the central California coast, extending from southern Marin County south to Cambria in San Luis Obispo County. The goals of the Sanctuary are to: 1) enhance the existing regulatory resource protection regime; 2) establish a coordinated research program to expand knowledge of the Sanctuary environment and resources, and thus provide the basis for sound management; 3) initiate a broad-based education and interpretive program to improve public understanding of the Sanctuary's importance as the habitat for a unique community of marine organisms; and 4) provide a comprehensive management framework to protect this habitat (NOAA 1992). Development of the Water Quality Protection Program is an integral part of the management framework.

## The Memorandum of Agreement

As part of the Management Plan for the Sanctuary, a Memorandum of Agreement (MOA) to develop an ecosystem-based Water Quality Protection Program (WQPP) for the Sanctuary was signed by eight key water quality agencies. These signatories are: the National Oceanic and Atmospheric Administration's Office of Ocean and Coastal Resource Management (NOAA/OCRM); the U.S. Environmental Protection Agency, Region IX (USEPA); the California Environmental Protection Agency (Cal EPA); the State Water Resources Control Board (SWRCB); the San Francisco Regional Water Quality Control Board (SFRWQCB); the Central Coast Regional Water Quality Control Board (CCRWQCB); the California Coastal Commission (CCC); and the Association of Monterey Bay Area Governments (AMBAG). Many additional local

and state agencies and organizations are working with the signatory agencies as formal members of the planning team (See Appendix A).

The purpose of the WQPP is to recommend and seek implementation of priority strategies and programs that address point and nonpoint sources of pollution. The program goal is to protect and enhance the chemical, physical, and biological integrity of the Sanctuary. Implementation of the program will be the responsibility of federal, state and local agencies working with businesses, landowners, environmental groups, and the public. To avoid duplication and overregulation, the MOA mandates that the water quality management process take into consideration the following permits, plans, research and monitoring efforts already in place in the region:

- Research and monitoring associated with the development of a Sanctuary Water Quality Protection Program, as outlined in the MOA;
- National Pollutant Discharge Elimination System (NPDES) permits issued under Section 13377 of the California Water Code;

### Water Quality Protection Program Goals & Objectives

- Ensure protection for all Sanctuary resources
- Enhance and protect the Sanctuary's chemical, physical, and biological integrity
- Identify & address specific threats to Sanctuary resources
- Develop consensus among agencies, business, landowners, and the public on practical solutions to problems
- Integrate mandates and expertise of existing coastal/ocean resources management
- Develop priority strategies and implementation schedules for control of point and nonpoint sources
- Assign responsibilities for carrying out strategies
- Identify costs and sources of funding
- Pool financial & staff resources to carry out strategies
- Establish a comprehensive water quality monitoring program
- Promote cooperative use of technology/information transfer
- Encourage public participation, education, and community stewardship of the Sanctuary and its watersheds



- Waste Discharge Requirements (WDR) issued under Section 13263 of the California Water Code;
- California Ocean Plan, Enclosed Bays and Estuaries Plan\*, Inland Surface Waters Plan\*, relevant Basin Plans, and CWA 208 Plans; and
- Nonpoint Source (NPS) Pollution Planning and Control Measures including Management Plans prepared under Sections 319 and 208 of the Clean Water Act (CWA) and under Section 6217(g) of the Coastal Zone Act Reauthorization Amendments (CZARA) of 1990.

### **An Integrated Management Approach**

The WQPP has been designed to take advantage of existing environmental management programs and resources within the Sanctuary region by looking for potential areas of cooperation and integration. This same approach has been successful in other parts of the country where agency staff and budgets are limiting factors. The WQPP is a consensus-building program that brings together all the stakeholders early in the process. Local, state, and federal government agencies, businesses, nonprofit organizations and members of the public all are helping shape water quality protection strategies (Appendices A and B). Signatories to the MOA and agencies and organizations that helped bring about the Sanctuary designation have committed the active participation of their staff in developing a water quality protection program.

It is likely that many of the problem pollutants and activities that have the potential to degrade Sanctuary resources can be addressed by management programs already established in the region. The key to making progress on protecting Sanctuary water quality is to recognize which programs are most suitable for addressing these problems, and, if necessary, identify how these programs can be enhanced to ensure appropriate water quality conditions. This is the first priority of integrated management in the region. The second is to establish activities to correct water quality problems not adequately addressed by existing management. The third component is to monitor water quality conditions over time and institute a process of continuous management to ensure that management activities generate meaningful results.

Figure 1 documents the WQPP's broad geographic range, including 11 watershed areas and three ocean segments. This area encompasses parts of eight

counties, twenty incorporated municipalities, two California Regional Water Quality Control Boards, numerous special districts, and the overlapping jurisdictions of approximately ten State and Federal regulatory agencies. Land use in the region is characterized by large agricultural areas, grazing land, urban and suburban development. This mix of background conditions and agency responsibilities mandates an approach that cuts across jurisdictional and political boundaries and focuses on ecosystems and watersheds.

Identification of the requirements to implement water quality protection programs, including costs, financing mechanisms, and institutional responsibilities, is a major concern and is the focus of this action plan. The WQPP will rely heavily on education as an important means to reduce pollutant inputs to the Sanctuary. Voluntary participation will be the preferred method of achieving Program goals, especially for the many sources of pollution (primarily nonpoint sources) that will prove difficult or impossible to regulate.

### **Why this Plan is Necessary**

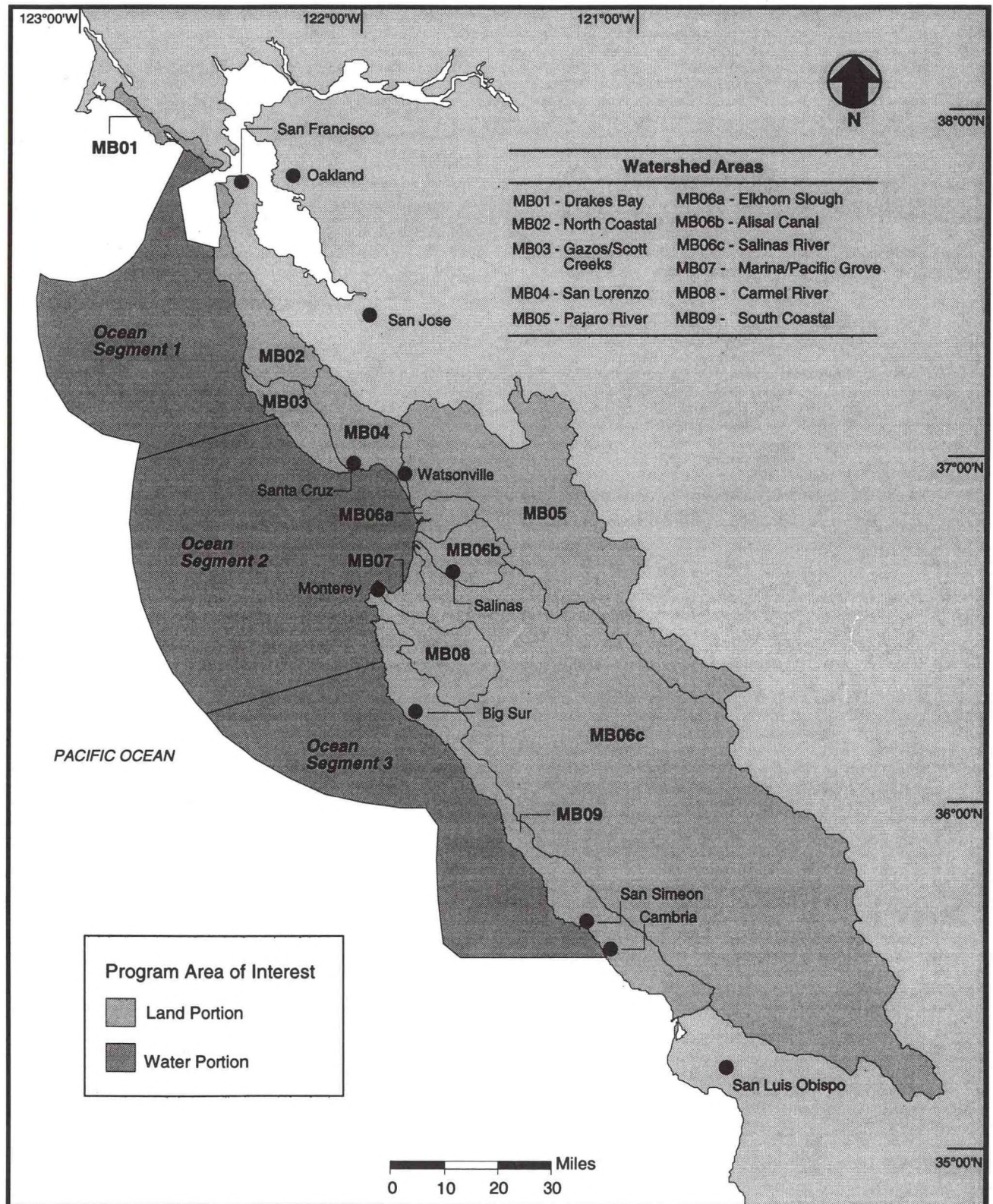
The WQPP is a comprehensive process for identifying water quality problems, developing management strategies, and implementing action plans to protect and enhance Sanctuary water quality. To fulfill these purposes participants in the Program require knowledge about the distribution and effects of pollution in the Sanctuary and its watersheds. An initial assessment of monitoring in the region was performed by NOAA in 1995 (NOAA 1995c). In addition, environmental management authorities are learning that improvements in ecosystems can only be realized through cooperative efforts, among themselves and with the public. Putting strategies into action that deal with these concerns is critical to the ultimate success of the Program.

Aside from the natural reasons for fostering a more cooperative management structure, there are practical reasons as well. Budgets for most of the resource agencies in the region are inadequate to achieve all of their objectives. Also, no institution has the authority to "manage" all of the variables that affect the condition of the resource they are charged with protecting. Political and administrative boundaries imposed on the natural landscape are not necessarily the appropriate ways to think about solving environmental problems.

\*These plans, rescinded by the State Water Resources Control Board in September 1994, are currently being revised.



Figure 1. General spatial framework of the Water Quality Protection Program





## Strategy Development

Figure 2 shows the sources of the strategies in this plan and Action Plan I-- Implementing Solutions to Urban Runoff. The sources and related efforts that initiated activity on the three strategies in this plan initially came from an urban runoff perspective. The strategies have been modified to accommodate broader Program needs which include many other categories of pollution.

Initial recommendations for addressing urban runoff were generated at a 1994 WQPP workshop attended by approximately 120 of the region's water quality experts (NOAA 1994). In addition to evaluating strategies from this workshop, the WQPP also considered recommendations developed by two other recent planning efforts. During 1994, the State Water Resources Control Board and the California Coastal Commission convened a Technical Advisory Committee (TAC) to address urban runoff. This TAC, consisting of urban runoff experts from throughout the state, developed recommendations for the state's Nonpoint Source Management Program to address the goals of the Coastal Zone Act Reauthorization Amendments (CZARA) Section 6217. Their report served as a source of ideas for possible implementation. Strategies developed by the WQPP also must be closely integrated with the ultimate set of recommendations adopted by the State of California under CZARA Section 6217.

