

WEST COAST GOVERNORS'  
AGREEMENT on OCEAN HEALTH  
CALIFORNIA OREGON WASHINGTON

## **Draft Action Plan**

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October 19, 2007

**Deadline for submitting public comment:**

December 1, 2007

**West Coast Governors' Agreement on Ocean Health  
Draft Action Plan**

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October 19, 2007

Dear Concerned Citizen,

We are pleased to announce the release of the draft Action Plan for the West Coast Governors' Agreement on Ocean Health. We invite you to provide us your comments and feedback, and look forward to considering them when finalizing the Action Plan.

To submit public comment on this draft, please visit the Website (<http://westcoastoceans.gov/contact>) or send us an email ([comments@westcoastoceans.gov](mailto:comments@westcoastoceans.gov)) before December 1, 2007.

Sincerely,

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California Resources Agency

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## **Executive Summary**

The Governors of Washington, Oregon, and California are collectively committed to protecting the health of the West Coast's ocean and coastal ecosystems and the economies that depend on them. On September 18, 2006, the Governors entered a landmark partnership by signing the West Coast Governors' Agreement on Ocean Health. In the agreement, the Governors identified seven issues of regional significance that can be more effectively addressed through collaborative efforts by all three states. The Governors identified those priority areas as:

1. Clean coastal waters and beaches
2. Healthy ocean and coastal habitats
3. Effective implementation of ecosystem-based management
4. Reduced impacts of offshore development
5. Expanded ocean and coastal scientific information, research, and monitoring
6. Increased ocean awareness and literacy among the region's citizens
7. Sustainable economic development of coastal communities

In addition to setting priority areas, the agreement defined four immediate actions for the states to jointly undertake. These actions focused on funding for nonpoint source pollution control programs, the prohibition of new oil and gas leasing, development, and production offshore, the development of a marine research plan for the West Coast region, and federal technical support for addressing issues of regional significance. The states have acted on each of these initial directives, and are presently continuing to participate in the identification and prioritization of regional research needs in cooperation with the four Sea Grant programs.

To draft the Action Plan, the Washington, Oregon, and California Governors' representatives considered public feedback received on a Discussion Paper released in March 2007. The paper suggested potential action items to attain the goals of the agreement. For several specific issues, the states were guided by technical advisory teams that included experts from each of the three states. The states also worked closely with a working group of federal agencies co-led by the Department of Commerce (DOC), Environmental Protection Agency (EPA), and Department of the Interior (DOI). With these federal partners, the states selected and refined the actions in this plan. These actions will be initiated within eighteen months of the plan's release, and many will be completed in that time. An implementation summit will be jointly held by the states and federal partners in 2008 to establish workgroups and set timelines for progress. The states will regularly provide updates to the public on accomplishments, and will publish a formal status report at the end of two years.

For each of the seven priority areas in the Action Plan, a vision, goals for obtaining that vision, and the issues encompassed by the priority are identified. The specific actions that will be undertaken by the three states are at the close of each section with estimated timeframes, and are tabled in Appendix A.

*Actions*

- **Sustained National Support**
  - *Encourage establishment of a national Ocean Trust Fund that would support ocean and coastal management efforts for state and federal government agencies.*
- **Preparing for the Effects of Climate Change**
  - *Collaborate on a West Coast-wide assessment of shoreline changes and anticipated impacts to coastal areas and communities due to climate change over the next 30-50 years, and work together to develop actions to mitigate and adapt to the impacts of climate change and related hazards.*
- **Polluted Runoff**
  - 1.1 *Work with the Administration and the U.S. Congress to provide adequate funding for coastal water quality programs to reduce polluted runoff, and enhance monitoring and enforcement of water quality regulations to improve the health of West Coast coastal waters.*
  - 1.2 *Make Low Impact Development (LID) a priority for the West Coast by focusing future grant and incentive programs to state and local governments on this objective.*
- **Harmful Algal Blooms and Hypoxia**
  - 1.3 *Exchange information between experts in all three states on management tools and techniques to promote development and operation of predictive capabilities of harmful algal blooms and hypoxia. Support the expansion of ocean observing system monitoring efforts amongst the three states for these purposes.*
- **Marine Debris**
  - 1.4 *Establish the baseline estimate of marine debris and derelict gear off the West Coast and set reduction goals. Support state and federal policies for achieving marine debris reduction goals.*
- **Maritime Shipping Emission Controls**
  - 1.5 *Urge the International Maritime Organization to adopt the U.S. proposal which sets stringent emission standards for ocean going vessels.*
- **Habitat Protection and Restoration**
  - 2.1 *Document, describe, and map ecological communities throughout West Coast waters and characterize existing human uses of those areas.*
  - 2.2 *Restore estuarine habitats, including coastal wetlands, to achieve a net increase in habitat and their function by at least ten percent over the next ten years.*
- **Marine Invasive Species**
  - 2.3 *Focus efforts on eradicating non-native cordgrasses (genus *Spartina*), which are transported between the three states on ocean currents.*
- **Ecosystem-based Management**

- 3.1 *Examine ongoing community-based efforts using ecosystem management principles in all three states and share lessons learned from these initiatives in order to encourage effective ecosystem-based management efforts across the West Coast.*
- 3.2 *Assess physical, biological, chemical, and socio-economic factors in ecosystem health across the West Coast to establish standards and indicators for ocean health.*
- 3.3 *Strengthen coordination between the three state representatives on the Pacific Fisheries Management Council.*
- **Offshore Oil and Gas Operations**
  - 4.1 *Continue to oppose new oil and gas leasing, development, and production in ocean waters off the West Coast.*
- **Alternative Environmentally Sustainable Energy Development**
  - 4.2 *Explore the feasibility for offshore alternative ocean energy development and evaluate the potential environmental impacts of these technologies.*
- **Ocean Awareness and Literacy**
  - 5.1 *Integrate ocean science and conservation into expanded environmental education curricula by encouraging changes to education content standards enhancing ocean literacy.*
  - 5.2 *Support outreach efforts to decision-makers at all levels and encourage improvement and expansion of volunteer programs such as clean marina initiatives.*
- **Regional Marine Research**
  - 6.1 *Support the West Coast Sea Grant regional marine research needs process by identifying funding sources and partners for a sustained approach to ocean and coastal research.*
- **Seafloor Mapping**
  - 6.2 *Complete a seafloor map of the bathymetry and habitat of all state tidelands and submerged lands out to three miles.*
- **Working Waterfronts and Sustainable Coastal Economies**
  - 7.1 *Support local planning efforts for working waterfronts to promote sustainable fisheries and prioritize coastal dependent businesses and infrastructure through grant processes and federal assistance programs.*
  - 7.2 *Establish baselines for coastal economies and promote sustainable coastal community development.*
- **Regional Sediment Management**
  - 7.3 *Develop regional sediment management plans to maximize beneficial use of sediments (i.e., sand) to protect and maintain critical community economic and environmental infrastructure.*

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## **Introduction**

The Governors of Washington, Oregon, and California formed a landmark partnership on September 18, 2006 when each signed the West Coast Governors' Agreement on Ocean Health. In the agreement, the Governors identified seven issues of regional significance, which they believe will be more effectively addressed through the collective effort of all three states. Together, the three states are joining forces to help protect the health of ocean and coastal ecosystems along the entire West Coast and the economies that depend on them. By working together to forge solutions and leverage funding, and by supporting and agreeing to national and state-level policies on coastal activities that impact the region, the Governors hope to make significant improvements in ocean and coastal health for the entire region.

### ***A Healthy Ocean and Coast***

In this plan, "ocean health" encompasses the diversity and function of ocean, coastal, and estuarine ecosystems, the plant and animal communities therein, the physical, chemical, and biological processes involved, and the economies and people dependent on them. Acknowledging that isolated efforts cannot address the breadth of degradation to the ocean, the states are committed to working together to address critical protection and management issues faced by all three states. By combining resources, the three states will affect positive change in the present state of ocean health.

### ***Why Work Together?***

Historically, state coastal and ocean management policies and activities were often conducted on an issue-by-issue basis. In 2003 and 2004, the Pew Oceans Commission and U.S. Commission on Ocean Policy released reports stressing the importance of regional collaborations to support ocean and coastal management on an ecosystem level. To address those growing concerns a number of multi-state partnerships are coalescing across the country. As expressed in the commissions' reports, regional multi-state arrangements are important for addressing coastal and ocean issues that are intrinsically inter-connected because they are within the same large marine ecosystem. Ocean currents and marine species do not recognize the jurisdictional or political boundaries where one state (or nation) ends and another begins. On the West Coast, the states of Washington, Oregon, and California are poised to collaborate – and have already begun to cooperate – on the key issues affecting major estuaries and the coastal ocean waters driven by the California Current, which connects each of the three states.

### ***History of the Agreement***

In addition to setting seven priority areas (see the box at right), the agreement also defined four immediate actions for the states to jointly

#### **The Agreement seeks to advance the goals of the following Priority Areas:**

- 1.** Clean coastal waters and beaches
- 2.** Healthy ocean and coastal habitats
- 3.** Effective implementation of ecosystem-based management
- 4.** Reduced impacts of offshore development
- 5.** Expanded ocean and coastal scientific information, research, and monitoring
- 6.** Increased ocean awareness and literacy among the region's citizens
- 7.** Sustainable economic development of coastal communities

undertake. These actions included supporting new funding for nonpoint source pollution control programs; opposing new oil and gas leasing development, and production offshore; developing a research plan for the West Coast region; and soliciting federal technical support for addressing issues of regional significance. Between September 2006 and June 2007, the states acted on each of these initial directives, and are presently continuing to participate in the identification and prioritization of regional marine research needs.

