



**CALIFORNIA
OCEAN AND COASTAL
INFORMATION,
RESEARCH,
AND OUTREACH
STRATEGY**



Adopted by:
**The California Ocean
Protection Council**
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Science should be the foundation of ocean and coastal management and policy; however, poor communication and lack of available applied science often leads to insufficient information for decision-makers. In many cases, the information needed by decision-makers exists, but is not easily accessible. Better dissemination of information is needed to improve the management of California's ocean and coastal resources. New research initiatives are necessary when information is not available. Science-based management and policy is critical to making informed decisions that balance human needs with the protection of ocean and coastal resources.

California's Ocean Action Plan, *Protecting our Ocean: California's Action Strategy*, calls on the California Ocean Protection Council to develop a statewide ocean and coastal information, research, and outreach strategy (Action 4). This strategy will help the council fulfill the mandate of the California Ocean Protection Act (COPA). COPA directs the state, "to improve monitoring and data gathering, and advance scientific understanding, to continually improve efforts to protect, conserve, restore, and manage coastal waters and ocean ecosystems." Specifically, COPA requires the council to, "establish policies to coordinate the collection and sharing of scientific data related to coast and ocean resources between agencies."





The strategy will help the council address the guiding principles and requirements established in COPA including, “sustainability, ecosystem health, precaution, recognition of the interconnectedness between land and ocean, decisions informed by good science and improved understanding of coastal and ocean ecosystems, and public participation in decision-making.” The priorities identified in this strategy will help the state implement ecosystem-based management, a critical objective identified by the U.S. Commission on Ocean Policy and the Pew Oceans Commission.

The strategy was developed by the following process:

- A workshop, co-sponsored by California Sea Grant College and Extension Programs, the University of California Marine Council, the California Ocean Science Trust, and the Resources Agency, was held to help identify California’s high priority ocean and coastal information, research, and outreach needs. More than 60 participants from academia, government agencies, non-governmental organizations, and industry attended the workshop.

- The Draft Information, Research, and Outreach Strategy was developed by council staff based on the results of the workshop and presented to the council at its June 10, 2005 meeting. The council staff solicited public comment on the draft strategy and received 21 comment letters. The California Ocean Science Trust, serving as a scientific advisory group to the council, helped the council staff refine the information, research, and outreach priorities in a public workshop held on July 6, 2005 at Scripps Institution of Oceanography.
- The council staff revised the draft strategy based on public comment and scientific advice and presented the final strategy to the council for adoption at its September 23, 2005 meeting.



II. STRATEGY GOAL AND OBJECTIVES

The goal of this strategy is to encourage and support information, research, monitoring, and outreach programs that address key ocean and coastal resource management, policy, science, and engineering issues that face the California. This goal shall be achieved by pursuing the following objectives:

- **Information.** Provide improved access to available information necessary to support ocean and coastal protection and management.
- **Research and Monitoring.** Identify the most critical ocean and coastal research needs for the state of California and pursue the most efficient and effective methods to increase research funding and data accessibility. Continue California's leadership in ocean and coastal monitoring programs and seek to improve, sustain, and expand these programs.
- **Outreach.** Coordinate outreach efforts with federal, state, and local agencies; academia; industry; and the non-governmental community to engage all Californians in the protection of the state's ocean and coast.

This strategy provides a framework for the council to achieve the stated goal and objectives by recommending initial actions for the council (Section III), establishing a policy for state funded research (Section IV), and identifying ocean and coastal information, research, and outreach needs (Sections V and VI).



RECOMMENDATION 1.

Make research part of the council's funding strategy.

The council should establish a firm commitment to fund research and monitoring activities that support management of the state's ocean and coastal resources. The California Sea Grant College Program and the University of Southern California Sea Grant Program have offered to partner with the council by coordinating the request for proposals, peer review of proposals, and post-award grant administration. The advantage of partnering with Sea Grant is that they have an established system for peer review including the Resources Agency Sea Grant Advisory Panel (RASGAP).

RASGAP, formed under the provisions of Section 6230 of the Public Resources Code, reviews projects for their benefit to the

management of the state's ocean and coastal resources. RASGAP is chaired by the Assistant Secretary for Ocean and Coastal Policy of the California Resources Agency and consists of representatives from state government, state legislature, state universities, and industry. In addition to RASGAP, a scientific review panel composed of academic scientists evaluates proposals according to a set of criteria including scientific merit, innovativeness, and qualifications of investigators.

The council staff will participate in all stages of the review process. After RASGAP and scientific review have been completed, Sea Grant and council staff will recommend research projects for the council's concurrence. The anticipated schedule would be for Sea Grant to release the request for proposals in January 2006 and have recommendations for the council by September 2006.

- **Suggested council action:** The council should dedicate a portion of its funds specifically for research that will support and improve management of the state's ocean and coastal resources. Council staff recommends that the council disburse \$1 million each year, pending availability of funding, to the California Sea Grant College Program and the University of Southern California Sea Grant Program for this purpose.



RECOMMENDATION 2.
Make California's ocean observing system a national model.