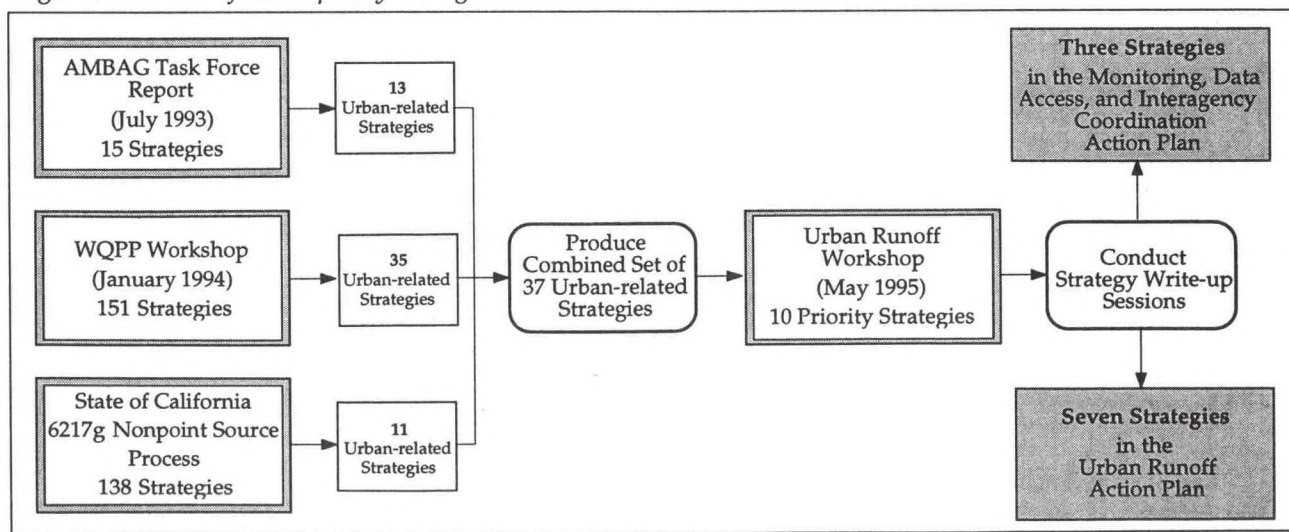
Recommendations on urban runoff in this region have also been developed by Camp Dresser & McKee, Inc. (1993) for AMBAG's Urban Runoff Water Quality Management Plan for the Monterey Bay

Region. These recommendations were prepared with the assistance of a TAC composed of representatives from the region's cities and counties. Recommendations in AMBAG's plan also serve as a valuable source of ideas for regional implementation.

Approximately 40 initial recommendations compiled from the above sources were evaluated at a workshop held in May 1995. Participants included representatives from local, State and Federal government agencies, and public and private organizations. Evaluation criteria included an analysis of environmental benefits, social and economic impacts and institutional responsibilities. From the 40 recommendations, ten strategies were identified as priorities for implementation. Seven of these dealt with urban runoff and are described in Action Plan I. The other three are general water quality strategies described in this plan. Details needed to implement these priority strategies were then added by members of the WQPP Project Development Team working with a variety of local and state experts on each strategy topic (see Appendices A and B). This process led to the detailed strategy descriptions presented in this action plan.

The strategies in this document identify costs, time schedules, institutional responsibilities, and the steps necessary for implementation. It should be noted, however, that these strategies may be modified as each undergoes further review in the WQPP workshop/public review process and as implementation begins. As noted in the Interagency Coordination Strategy (G.3), a continuous management process or coordinating council will be formed to oversee implementation of all WQPP strategies, and recommend refinements where necessary.

Figure 2. Sources of water quality strategies





## An Overview of the Actions

*This section of the document summarizes the proposed actions. It provides information on how the actions overlap in time, the anticipated costs of the strategies, and the institutions that could have an important role in implementation.*

## The Three Strategies

The three strategies in this plan provide a foundation for the WQPP as a whole. These strategies, dealing with regional monitoring, data access, and inter-agency coordination, are being introduced early in the process of action plan development because they are critical to addressing all water quality issues. They will evolve as other phases of the Program are developed.

### Three Strategies in this Action Plan

G.1 Regional Monitoring

G.2 Data Access

G.3 Interagency Coordination

## A Proposed Schedule

Table 1 shows a proposed schedule for action for the three strategies. This schedule was developed by the interagency Project Development Team after other details of the strategies (costs, steps to implementation, institutional roles) were worked out. It is very ambitious and assumes that institutions targeted for leading or assisting implementation for a given strategy will be ready to cooperate and have the resources available to do the job. It also assumes that work on subsequent water quality issues (marinas and boating, agriculture, point sources) addressed by the WQPP will not conflict with these proposed actions. Neither of these assumptions are likely to hold entirely true, but in the absence of better knowledge about how these factors might influence timing of the actions, the proposed schedule provides a starting point for future discussions.

All three strategies are already being implemented. These have either been conducted as part of the exercise that produced this initial action plan (G.1 Regional Monitoring and G.2 Data Access), or are very closely related to an ongoing activity in a participating agency (G.3 Interagency Coordination). The number of person months identified in the table represent the amount of staff time that could be

Table 1. *Schedule of activities*

Strategy/Activity	Person Months*	Calendar Year																			
		1995				1996				1997				1998				1999			
		Quarter				Quarter				Quarter				Quarter				Quarter			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
<b>G.1 Regional Monitoring</b>																					
1 Conduct preliminary assessment	3																				
2 Expand assessment and conduct workshop	3																				
3 Evaluate other regional monitoring approaches	2																				
4 Identify questions/parameters to be monitored	3																				
5 Map existing station locations	2																				
6 Produce monitoring plan	6																				
7 Develop program infrastructure	5																				
8 Implement monitoring program	24																				
9 Review, interpret, and communicate results	24																				
<b>G.2 Data Access</b>																					
1 Identify existing monitoring data	4																				
2 Form Interagency Data Task Force (IDTF)	2																				
3 Identify questions to be answered	3																				
4 Identify/evaluate existing database systems & networks	1																				
5 Identify relevant data sets, standard format and system design	7																				
6 Improve data access—Internet connections and digital formats	2																				
7 Develop QA/QC protocols and MOAs	6																				
8 Develop metadata and summary data for each program	4																				
9 Conduct annual interagency performance review	1																				
<b>G.3 Interagency Coordination</b>																					
1 Establish WQ Council	2																				
2 Establish linkages with other groups	4																				
3 Coordinate implementation of WQPP strategies	18																				
4 Prioritize funding goals	4																				
5 Coordinate permit review	18																				
6 Coordinate enforcement activities	9																				
7 Evaluate new problems/develop strategies	6																				

G - Activity partially funded by CWA Section 319 Grant.

\* Estimated amount of staff time required to implement activity.



required to implement the action. In addition to these estimates, there will be an ongoing commitment of time for these strategies because they have long-term needs and serve planning, assessment, or coordination functions.

As other water quality issues are addressed by the Program and as the Water Quality Council assumes oversight of the WQPP, this schedule will have to be adjusted to reflect a broader set of priorities. Special consideration will have to be given to actions that are the most feasible and are likely to generate positive results in the field. In addition, actions that are funded by grants or other financial awards will have to be implemented according to the funding agreements developed by the parties involved. Despite these caveats, this schedule should provide a reasonable estimate of the amount of time it could take to implement the strategies.

### How Much Will It Cost?

It has been difficult to get precise estimates for many of the actions proposed in this plan. Uncertainty about the scale and scope of some of the actions and the natural tendency for the level of implementation to rise and fall as institutional priorities change makes predicting future costs particularly difficult.

For any given strategy, the estimated costs can be divided into two general groups, those that are onetime expenses (e.g. forming task forces, asking and answering specific questions) and those that are ongoing and recurring (e.g. assessing and evaluating new problems, evaluating program effectiveness).

The figures in Table 2 assume that much of the support for implementation can come from in-kind services from participating agencies. In those cases the dollar figures represent the portion of a person's salary and benefits that would be necessary to carry

out the function. In other cases, services and equipment will have to be purchased on the open market. Changing economic conditions can make these costs rise or fall. To help address some of these uncertainties, ranges are used for selected actions.

This cost information is not intended to be used for preparing detailed, multi-year budgeting proposals to potential funding sources. It is best used as a way to obtain a rough estimate of the commitment that might be required to fully implement a strategy.

### Which Institutions Are Involved?

The success of the Program hinges upon the degree to which the vision guiding this effort and the responsibility for its implementation can be shared across the experience and resource bases of the many public and private institutions in the region. The way in which these groups are being asked to participate in the WQPP reflects that reality. The lead institutions shown for each strategy in Table 3 were selected for one or more of the following reasons: 1) they were the source of a new idea that has been developed into a strategy; 2) they have the greatest degree of responsibility in that area; or 3) they already have significant experience in that area.

Primary support by an institution could require as much or more effort as the lead institution for a given strategy. These are usually the groups that have the most direct knowledge of how the strategy needs to work "on the ground." As with the schedule and cost information, these roles are subject to change as priorities are reestablished over the course of Program implementation.

Table 2. Strategy implementation costs (\$1,000)

Strategy	Calendar Year						
	1996		1997		1998		Ongoing
	Capital	Labor & Services	Capital	Labor & Services	Capital	Labor & Services	Cost/yr
G.1 Regional Monitoring		25		75		210	200-300+
G.2 Data Access	5	35-45	5	55-95		5-10	5-10
G.3 Interagency Coordination		85		50-60		185-255	135-175
<b>Total</b>	<b>5</b>	<b>145-155</b>	<b>5</b>	<b>180-230</b>	<b>0</b>	<b>400-475</b>	<b>340-485+</b>

Table 3. Strategy implementation roles

	Federal				State							Regional				Local				
	Monterey Bay NMS	NOAA	U.S. EPA	U.S. Geological Survey	CA Coastal Commission	RWQCB #2	RWQCB #3	SWRCB	Resources Agency	Dept. of Fish and Game	Univ. of California Sea Grant	WQPP/WQ Council	AMBAG	Interagency Data Task Force	NonProfit Foundation	MBNMS Research Panel	Monterey County	San Luis Obispo County	San Mateo County	Santa Cruz County
Strategies and Activities																				
G.1 Regional Monitoring																				
1	Conduct preliminary assessment	○	●									○								
2	Expand assessment and conduct workshop	●		●		○	●			○		○								
3	Evaluate other regional monitoring approaches	○				○	●			○		○					○	○	○	○
4	Identify questions/parameters to be monitored	○		○		○	●	○		○	○	○					○	○	○	○
5	Map existing station locations			○	●			●		○	○		○							
6	Produce monitoring plan	○		○		○	●	○		○	○	○					○	○	○	○
7	Develop program infrastructure	○		○		○	●	○		○	○	○					○	○	○	○
8	Implement monitoring program					○	○					○			●					
9	Review, interpret, and communicate results					○	○					○			●					
G.2 Data Access																				
1	Identify existing monitoring data		●	●			○					○								
2	Form Interagency Data Task Force (IDTF)			○		○	○	○				●	●			○				
3	Identify questions to be answered	○		○		○	●	○		○	○	○	○	●			○	○	○	○
4	Identify/evaluate existing database systems & networks	○									○		○	●						
5	Identify relevant data, standard format, & system design				○			○			○	○	○	●						
6	Improve data access--Internet connections and digital formats	○	○						○			○	○	●						
7	Develop QA/QC protocols and MOAs			○				●		●			○	●						
8	Develop metadata and summary data for each program			○				●		●			○	●						
9	Conduct annual interagency performance review	○										○	○	●						
G.3 Coordination/Communication																				
1	Establish WQ Council	●										○								
2	Establish linkages with other groups	●										●								
3	Coordinate implementation of WQPP strategies	○										●								
4	Prioritize funding goals	○										●								
5	Coordinate permit review	○				○	○	○		○		●	○							
6	Coordinate enforcement activities	○				○	○			○		●	○							
7	Evaluate new problems/develop strategies	●										●								

● - Lead Institution for Implementation, ○ - Primary Support for Implementation



## General Strategy Descriptions

*This section describes the strategies proposed to address general water quality problems that cut across a variety of pollution sources. For each strategy, information is provided on specific problems, a description of how the strategy proposes to address the problems, and a discussion of how the strategy will be implemented.*

### Regional Monitoring, Data Access, and Interagency Coordination

Two strategies are proposed to help improve the access to and quality of information on water quality conditions in the region. A third strategy is proposed to develop the framework for conducting and implementing the WQPP. All three strategies span the cross-section of water quality issues addressed by the WQPP.