In March 2007, the states released a Discussion Paper to receive public feedback on additional proposed action items. The Washington, Oregon, and California Governors' representatives developed this Action Plan by considering those public comments, which were received at public meetings in all three states, submitted over the website, and sent to the states' representatives by interested members of the public, nongovernmental organizations, private industries, and local, state, and federal agencies.

In addition to consideration of public comment, the plan was developed with the support of technical advisory teams made up of experts representing every state that counseled the states' representatives on the status of science and policy on particular issues and assisted with crafting draft action items for consideration. The states also worked closely with a federal working group formed by the Subcommittee on Integrated Management of Ocean Resources (SIMOR), co-led by the Department of Commerce (DOC), Environmental Protection Agency (EPA), and Department of the Interior (DOI). Working with these federal partners, the states selected and refined actions that will be initiated within eighteen months after the Action Plan's release.

### ***Organization of the Action Plan***

Each of the seven priority areas identified in the agreement is addressed in a separate section within the Action Plan. Cross-cutting themes, particularly for research and monitoring needs, are highlighted in text boxes. A vision and goals for obtaining that vision are defined for each priority area, followed by an overview of the issues encompassed by the priority. An analysis of how each state and the federal government are presently approaching the issues is provided, and specific findings of need or fact are described. Each section closes with the specific actions the three states will undertake to address the issues.

### ***Addressing Ecosystem-based Management***

Ecosystem-based management (EBM) is an overarching principle that is inherently connected to each of the Governors' seven priority areas. Many of the public comments received highlighted Priority Area 3, the effective implementation of EBM, as an integrating tool for accomplishing the objectives of each of the other priority areas. Public input emphasized the importance of ecosystem approaches. This plan recognizes the connectedness of issues under each priority, and many of the actions are requisites or supporting components for other actions. For example, the completion of seafloor maps for the West Coast (Priority 6) and a comprehensive geographic information system (GIS) characterizing habitat and human uses (Priority 2) will help establish baseline ocean health indicators (Priority 3) that are necessary for a better understanding of the status of West Coast ecosystems (Priority 6) and how they will respond to the impacts of climate change (Priority 7).

***Putting the Actions into Action***

The actions identified in this plan will be initiated over the next eighteen months and have a range of timelines for completion. Many will require the establishment of working groups or committees. These factors will be the focus of the West Coast Governors' Agreement Implementation Summit, to be jointly held by the states and federal partners in 2008. The states will regularly provide updates to the public on progress of implementing the Action Plan and will publish a formal status report at the end of two years.

The Washington, Oregon, and California Governors' representatives acknowledge that the actions identified cannot be fully implemented with existing resources. Throughout the plan, the three states identify specific support needed from federal agencies and other partners in order to accomplish the goals.

## **A Call for Sustained National Support**

The U.S. Commission on Ocean Policy and Pew Oceans Commission reports and the Joint Ocean Commission Initiative recommend the establishment of a dedicated funding source for federal and state ocean and coastal management. A national Ocean Trust Fund would provide a long-term source of funding specifically for improving our understanding of ocean and coastal resources and implementing more effective management of these resources. Secure funding is necessary to address new ocean and coastal management efforts, including activities contained in this action plan and the recommendations of the two ocean commissions.

*Therefore, the West Coast Governors encourage establishment of a national Ocean Trust Fund that would support ocean and coastal management efforts for state and federal government agencies.*

The three states urge the Administration and the California, Oregon and Washington Congressional delegations to consider establishing a dedicated source of revenues for ocean and coastal management. The establishment of an Ocean Trust Fund would demonstrate national commitment to improved ocean policy and assist the states in addressing management and research needs. Both commissions identified several viable funding sources which do not require new taxes, and outlined ways to allocate funds to the states and to federal ocean agencies.

## **Preparing for the Effects of Climate Change**

The three states recognize the inevitability of impacts on ocean and coastal resources from climate variations and long-term climate changes. Climate change alters the shoreline, ocean currents and temperature, and fragile ecosystems. These impacts will affect every priority in this agreement and many of the specific action items. Although models provide predictions and scenarios, these impacts and corresponding ecosystem responses are still shrouded with uncertainties.

*Therefore, the West Coast states will collaborate on a West Coast-wide assessment of shoreline changes and anticipated impacts to coastal areas and communities due to climate change over the next 30-50 years, and work together to develop actions to mitigate and adapt to the impacts of climate change and related hazards.*

To model impacts to the West Coast under various likely climate change scenarios, the states will engage with academia and local, state, and federal government agencies, and will use the same frames of reference (i.e., models appropriate for providing inputs and assessing regional climate changes; scenarios published for greenhouse gas emissions) for predicting and responding to shoreline changes from storm surges and sea level rise. In addition, the states will support the development of climate scenarios on the likelihood and severity of changes in factors such as precipitation, average temperatures, and number of extreme heat days.

**Priority Area 1:  
Ensure Clean Coastal Waters and Beaches**

<b>Vision</b>	<b>Goals</b>
<i>Clean coastal waters and beaches where marine life thrives and where people can safely enjoy swimming, fishing, and other activities without the detrimental effects of pollution and marine debris.</i>	<ul style="list-style-type: none"><li>• Improve coastal water quality by reducing water pollution through better stormwater management, pollution source detection and reduction, and other strategies to reduce polluted runoff.</li><li>• Decrease the number of beach/coastal closure days and reduce the area affected by these closures over time.</li></ul>

**Issue**

Ocean water quality is critical to the health of marine and coastal ecosystems and human uses for recreation, food, and commerce. Some human activities on land and in the marine environment adversely affect the quality of the Pacific Ocean. Sediment and debris are flushed by storm water from coastal landscapes into the ocean. Chemicals and pharmaceuticals in treated waste are discharged into rivers, estuaries, and the sea. Vessel hulls and ballast water can introduce non-native species to new areas. Ocean currents carry all of these – invasive species, contaminants, sediment, and debris – far from their sources.

Land development and associated polluted runoff put further pressure on water quality along the Pacific Coast. For example, hypoxia, the reduction in dissolved oxygen that results in ocean “dead zones,” may be triggered by excess nutrients from human activities, upwelling, and changes to ocean circulation. Dead zones can result in death or injury to fish, shellfish, and other marine species. In addition, several types of harmful algal blooms (HABs) occur along the West Coast, and their increasing occurrence may be related to nutrient pollution and climate change. These events are not limited to coastal waters but can also impact coastal river systems. HAB impacts along the West Coast have ranged from the loss of economically and culturally vital shellfish resources to illness and death in humans and in marine species. Just one harmful bloom event can cost tens of millions of dollars to local coastal economies.

<p><b>Clean Marinas</b></p> <p>Clean marinas are an important part of working waterfronts, described in <b>Priority 7</b>. Boater education for best practices at marinas is incorporated in <b>Priority 5</b>.</p>
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Air pollution can also influence water quality, as air pollutants enter the water from rain. Air emissions from large vessels transiting the coast and activities in ports and harbors are, therefore, a growing concern for the three states. In addition, the congregation of recreational and commercial boats at marinas, the activities that often occur at marinas, and the physical location of marinas in and near the water (often located in sheltered areas with limited water movement or flushing) can result in significant local impacts to water quality. The implementation of best management practices by marinas to control and prevent point and nonpoint

sources of pollution is critical to protecting our sensitive marine environments. The impacts of these human-induced disturbances to marine systems, as well as natural variations, need to be understood to ensure a healthy ocean ecosystem and coastal-dependent communities.

## **Issue Analysis**

Poor water quality is directly related to polluted runoff, which has six main sources: urban areas, marinas, agriculture, forestry practices, modification of shorelines and streams, and degradation of wetlands and other vegetated coastal habitats. To various degrees, the states are seeking to address these issues through the Coastal Nonpoint Source Pollution Control Program and Section 319 of the Clean Water Act. One approach is to implement low impact development (LID) measures. LID is a method of land development that aims to maintain the natural movement of water through a watershed. Impervious surfaces like roads and parking lots alter the movement of water and increase polluted runoff because stormwater cannot penetrate the ground. LID strategies include improved drainage, use of porous pavement, preservation of native vegetation, and creation of vegetated channels that promote infiltration, trap sediment, and help treat pollutants. In order to successfully reduce polluted runoff from growing urbanized areas, these efforts must be expanded.

### **Low Impact Development**

Low impact development strategies support the long-term viability of coastal communities, described under **Priority 7**. These measures help urbanized areas rebound from hazard events and adapt more easily to climate changes.

Local, state, and federal water quality monitoring programs along the West Coast are often not well coordinated. Many monitoring programs are episodic rather than continuous and most are chronically under-funded. Incompatible data collection formats contribute to a general time-lag in reporting data and synthesizing findings. Resource managers and public health officials frequently lack a clear and timely picture of water quality and other conditions as the basis for local, state, and federal actions to protect these resources and to protect human health. Increased monitoring can improve understanding of the causes of HABs and hypoxia and enhance the prediction of events, which are escalating in frequency and extent.

### **Harmful Algal Blooms and Hypoxia**

Research and monitoring for harmful algal blooms and hypoxia are a highlighted need under **Priority 6**. The three states require predictive capabilities in order to implement timely management actions.