California began making systematic offshore observations as part of the California Cooperative Oceanic Fisheries Investigations (CalCOFI) more than 50 years ago. CalCOFI surveys have proven so valuable, that this sampling protocol will expand through the Pacific Coast Ocean Observing System (PaCOOS) to cover the entire California

Current Large Marine Ecosystem. These efforts have been done in close collaboration with the National Oceanic and Atmospheric Administration (NOAA), a partnership that has proven valuable to both the state and NOAA. A high priority of the Governor's Ocean Action Plan is to develop a strategic plan for the full operation of an integrated ocean observing system for California (Action 8). California has provided an unprecedented investment of \$21 million to develop a coastal currents monitoring system, which is an important step in creating an integrated ocean observing system. California and its integrated ocean observing system regional associations are now working to better coordinate the efforts of existing systems, address critical gaps, and improve operations and the delivery of information to users. These systems, when fully operational, will be used to support oil spill cleanup operations, fisheries and water pollution analyses, search and rescue operations, and a variety of other applications.

- **Suggested council action:** The council should urge the National Oceanic and Atmospheric Administration to expand its support and help California's integrated ocean observing system become a national model, specifically aiding in improved data management and communications, helping fill in critical observation gaps, and developing useful products from these ocean observing efforts.





RECOMMENDATION 3.

Seek federal support for California's research needs.

Both the U.S. Commission on Ocean Policy and the Pew Oceans Commission have called for the development of a national strategy to increase scientific knowledge of coastal and ocean resources. Coastal states need improved ways to access information collected by federal agencies, influence the research and monitoring sponsored by these agencies, and facilitate dissemination of this information. The U.S. Ocean Action Plan calls on the Joint Subcommittee on Ocean Science and Technology under the President's Committee on Ocean Policy to develop a national ocean research priorities plan and implementation strategy. California and other coastal states must ensure that their information and research needs are included in this national plan.

Suggested council actions:

- The council should authorize its Chair to write to the President's Committee on Ocean Policy and other committees involved in the development of the national ocean research priorities plan to request an opportunity for California and other coastal states to provide input into the development of the plan and obtain improved access to federal information, funding, and assistance.
- The council should work with the Coastal States Organization to provide a united approach and ensure that the national ocean research priorities plan addresses state information and research needs.
- California should continue to advocate for the doubling of the national ocean and coastal research budget, as recommended by the U.S. Commission on Ocean Policy.



RECOMMENDATION 4.

Improve access to and coordination of ocean and coastal information in California.

California needs an up-to-date internet-based information system that provides access to information (e.g. news, data, GIS, documents, organizations) related to the protection and management of the state's ocean and coastal resources. The Resources Agency currently hosts the California Ocean and Coastal Environmental Access Network (CalOCEAN). The Governor's Ocean Action Plan calls for this system to be revitalized (Action 9) because it has become outdated and new technology would substantially enhance its capabilities.

In addition to an internet-based information system, California could benefit from a process to help coordinate research and monitoring activities in the state, synthesize results, and package information for use by managers, policymakers, educators, and the general public. The products of such an effort could be distributed on the revitalized CalOCEAN system. Coordination through this process could reduce overlap of monitoring efforts, minimize redundant costs, and assist the state in identifying critical gaps in research needed to answer management and policymaking questions.

- Suggested council action: The council should hold focus group meetings to identify partners, needs, and users for an internet-based ocean and coastal information system and for a process to better coordinate and synthesize research and monitoring.



RECOMMENDATION 5.
Incorporate ocean and coastal science into K–12 and adult education programs.

Teaching the public about the ocean and coast, the fundamentals of science, and how humans influence the environment is critical to fostering good stewards of our ocean and coastal resources. Incorporating these principles into K–12 curriculum is essential to connecting with the next generation of ocean stewards. The Governor’s Ocean Action Plan calls on the council to ensure that ocean and coastal education is included in the environmental principles and concepts being developed pursuant to the implementation of the Education and the Environmental Initiative (Pavley, Chapter 665, Statutes of 2003, AB 1548).

- Suggested council action: The council should continue to actively participate in the Education and the Environment Initiative process to ensure that the important principles and concepts of ocean and coastal science are included in the K–12 Education and the Environment Initiative’s model curriculum (i.e. standards, frameworks, texts, and tests) and continuing education programs.



RECOMMENDATION 6.

Build a public outreach strategy in cooperation with federal, state, and local partners.

The state of California and NOAA's National Marine Sanctuary Program have assembled the California-Ocean Communicators Alliance, a network of professionals with expertise in communicating ocean and coastal issues. The Ocean Communicators Alliance will work with government agencies, academia, industry, and non-government organizations to launch an ocean and coastal stewardship media campaign.

The Consortium for Oceanographic Research and Education and the Aquarium of the Pacific are convening scientists and educators to develop a portfolio of information that every citizen should know to be "ocean literate." This effort will take advantage of the work that has been done for K-12 teachers and students by the Centers for Ocean Sciences Education Excellence and the National Marine Educators Association.

The Sea Grant Extension Program and the Division of Agriculture and Natural Resources have a unique network of Marine Advisors and Specialists throughout the state. The Marine Advisors and Specialists conduct applied research and deliver science-based education to coastal residents and resource managers. They use a variety of extension education models including individual consultations, issue focused workshops, and larger conferences to disseminate information and create educational opportunities.