#### Why focus on these topics?

There are a variety of federal, state, local and volunteer monitoring programs related to water quality within the Monterey Bay Sanctuary and its watersheds. Each of these programs operates according to a specific mandate or goal.

Although many of these programs obtain valuable information, coordination among them is limited. Limited monitoring by dischargers on localized effects is currently conducted without reference to broader regional impacts. For both permittees and government monitoring efforts, station locations, sampling protocols and data presentation methods are often developed by the individual programs without reference to other types of monitoring efforts in the region. Lack of coordination limits the ability of scientists and managers to compare information between programs, and develop a comprehensive regional evaluation of pollutant impacts. In some cases it is also an economically inefficient approach to monitoring, requiring separate contractors, monitoring equipment, report preparation, etc. Cost-sharing and pooling of resources among monitoring efforts could eliminate these redundancies and provide more monitoring information per dollar spent.

Available monitoring information does not currently provide an in-depth portrayal of water quality conditions and problems in the Sanctuary. Spatial

and temporal gaps are inherent in the existing monitoring record, due to lack of adequate funding and to lack of coordination among programs. In addition, monitoring should be better tailored to provide consistent, readily understandable information to resource managers for making decisions.

Even if all of the proper information is gathered to better understand the ecosystem, gaining access to it can be a problem. Many government agencies, academic institutions, permit applicants and public groups collect a wide variety of water quality and related environmental data in Monterey Bay National Marine Sanctuary and its watersheds. With the

### Regional Monitoring, Data Access, and Interagency Coordination Strategies

#### G.1 Regional Monitoring

- Conduct preliminary assessment
- Expand assessment and conduct workshop
- Evaluate other existing monitoring approaches
- Identify questions and parameters to be monitored
- Analyze existing station locations
- Produce monitoring plan
- Develop program infrastructure
- Implement monitoring program
- Review, interpret, and communicate results

#### G.2 Data Access

- Identify existing monitoring data
- Form interagency Data Task Force
- Identify specific questions to be answered by data
- Identify and evaluate existing database systems and networks
- Identify relevant data, standard format & access system design
- Develop QA/QC protocols and MOAs
- Develop metadata and summary data for each program
- Conduct annual performance review

#### G.3 Interagency Coordination

- Establish a management council for the Water Quality Protection Program
- Establish linkages with other groups
- Coordinate implementation of WQPP strategies
- Prioritize funding goals
- Coordinate permit review
- Coordinate enforcement activities
- Evaluate new problems and develop new strategies



proliferation of distributed data systems, it is difficult for resource managers, scientists and other information users to determine what information is available, either in digital or hard copies.

Data collected under various programs is generally designed to meet a specific purpose for particular agencies or organizations. Although these data are often valuable, linkages to other types of data and users are frequently lacking. Data management, quality control, information storage, data presentation and distribution methods differ from program to program, and gaining access to readily understandable information is often difficult. Important information is often available only in hard-copy, making it difficult to use data quickly and efficiently.

This fragmentation of data among a variety of programs impedes the ability of scientists and managers to gain a comprehensive view of the health of the Sanctuary and its watersheds, and to use the information in making management decisions.

While the actions outlined in the previous pages will help address specific concerns about urban runoff, there are many other administrative problems that cut across a number of water quality issues. There are over 150 federal, state and local agency programs addressing various aspects of water quality in the Sanctuary and its watersheds. Because of the number and diversity of programs and agencies involved, effective coordination among them is difficult.

There is currently no permanent framework for formal or continuous interagency coordination to share data, evaluate water quality problems, prioritize the use of staff resources and funding to address problems, and develop effective regional solutions. Although many agencies have been working together as part of the Water Quality Protection Program, there is no permanent interagency framework in place to ensure implementation of strategies developed under the Program, evaluate the success of the strategies, and modify or develop new strategies as additional problems arise.

Lack of effective coordination among agencies results in inefficient use of economic resources, reduces protection for natural resources, and creates confusion for the public. It also impedes the development of comprehensive watershed management programs needed to address complex water quality issues.

## Strategy G.1 Regional Monitoring

### Summary of Strategy

#### Activities:

- Conduct preliminary assessment
- Expand assessment and conduct workshop
- Evaluate other existing monitoring approaches
- Identify questions and parameters to be monitored
- Analyze existing station locations
- Produce monitoring plan
- Develop program infrastructure
- Implement monitoring program
- Review, interpret, and communicate results

#### Participating Institutions:

- |                          |                     |
|--------------------------|---------------------|
| • RWQCB 3                | • CDFG              |
| • RWQCB 2                | • SWRCB             |
| • NOAA                   | • CCC               |
| • MBNMS                  | • WQPP              |
| • US EPA                 | • AMBAG             |
| • Foundation             | • Monterey County   |
| • UC Sea Grant           | • Santa Cruz County |
| • USGS                   | • San Mateo County  |
| • San Luis Obispo County |                     |

**Schedule:** Underway. Two to three years may be required to fully implement the strategy.

**Cost:** \$80,000 through December of 1996.  
Ongoing cost \$200,000 to \$300,000 per year, increasing as Phases II and III are added.

The objectives of this strategy are to (1) coordinate existing monitoring activities within the Sanctuary and its adjacent watersheds and (2) develop a cost-effective, comprehensive approach to providing managers at federal, state, and local agencies the information they need to protect aquatic resources. This coordinated approach will track changes in the environmental health of the Sanctuary and its watersheds, and provide effective input to management decisions. The following are some of the major features of this strategy:

- A comprehensive characterization of existing water quality conditions, including water, sediment and tissue data.
- An assessment of the environmental health of the Sanctuary and its watersheds based on ecological risks (i.e. contaminant concentrations, effects on fish, shellfish and biological



Table 4. Institutional responsibilities and staffing requirements for Strategy G.1, Regional Monitoring

Primary Activity	Lead	Primary Support	Person Months
1. Conduct preliminary assessment	NOAA	MBNMS/WQPP	3
2. Expand assessment and conduct workshop	MBNMS; US EPA; RWQCB 3	RWQCB 2; WQPP; CDFG	3
3. Evaluate other existing monitoring approaches	RWQCB 3	MBNMS; RWQCB 2; Monterey, Santa Cruz, San Luis Obispo, & San Mateo Counties; CDFG	2
4. Identify questions and parameters to be monitored	RWQCB 3	MBNMS/WQPP; CDFG; SWRCB; RWQCB 2; US EPA; Monterey, Santa Cruz County, San Luis Obispo, & San Mateo Counties; UC Sea Grant	3
5. Map existing station locations	SWRCB; CCC	CDFG; AMBAG; UC Sea Grant; USGS	2
6. Produce monitoring plan	RWQCB 3	MBNMS/WQPP; CDFG; SWRCB; RWQCB 2; US EPA; Monterey, Santa Cruz County, San Luis Obispo, & San Mateo Counties; UC Sea Grant	6
7. Develop program infrastructure	RWQCB 3	MBNMS/WQPP; CDFG; SWRCB; RWQCB 2; US EPA; Monterey, Santa Cruz County, San Luis Obispo, & San Mateo Counties; UC Sea Grant	5
8. Implement monitoring program	Foundation	RWQCB 2 and 3; WQPP	2*
9. Review, interpret, and communicate results	Foundation	RWQCB 2 and 3; WQPP	1-2*

communities, effects on humans and effects on sensitive biological habitats).

- Monitoring of long-term trends.
- Identification of hot spots and pollution sources.
- Monitoring of the overall success of the WQPP and other management programs.
- Initiation of experimental studies to further evaluate impacts and refine the monitoring programs.
- Development and distribution of an annual report to decision-makers which presents monitoring information from a variety of programs in a readily understandable format, and provides input to management decisions.

## Primary Activities

### Activity 1 - Conduct Preliminary Assessment.

An initial assessment of 20 existing Federal, State and local monitoring programs to identify constituents measured, station locations, and sampling frequencies, and help clarify the problems previously noted.

*Early Implementation* - This activity was completed by NOAA's SEA Division, MBNMS, and WQPP participants in May 1995. The results of this activity were used in Activity Two.

### Activity 2- Expand Assessment and Conduct Workshop.

Conduct additional program assessments and develop initial recommendations (with EPA and the consulting firm Tetra Tech, Inc.)

- Identify and assess the station locations, constituents measured, and frequency of monitoring for additional programs, and extend survey to gather information on program mandates and methodologies.
- Develop initial recommendations on the feasibility of coordinating regional monitoring, including design characteristics; selection of indicators; compatibility of monitoring methods; and data storage, sharing, and analysis. Tailor recommendations for two phases—coordination of monitoring associated with NPDES, WDRs and urban runoff programs, and coordination among other federal, state and local monitoring programs.
- Sponsor a workshop targeted to managers of monitoring programs, regulatory agencies, key dischargers, and environmental groups to present, evaluate and refine initial recommendations and determine next steps/questions to be addressed.

*Early Implementation* - WQPP worked with EPA and its consulting firm TetraTech to complete additional program assessments (TetraTech, Inc. 1995). The WQPP cosponsored a workshop in October 1995



Table 5. *Costs for completing activities and funding sources for Strategy G.1, Regional Monitoring (\$1,000)*

Primary Activity	Costs							Funding Sources		Funding Source
	1996		1997		1998		Ongoing	Existing	Potential	Institution
	Capital	Labor & Services	Capital	Labor & Services	Capital	Labor & Services	Cost/yr			
1. Conduct preliminary assessment*								In-Kind Services		NOAA
2. Expand assessment and conduct workshop*								CWA Section 403; Appropriations		US EPA
3. Evaluate other existing monitoring approaches		4		4				In-Kind Services		RWQCB 2 & 3; MBNMS
4. Identify questions and parameters to be monitored		6		6				In-Kind Services		RWQCB 2 and 3; MBNMS; CDFG; US EPA; Other WQPP
5. Map existing station locations		5		5					In-Kind Services; Appropriations; Grants	SWRCB; CDFG; AMBAG; CCC
6. Produce monitoring plan		10		30					In-Kind Services; Grants (205, 319, 308, 403, Packard)	RWQCB 2 & 3; SWRCB; US EPA; NOAA-CCEH
7. Develop program infrastructure				30		10			In-Kind Services; Grants	
8. Implement monitoring program						200	100-150+		Permit Fees; In-Kind Services	
9. Review, interpret, and communicate results						100-200**	100-150+		Permit Fees; In-Kind Services	

\* Activities 1 &amp; 2 were completed in 1995 at an estimated cost of \$55,000.

\*\* Activity will be implemented in 1999.

with the Regional Boards and EPA to develop initial recommendations. Participants included federal, state, and local agencies, dischargers, and environmental groups.