To address the increasing incidence of HABs along the nation's coastline, NOAA, EPA, and NASA are providing \$10 million nationwide in funding via the Ecology and Oceanography of Harmful Algal Blooms (ECOHAB) program to research algal species that may cause deleterious effects on human and coastal ecosystem health. Another NOAA funded effort, the Monitoring and Event Response to Harmful Algal Blooms (MERHAB) program, supports projects such as the Olympic Region Harmful Algal Bloom (ORHAB) partnership. The ORHAB partnership is a collaborative federal, state, tribal, and local

ecosystem-based research and monitoring program that provides early warning of harmful algal blooms on Washington's outer coast. It is now funded through user fees collected by Washington State. ORHAB warnings have saved at least three million dollars each year for Washington's

coastal fisheries by enabling safe and selective beach openings during bloom events in 2001 and 2003-2006.

While these programs focus on marine events, an interagency workgroup on the Klamath River is an example of an effort to address HAB impacts on river systems. Formed in 2006 with federal, state, tribal, and local governments and commercial and private entities, the workgroup provides oversight on and coordination for various monitoring efforts to identify the presence, distribution, and possible causes of blue-green algae and their toxins.

Marine debris is another specific water quality issue that is a priority to all three states. All three states have annual coastal clean up programs. In 2002, Washington passed legislation urging the coordination of derelict fishing gear removal in the state. The Northwest Straits Commission, working with the Washington Department of Fish and Wildlife, developed a program and published guidelines for derelict fishing gear removal. Since that time, the Commission has removed over 1,245 derelict crab pots and 550 derelict fishing nets covering approximately 120 acres of marine habitat from Puget Sound. Thousands of dead animals, representing 55 different species were removed from the gear including marine mammals, birds, fish (including listed Chinook, chum and bull trout), octopus, and crab. The Commission established a goal of eliminating 90% of derelict fishing gear in priority areas of Puget Sound by 2012. The state hopes to expand the program beyond the Northwest Straits to other coastal areas.

In Oregon, the Department of Fish and Wildlife in partnership with Oregon Dungeness Crab Commission, Oregon Salmon Commission, and Oregon State Police, provided Restoration and Enhancement funds and staff time on a state project to develop a derelict crab gear retrieval program. This project was also an integral component of the federal project that also involved Oregon Fishermen's Cable Committee, Sea Grant, and Tyco International. All partners are continuing their efforts on derelict crab gear retrieval. In California, the Ocean Protection Council (OPC) adopted a resolution on marine debris in February 2007, which created a Marine Debris Steering Committee to specifically target the reduction and prevention of land-based sources of plastic debris. The OPC also funded a pilot derelict gear removal program in the Channel Islands and is considering expanding that program. Also this year, NOAA formally created a marine debris program and increased funding dedicated to research and removal.

The operations of commercial maritime shipping impact air quality by releasing soot and oxides of sulfur and nitrogen. These pollutants contribute to localized air quality impacts to communities near ports and the formation of regional smog and water quality degradation. If ships calling on West Coast ports were required to burn low sulfur fuel, major decreases in emissions associated with adverse health impacts would be achieved. The International Convention for the Prevention of Pollution from Ships (MARPOL) includes six annexes that set regulations recognized and adhered to by 22 ratifying nations. Annex VI caps sulfur content of fuel and limits emissions of sulfur and nitrogen oxide. To date, the U.S. has not ratified this annex, but submitted a proposal to the International Maritime Organization (IMO) to improve emission standards for ocean-going vessels beyond those initially set out by Annex VI.

## **Findings**

## **Water Quality**

### **Finding 1A**

*Nonpoint source pollution, or polluted runoff, is the most significant source of water pollution along the West Coast, impairing marine life in estuaries, bays, and nearshore waters.*

Although systems to address polluted runoff have been in place for years, a renewed commitment among federal, state, local agencies, the private sector, and academia is necessary. The West Coast Governors' Agreement called for immediate action by the three states to appeal for national funding to address the threat of nonpoint source pollution. In June 2007, the Governors sent a joint letter to the House and Senate Appropriations Subcommittees urging the restoration of funding in fiscal year 2008 for the Coastal Nonpoint Source Pollution Control Program. The states will continue to advocate for secured federal funding sources to address polluted runoff, including funding for the Coastal Nonpoint Source Pollution Control Program, Section 319 of the Clean Water Act, and the Beaches Environmental Assessment and Coastal Health (BEACH) Act.

The BEACH Act is currently undergoing reauthorization, and the House and Senate are considering changing the Act's language to expand the allowable uses of funds. At present, the EPA distributes BEACH Act grant funds to states only for beach monitoring and public notification requirements. Expansion of the authority and resources of the Act would allow states to pursue source tracking studies, sanitary surveys, and prevention efforts.

In addition to this program, EPA administers the West Coast Estuary Initiative, which funds estuary-focused water quality improvement projects. Continued funding of this initiative would allow additional estuarine areas along the West Coast to receive support for polluted runoff reduction and improved water quality.

### **Finding 1B**

*Low impact development (LID) strategies have been recognized since the early 1980s, however, little progress has been made in ensuring LID-related methods are applied in planning, construction, or operation of coastal developments.*

Examining the question of why there has been little progress made in applying LID principles to date may provide insight on the structural constraints that need to be considered in developing and pursuing a strategy.

## **Harmful Algal Blooms (HABs) and Hypoxia**

### **Finding 1C**

*Additional research and expanded monitoring efforts are essential to understanding the threats posed by HABs and to support management actions relating to Pseudo-nitzschia and other algae blooms along the West Coast. Research and monitoring is also necessary to*

*understanding the connection between the increasing occurrence of hypoxia events, nutrient pollution, and climate change.*

With advance notice of these events, immediate management actions can be undertaken. These monitoring programs must be made operational so the public receives timely notice and maximum protection. In spring 2006, a massive unforeseen HAB event occurred along the central California coast, caused by the diatom *Pseudo-nitzschia*. This event resulted in record levels of domoic acid, a neurotoxin that results in amnesic shellfish poisoning and caused the death of hundreds of seabirds and marine mammals including seals, dolphins, and sea otters. *Pseudo-nitzschia* and outbreaks of domoic acid poisoning occur West Coast-wide with harmful bloom event hot spots in all three states.

## **Marine Debris**

### **Finding 1D**

*Marine debris is a significant threat to the health of the marine environment and is increasing along the West Coast and in the North Pacific Gyre.*

Densities of small plastic pieces have tripled during the last decade in the North Pacific Gyre, a clockwise-circulating area that encompasses a majority of the northern Pacific Ocean and which is bounded on the east by the California Current. The U.S. Department of Commerce estimates that 80% of marine debris comes from land-based sources, much of which is composed of plastic and lasts hundreds of years or longer without biodegrading. Wildlife species, some of which are threatened or endangered species under state or federal law, can ingest and may become trapped or entangled in marine debris. In addition, organisms attach to plastic and can float to distant habitats and become harmful invasive species. Lost and abandoned fishing gear is another significant component of marine debris, which can be deadly to wildlife and dangerous to boaters and divers. Lost or abandoned fishing gear also can have an economic impact to fisheries. In Puget Sound alone, the Northwest Straits Commission estimates that derelict crab pots may be killing 200,000 lbs of Dungeness crab per year worth approximately \$334,000. This represents at least eight percent of the Dungeness crab fishery lost to derelict pots – a significant impact to the commercial and recreational fishery.<sup>1</sup> Marine debris and derelict gear create a visual blight on the coast, represent a threat to populations of marine wildlife and coastal and ocean-dependent economies, and in certain circumstances, may pose a public health threat.

## **Air Quality**

### **Finding 1E**

*Commercial maritime shipping traffic along the West Coast contributes significantly to air pollution, but international measures could be imposed to reduce emissions including oxides of sulfur and nitrogen, particulate matter, and lower total air pollutant loads.*

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<sup>1</sup> Northwest Straits Commission, 2007 unpublished data

Emissions from ocean-going ships are a growing concern on the West Coast of the U.S. and Canada. The U.S. Department of Transportation predicts a doubling of international and domestic marine trade over the next twenty years. By 2030, the U.S. EPA estimates that out of all U.S. mobile emission sources, ocean-going vessels will account for 28% of nitrogen oxide emissions, 20% of direct particulate matter emissions, and 83% of sulfur oxide emissions. New technologies and fuels could significantly reduce the amount of air pollution from maritime shipping traffic. However, international standards for ships are currently far short of being sufficient to address air pollution and its impacts in populated areas.

The U.S. government recently submitted a proposal to the International Maritime Organization (IMO) which would set much more stringent standards for particulate matter, nitrogen oxides, and sulfur oxides. The U.S. proposal is a flexible approach requiring the use of 0.1% distillate fuels within a certain distance of the coastline and while in port, or a range of technologies resulting in equivalent emission reductions. The U.S. proposal will be considered at the April 2008 meeting of the IMO subcommittee engaged in developing a new emissions standard. While an international solution through the IMO process is preferred, the states are committed to achieve equivalent emissions reductions through other avenues, if the IMO does not act on a timely basis. U.S. EPA, Environment Canada, and the California Air Resources Board are currently working on gathering the technical data that will support the federal governments' application to the IMO. The California Air Resources Board is also gathering information that will support local rulemaking efforts in addition to the IMO proposal.

## **Actions**

### **Polluted Runoff**

#### **Action 1.1**

*Work with the Administration and the U.S. Congress to provide adequate funding for coastal water quality programs to reduce polluted runoff, and enhance monitoring and enforcement of water quality regulations to improve the health of West Coast coastal waters.*

Enhancing monitoring and enforcement of water quality laws requires continued funding for the Coastal Nonpoint Source Pollution Control Program, Section 319 of the Clean Water Act, and the BEACH Act. Specifically, the states support reauthorization of the BEACH Act with expansion of allowable uses of funds, such as source identification. The states will also advocate for continued funding and expansion of the West Coast Estuary Initiative. The states recognize that available government funding and capacity for addressing land-based pollution are limited, and that these resources must be focused to result in significant change.