Suggested council actions:

- The council should work with NOAA's National Marine Sanctuary Program and the Ocean Communicators Alliance to launch an ocean and coastal stewardship media campaign at the next California and the World Ocean Conference in September 2006.
- The council should partner with the Consortium for Oceanographic Research and Education and the Aquarium of the Pacific to extend their ocean literacy effort throughout California.
- The council should partner with California Sea Grant Extension Program and the Division of Agriculture and Natural Resources to help facilitate information sharing to apply the best available science to the development of sound policy and resource management.



The state of California should establish funding guidelines for ocean and coastal research initiatives so that all research funded by the state is directed to help meet California's ocean and coastal management needs. The following policy should be used in all decisions to use state funds for ocean and coastal research.

The state of California will support the acquisition of information or the initiation of new research that addresses or substantially contributes to management, protection, conservation, or restoration of the state's coastal and ocean resources. These endeavors must support the mandatory provisions of the California Ocean Protection Act and be consistent with the actions contained within Governor Schwarzenegger's Ocean Action Plan.

RESEARCH PROJECTS FUNDED BY THE STATE SHOULD:

- Provide a clear research objective, demonstrate the use of sound scientific methods and experimental design, and specify the anticipated product.
- Demonstrate how the project can assist, complement, or augment the work of government agencies or private sector interests in their efforts to manage, protect, conserve, or restore coastal or ocean resources.
- Be supported by, prepared in cooperation with, or of expressed interest to a public or private agency or association involved with the management, protection, conservation, or restoration of coastal or ocean resources.
- Promote or be of discernible benefit to current or future generations.



There are many ways to organize California’s information and research needs. After consultation with the various partners in this effort, the ocean and coastal information and research needs have been organized into the following five broad categories.

The important cross-cutting needs identified on the right apply to several or all of the information and research categories.



CROSS-CUTTING NEEDS

- Ecosystem-based management
- Integrated ocean observing systems
- Monitoring programs
- Seafloor mapping
- Social and economic data including fishing, recreation, and ports
- Technology and engineering to support sustainable coastal-dependent industries
- Data accessibility, synthesis, and dissemination
- Climate change

INFORMATION AND RESEARCH CATEGORIES

1. Fisheries and Aquaculture
2. Organisms, Habitats, and Ecosystems
3. Coastal Hazards, Shoreline Processes, and Beaches
4. Water, Air, and Sediment Quality
5. Invasive Species

The priority information and research needs in each of these categories are identified in their respective sections.

1. FISHERIES AND AQUACULTURE

Information and research are needed to help managers understand the causes of declines and successes in California's fisheries, preserve marine biodiversity, and promote sustainable and efficient aquaculture practices.

- Develop methods to implement ecosystem-based fisheries management.
- Gather more information on fishery species.
- Study sustainable aquaculture practices.
- Improve communication, collaboration, and conflict resolution among user groups.

2. ORGANISMS, HABITATS, AND ECOSYSTEMS

Information and research is needed to protect and restore ocean and coastal organisms, ecosystems, and habitats.

- Study the science of marine protected areas.
- Improve understanding of ecosystem structure and function.
- Identify, protect, and restore critical habitats.
- Improve understanding of human behavior and decision-making.
- Study the stressors on marine life of current and potential ocean uses such as once-through cooling for coastal power plants.



3. COASTAL HAZARDS, SHORELINE PROCESSES, AND BEACHES

Information and research is needed to better identify, predict, and respond to coastal hazards and improve the management of California's beaches and shorelines.

- Improve coastal hazard identification and forecasting.
- Develop coastal hazard response strategies.
- Study sediment changes, impacts, and management.
- Conduct legal and public policy analyses.



4. WATER, AIR, AND SEDIMENT QUALITY

Information and research are needed to improve water, air, and sediment quality in California and reduce risks to human health and the ecosystem.

- Determine the impacts of non-point source (polluted runoff) and storm water pollution.
- Develop baseline health indicators.
- Identify sources of pollutants.
- Conduct risk assessment for emerging contaminants such as pathogens.
- Develop strategies to improve contaminated sediment management.
- Improve non-point source and storm water pollution control technologies, remediation, and mitigation.

5. INVASIVE SPECIES

Information and research on invasive species is needed to prevent introductions, detect new invaders, eradicate successful invaders, and control established non-native species.

- Expand prevention strategies for invasive species.
- Quantify risks posed by all vectors of invasive species.
- Develop a state-wide invasive species detection protocol.
- Develop a more science-based eradication approach.
- Identify methods to control the spread of invasive species.



Outreach efforts in the following areas are needed to engage all Californians in the protection of California’s ocean and coastal resources.

- Improve communication between scientists, managers, stakeholders, and policymakers.
- Incorporate ocean and coastal science into K–12 curriculum and adult education programs.
- Support informal educational opportunities to connect with underserved groups.
- Promote ocean and coastal stewardship for all age-groups.
- Support web-based information centers.
- Support programs that promote future ocean leaders and their professional development.





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