#### **Activity 3- Evaluate Other Existing Monitoring Approaches.**

Evaluate structure and approaches used in existing regional monitoring programs in San Francisco Bay, the Southern California Bight, and Puget Sound, and identify those which are most appropriate for the Sanctuary and its watersheds. This should include evaluations of nonprofit organizations dedicated to regional monitoring, and permit fee structures to support regional monitoring in lieu of selected local effects monitoring. Conduct this evaluation through presentations at the initial workshop, interviews and document reviews.

RWQCB 3 will lead in implementing this activity, with support from MBNMS, RWQCB 2, CDFG, and counties.

#### **Activity 4- Identify Questions and Parameters to be Monitored.**

Identify specific questions and parameters, and sponsor additional workshop(s), including more technical and scientific representatives.

a) Develop a series of specific questions relating to water quality problems, constituents of concern, and contributing sources.

b) Identify key parameters or a suite of parameters that should be thoroughly monitored to provide critical information and serve as indicators of water quality degradation.

This activity will be lead by RWQCB 3 with support from WQPP, RWQCB 2, CDFG, MBNMS, EPA, SWRCB, UC Sea Grant, and counties.

#### **Activity 5- Map/Analyze Existing Station Locations.**

Prepare GIS overlays and assess station locations.

a) Prepare monitoring information for GIS overlays, to be added to existing GIS databases (see Environmental Data Base Strategy).

b) Compare existing monitoring programs relative to land uses and pollutant sources to determine necessary revisions of station locations.

This activity will be lead by the SWRCB and CCC with support from CDFG, UC Sea Grant, USGS, and AMBAG.



**Activity 6- Produce Monitoring Plan.**

Develop a plan containing specific recommendations and cost comparisons.

- a) Develop specific recommendations on how existing station locations, frequency of monitoring, constituents sampled, sampling protocols, data sharing, etc. should be modified to better address questions.
- b) Estimate costs currently incurred by dischargers and agencies for independent monitoring, and compare with estimated costs of coordinated regional monitoring program.

RWQCB 3 will lead this activity with support from the same agencies identified in Activity Four.

**Activity 7- Develop Program Infrastructure.**

Develop agency support and organizational structure

- a) Develop agency and discharger support, necessary MOAs and permit modifications to modify/coordinate existing programs.
- b) Develop additional funding to modify/expand monitoring, where needed.
- c) Establish/utilize an independent nonprofit foundation and interagency steering committee to oversee regional monitoring program.

RWQCB 3 will lead this activity with support from the same agencies identified in Activity Four.

**Activity 8- Implement Monitoring Program.**

Implement regional monitoring program, initially focusing on coordinated monitoring for permittees.

The nonprofit foundation and steering committee established under Activity Seven would lead this step with support from the Regional Boards and the WQPP.

**Activity 9- Review, Interpret, and Communicate Results.**

Conduct an annual interagency review and prepare a report on the program to identify hot spots, evaluate the overall health of the Sanctuary, and evaluate the success of the WQPP. The review team should consist of scientists, managers, planners, key dischargers and environmental groups. Package the

results of the review to provide readily understandable information to decision makers and the public. (See Data Access Strategy G.2)

The nonprofit foundation and steering committee established under Activity Seven would lead this step with support from the Regional Boards and the WQPP.

**Implementation**

As indicated in Table 4, this strategy will require a high degree of cooperation among agencies in the region.

Phase I will focus on coordination of monitoring conducted under NPDES, WDRs and urban runoff programs for marine areas and coastal regions of the Sanctuary's watersheds.

Phase II will expand coordination to include other federal, state and local monitoring programs operating in marine areas and coastal regions of the watersheds, as well as volunteer monitor efforts.

Phase III will expand monitoring to include programs in the upper portions of the watersheds. This last phase is not included in the accompanying estimates of staffing and costs.

**Related Programs** - A variety of existing federal, state, and local monitoring efforts might be part of a coordinated effort. These include: RWQCB NPDES Permits and Waste Discharge Requirements; SWRCB's Bay Protection and Toxic Cleanup Program; Mussel Watch Program; and Toxic Substances Monitoring Program; NOAA Status and Trends Program; CDPR Environmental Hazards Assessment Program; Department of Water Resources Monitoring Programs; Monterey County Recreational, Coastal Sediment and Water Quality Monitoring Program; Santa Cruz County Surface Water Monitoring Program; and others. These and other existing monitoring programs are described in two documents prepared for the WQPP (NOAA 1995c, Tetra Tech, Inc. 1995).

**Schedule** - Table 1, in the Overview of the Actions section, depicts the schedule for conducting each activity. Activity One and Activity Two have been completed.

**Cost and Funding** - Estimated costs and funding sources are shown in Table 5. Implementation of the strategy is estimated to cost between \$200,000 and



\$300,000 per year initially, with costs increasing as Phases II and III are added. Funding could potentially come from grants, in-kind services, and permit fees. Implementation may also entail modifications in how existing monitoring dollars are spent. Costs for fully implementing the strategy are unknown.

This strategy will require a significant commitment of resources to implement, especially in the early activities. Personnel from all of the agencies and all major dischargers monitoring water quality in the region should be part of the decisionmaking process. Some of the expense of this effort may be recouped from the savings in staff time and expenditures currently directed at efforts that may not be continued in their present form.

### Performance Measures

Success will be measured in the following ways:

Short-term—number of monitoring efforts participating in regional program, presentation of more readily accessible and understandable information at annual reviews and in documents, and successful examples of jointly sharing resources/costs;

Longer term—demonstrated use of monitoring data in management decisions, reduction in pollutant loadings through feedback to management measures, and increase in public awareness

Success will be measured by WQPP committees and a steering committee of the nonprofit foundation to be established. It may take up to three years to begin to see positive results from this strategy.

### Review/Key Decisions

The successful implementation of this strategy depends upon the degree to which a cooperative system of monitoring can address the needs of individual agencies.

All of the remaining activities in this strategy require the careful scrutiny and participation of the agencies monitoring water quality in the region. If Activities Two through Five can be accomplished in a timely manner and show some early positive results, the monitoring institutions in the region are much more likely to participate in implementing this concept.

## Strategy G.2 Data Access

### Summary of Strategy

#### Activities

- Identify existing monitoring data
- Form interagency Data Task Force
- Identify specific questions to be answered by data
- Identify and evaluate existing database systems and networks
- Identify relevant data, standard format and access system design
- Improve data access
- Develop QA/QC protocols and MOAs
- Develop metadata and summary data for each program
- Conduct annual performance review

#### Participating Institutions:

- |                          |                     |
|--------------------------|---------------------|
| • AMBAG                  | • RWQCB 2 and 3     |
| • IDTF                   | • SWRCB             |
| • WQPP                   | • CDFG              |
| • CCC                    | • MBNMS             |
| • US EPA                 | • NOAA              |
| • CA Resources Agency    | • UC Sea Grant      |
| • Monterey County        | • Santa Cruz County |
| • San Luis Obispo County | • San Mateo County  |

**Schedule:** Some activities are already being implemented. Strategy will be substantially implemented by end of 1997. Program will be ongoing.

**Cost:** \$100,000 to \$150,000 through December 1997. Ongoing cost \$5,000 to \$10,000.

Develop a digital Environmental Data Access System (EDAS) linked to information on water quality and related parameters for the Sanctuary's watersheds and ocean areas. The EDAS will provide environmental scientists and resource managers with the tools to evaluate problems and make environmental management decisions. The EDAS will provide access to existing database systems from a wide variety of agencies and organizations. The spatial area of interest should include all of the Sanctuary and the watersheds that drain into it. Historical information should only date back to 1975. Efforts will first focus on existing digital information. Hard copy data sets will be entered digitally as appropriate. This strategy is closely linked to the proposed Regional Monitoring Strategy (G.1).



Table 6. Institutional responsibilities and staffing requirements for Strategy G.2, Data Access

Primary Activity	Lead	Primary Support	Person Months
1. Identify existing monitoring data	NOAA; US EPA	WQPP; RWQCB 3	4
2. Form Interagency Data Task Force (IDTF)	AMBAG; WQPP	SWRCB; RWQCB 2 & 3; MBNMS-RAP; USGS	2
3. Identify questions to be answered (From Regional Monitoring Strategy (G.1))	IDTF; RWQCB 3	MBNMS/WQPP; CDFG; SWRCB; RWQCB 2; US EPA; UC Sea Grant; Monterey County; Santa Cruz County	3
4. Identify & evaluate existing database systems and networks	IDTF		1
5. Identify relevant data, standard format, and access system design	IDTF	CCC; AMBAG; SWRCB; WQPP	7
6. Improve data access--Internet connections and digital formats	IDTF	NOAA; MBNMS; Resources Agency	2
7. Develop QA/QC protocols and MOAs	SWRCB; CDFG	US EPA; IDTF; AMBAG	6
8. Develop metadata and summary data for each program	SWRCB; CDFG	US EPA; IDTF; AMBAG	4
9. Conduct annual interagency performance review	IDTF	AMBAG; WQPP	1

The major components of the strategy are:

- 1) The EDAS will contain metadata explaining: (a) various data available; (b) summary information on the participating programs (including data related to station locations, pollutants monitored, and frequency of sampling); (c) information on how to access the actual monitored values through the Internet or other electronic means if data are available in digital format, (d) information on the location of hard copy information, and (e) a bibliography of published reports.
- 2) The EDAS will be designed so digital information on monitored values can be easily extracted and used to develop a variety of products including maps, tables, and graphs. This information will be used for developing annual interagency reviews of the health of the Sanctuary and its watersheds (See Regional Monitoring Strategy). It will also be available to individual agencies to facilitate planning, permit reviews, etc.
- 3) Water quality and related environmental information will be overlaid on existing land-use and geographic data. Data will be identified, obtained, and added to the EDAS in three distinct phases: Phase I--Water, sediment and tissue quality data; Phase II--Geophysical, oceanographic, and terrestrial hydrogeology; and Phase III--Biological communities.

## Primary Activities

### Activity 1 - Identify Existing Monitoring Data.

Identify existing federal, state and local data sets containing water quality data.

An initial assessment of water quality monitoring was completed by NOAA in early 1995; and an additional analysis was completed by the consulting firm TetraTech in November 1995 for US EPA (see Regional Monitoring Strategy G.1). AMBAG also began the cataloging of relevant data sets as part of its CAMPITS project and will continue during 1996-97.

### Activity 2 - Form Interagency Data Task Force (IDTF) and Define Duties

A group will be formed to direct implementation of this strategy. These Task Force members will be drawn from the many institutions with a stake in the monitoring framework established in the region. They also should reflect the agencies with environmental decisionmaking responsibilities. The two parts of this activity are shown below.

- a) Identify agencies and institutions conducting or compiling monitoring data in the region who should be members of the IDTF.
- b) Define specific duties of the IDTF



Table 7. Costs for completing activities and funding sources for Strategy G.2, Data Access (\$1,000)

Primary Activity	Costs							Funding Sources		Funding Source
	1996		1997		1998		Ongoing	Existing	Potential	Institution
	Capital	Labor & Services	Capital	Labor & Services	Capital	Labor & Services	Cost/yr			
1. Identify existing monitoring data								In-Kind Services		NOAA
2. Form Interagency Data Task Force (IDTF)		5-10							In-Kind Services	Participants
3. Identify questions to be answered**									In-Kind Services; Grants	NOAA, US EPA*
4. Identify & evaluate existing database systems and networks		5-10							In-Kind Services; Grants	NOAA, US EPA*
5. Identify relevant data sets, standard format and system design	5	20	5	20					In-Kind Services; Grants	NOAA, US EPA*
6. Improve data access--Internet connections and digital formats		5		5					In-Kind Services; Grants	NOAA, US EPA*
7. Develop QA/QC protocols and MOAs				20-50					In-Kind Services; Grants	NOAA, US EPA*
8. Develop metadata and summary data for each program				10-20					In-Kind Services; Grants	NOAA, US EPA*
9. Conduct annual interagency performance review						5-10	5-10		In-Kind Services; Grants	NOAA, US EPA*

Bold indicates that the activity was completed in 1995.