*Timeframe: Ongoing.*

#### **Action 1.2**

*Make Low Impact Development (LID) a priority for the West Coast by focusing future grant and incentive programs to state and local governments on this objective.*

Examine and share incentive-based programs to support local government efforts for community planning using LID strategies. The states will collaborate on grant programs and share lessons learned to effectively provide incentives and assistance for communities to pursue activities aimed at reducing the impacts of development in coastal areas. Further, the states will coordinate with NOAA and local governments to bring coastal community planning and development training to six interested West Coast communities (two in each state). These communities will likely include those that are presently updating, or plan to update, their general plans. The training can focus on growth alternatives and related topics, such as water quality, financing mechanisms, and hazards and climate adaptation.

*Timeframe:* Initiated within 18 months of release of the final action plan. Training will be conducted by summer 2009.

## **Harmful Algal Blooms and Hypoxia**

### **Action 1.3**

*Exchange information between experts in all three states on management tools and techniques to promote development and operation of predictive capabilities of harmful algal blooms and hypoxia. Support the expansion of ocean observing system monitoring efforts amongst the three states for these purposes.*

The states will explore the development of predictive capabilities for alerting ocean users and resource managers of HAB and hypoxia events. To do so, in 2008 the states will hold a HAB workshop in conjunction with federal partners to reach consensus on the present state-of-knowledge and prioritize the information needed by decision makers to lessen the impacts of the HAB events on humans and critical marine resources. The three states will improve the general understanding of hypoxic events and their impacts along West Coast by working with federal, state, and academic experts to record and track incidences.

*Timeframe:* HAB workshop will be held in 2008. Other timelines may be identified in the final action plan.

## **Marine Debris**

### **Action 1.4**

*Establish baseline estimates of marine debris and derelict gear off the West Coast and set reduction goals. Support state and federal policies for achieving marine debris reduction goals.*

Several recent initiatives across the West Coast have called for a significant reduction in marine debris and the institution of prevention measures. The states will agree on

baselines, established by assessing data collected by clean up programs, state and federal agencies, and nonprofit organizations. The states will then identify a target reduction level to achieve by various prevention and clean-up measures, and will partner with and pursue resources from the NOAA Marine Debris Prevention and Removal Program. The states will share lessons learned from existing and emerging state and federal programs and guidelines to pursue safe and effective debris and gear removal. The states will evaluate existing activities such as the annual coastal clean-up day and litter prevention programs to effectively expand marine debris reduction activities.

*Timeframe:* Initiated within 18 months of release of the final action plan.

## **Maritime Shipping Emission Controls**

### **Action 1.5**

*Urge the International Maritime Organization to adopt the U.S. proposal which sets stringent emission standards for ocean going vessels.*

The states will work with the U.S. EPA to gain approval for the U.S. proposal to the IMO to set international standards requiring either the use of 0.1% distillate fuels within a certain distance of the coastline and while in port or a range of technologies resulting in equivalent emission reductions. As a result of this measure, air pollution from maritime shipping will be significantly reduced regionally and worldwide. The measure is estimated to reduce sulfur emissions alone by 80%.

*Timeframe:* Work with the U.S. EPA to gain approval of the IMO subcommittee in April 2008.

**Priority Area 2:  
Protect and Restore Ocean and Coastal Habitats**

<b>Vision</b>	<b>Goals</b>
<i>Estuarine, marine, and coastal habitats are ecologically healthy and allow for public enjoyment and sustainable use.</i>	<ul style="list-style-type: none"><li>• Identify key habitats to protect and restore along the West Coast.</li><li>• Restore estuarine habitats and their function.</li><li>• Eradicate invasive <i>Spartina</i> cordgrasses coast-wide.</li></ul>

**Issue**

Pacific Coast ecosystems contain many unique habitats, such as the rocky intertidal zone, estuaries, and near shore reefs, which support a diverse array of marine life. Populations that live in these important habitats are linked through the California Current, which generally flows southward along the coast from southern British Columbia to southern Baja California. Features such as upwelling zones, freshwater plumes, off-shore jets, and circulation eddies all affect the movement of the California Current, which in turn sustains the West Coast's unique coastal and offshore habitats. The ecosystems of the California Current contain the kelp, zooplankton, and krill that are the foundation of a food web supporting sea mammals like the humpback whale and elephant seal, millions of seabirds, sea turtles, slow-growing deep sea corals, and fish species such as salmon, halibut, and crab that are important for commercial, recreation, tribal and subsistence harvest.

These distinct marine features and habitats contribute to the overall health of ocean ecosystems. Many of these marine habitats provide high economic value, but some human uses degrade these resources. These human impacts, coupled with steadily increasing human presence on the coast, translate into the continued vulnerability of coastal and marine habitats to further degradation or loss. In addition, already stressed marine habitats and their resident plant and animal communities are threatened by the influences of climate change on their location, diversity, and abundance (e.g., sea level rise, water temperature differences, and circulation changes will force ecosystems to change and alter species distribution). These communities are also jeopardized by the spread of aquatic invasive species, many of which thrive in degraded environments.

Aquatic invasive species are considered one of the greatest threats to native species and habitats. The introduction of aquatic invasive species into West Coast waters threatens the ecological, social, public health, and economic integrity of the region's marine resources. Because these species have few natural controls in their new habitat, they spread rapidly and destroy native plant and animal communities, damage recreation opportunities, lower property values, and

impact irrigation, water distribution systems, and water-dependent industries. One estimate suggests that aquatic invasive species cause a loss of \$120 billion annually to the U.S. economy.<sup>2</sup>

There are a variety of vectors through which aquatic invasive species may be introduced, including release from ballast water, escape from aquaculture production areas, the use of live bait, inappropriate disposal of unwanted aquarium species, or transportation on the hulls of commercial and recreational vessels. Examples of aquatic invasive species presently found on the West Coast include cordgrasses (*genus Spartina*), European green crab (*Carcinus maenas*), Chinese mitten crab (*Eriocheir sinensis*), and *Caulerpa taxifolia*. All three states have undertaken multimillion dollar projects to control or eradicate aquatic invasive species within their boundaries.

Restoration and protection of coastal and marine habitats from invasive species, detrimental human uses, and damaging activities are essential to maintaining the ecological integrity and economic well-being of the region.

## **Issue Analysis**

The three states have, to varying degrees, identified and established levels of protection for coastal and marine habitats and species. However, the states have not conducted an identification exercise that focuses on contributions of key habitats to the health and sustainability of the larger ecosystem on a regional scale.

Similarly, while each state has conducted a significant effort to eradicate marine invasive species, there has not been a coordinated method of regional communication or eradication. Because of this, invasive species that are introduced or re-introduced by interstate vessel traffic and coast-wide ocean currents will persist despite removal efforts. It is therefore crucial that all three states work together to comprehensively eradicate species, such as non-native cordgrasses, which are impacting rare habitats across the West Coast. There is a substantial amount of information available about how to best eradicate non-native *Spartina* cordgrasses. Washington State has already succeeded in removing 85% of the invasive cordgrasses in Willapa Bay, once a heavily infested area. California has aggressive efforts to eradicate non-native cordgrasses in San Francisco Bay, but non-native cordgrasses have also been found in Humboldt Bay, and eradication efforts there would have to be significantly augmented to eliminate the transportation of seeds from Humboldt Bay to Oregon and Washington.

### **Aquatic Invasive Species**

Research and monitoring for aquatic invasive species are a highlighted need under **Priority 6**. The three states require aquatic invasive species research and monitoring in order to understand the relevant risk that hull fouling, live bait, and aquaculture present to the region in terms of introducing invasive species.

The principle federal legislation concerning aquatic invasive species is the Nonindigenous Aquatic Nuisance Prevention and Control Act of 1990 (NANPCA) as revised by the National Invasive Species Act of 1996 (NISA). The law created the Aquatic Nuisance Species Task Force,

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<sup>2</sup> Pimentel, D.; Lach, L.; Zuniga, R.; Morrison, D. 2000. Environmental and economic costs of nonindigenous species in the United States. *Bioscience* 50:53-65.

co-chaired by NOAA and the U.S. Fish and Wildlife Service and dedicated to preventing and controlling aquatic nuisance species. To become eligible for federal funding, each state is to develop an Aquatic Invasive Species Management Plan for approval by this Task Force. NISA amendments to NANCPA also created the Western Regional Panel on Aquatic Nuisance Species to identify priorities, coordinate exotic species program activities, and advise public and private interests on control efforts in the region.

Under NISA, the U.S. Coast Guard has established mandatory ballast water management requirements for vessels entering the U.S. Exclusive Economic Zone, including retaining ballast water on board, conducting mid-ocean exchange, or using an approved ballast water treatment method. Washington, Oregon, and California have individually passed mandatory ballast water exchange and management laws, which are similar to the federal law but include additional requirements for vessel traffic. The Pacific Ballast Water Group, consisting of members of the shipping industry, state and federal agencies, and environmental organizations, has provided the forum for the states to coordinate their ballast water policies.

## **Findings**

### **Key Regional Habitats**

#### **Finding 2A**

*The identification of key habitats (or “important ecological areas”) for the West Coast is a critical first step for future potential protection efforts relevant to the three states.*

Important ecological areas include habitats or marine communities which contribute to an ecosystem’s health, including its function, structure, or ability to survive or adapt to changes. For example, rocky seafloor areas are used as feeding, spawning, and nursery grounds and are critical for the survival of many fish and invertebrate species. Identification of the location and health of these key habitats and the potential threats they face would allow appropriate management measures to be considered and could provide a target for expanded monitoring systems.

Currently, there are large gaps in information about seafloor habitat. At the same time, there are multiple unmapped human uses taking place. In effect, identification of habitats and overlapping human uses would contribute to a comprehensive ecosystem and habitat protection strategy.

#### **Seafloor Mapping**

Seafloor mapping, discussed in **Priority 6**, will help fill gaps in understanding about the types and distribution of seafloor habitats.

#### **Finding 2B**

*Estuarine habitats and their ecological functions are crucial for supporting sensitive species and for sustaining the coastal-dependent economy.*

Estuarine systems, such as coastal wetlands, are essential to the life stages of several threatened or endangered species, including salmonids. Salmonids rely on estuarine habitats twice during their lifetimes: first as young smolts preparing to enter the ocean

and again as adults returning from the ocean to their native stream to reproduce. In addition, tidal wetlands, eelgrass beds, and expanses of benthic habitat provide necessary habitat for many species of marine fish, Dungeness crab, migrating waterfowl and shorebirds, and shellfish. Estuaries are among the most biologically productive habitats on the planet and are key areas for aquaculture and recreation.

## **Marine Invasive Species**

### **Finding 2C**

*The battle to eradicate marine invasive species can no longer be fought effectively state by state since waters are truly shared West Coast wide.*

Despite ballast water management efforts, some invasive species are transported between states on the California and Davidson Currents. A recent study by Portland State University<sup>3</sup> found that drift cards released in three West Coast bays were found as far away as Alaska. The three states must take a regional approach to the issue, including working with our neighbors in Mexico, British Columbia, and Alaska to successfully eradicate introduced species.

### **Finding 2D**

*Non-native cordgrasses (genus *Spartina*) threaten the already rare mudflat ecosystems of the West Coast, and present an opportunity for the states to implement a successful West Coast-wide eradication effort.*

Four species of non-native *Spartina* currently occur between Comox Harbor in British Columbia and San Francisco, California. Where established, these invaders convert estuarine mudflats and salt-marsh ecosystems into uniform expanses of cordgrass, significantly reducing foraging habitat for migratory and shorebird populations and dramatically shifting the nutrient cycle.

*Spartina alterniflora* is prevalent in San Francisco Bay, where it threatens to extirpate the native cordgrass (*Spartina foliosa*) by competition and hybridization. In Humboldt Bay, *Spartina densiflora* dominates over 90% of the remaining marsh habitat, and smaller infestations have taken root in Baynes Sound, British Columbia; Grays Harbor and Puget Sound in Washington; and Tomales and San Francisco Bays in California. *Spartina patens* occurs in all three states, where it forms dense monocultures and has proven difficult to eradicate. *Spartina anglica*, deemed one of the world's 100 worst invasive alien species, is found mainly in Puget Sound, but is also established in San Francisco Bay, and Boundary Bay and the Frazer River delta in British Columbia.

## **Actions**

### **Habitat Protection and Restoration**

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<sup>3</sup> Howard, V.; M. Pfauth; M. Sytsma; D. Isaacson. 2007. *Oregon Spartina Response Plan*. Prepared for Oregon Department of Agriculture by the Center for Lakes and Reservoirs, Portland State University, Portland, OR. 79 pg.

**Action 2.1**

*Document, describe, and map ecological communities throughout West Coast waters and characterize existing human uses of those areas.*

The states will continue to build upon the existing knowledge base of ecological communities and develop geographic information systems (GIS) for the entire West Coast. These systems will be useful for identifying strategies to ensure important habitats are effectively protected. Completing the information databases will require the significant assistance of federal agency, nonprofit, and university partners. The states will also work with fishermen and tribes to identify and characterize habitats. This enhanced characterization of habitats will be supported by seafloor mapping data and additional information and studies related to the California Current. In addition to more thoroughly understanding the interactions of marine species, states will document the range of human activities in state ocean waters. Information about use patterns can then inform decisions made by states to implement protection measures.

**Cooperative Research**

Cooperative research and seafloor mapping are also referred to in **Priority 6.**

*Timeframe:* GIS will be complete by 2012. Other timelines may be identified in the final action plan.

**Action 2.2**

*Restore estuarine habitats, including coastal wetlands, to achieve a net increase in habitat and their function by at least ten percent over the next ten years.*

In cooperation with local, state, and federal agencies, nongovernment entities, and stakeholders, the three states will work to restore estuarine habitats along the West Coast, with a goal of attaining a net increase in habitat and function, by expanding existing restoration programs. The states will support establishing benchmarks and indicators to evaluate progress.

*Timeframe:* Ongoing, with benchmarks and ultimate goal reached by 2018.

**Marine Invasive Species**

**Action 2.3**

*Focus efforts on eradicating non-native cordgrasses (genus *Spartina*), which are transported between the three states on ocean currents.*

The states will prioritize the complete eradication of invasive *Spartina* cordgrasses along the West Coast and will share strategies and lessons learned for their effective removal. The states will also cooperate on reducing pathways of introduction and spread of invasive species, such as commercial ships and recreational boats, and set priorities for eradicating existing and new threats that affect multiple states.

*Timeframe:* Ongoing. Plan for full eradication of *Spartina* by 2018.

**Priority Area 3:  
Promote the Effective Implementation of Ecosystem-based Management**

<b>Vision</b>	<b>Goals</b>
<i>A healthy, thriving, and resilient marine and coastal ecosystem along the entire West Coast that supports a range of human activities.</i>	<ul style="list-style-type: none"><li>• Promote a strong foundation of knowledge for ecosystem-based management using indicators of health.</li><li>• Strengthen coastal communities' ability to engage in ecosystem-based management initiatives.</li></ul>

**Issue**

An ecosystem is a geographically specified system of organisms (including humans), the environment, and the processes that control the dynamics of their relationship. Ecosystem approaches to management go beyond single-species or single-issue management by integrating all aspects of the system to evaluate and manage the area and its resources in its entirety. Ecosystem-based management (EBM) is a process that integrates ecological, social, and economic goals, recognizes humans as key components of the ecosystem, and considers ecological rather than political boundaries. Further, an EBM approach assesses cumulative impacts from various sources and strives to balance conflicting uses. It accounts for complexity and uncertainty of natural processes and social systems, incorporating adaptive policies in the face of uncertainties. Using this approach to manage resources requires the consideration of multiple factors such as pollution, coastal development, harvest pressure, ecological interactions, and watershed management. EBM therefore requires engaging multiple stakeholders to define problems, incorporate scientific understanding, set goals, and find solutions.

An integrated ecosystem assessment (IEA) is a scientific approach being used by NOAA to define the current state of ecosystem health. An IEA is an analytical tool that uses information on natural and socio-economic factors in relation to specified ecosystem management goals. It involves and informs citizens, industry representatives, scientists, resource managers, and policy makers through formal processes that contribute to attaining the goals of EBM. The spatial scale is a function of the ecology, geology, and oceanography of a region as well as the scale of management issues and governance structures. For example, while an IEA may focus on a single bay, it also considers large-scale issues, such as climatic variability and linkages to adjacent ecosystems. Therefore, an IEA in one region along the West Coast can be linked to other IEAs and EBM for smaller areas along the California Current. IEAs are currently being conducted by NOAA in partnership with state and local entities to enable EBM.

Implementing EBM will be challenging. The West Coast is dominated by the California Current Large Marine Ecosystem and is affected by large scale atmospheric and ocean conditions of the northeast Pacific Ocean. Transitioning to EBM is further complicated by the existing fragmented, single-issue approach to ocean management, budget constraints on state and federal agencies, gaps in data and information, and a lack of timely connections between research and

management needs. EBM will require a sustained effort to integrate numerous state and federal programs and authorities and to acquire information at an appropriate ecosystem scale for management decisions.

## **Issue Analysis**

The West Coast includes many types of ecosystems that produce healthy habitats for wildlife, as well as products and services that humans require and enjoy. The quality of the products and services offered by these ecosystems is impacted by multiple stressors such as pollution, habitat degradation, climate alterations, and human population growth. An ecosystem-based approach provides a comprehensive understanding of these ecosystems and is needed to support complex and difficult management decisions. Analytical tools, such as IEAs conducted by NOAA (see the box below), are needed to identify how human and natural factors change the ecosystem and what management strategies might accomplish. Moreover, these analytical tools will assure that the EBM process is dynamic, allowing managers to change course and assess potential impacts of these changes, if necessary, as new information becomes available.

**An Integrated Ecosystem Assessment  
for Puget Sound**

NOAA is now embarking on a pilot IEA in Puget Sound, where multiple stressors impact the quality of the products and services offered by the ecosystem and a comprehensive understanding is needed to support complex and difficult management decisions. A variety of other areas along the West Coast, including the Columbia River estuary, San Francisco Bay, Monterey Bay and the Southern California, face a similar array of complex issues. IEAs may provide baseline information and indicators to assess future changes to the ecosystem.

To date, the laws and institutions in place within each state have not been considered from a coast-wide perspective. There are tools and resources existing or underway to address this gap. For example, an online interactive legislative atlas, part of the larger Digital Coast effort to provide data to coastal resource managers, is presently being developed for the West Coast states by the NOAA Coastal Services Center. This atlas includes searchable legislative summaries and provides a spatial perspective of ocean and coastal laws and resource agency jurisdictions. The effort is

expected to assist with the challenges of implementing EBM on the West Coast, and will provide a snapshot of the policy infrastructure from a regional and state-level perspective, allowing the identification of factors that assist or hinder effective EBM. Related to this, California has completed an inventory and overview of laws pertaining to management of ocean and coastal resources, and other state-specific and region-wide efforts to identify pertinent laws and jurisdictions are being developed.