\* Potential grant sources include: CWA 205j, NOAA Charleston Center for Ecosystem Health, and NOS Partnership Funds

\*\* Completed in Regional Monitoring Strategy

AMBAG and the WQPP will lead in the formation of a task force with support from the SWRCB, the RWQCBs, the USGS, and the MBNMS Research Advisory Panel.

### Activity 3 - Identify Specific Questions to be Answered by Database.

Coordinate development of specific questions to be addressed by the Regional Monitoring Program (see Regional Monitoring Strategy G.1) with the IDTF to facilitate answering these questions through the database.

This activity will be implemented via strategy G.1 (Regional Monitoring Program).

### Activity 4 - Identify and Evaluate Existing Database Systems and Networks.

Identify and evaluate existing database systems and networks to determine if the Sanctuary EDAS can or should be added to their system.

- a) California Resource Agency's California Environmental Resource Evaluation System (CERES) and California Department of Fish and Game's Monterey Bay GIS Pilot Project.

- b) SWRCB's Water-On-Line system managed by UC Davis' metadata catalog system and access network.

- c) EPA Region IX's Southern California Bight environmental management project.

- d) San Francisco Estuary Institute's regional monitoring database for the San Francisco Estuary Project.

- e) Other database systems, including the SWRCB's Bay Protection and Toxic Cleanup Program, State Mussel Watch Program, and Toxic Substances Control Program.

The Data Task Force will conduct this activity.

### Activity 5- Identify Relevant Data Sets, Standard Format and Access System Design.

- a) The IDTF will identify relevant data sets and recommend a data format. Evaluate national recommendations for coordination and data formatting defined in Presidential Executive Order, NGDC/NESDIS or EPA EMAP data reporting conventions.



- b) Encourage all researchers and agencies to georeference their data, and store data in digital formats. Make additional GPS systems available for loan to facilitate georeferencing of data.
- c) Encourage researchers and monitoring agencies to use the recommended format to facilitate access to digital data. Where standardization of formats is not feasible, develop translation procedures which can accommodate data from a variety of formats and coordinate systems.
- d) Obtain consensus on the access system design so data can be evaluated using the EDAS. Apply geo-coding recommendations to link key regional data to site-specific databases.

The Data Task Force will conduct this activity with primary support from the SWRCB, CCC, AMBAG and the WQPP.

**Activity 6- Improve Data Access--Internet Connections and Digital Formats.**

- a) Make metadata and monitored values available through Internet connections.
- b) Prioritize hard copy data sets that should be entered into an electronic format.
- c) Provide digital copies of NOAA's 1995 WQPP summary of monitoring programs on the Internet.

This activity will be led by the Data Task Force with primary support from the California Resources Agency, MBNMS and NOAA.

**Activity 7- Develop QA/QC Protocols and Necessary MOAs.**

Develop quality assurance/quality control (QA/QC) protocols and inter-laboratory calibration requirements through a Memorandum of Agreement with participating agencies and research institutions.

- a) The MOA could build upon AMBAG's MOA for Data Sharing. IDTF will reach consensus on MOA content.
- b) Agencies and researchers agree to submit information to the EDAS each year in the agreed upon formats, or in versions which can be readily translated for easy access.

This activity will be led by the Data Task Force, SWRCB, and the CDFG with support from the AMBAG and US EPA.

**Activity 8- Develop Metadata and Summary Data for Each Program.**

- a) Requirements will be defined in the QA/QC protocols.
- b) Design metadata and summary files to allow data reviewers to understand how data should be interpreted.

This activity will be led by the Data Task Force, SWRCB, and CDFG with support from the AMBAG and US EPA.

**Activity 9- Conduct Annual Interagency Performance Review.**

- a) Assess level of use, increase in geo-referencing of data, progress in linking of data and facilitating access. Prepare an annual report with recommendations based on the assessment.
- b) Use the database to facilitate the annual review of Sanctuary environmental health to be conducted as part of the Regional Monitoring Strategy, and coordinate the annual database performance review with this effort.

This will be conducted by the Data Task Force with support from AMBAG and the WQPP.

**Implementation**

The lead agency for overseeing the implementation of all the activities comprising this strategy has not yet been identified. Table 6 shows the institutional responsibilities for each activity.

**Related Programs** - Implementation of this strategy will require coordination among a variety of existing databases, networks and programs, including the Resource Agency's California Environmental Resource Evaluation System (CERES), AMBAG CAMPITS and GIS programs, CCC's GIS networking grant from Center for Coastal Ecosystem Health, California Department of Fish and Game Monterey Bay GIS Pilot Project, State Mussel Watch Program, SWRCB Bay Protection and Toxic Cleanup Programs, RWQCB's GIS programs, Sanctuary/CSUMB programs, Monterey County Water Resources Agency GIS programs, etc. Additional information on existing programs can be found in Appendix C.



**Schedule** - Table 1, in the Overview of the Actions section, depicts the schedule for conducting each activity.

**Cost and Funding** - Estimated costs and funding sources are shown in Table 7. Cost estimates range from \$100,000 to \$170,000 to conduct these activities and implement the strategy.

This strategy will require a moderate commitment of resources to implement.

### Performance Measures

Success will be measured using the procedures outlined in Activity Nine. It may take up to two years before measurable results are demonstrated.

### Review/Key Decisions

This strategy, like the Regional Monitoring approach, will require a great deal of cooperation among a number of institutions in the region. The success of this strategy is closely tied to the progress made in working out a monitoring framework for the Sanctuary and its watersheds.

## Strategy G.3 Interagency Coordination

### Summary of Strategy

#### Activities:

- Establish a management council for the Water Quality Protection Program
- Establish linkages with other groups
- Coordinate implementation of WQPP strategies
- Prioritize funding goals
- Coordinate permit review
- Coordinate enforcement activities
- Evaluate new problems and develop new strategies

#### Participating Institutions:

- |                |            |
|----------------|------------|
| • WQ "Council" | • MBNMS    |
| • CCC          | • CDFG     |
| • RWQCB #2     | • RWQCB #3 |
| • AMBAG        |            |

**Schedule:** Some activities are already underway. Strategy will be substantially implemented by the end of 1997. Program will be ongoing.

**Cost:** \$85,000 to \$95,000 through December 1996. Ongoing cost \$135,000 to \$175,000.

Coordinate water quality issues/programs related to urban runoff, agriculture and marina activities, and wetland restoration efforts, which affect the Sanctuary and its watersheds. Include water quality strategies as part of broader watershed management programs.

Establish a framework for continuous interagency coordination on water quality and watershed management. Coordination should include implementation of WQPP strategies, including funding priorities, education, technical assistance, criteria and guidelines, monitoring and data exchange, permit review, and enforcement. This regional framework should facilitate ocean and watershed management, prioritize activities among watersheds and ocean areas, and reduce or control costs to the individual agencies.



A Water Quality Council will be formed to:

- a) Finalize plans for additional water quality issues.
- b) Coordinate implementation of the Water Quality Protection Program and evaluate the success of the strategies.
- c) Assess new problems as they arise, and develop new strategies as needed.
- d) Facilitate and support local watershed programs.
- e) Facilitate ongoing interagency coordination on key WQPP strategies, including public education, technical assistance, monitoring, data sharing, criteria and guidelines, and best management practices.
- f) Improve coordination on other issues, including prioritization of annual funding and grant activities, permit reviews, and enforcement.
- g) Communicate with public and private groups and involve them in developing and implementing the WQPP.

The Council would evolve from and replace the existing WQPP planning committees.

## Primary Activities

**Activity 1 - Establish a regional Water Quality Council which meets quarterly.**

- a) Identify federal, state and local institutions and groups that should be part of the Council. Use existing WQPP committees as a starting point, and expand to include additional representation from technical assistance and stakeholder groups. Identify structure of the Council, and working groups.
- b) Identify official institutional representatives from each agency/group, and develop MOUs to obtain formal commitment of staff time for their role on the Council.

MBNMS will lead in establishing the Council, working with WQPP-member agencies.

### **Activity 2 - Establish linkages and coordination between the Council and other agencies/groups**

- a) Establish linkages with other agencies and groups (e.g. local jurisdictions, Technical Advisory Committees, watershed groups) who can collaborate on implementation of priority WQPP strategies.
- b) Use the council to help initiate new and foster existing coalitions of landowners, nonprofit groups, local, state and federal government agencies to guide coordinated watershed programs addressing urban, agricultural and marina issues.
- c) To complement increased coordination within watersheds, establish ongoing communication among the watershed groups and with groups focused on the marine environment.

Table 8. Institutional responsibilities and staffing requirements for Strategy G.3, Interagency Coordination

Primary Activity	Lead	Primary Support	Person Months
1. Establish Water Quality Council	MBNMS	WQPP	2
2. Establish linkages with other groups	WQ Council; MBNMS		0.25*
3. Coordinate implementation of WQPP strategies	WQ Council	MBNMS	2*
4. Prioritize funding goals	WQ Council	MBNMS	0.25*
5. Coordinate permit review	WQ Council	AMBAG; CCC; MBNMS; RWQCBs 2 & 3; CDFG	18
6. Coordinate enforcement activities	WQ Council	RWQCB 2 & 3; MBNMS; CDFG; AMBAG	9
7. Evaluate new problems/develop strategies	WQ Council	MBNMS	.5*

\* Full-time equivalents per year



- d) To develop support for regional plans, link the regional Water Quality Council with the proposed Statewide council of agency directors focused on ocean and watershed issues (see California Resources Agency 1996).

The Council will lead this activity with MBNMS leading coordination of the Council. Elements of this activity have already been initiated by the WQPP, but not as a formal Council activity.

**Activity 3 - Coordinate implementation of WQPP strategies.**

- a) Identify and pursue agency resources to implement strategies.
- b) Submit collaborative interagency grant proposals where necessary.
- c) Assist designated lead and supporting agencies for each strategy in coordinating implementation and promoting strategy in various areas throughout the region.
- d) Assist designated lead agencies in evaluating the success of the strategy and recommending modifications if necessary.
- e) Assist in developing a network of volunteers, interns and graduate students who can help agencies implement strategies.

The Council will lead this activity with the MBNMS leading coordination of the Council. Elements of this activity already have been initiated by the WQPP, but not as a formal Council activity.

**Activity 4 - Prioritize funding goals.**

- a) Develop interagency coordination on regional grant funding priorities for types of water quality projects and geographic areas. This prioritization should build upon problems and strategies developed by the Water Quality Protection Program, and include prioritizing the need for funding among watersheds, among nonpoint sources within watersheds, and among management strategies.
- b) Give priority ranking for state and federal funding for nonpoint source control and abatement to projects which are part of the Water Quality Protection Program and/or other comprehensive watershed management plans.
- c) Work with agencies that purchase land and/or conservation easements (e.g. Nature Conservancy, Trust for Public Land, Coastal Conservancy, etc.) to prioritize purchases based on watershed planning.

The Council will lead in implementing this activity.