Although the three states are beginning to consider EBM on a regional scale, a number of efforts along the West Coast have already engaged stakeholders, managers, policy makers, and scientists in ecosystem-level efforts at local and smaller regional levels. Such collaborative efforts have been important local drivers of EBM, and are taking place in locations such as the San Juan Islands, Washington; Port Orford, Oregon; and Elkhorn Slough, Morro Bay, and Ventura, California, as well as a new effort in Humboldt Bay (see the box to the right). In these places, agencies and stakeholders are already partnering to identify specific EBM objectives and address the obstacles to attaining those goals.

Ecosystem-based approaches to fishery management are increasingly recognized as important tools by state and federal governments. The Pacific States Marine Fisheries Commission's definition of ecosystem-based fishery management acknowledges the importance of understanding ecosystem dynamics and human influences, and underscores the challenges of balancing competing goals of fishery extraction and conservation.

The Pacific Fisheries Management Council (PFMC) is presently developing a Fishery Ecosystem Plan that will incorporate ecosystem-based fishery management principles. The plan will not replace existing fishery management plans (FMPs), but will serve as an umbrella document that complements existing FMPs by introducing new authorities, new scientific findings, and new theories to the PFMC process. The Fishery Ecosystem Plan will cover species not contained in existing FMPs, illuminate the connections between existing FMPs, and provide coastwide policy guidance.

**Community-based EBM Programs:  
An Example from Humboldt Bay, California**

The Humboldt Bay Ecosystem Program, coordinated by the Eureka Sea Grant office, will build a framework for partners to collaborate on EBM, prepare proposals on high priority issues to secure funding for EBM efforts, and develop recommendations for establishment and maintenance of a centralized Humboldt Bay Ecosystem database.

## **Findings**

### **Finding 3A**

*Single-sector approaches to ocean and coastal management can inhibit effective management of ocean and coastal ecosystems.*

Both the U.S. Commission on Ocean Policy and Pew Oceans Commission found that protection of critical ecosystem functions is difficult to achieve by relying on the historic focus on single-sector governance approaches. Overlapping jurisdictions and other features of governance that inhibit ecosystem-based management have been recognized for a long time. All three states recognize this fact and are improving ways to enhance ecosystem health through the implementation of ecosystem based management approaches. Implicit in the Governors' agreement itself, and its implementation, are the preliminary steps toward coordinating overlapping jurisdictions on a regional level.

### **Finding 3B**

*Most information about ecosystem health is based on the assemblage of sector based information sources, instead of from assessments intended to address the overall health of ecosystems.*

The assessment of the health of regional ecosystems will be difficult absent this type of analysis. Yet, conducting these assessments will be complicated and require significant fiscal investment to complete. Federal assistance (both technical and fiscal) would be required for the West Coast states to conduct such an analysis. To achieve this, the federal government could provide a toolbox of standardized parameters, key indicators, and drivers of ecosystem health that would be used by those that implement EBM. A few of these parameters may be included in all assessments, while others would be chosen

from the toolbox based on the unique characteristics of the geography or system of focus. These indicators should cover environmental, social, and economic factors and incorporate common, transferable measures to enable comparison of ecosystem health among areas and over time.

**Finding 3C**

*Sustainable fisheries depend on healthy ecosystems. Fishery management must no longer be based on a single-species approach but focus on the ecosystem as a whole.*

Ecosystem-based fishery management considers ecosystem-level interactions instead of focusing on individual species. The habitat, predators, prey, and other community interactions of the target fishery are taken into account when setting fishing policies. This approach provides the foundation for long-term sustainability of fisheries, but implementation is hindered by data needs for decision-making and building consensus and by jurisdictional management boundaries that do not reflect the true range of species.

**Actions**

**Action 3.1**

*Examine ongoing community-based efforts using ecosystem management principles in all three states and share lessons learned from these initiatives in order to encourage effective ecosystem-based management efforts across the West Coast.*

Several communities are currently working towards incorporating ecosystem-based management principles into local management efforts. These initiatives involve extensive partnerships, and are taking place in areas across the West Coast. For example, projects are underway in the San Juan Islands, Washington; Port Orford, Oregon; and Humboldt Bay, Elkhorn Slough, Morro Bay, and Ventura, California. The three states will share information on these projects as part of an information-sharing network for community-based initiatives, to gain insight on putting EBM into practice. This effort will facilitate the exchange of lessons learned and will cultivate local, state, and federal agency coordination for regional-level ecosystem management across the West Coast.

*Timeframe:* Establish West Coast EBM Network during 2008. Other timelines may be identified in the final action plan.

**Action 3.2**

*Assess physical, biological, chemical, and socio-economic factors in ecosystem health across the West Coast to establish standards and indicators for ocean health.*

The states support the development of an integrated ecosystem assessment (IEA) for the West Coast, with the assistance of the federal government. The assessment will establish standards and indicators for ocean health. In concert with state and federal agencies, local and tribal governments, NGOs, and academia, the states will hold a joint workshop in late 2008 to discuss existing efforts along the West Coast. The workshop will also aim to determine what other information is required (e.g., high resolution remote sensing data,

seafloor maps, and ocean observing system data) to advance ecosystem management approaches.

*Timeframe:* IEA workshop will be held in fall 2008. Other timelines may be identified in the final action plan.

**Action 3.3**

*Strengthen coordination between the three state representatives on the Pacific Fisheries Management Council (PFMC).*

As the Governors improve tri-state coordination and focus on solutions to regional issues, the three state representatives on the PFMC will enhance communication and cooperation in support of regional fisheries management as appropriate.

*Timeframe:* Ongoing.

**Priority Area 4:  
Reduce Adverse Impacts of Offshore Development**

<b>Vision</b>	<b>Goal</b>
<i>No new offshore oil and gas leasing and development shall occur in state tidelands or within the federal Outer Continental Shelf. The energy potential of wind, wave and tidal currents are appropriately and safely considered along the West Coast.</i>	<ul style="list-style-type: none"><li>• State and federal agencies work from a shared strategy to ensure that future offshore energy development activities along the West Coast are comprehensively planned to maximize energy generation while minimizing negative impacts to marine life and coastal communities.</li></ul>

**Issue**

The three states have determined that new offshore oil and gas development in ocean waters along the West Coast is unacceptable due to the harmful impacts to the marine and coastal environment. Therefore, the states are committed to exploring options for developing renewable energy sources in an environmentally sustainable manner. Recent advances in wind, wave, current and tidal energy conversion technologies have improved the economic viability of these alternatives. However, while pilot projects around the world are beginning to provide a better understanding of the benefits and impacts of these nascent technologies, they are largely untested in West Coast waters.

There is a high degree of interest to develop electricity using wave energy and tidal flow along the West Coast, particularly from the San Francisco Bay to areas to the north. Over the past year, energy development and study proposals for projects in all three states were filed with the Federal Energy Regulatory Commission (FERC). State and federal agencies across the West Coast are working to develop effective regulatory and permitting frameworks to deal with offshore alternative energy. Currently, however, no coordinated effort exists among the three states to address the feasibility of energy generation and the potential for environmental impacts on a regional basis.

**Issue Analysis**

As the need and demand for alternative sources of energy continues to rise, the West Coast states are examining options for offshore wind, wave, current, and tidal energy production. Private and public entities have received preliminary permits to explore the feasibility, efficiency, and impacts of these technologies. Many are pursuing (or would like to pursue) pilot projects or long-term licenses for projects in West Coast waters. Approving these activities on a long-term basis requires an understanding of the presence and status of sensitive marine and coastal areas, as well as clarification of the authorities, regulatory policies, and permitting processes for offshore energy production. As a region, there is a need to establish baseline information that could be incorporated into environmental or programmatic impact studies for siting alternative energy facilities in the outer continental shelf and in state coastal waters, bays, and estuaries.

Furthermore, the lack of data on environmental impacts of these new technologies makes it difficult to permit or license projects. Often agencies attempt to improve this understanding by requiring intensive monitoring and adaptive management.

***Status of Ocean Energy in Washington***

In 2005, Washington passed landmark legislation promoting the use of renewable energy sources; in 2006, voters passed legislation mandating 15% of new energy generation from a portfolio of renewable technologies. Washington now has a market for alternative energy with a generally robust demand system and green energy purchase options. Now, officials must develop the

regulatory framework for this expanded portfolio of sources. One of the challenges is conflicting perspectives over the build-out of the transmission system as energy projects move forward. To date, ten preliminary permits have been issued by FERC to study tidal energy production in Puget Sound and other major estuaries. Finavera is pursuing a license for a wave energy project in Makah Bay on Washington's outer coast, the furthest along in the process of any of these projects. FERC recently released an environmental assessment as part of the licensing process.

***Status of Ocean Energy in Oregon***

Oregon currently has seven active preliminary permit applications before FERC, four of which already have been approved. For one project, the Reedsport application, state and local government, federal agencies, and stakeholders have developed a declaration of cooperation which identifies and provides a framework for resolving specific issues and concerns. Stakeholders are also considering a possible settlement agreement for the FERC process. Private energy developers are expected to install the first power generation buoys (a 14-buoy array) in spring of 2009 near Reedsport. In addition, a test buoy and scientific monitoring buoys were deployed in summer 2007, near Newport.