Table 9. Costs for completing activities and funding sources for Strategy G.3, Interagency Coordination (\$1,000)

Primary Activity	Costs							Funding Sources		Funding Source
	1996		1997		1998		Ongoing	Existing	Potential	Institution
	Capital	Labor & Services	Capital	Labor & Services	Capital	Labor & Services	Cost/yr			
1. Establish Water Quality Council				5				In-Kind Services		NOAA, MBNMS, WQPP
2. Establish linkages with other groups		5		5		5	5		In-Kind Services	WQPP
3. Coordinate implementation of WQPP strategies		75		100		100	100		In-Kind Services	NOAA, MBNMS, WQPP
4. Prioritize funding goals				10-20		10-20	10-20		In-Kind Services	NOAA, MBNMS, WQPP
5. Coordinate permit review				20		20-50			In-kind Services; Grants	NOAA; MBNMS; WQPP; CCC; CDFG;
6. Coordinate enforcement activities				10		30			In-kind Services; Grants	NOAA; MBNMS; WQPP; RWQCB 2 & 3
7. Evaluate new problems/develop new strategies						20-50	20-50		In-Kind Services	MBNMS, WQPP



**Activity 5- Coordinate permit review.**

- a) Identify permit processes related to water quality issues. For key types of permits, conduct an interagency evaluation of permit review processes to prioritize, coordinate, and expedite these efforts.
- b) Develop MOUs among agencies with similar goals to define lead responsibilities for reviewing certain issues or components of permits in order to reduce duplication of effort among agencies and shorten review periods.
- c) Develop on-line permit review networks/ bulletin boards to quickly share information and concerns. Establish an interagency permit database to assist in evaluating cumulative impacts of permits on the region's water quality.
- d) To facilitate permit review, mapping and evaluation of cumulative impacts, require that all applications, Notices of Intent and permits include latitude and longitude or polygon coordinates, and a standard coding system that identifies the hydrological sub-area.
- e) Investigate multi-agency consolidation of common portions of permit applications to simplify the process for applicants. Identify permit processes which could benefit most from this approach, conduct side-by-side analysis of permits to identify common information, and solicit agency agreements on simplification/ consolidation of the permitting process.
- f) Develop model permit language to be included in permits that affect water quality issues.
- g) Where not currently available, create and distribute user-friendly permit "road maps" for various types of projects to enable applicants to readily understand the process and identify the agencies involved.

The Council will lead in this activity with primary support from the MBNMS, CCC, CDFG, RWQCB and AMBAG.

**Activity 6- Coordinate enforcement activities.**

- a) Develop interagency sharing of enforcement officers to augment limited enforcement staff and compliance, e.g. through MOU's, cross-deputization, etc.

- b) Improve coordination between agencies and nonprofit organizations/volunteers to increase level of citizen reports of water quality violations, and ensure that reported information contains adequate detail to allow follow-up.
- c) Develop a regional tracking and mapping system of public reports of water quality violations which can be regularly distributed to enforcement agencies to pinpoint areas with recurring problems.

The Council will lead with primary support from MBNMS, CDFG, the RWQCBs, and AMBAG.

**Activity 7- Evaluate new water quality problems and develop additional strategies as needed.**

The Council will lead this activity with support from the MBNMS.

**Implementation**

Leadership for coordination of the water quality council should come from MBNMS, working in close collaboration with WQPP participating agencies.

Leadership in development and implementation of individual watershed programs should be the responsibility of the RWQCBs, AMBAG, NRCS, and RCDs, working with the Council, local governments and stakeholders.

Leadership in working with the Council to improve coordination on permitting and enforcement issues should come from CCC, CDFG, RWQCB, AMBAG and MBNMS.

Table 8 lists the institutions with lead responsibility for implementing each activity, those providing primary support, and personnel requirements.

**Related Programs** - Implementation of this strategy will require the cooperation of the existing Project Development Team and the Program Review Committee of the Water Quality Protection Program. This strategy is related to over 150 existing water quality programs identified in the Sanctuary and its watersheds.

**Schedule** - The activities comprising the strategy will be conducted in three phases:

**Phase I** will establish the institutional framework for regional cooperation by formalizing the



Water Quality Council and developing links to other groups (Activities One and Two).

Phase II will focus on interagency coordination to prioritize funding and assist lead agencies in implementation of WQPP strategies (Activities Three and Four).

Phase III will focus on additional interagency coordination needed for permitting & enforcement issues, and assessment of evolving new problems and strategies where needed. This phase should occur after interagency partnerships are well established, and majority of WQPP strategies are well on the way to implementation. Existing coordination on permitting and enforcement issues will continue until Phase III begins.

**Schedule** - Table 1, in the Overview of the Actions section, depicts the schedule for conducting each activity.

**Cost and Funding** - Estimated costs and funding sources are shown in Table 9. Estimated costs range from \$85,000 to \$150,000 per year in the initial years, with costs increasing substantially to coordinate permitting and enforcement.

This strategy will require a significant commitment of resources to implement.

## **Performance Measures**

Successful implementation and evaluation of WQPP strategies, more effective interagency coordination, and securing of additional resources to address problems will be indicators of the success of this strategy.

## **Review/Key Decisions**

This strategy will require careful review by all affected agencies.



## How Can These Actions Help?

The primary reason for developing this action plan and the entire WQPP is to provide the Sanctuary with clean water and fewer resource degradation problems. The three strategies in this plan focus not on the actions necessary to deal with any specific pollution threat or source, but rather with the framework in which water quality management decisions will be made.

There are two general areas of benefit to implementing the actions in this document: 1) gaining a better understanding of the regional water quality conditions and their role in the ecosystem and 2) an improvement in the way in which the institutions work with each other and the public.

## Focus on the Resource as a System

Even to the present, the Sanctuary has not had the benefit of a thorough water quality 'check up.' Some data have been gathered on selected sites for selected purposes but not specifically to gauge the health of the region as a whole. By developing this perspective through the regional monitoring strategy (G.1), resource managers can begin to better understand the relationships between human activity and environmental conditions and trends.

Modifications to monitoring programs will be made so that a suite of indicators will be monitored which will provide the best portrayal of water quality conditions in the Sanctuary, providing managers with insights into which problems require the most attention and resources. In addition, the strategies will assure that monitoring activities within the Sanctuary will be coordinated and designed to effectively gauge the current health of the system, and trends in water quality. As a result of these strategies, managers will be able to make informed decisions to protect and enhance water quality in the Sanctuary and its watersheds.

While waiting for new information to come on-line, it is important to make the best use of existing data. Strategy G.2 (Data Access) will establish a framework for the exchange and storage of environmental and other data necessary for improved resource management. The strategy will address information availability problems by developing an integrated digital database for the Sanctuary and its watersheds. This

will provide a cost-effective, comprehensive approach to providing managers at federal, state and local agencies the information they need to protect Sanctuary resources. The data network will be designed so that information can be easily extracted and used to develop a variety of products such as maps, tables, and graphs.

The coordinated monitoring and database strategies will ensure that data is collected in a consistent manner throughout the region, and stored in a data network designed for easy retrieval of information. This will allow agencies to gather baseline information necessary to focus programs and plans on effective watershed solutions to water quality problems.

## Getting Away from 'Business as Usual'

Flat or declining budgets along with a public outcry for more responsive government make implementation of the strategies in this action plan imperative. It is becoming more and more clear that public institutions have to find new and better ways of doing business with each other. They also must be creative in how they bring the public into the process of environmental management. There is little doubt that the sum effectiveness of all the water quality programs and plans adopted by the various federal, state, and local government agencies in the region could be enhanced by pooling resources, coordinating management actions, and integrating programs. Coordinating programs across agencies and levels of government is a difficult undertaking, but will substantially increase the effectiveness of efforts to reduce the impacts of point and nonpoint pollution sources, and in turn improve water quality throughout the Sanctuary and its watersheds.

Strategy G.3 will establish a framework for continuous interagency coordination of water quality and watershed management. This includes: 1) implementing WQPP strategies; 2) establishing regional funding priorities; 3) coordinating of education efforts; 4) developing regional criteria and guidelines for addressing water quality; 5) coordinating permit review processes; and 6) coordinating regional enforcement of pertinent regulations, ordinances and laws.



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## **Socioeconomic Considerations**

These strategies (and their activities) should not have any regulatory impact and should therefore be relatively inexpensive for both individuals and the business community to implement. While the most visible benefits are expected in sectors of the economy where clean water is critical (recreation, tourism, and commercial fishing), protection of the marine and aquatic resources in the Sanctuary is fundamental to the entire region's economy.

### **Regional Monitoring (G.1)**

This strategy is not likely to have any direct economic impact on the economy other than the amount of money expended on the monitoring itself. Results from the monitoring may lead to actions that do have a more noticeable effect on the public and private sector however.

### **Data Access (G.2)**

Implementing this strategy could lead to some positive economic impact in certain sectors of the economy, especially those that depend on environmental data. Providing better access to these data for users in the private sector (e.g. engineering and construction firms) could reduce costs associated with development and permit application. No known adverse impacts are anticipated by implementing this strategy.

### **Interagency Coordination (G.3)**

This strategy should benefit agencies with administrative and operational cost savings through resource pooling, and reduction of duplicative agency efforts. The public may see a benefit in the form of lower taxes and/or reduced tax increases in the future since programs should accomplish more with lower costs to the local jurisdictions.

This strategy could also benefit the private sector by reducing cost associated with permitting. Better agency coordination should shorten the time required for project review and approval. It could also possibly eliminate multiple submissions of documentation to different authorities.



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## Definitions of Acronyms

AMBAG .....	Association of Monterey Bay Area Governments	NPS .....	Nonpoint Source
CalEPA .....	California Environmental Protection Agency	NRCS .....	Natural Resources Conservation Service (Previously Soil Conservation Service)
CAMPITS .....	Coastal Aquatic and Marine Projects Information Transfer System	NURP .....	National Urban Runoff Program
CCC .....	California Coastal Commission	O & M .....	operations and management
CCRWQCB .....	Central Coast Regional Water Quality Control Board	OCRM .....	Office of Ocean and Coastal Resource Management
CDFG .....	California Department of Fish and Game	ODES .....	Ocean Data Evaluation System
CDPR .....	California Department of Pesticide Regulation	ORCA .....	Office of Ocean Resources Conservation and Assessment
CERES .....	California Environmental Resource Evaluation System	PAH .....	Poly Aromatic Hydrocarbon
COG .....	Council of Governments	PCB .....	Polychlorinated Biphenyl
CSUMB .....	California State University at Monterey Bay	QA/QC .....	quality assurance and quality control
CWA .....	Clean Water Act	RCD .....	Resource Conservation District
CZARA .....	Coastal Zone Act Reauthorization Amendments	RWQCB .....	Regional Water Quality Control Board
EDAS .....	Environmental Data Access System	SEA .....	Strategic Environmental Assessments
EMAP .....	U.S. EPA's Environmental Mapping and Analysis Program	SFRWQCB .....	San Francisco Regional Water Quality Control Board
GIS .....	geographic information system	SWRCB .....	State Water Resources Control Board
GPS .....	global positioning system	TAC .....	Technical Advisory Committee
IDTF .....	Interagency Data Task Force	UC .....	University of California
MBNMS .....	Monterey Bay National Marine Sanctuary	USDA .....	U.S. Department of Agriculture
MOA .....	Memorandum of Agreement	USEPA .....	U.S. Environmental Protection Agency
MOU .....	Memorandum of Understanding	USGS .....	U.S. Geological Survey
NERR .....	National Estuarine Research Reserve	WDR .....	Waste Discharge Requirements
NESDIS .....	National Environmental Satellite Data and Information Service	WQ .....	water quality
NGDC .....	National Geographic Data Center	WQPP .....	Water Quality Protection Program
NOAA .....	National Oceanic and Atmospheric Administration		
NPDES .....	National Pollutant Discharge Elimination System		