To further develop the technical and scientific basis for making wave energy decisions, Oregon State University and the Oregon Coastal Management Program will hold a scientific workshop in October 2007. The Governor's Office is coordinating and providing guidance to state agencies in assessing the states' regulatory environment for wave energy development and developing options for preparing a comprehensive wave energy and ocean use framework plan to meet a variety of concerns being raised by stakeholders and coastal communities.

***Status of Ocean Energy in California***

In 2002, California legislation established the California Renewables Portfolio Standard program, which requires an annual increase in renewable energy generation of at least one of

**Ocean Energy**

Research and monitoring for alternative ocean energy technologies are a highlighted need under **Priority 6**. To make wise decisions on siting ocean energy projects, the states require the identification of sensitive areas and their present conditions. The states will therefore prioritize data collection of baseline environmental, social, and economic information on ocean resources and existing activities that would be affected by offshore energy development, and will pursue monitoring of ocean energy projects to assess impacts once the technologies are in place.

utilities' sales, with an ultimate goal of 20% by 2017. The goal was then accelerated, and now requires utilities to obtain 20% of their power from renewable sources by 2010. California presently has five proposed energy development projects, primarily for wave energy in Mendocino and Humboldt Counties and one for tidal energy in San Francisco Bay. The California Energy Commission and Ocean Protection Council (OPC) recently agreed to jointly fund a study examining the potential environmental impacts of wave and tidal energy technologies. The OPC is working with state and federal regulatory agencies to identify appropriate permitting processes and is planning to host up to three informal public workshops (the first of which will be held in late October 2007 in Eureka) to hear concerns from ocean users, including fishermen and other concerned stakeholders.

## **Findings**

### **Offshore Oil and Gas Development**

#### **Finding 4A**

*Future oil and gas leasing, exploration, and development off the West Coast will cause unacceptable adverse impacts.*

The long standing position of all three states is that offshore oil and gas development has unacceptable detrimental impacts to the marine life and habitats of the West Coast. This is based on thorough evaluations of the impacts from all phases of these operations.

### **Environmentally Sustainable Energy Development**

#### **Finding 4B**

*New environmentally sustainable energy production could provide reliable sources of energy for the West Coast, but the feasibility and environmental impacts of these technologies is not yet fully understood.*

All three states are looking into these technologies and have received proposals to move forward on development.

## **Actions**

### **Offshore Oil and Gas Operations**

#### **Action 4.1**

*Continue to oppose new oil and gas leasing, development, and production in ocean waters off the West Coast.*

This has been the long standing position of all three states, and this position was just re-affirmed by all three governors in their September 29, 2006 letter to the President of the United States and the U.S. Congress. The three Governors will continue to oppose any

proposals by Department of the Interior or legislation under consideration by the U.S. Congress that would facilitate new oil and gas development off the West Coast.

*Timeframe:* Ongoing.

## **Alternative Environmentally Sustainable Energy Development**

### **Action 4.2**

*Explore the feasibility for offshore alternative ocean energy development and evaluate the potential environmental impacts of these technologies.*

The three states will support efforts by the Federal Energy Regulatory Commission (FERC), the Department of Energy (DOE), and the Minerals Management Service (MMS) to coordinate and clarify regulatory processes between state and federal waters. The states will collaborate with the FERC, DOE, and MMS to evaluate the potential benefits and impacts of renewable ocean energy projects off the West Coast, as well as developing the long-term regulatory structure for removal or expansion of activities. Due to gaps in understanding about the presence and status of ocean habitats and associated ecological processes, the states will jointly support the collection of baseline environmental, social, and economic information on ocean resources and existing activities that would be affected by offshore development (see Priorities 3 and 6). The three states and the federal government will host a workshop in early 2008 to consider the issues surrounding offshore energy development, explore the feasibility of a West Coast-wide approach and consistency of state and federal regulatory programs, and begin drafting a regional plan. The states will send a letter to SIMOR and, in cooperation with MMS and FERC, to the Department of Energy pursuing federal support for the workshop.

*Timeframe:* The workshop on offshore energy will be held in early 2008. Other timelines may be identified in the final action plan.

**Priority Area 5:  
Increase Ocean Awareness and Literacy Among Citizens**

<b>Vision</b>	<b>Goal</b>
<i>The West Coast has an informed citizenry that understands the value of ocean and coastal resources, processes, and ecosystems.</i>	<ul style="list-style-type: none"><li>• Share ocean education opportunities with the entire population to elevate stewardship of coastal and marine resources and awareness of the connections between the ocean and our health and economic well-being, and between our activities and ocean health.</li></ul>

**Issue**

The U.S. Commission on Ocean Policy noted that an interested and engaged public is needed to successfully address complex coastal and ocean issues that effectively balance use with conservation. Today, as the Commission pointed out, the American public does not understand the importance of the ocean to their lives or to the quality of life on Earth. According to a national survey on ocean awareness, nearly 60% of Americans do not realize that more plants and animals live in the oceans than on the land; 75% mistakenly believe that forests, rather than oceans, are the planet's major source of oxygen; and 40% are unaware of the essential role oceans play in regulating climate.<sup>4</sup>

The need for greater public awareness about the conditions of our nation's coasts and oceans was identified in the 2004 Pew Oceans Commission and the U.S. Commission on Ocean Policy reports. The U.S. Commission on Ocean Policy report stated that "this information gap is a significant obstacle in achieving responsible use of our nation's ocean and coastal resources, empowering public involvement in ocean-related decision making, and realizing support for wise investments in, and management of, ocean-related activities."<sup>5</sup>

Numerous marine science education and awareness programs already exist on the West Coast. Some, such as those operated by Sea Grant and other academic programs, involve curricula in the region's schools. Others are local interpretive programs that protect specific coastal sites, such as at those at Año Nuevo State Reserve in California and Haystack Rock in Oregon. Visitor centers and aquariums provide focal points for public education, while programs such as the nationwide ReefCheck, Washington's COASST (Coastal Observation and Seabird Survey Team) and California's Beach Watch, train the public to collect and report data that supplement monitoring efforts and further our understanding of the marine environment.

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<sup>4</sup> 1999. Belden, Russonello, & Stewart and American Viewpoint. *Communicating about Oceans: Results of a National Survey*. Washington, D.C.: The Ocean Project

<sup>5</sup> 2004. U.S. Commission on Ocean Policy. *An Ocean Blueprint for the 21st Century*. Chapter 8: Ocean Stewardship: The Importance of Education and Public Awareness. Washington, D.C.

Each of the programs described above individually reaches a target audience on a daily basis. However, there is no comprehensive regional strategy to link these programs in a collective network that can support the growth of a widely embraced, long-term stewardship ethic of the nature prompted by the U.S. Commission on Ocean Policy and the Pew Oceans Commission.

## **Issue Analysis**

Individually, each of the three states is launching or continuing ocean awareness and literacy programs that are complementary but not coordinated. Washington is pursuing strategies to improve ocean education, collaborating with tribes and school districts, and to raise general ocean awareness. The Puget Sound Partnership will be launching a major education effort around recovery of Puget Sound. California is working to enhance K-12 textbook treatment of ocean issues through the Education and the Environment Initiative led by the California Environmental Protection Agency, and works with the NOAA National Marine Sanctuary Program on the statewide “Thank You Ocean” campaign. Oregon is supporting a variety of efforts including diverse public educational and interpretive programs, such as those at the Hatfield Marine Science Center in Newport and the South Slough National Estuarine Research Reserve. Marine science curriculum was developed by the Oregon Institute of Marine Biology for public schools along the southern Oregon coast. In addition, the Oregon Coastal Management Program provides resources for the ongoing development and administration of the Oregon Coastal Atlas, as well as publications and materials to improve the public's understanding of critical coastal and ocean management issues.

In addition to the public ocean education efforts described above, all three states have annual coastal clean up programs that teach citizen volunteers about marine debris and voluntary clean marina programs that aim to improve local water quality by promoting best practices at marinas (see box at right).

### **Marine Debris and Clean Marinas**

Marine debris is addressed in **Priority 1**.

Clean marina programs provide information to marine facility managers and boaters on eliminating or reducing the input of pollutants such as oil, cleaning chemicals, sewage, fish waste, and trash – into the environment. Clean marinas are also discussed in **Priorities 1 and 7**.

## **Findings**

### **Ocean Awareness and Literacy**

#### **Finding 5A**

*Ocean and coastal stewardship begins with the citizens of the West Coast; it is important to expand their awareness of ocean and coastal issues to protect and sustain resilient marine ecosystems.*

All three states have a wide variety of awareness programs run by all levels of government, non-governmental entities, academia, and the private sector. Most of these programs are not linked or coordinated in a systematic way.

#### **Finding 5B**

*Nationally funded programs exist to support ocean education efforts, which represent a significant resource for the three states in establishing an ocean literate public.*

The National Science Foundation funded three regionally-focused Centers for Ocean Sciences Education Excellence (COSEE) on the West Coast: COSEE California, COSEE West, and COSEE Learning Communities. These centers promote partnerships between scientists and educators, design methods and materials for ocean sciences education, and promote public ocean literacy. Other significant ocean education initiatives that may be valuable resources for the states include the National Marine Educators Association (NMEA) and the Pacific Education Institute.

## **Actions**

### **Ocean Awareness and Literacy**

#### **Action 5.1**

*Integrate ocean science and conservation into expanded environmental education curricula by encouraging changes to education content standards enhancing ocean literacy.*

The states will explore avenues for creating or expanding K-12 ocean education curriculum in schools and seek opportunities for hands-on educational experiences for children. To do so, the states will pursue partnerships with the Centers for Ocean Sciences Education Excellence (COSEE), the Southwest Marine/Aquatic Educators Association and Northwest Aquatic and Marine Educators chapters of the National Marine Educators Association (NMEA), the Pacific Education Institute, and others.