## Appendix A. WQPP Core Group Structure

Representative	Institution/Affiliation	City/State
<b>PROJECT DEVELOPMENT TEAM</b>		
Papadakis, Nick*	AMBAG	Marina, CA
Strnad, Les	CCC Santa Cruz	Santa Cruz, CA
Sheehan, Linda	Center for Marine Conservation	Pacific Grove, CA
Johnston, Deborah	Department of Fish and Game	Monterey, CA
Maki, Steven	Monterey County Planning and Building Inspection	Salinas, CA
Ueber, Ed	NOAA, Gulf of the Farallones NMS	San Francisco, CA
Jackson, Terry*	NOAA, Monterey Bay NMS	Monterey, CA
Carlin, Michael	RWQCB, Region 2	Oakland, CA
Thomas, Michael/McCann, Lisa	RWQCB, Region 3	San Luis Obispo, CA
Herzberg, Sam	San Mateo County Planning	Redwood City, CA
Bradford, Donna	Santa Cruz County Planning	Santa Cruz, CA
Martinson, Stan	SWRCB	Sacramento, CA
Starr, Rick	University of California Sea Grant Extension Program	Moss Landing, CA
Pajarillo, Jovita	US EPA	San Francisco, CA
<b>PROGRAM REVIEW COMMITTEE</b>		
Walsh, Michael	U.S. Army Corps of Engineers	San Francisco, CA
Del Piero, Marc*	Cal EPA and SWRCB	Sacramento, CA
Baird, Brian	California Resources Agency	Sacramento, CA
Grove, Tami*	CCC Santa Cruz	Santa Cruz, CA
Saunders, Rachel	Center for Marine Conservation	Pacific Grove, CA
Wright, Mary	Department of Parks and Recreation	Monterey, CA
Silberstein, Mark	Elkhorn Slough Foundation	Moss Landing, CA
Kimple, Steve	Elkhorn Slough NERR	Watsonville, CA
Nutter, Richard	Monterey County Agricultural Commissioner	Salinas, CA
Patterson, Richard	Monterey County Hospitality Association	Pebble Beach, CA
Carney, Bud	Monterey County Planning and Building Inspection	Salinas, CA
Ricketts, Mike	Monterey Fishermen's Marketing Association	Carmel Valley, CA
Abbott, Steve	PG&E, Industry	Moss Landing, CA
Vacant*	RWQCB, Region 2	Oakland, CA
Jagger, Paul*	RWQCB, Region 3	San Luis Obispo, CA
Laurent, Bud	San Luis Obispo County & COG	San Luis Obispo, CA
Ricker, John	Santa Cruz County Environmental Health	Santa Cruz, CA
Townsend, Joe	Santa Cruz Port District	Santa Cruz, CA
Reis, John	U.S. Coast Guard	Monterey, CA
Jordan, Kathleen	USDA Forest Service	King City, CA
Cerna, Al	USDA Natural Resources Conservation Service	Salinas, CA
Rea, Maria*	U.S. EPA	San Francisco, CA
<b>PROGRAM PLANNING AND SUPPORT</b>		
Price, Holly	Program Director	Monterey, CA
Cotter, Patrick	NOAA, Monterey Bay NMS & CCC, Santa Cruz	Monterey, CA
Evans, Kip	NOAA, Monterey Bay NMS	Monterey, CA
Laughlin, Steve	NOAA, Monterey Bay NMS	Monterey, CA
Basta, Dan	NOAA, SEA Division	Silver Spring, MD
Clement, Chris	NOAA, SEA Division	Silver Spring, MD
Goodspeed, Tim	NOAA, SEA Division	Silver Spring, MD
McDonough, John	NOAA, SEA Division	Silver Spring, MD
Remer, Davida	NOAA, SEA Division	Silver Spring, MD

\* Monterey Bay National Marine Sanctuary Water Quality Protection Program MOA Signatory Representative



## Appendix B. Other Action Plan Participants

*The following individuals participated with WQPP Committee members in a series of workshops to develop the strategies in this plan.*

Arturo Adlawan, City of Salinas Public Works  
Bill Allayaud, California Coastal Commission, Sacramento  
Eugene Bromley, U.S. Environmental Protection Agency  
Frank Catherina, Caltrans- District 5  
Victor DeFlaming, State Water Resources Control Board  
Andrew DeVogelaere, Monterey Bay National Marine Sanctuary  
Sharon Erspamer, Santa Cruz Water Quality Task Force  
Deb Farley, City of Carmel  
Fran Farina, Monterey Peninsula Water Management District  
Rachel Fatoohi, Santa Cruz County Public Works  
Virginia Fry, Fort Ord Restoration Advisory Board  
Andy Gustavson, San Mateo County Planning Department  
Carl Hooper, Bestor Engineers, Inc.  
Ted Horton, Pebble Beach Company  
John Knight, Monterey County Planning and Building Inspection  
Marla Lafer, State Water Resources Control Board  
Tom Mumley, San Francisco Bay Regional Water Quality Control Board  
Vicki Nichols, Save Our Shores  
Michael Perrone, State Water Resources Control Board  
Max Puckett, Department of Fish and Game  
Gary Ruggerone, Caltrans District 5  
Steve Scheiblaue, City of Monterey  
Bruce Thompson, San Francisco Estuary Institute  
Jon Van Coops, California Coastal Commission  
Paul Veisze, Department of Fish and Game  
Jim Werle, Association of Monterey Bay Area Governments  
Keith Whitman, Santa Clara Valley Water District  
Steve Williams, Association of Monterey Bay Area Governments  
W.C. Woodworth, private citizen



## Appendix C

### EXISTING MONITORING PROGRAMS

The following are brief summaries of some of the monitoring programs conducted in the Sanctuary and its watersheds. More detailed information can be found in NOAA 1995c and Tetra Tech, Inc. 1995.

#### Federal Monitoring Programs

##### *NOAA: National Status and Trends Program*

This program is designed to observe and assess the status and trends in environmental quality conditions in estuarine and coastal waters throughout the Nation. Its purpose is to identify the relationships between human activities and these conditions. The program is organized into two components: the National Mussel Watch Project, and Benthic Surveillance Project. Together they operate eight stations in the Sanctuary, and monitor marine and estuarine waters, sediment, and tissues once every two years. A variety of substances are monitored, including pesticides, PCBs, PAHs, petrochemicals, trace elements, and other inorganic and organic constituents.

Station information from the projects is available in digital, map, and hard copy form, and can be easily input to a variety of software applications, including Microsoft Excel and Lotus. Information from the projects also is being made available over the internet. The program has been in operation since 1986, and data is characterized as moderately complete.

**Contact:** Gunnar Lauenstein, NOAA 1305 East West Hwy., SSMC-4 Room 10651, Silver Spring, MD 20910, telephone (301) 713-3028.

##### *USGS: Monterey Bay National Marine Sanctuary Seafloor and Sediment Transport Program*

This research program is designed to describe seafloor geology and sediment throughout the Sanctuary. Seafloor samples are collected to characterize the geology of the nearshore shelf area and the Monterey Canyon. Sonar images of the seafloor will be used to map the area, while current meters will collect long-term data on physical oceanographic conditions on the continental shelf and in the Monterey Canyon.

The data base system is ARC/INFO and the USGS's Pacific Marine Geology Data Bank. Data are output in ARC/INFO or ASCII format. Data files contain station location, constituent sample, periods, frequency and sampling interval.

The sampling interval is fixed, and the classifications of constituents sampled include physical properties, turbidity/suspended matter, and currents. Specific constituents include grain size, toxic chemical sampling, organic geochemistry, physical properties, and mineralogy. Data are characterized as sparse, and can be used for research by Federal, State and local agencies and academia.

**Contact:** Steve Eittreim, USGS 345 Middlefield Road, Mail Stop 995, Menlo Park, CA 94025, telephone (415) 354-3162.



## State Monitoring Programs

### **SWRCB: Bay Protection and Toxic Cleanup Program (BPTCP)**

The BPTCP is a state monitoring program designed to identify toxic hot spots in river deltas, estuaries and coastal areas in California, and includes many sampling stations in the Sanctuary's watersheds. Chemical analyses, toxicity tests and biological assessments are performed.

Numeric and qualitative data are available in digital files and map form. The data base uses Oracle, and the information can be translated into ARC/INFO, ARC/VIEW, dBASE, Lotus, Harvard Graphics, or ASCII format. Data files are organized by latitude and longitude, constituent classification, and date of collection. Media sampled include marine water, sediment, estuarine water and tissue. Data are used for planning and management by State and local governments. The constituents sampled include: physical properties, metals, organic chemicals, pesticides, nutrients, and bioassays.

The period and frequency of the sampling program varies with identification of potential hot spots. The sampling design is statistical, and the data characterized as moderately complete.

**Contact:** Mary Tapple, SWRCB, 901 P Street, Sacramento, CA 95812, telephone (916) 657-0637; Stan Martinson, SWRCB, 901 P Street, Sacramento, CA 95814, telephone (916) 857-1134.

### **SWRCB: State Mussel Watch Program (SMW)**

The SMW program conducts tissue analysis of caged, transplanted or resident mussels or clams to detect chemicals that bioaccumulate. Some sediment analyses have also been conducted. The data format is R/Base and can be converted to dBASE. Data are organized by sampling station, constituent classification, and date of collection. Data extend from 1977 to the present, although future program funding is severely threatened.

The SMW program conducts sampling at many locations in coastal areas of the Sanctuary's watersheds and throughout the state. Constituents sampled include metals, organometallic compounds, pesticides, PCBs, PAHs, and phenolics. Concentrations are reported in dry weight, wet weight, and lipid-normalized weight. The RWQCBs determine sampling locations, including reference stations. Sampling occurs annually, but the same sampling stations are not monitored each year. Information from this program is used for research, planning and management by local, state and federal agencies and academia.

**Contact:** Del Rasmussen, SWRCB, 901 P Street, Sacramento, CA 95814, telephone (916) 657-0916; Mark Stephenson, Department of Fish and Game, Pollution Studies Lab, PO Box 747, Moss Landing, CA 95039, telephone (408) 633-0128.

### **SWRCB: Toxic Substances Monitoring Program (TSM)**

The TSM Program measures metals, pesticides, PCBs and other organic chemicals in fish and bivalve tissues. Trace metals, pesticides, PCBs and PAHs are analyzed in the test species' tissues.

The data base system is R/Base, and numeric data are reported by sampling sites. Data files are available for all Sanctuary watersheds except MB01. Media sampled include tissue and limited sediment sampling. Data are used for research, planning and management activities, and by local, state and federal government agencies and academia.

Data from 1978 to the present are available. Sampling is conducted on an annual basis, and sampling sites vary from year to year depending upon the needs of the Regional Boards.

**Contact:** Del Rasmussen, SWRCB, 901 P Street, Sacramento, CA 95814, telephone (916) 657-0916; Michael Thomas, RWQCB, 81 Higuera, Suite 200, San Luis Obispo, CA 93401, telephone (805) 542-4623.



***CDPR: Environmental Hazards Assessment Program***

The DPR Environmental Hazards Assessment Program monitored the spatial and temporal distribution of pesticide contamination and aquatic toxicity. Water samples, collected weekly from August 1994 to August 1995, were analyzed for pesticides. Collected near Gonzales in Monterey County on the Salinas River (Sanctuary Watershed MB06c), these samples are used for research and State and local government planning. Pesticide and bioassay data for this project are characterized as complete, but data are available in hard copy only.

**Contact:** Adrian Bradley, CA EPA, DPR, 1020 N Street, Room 161, Sacramento, CA 95814-5624, telephone (916) 324-4339.

***California Department of Health Services: Elkhorn Slough Monitoring Program***

The CA Department of Health Services conducted a project from October 1993 to June 1995 that was designed to monitor surface water quality in Elkhorn Slough. Surface waters were monitored on a monthly basis at 12 stations within Elkhorn Slough. Pathogens were measured using the Interstate Shellfish Sanitation Program and National Shellfish Sanitation methods. Hard copies of data are available at the California Department of Health Services. Electronic data are also available in PARADOX.

**Contact:** Joyce Bradley, California Department of Health Services, P.O. Box 942732, Station 396, Sacramento, CA 94234-7320.

***Department of Water Resources, San Joaquin District: Surface Water Monitoring***

The Department of Water Resources monitors the quality of California's freshwater resources. Twenty-three surface water stations are located throughout the watersheds of the Sanctuary. Historic water chemistry has been collected from 22 of these stations. Currently surface water quality is monitored on a semiannual basis. Historic monitoring records exist for general minerals, nutrients, metals, phenolics and pesticides. Currently all stations are monitored for general minerals. Digital data are available at the Department of Water Resources, San Joaquin District Office in spreadsheet format. Hard copies of the data are also available.

**Contact:** Arvy Swansen, Department of Water Resources, San Joaquin District, 3374 E. Shields Ave., Fresno, CA 93726-6990, telephone (209) 445-5481.

## **Regional and County Monitoring Programs**

***RWQCBs: NPDES Permits and Waste Discharge Requirements (WDR)***

The RWQCBs issue NPDES Permits under authority delegated to them by EPA under the Clean Water Act Section 402. They also issue Waste Discharge Requirements (WDR) under the State's Porter-Cologne Act. There are about 50 active NPDES permits and hundreds of active WDRs issued to permittees throughout the Sanctuary and its watersheds. The Sanctuary has an NPDES permit tracking data base that is updated each month, containing information on the parameters monitored and the monitoring frequency. The RWQCB in San Luis Obispo also has an NPDES permit tracking data base in dBASE II for Region #3. The RWQCB's WDR information is difficult to access because data are in hard copy form.

The permittees are required to sample influent, effluent and receiving water stations for various parameters, depending on the type of discharge and the discharge location. Most of the monitoring data for both the NPDES and WDR programs are numeric and in hard copy form for specific monitoring stations. However, some data may be obtained from the dischargers in a digital format. Media sampled include freshwater, estuarine water, marine water, sediment, and tissue. The data are used by the RWQCBs and other State and local governments for planning and compliance monitoring. The duration of monitoring for each permit is variable. The classifications of constituents monitored include physical properties, metals, nutrients, organic chemicals, pesticides, microorganisms, and bioassays.



**Contacts:** Michael Thomas, RWQCB, Central Coast Region, San Luis Obispo, 81 Higuera Street, Suite 200, San Luis Obispo, CA 93401-5414, telephone (805) 549-3147; Michael Carlin, RWQCB, San Francisco Bay Region, 2101 Webster Street, Suite 500, Oakland, CA 94612, telephone (510) 286-1255.

**RWQCBs: National Pollution Discharge Elimination System (NPDES) Permit Program for Storm Water Discharges**

The NPDES Storm Water Permit Program is designed to regulate storm water discharges from industrial activities; and storm water discharged from municipal storm drain systems serving populations greater than 100,000. San Mateo County and the City of Salinas require NPDES storm water permits. In addition, Pacific Gas and Electric in Moro Bay and Moss Landing; and the National Refractories and Minerals Corporation in Moss Landing all have ongoing storm water monitoring programs under NPDES storm water permits.

Storm water at these facilities is monitored twice annually for oil and grease, pH, specific conductance, total suspended solids, and any other toxic chemical that has a reasonable potential to be present in storm water.

Hard copies of data are available at the Regional Water Quality Control Boards. In addition, each of the facilities is required to maintain a three-year backlog of monitoring information. Data are also available through EPA's STORET national database.

**Contact:** Adam White, RWQCB, Central Coast Region, 81 Higuera Street, Suite 200, San Luis Obispo, CA 93401-5414, telephone (805) 549-3147; Bruce Wolfe, RWQCB, San Francisco Bay Region, 2101 Webster Street, Suite 500, Oakland, CA 94612, telephone (510) 286-1255.

***AMBAG Urban Runoff Water Quality Management Plan for the Monterey Bay Region***

This project evaluated pollution from storm drains in urban areas around Monterey Bay. Data from the project are available in digital, map and hard copy format, and were collected at four sites in Santa Cruz and Monterey Counties (Sanctuary watersheds MB04, MB05, MB06c and MB07). Data collected during winter storm events between February 1992 and February 1993 were compared with the results of the National Urban Runoff Program (NURP) conducted in the 1970s, and are used for Federal, State and local government planning. Data, including physical properties, metals, pesticides, nutrients, organic chemicals and microorganisms, are characterized as sparse.

**Contact:** Frank Barron, AMBAG, PO Box 809, Marina, CA 93933-0809, telephone (408) 883-3750.

***Monterey County: Recreational Water Monitoring***

This program monitors total and fecal coliform bacteria concentrations in water contact areas. Numeric data are available in hard copy form. A data base system is not used at this time. Data are organized by sampling sites.

The program focuses on Monterey County only (Sanctuary watersheds MB06a-c). Media sampled include fresh, estuarine, and marine water. Data are used for management by local and State governments. Samples are taken monthly at fixed intervals; information has been collected since the 1970s. Data are characterized as moderately complete.

**Contact:** Bruce Welden, Monterey County Division of Environmental Health, 1270 Natividad Road, Salinas, CA 93906-3198, telephone (408) 755-4880.



***Monterey County Water Resources Agency (MCWRA): Surface Water and Ground Water Quality Monitoring Programs***

Surface water is monitored at a total of 43 stations within Monterey County. Sampling locations include Elkhorn and Moro Cojo Sloughs, the Salinas River and its two reservoirs. The frequency of sampling varies with the project and ranges from monthly to three times a year. Physical and chemical constituents are measured including: ammonia, chlorine, nitrate, orthophosphate and sulfate. In addition, groundwater is monitored in an annual sampling program and through a dedicated monitoring well program. Digital copies of the data as well as maps for some projects are available at MCWRA.

**Contact:** Kathy Thomasberg, MCWRA, P.O. Box 930, Salinas CA 93902, telephone (408) 755-4860

***Santa Cruz County: Groundwater Quality Monitoring Program***

This program samples water from wells in coastal areas to track seawater intrusion and nitrate increases in agricultural aquifers. Numeric data are in digital form. The data base is R/Base, and output can be formatted in ASCII, dBASE, or Lotus. Digital files are available by station, constituent sampled, period, frequency, and interval. The scope of the project is Santa Cruz County only (Sanctuary watersheds MB03, MB04 and MB05). The media sampled is groundwater, data are used for planning and research by local and State governments.

The frequency of sampling varies, the sampling interval is fixed, and the sampling design is statistical. Constituents sampled include nutrients, heavy metals, and other organic chemicals. Data are characterized as moderately complete.

**Contact:** Robert Golling, County of Santa Cruz, 401 Ocean Street, Santa Cruz, CA 95060, telephone (408) 454-4624.

***Santa Cruz County: Surface Water Monitoring Program***

This monitoring program measures baseline water quality concentrations and changes in water quality, and identifies sources of water quality degradation in Santa Cruz County. Data are used for research and planning by local and State governments.

The data base is Symphony (Lotus), R/Base, and SPSS, and is characterized as moderately complete. Data are available in digital and hard copy formats, and the information is reported numerically.

Samples are taken monthly and the sampling interval is intermittent. Media sampled include freshwater, flowing freshwater, estuarine water, and marine water. Parameters measured include physical properties (temperature, pH, dissolved oxygen), nutrients, microorganisms (fecal coliform bacteria), turbidity/suspended matter, and heavy metals.

**Contact:** John Ricker, Santa Cruz County Environmental Health Department, 4501 Ocean Street, Santa Cruz, CA 95060, telephone (408) 454-3128.

***Pajaro Valley Water Management Agency Monitoring Program***

The Pajaro Valley Water Management Agency has 24 surface water stations (and approximately 106 groundwater stations located in watershed MB05 of the Sanctuary). Constituents monitored vary from station to station. Water samples are analyzed for physical parameters, total dissolved solids, total suspended solids, chloride, nitrate, metals, organics, pathogens, total suspended solids, orthophosphate, total kjeldahl nitrogen and radioactivity.

Hard copies and digital data are available at the Pajaro Valley Water Management Agency. Digital data are stored in Access.



**Contact:** Charlie McNiesch, Pajaro Valley Water Management Agency, 145 Westridge Drive, Watsonville, CA 95076, telephone (408) 722-9292.

***Surfrider Foundation: Santa Cruz Near Shore Waters Monitoring***

The Surfrider Foundation has 10 monitoring stations. Water quality is monitored on a weekly basis. Water samples are analyzed for *E. coli* bacteria. Digital and hard copies of the data are available. Digital data are stored in dBase IV.

**Contact:** Jim Montgomery, Lab Manager, Blue Water Task Force, Santa Cruz Chapter, Surfrider Foundation, 229 Via Trinita, Aptos, CA 95003, telephone (408) 353-1892.

## Federal Data Bases

### ***U.S. EPA: Ocean Data Evaluation System (ODES)***

ODES is a computer-based program created by EPA that provides a standardized format for reporting water, sediment and biological monitoring data for many different marine environmental management programs and wastewater dischargers throughout the Nation. Information from a variety of media, including marine water, sediment, effluent, and bioassays from tissue sampling are in the data base, and include information on constituent classifications such as physical properties, metals, organic chemicals, nutrients, microorganisms and bioassays. Data can be extracted and used by local, state and federal government agencies and academia to create digital files, maps, and hard copy output.

Numeric and qualitative data are reported by sampling site, and files (station, constituents, period, frequency, and interval) are available for many monitoring programs. Most programs reporting to ODES conduct monthly and annual monitoring at fixed intervals, although data completeness is sparse. EPA has examined the data base and determined that no data exist in the data base for outfalls in the Sanctuary.

**Contact:** Robert Hall, U.S. EPA, Region IX (W-2-3), 75 Hawthorne Street, San Francisco, CA 94105, telephone (415) 744-1936.

### ***U.S. EPA: STORET***

The STORET data base is comprised of water, sediment, and biological data submitted to Federal and State agencies from local and regional dischargers under the Clean Water Act Section 402 NPDES permitting program. Numeric and qualitative data are available in digital, map and hard copy formats. The data base system is PL1. Output formats include: Arc/INFO, dBASE, Lotus and special STORET formats. Data are reported by specific sampling sites, and are moderately complete from 1920 to the present.

Depending on the location of a facility and its permit requirements, freshwater, marine water, estuarine water, sediment, effluent, and tissue may be sampled. Monitoring at the facilities occurs daily, weekly, monthly and/or annually at fixed intervals as defined by the NPDES permit. The sample designs for the NPDES permits include random, statistical and modeling programs.

Classifications of constituents sampled include physical properties, heavy metals, nutrients, organic chemicals, chlorophyll, microorganisms and pesticides depending on the permit. Data are used for research, planning and management by local, state and federal government agencies and academia.

**Contact:** Eric Wilson, U.S. EPA Region IX (W-2), 75 Hawthorne Street, San Francisco, CA 94105, telephone (415) 744-1964.