*Timeframe:* Initiated within 18 months of release of the final action plan.

#### **Action 5.2**

*Support outreach efforts to decision-makers at all levels and encourage improvement and expansion of volunteer programs such as clean marina initiatives.*

The states will seek to improve communication between education centers along the West Coast to help expand opportunities for public awareness and citizen science activities. The states will request adequate federal funding and expansion of environmental education.

*Timeframe:* Initiated within 18 months of release of the final action plan.

**Priority Area 6:  
Expand Ocean and Coastal Scientific Information, Research, and Monitoring**

<b>Vision</b>	<b>Goals</b>
<p><i>A sustained research and monitoring program for the entire West Coast that provides timely and relevant information to support coastal and ocean management programs.</i></p>	<ul style="list-style-type: none"><li>• Create a regional research priority plan to strategically focus investments in improved scientific understanding of ocean resources and processes. Ensure regional data comparability to allow a regional gauge of the status of the ecosystem.</li><li>• Improve understanding of existing and emerging issues that affect ocean health (such as harmful algal blooms, hypoxia, invasive species, ocean energy, and climate change) and the drivers of change (including economic, technological, demographic, and cultural trends) so that ocean and coastal managers have necessary information to make appropriate management decisions.</li><li>• Map the seafloor bathymetry and habitat of all state tidelands out to three miles by 2020.</li></ul>

**Issue**

Connecting science to management is a crucial foundational piece of any decision making process, particularly for ocean and coastal policy. Although management decisions ideally incorporate a high level of certainty from supporting information, managers are often faced with uncertainty in what is known scientifically about an issue, forcing decisions to be made without a sufficient understanding of the ecosystem, its inhabitants and processes, and the outcomes of a particular decision. It is important to recognize that resource managers need information in the near-term to make decisions, but the time required to provide research results can be substantial due to research processes required for robust scientific conclusions. This is further complicated by the inherent complexity of ecosystem-based management, which often requires information synthesized from many disciplines that traditionally have not been integrated.

For the states to support the collection and dissemination of scientific information, they must identify data priorities for management issues, and sustain and expand data collection and analysis through monitoring and research exercises. Extensive research and monitoring activities are underway across the West Coast, including rigorous research conducted at academic and other reputable institutions and widespread short- and long-term monitoring efforts that contribute to the region's ocean observing systems. Of all these efforts, mapping seafloor bathymetry and benthic habitats is of paramount importance, which when completed will provide

a foundation to understanding the ocean and coastal environment and resources. As a result, seafloor mapping is also vital to advancing ecosystem-based management.

In addition to seafloor maps, baseline data is critical for establishing the present status of ocean health, and monitoring is required both for near-real time change detection and for time-series data to detect long-term shifts. Because the California Current connects and drives the waters off each state as one complete system, it is important to use baseline and monitoring data to understand the system on a regional basis. There are a number of efforts along the West Coast to bring this information together through the coordination of ocean observing systems. These efforts, including the three regional associations along the West Coast and the California Current-wide effort undertaken by the Pacific Coastal Ocean Observing System (PaCOOS), need further development and involvement from the states to achieve the goal of West Coast-wide baseline and monitoring information. The three states now have a unique opportunity to combine data collection and monitoring at local, state and regional scales along the West Coast.

**Ocean Observing Systems Regional Associations of the West Coast**

**NANOOS** ([www.nanoos.org](http://www.nanoos.org))  
Northwest Association of Networked Ocean Observing Systems

**CeNCOOS** ([www.cencoos.org](http://www.cencoos.org))  
Central and Northern California Ocean Observing System

**SCCOOS** ([www.sccoos.org](http://www.sccoos.org))  
Southern California Coastal Ocean Observing System

## **Issue Analysis**

Common benchmarks, comprehensive and integrated data sets, and additional research are needed to monitor ocean health on a regional scale. The three states are identifying specific areas as joint priorities for research and monitoring to obtain a fuller understanding of system dynamics, particularly related to climate change and circulation patterns. These priorities will be incorporated into the preparation of a regional research plan that is already underway.

To connect science to management, the Sea Grant programs in Washington, Oregon and California are collaborating with a variety of agencies and stakeholders to collect public comment and develop a comprehensive Regional Research and Information Plan for the California Current Large Marine Ecosystem. This plan is in response to recent national recommendations calling for a regional approach to research planning, and is funded from a \$500,000 National Sea Grant Program grant. Extensive workshops are being held in all three states to identify and prioritize research and information needs for the West Coast. The process is designed to engage stakeholders across a broad range of ocean and coastal interests, including coastal residents, scholars and researchers, community organizations, marine conservation groups, state and local governments, resource managers at both the state and federal levels, and any person or group who depends on ocean resources for livelihood or recreation. These priorities will be used to seek research that can help support all the objectives included in this action plan.

### ***Seafloor Mapping***

Mapping all state waters, including large estuaries and bays (i.e., San Francisco Bay, Puget Sound), with uniform acceptable standards would provide significant support for implementing

**Seafloor Map Applications**

In addition to supporting research and management of living marine resources and providing baselines for monitoring change, seafloor maps can:

- Support the prediction of hypoxia and recurring “deadzones” (**Priority 1**)
- Locate submerged debris or cultural resources (**Priorities 1, 2**)
- Increase the knowledge base for essential fish habitats and other key habitats (**Priorities 2, 3, 6**)
- Assist in siting offshore infrastructure, such as pipelines, energy facilities, communication cables, and ocean observatories (**Priorities 4, 6, 7**)
- Give insight to shoreline processes and impacts from storms (**Priority 7**)
- Support tsunami, storm surge, and earthquake hazard assessments (**Priority 7**)

many of the Agreement’s seven priorities. There are a large number of complementary areas and management issues that would be served by mapping bathymetry and marine habitats along the West Coast.

Three of the primary challenges associated with completing a seafloor map for the West Coast are identifying and securing funding sources to get comprehensive seafloor mapping accomplished, developing uniform mapping standards within and across the three states; and designing and completing a uniform map product. The status of seafloor mapping in each state is described in the following paragraphs.

***Status of Seafloor Mapping in Washington***

To date, a number of sections of the Washington margin have been mapped at various resolutions by different organizations (e.g., Oregon State University, NOAA, and the U.S. Navy). Presently there is an agreement between NOAA and the U.S. Navy that regulates the acquisition, control, and dissemination of high-resolution bathymetry data within a security zone off Washington and northern Oregon. Over the past several years, habitat mapping has been a high priority for Washington and for coastal treaty tribes. There are also ongoing efforts to complete high-resolution maps for small, isolated areas within sections of Puget Sound through collaborations between academia and state and federal agencies. In addition, the NOAA Olympic Coast National Marine Sanctuary is working to map all waters in its jurisdiction; however, at current rates, it does not expect to finish the effort until 2043.

***Status of Seafloor Mapping in Oregon***

In 2006, over twenty Oregon-based marine scientists signed a Scientific Consensus Statement for Mapping the Oregon Territorial Seafloor. In 2007, a legislative effort to fund seafloor mapping was initiated by the universities, which ultimately did not succeed. To date, a number of sections of the Oregon margin have been mapped at various resolutions primarily by Oregon State University and NOAA, and additional mapping is ongoing on a limited basis by Oregon Department of Fish and Wildlife (DFW) in state waters. In total, less than five percent of Oregon’s territorial sea (within the three nautical mile limit) has been mapped. However, competing ocean uses coming to the forefront in Oregon (e.g., energy, aquaculture) have recently highlighted the need for a complete map of the seafloor, and another legislative effort is anticipated for the 2009 session.

***Status of Seafloor Mapping in California***

Currently, approximately 33% of California’s territorial sea and offshore waters has been mapped at various resolutions by a combination of academic and federal agencies. The state

has undertaken a major initiative to complete a high-resolution seafloor mapping survey of California's territorial sea, through a collaboration of the California Ocean Protection Council (OPC), the California Coastal Conservancy, the California Department of Fish and Game, USGS, California Geological Survey, California State University Monterey Bay, and NOAA. The OPC has made it a goal to map all state waters over the next five years.

## **Findings**

### **Regional Marine Research**

#### **Finding 6A**

*The West Coast currently lacks a plan to identify and help direct priorities for regional marine research.*

There are many marine management issues common to all three West Coast states. Addressing those issues in one state will impact the neighboring states. For example, the three states identified harmful algal blooms, hypoxia, aquatic invasive species, ocean energy, and climate change as common issue areas requiring specific research for more effective management decisions. State staff and the Sea Grant community are working to develop a research plan that will improve knowledge throughout the West Coast on pervasive issues affecting each of the three states, such as those listed above. A plan developed by the West Coast Sea Grant programs is intended to identify these issues and to direct state and federal investments. Further, cooperative research between scientists and fishermen, and the incorporation of traditional knowledge from tribal members, can quickly advance the knowledge base of the status of the health of West Coast ecosystems (see the box at right).

#### **Cooperative Research**

Cooperative research for habitat identification and characterization is referred to in **Priority 2**.

In 2008, the California Ocean Protection Council (OPC) will consider funding a cooperative Fisheries Research Institute that would develop, solicit, and fund projects that create equal partnerships among fishermen and academic scientists to address the fishery independent data needs of state and federal agencies. OPC staff will work with the Institute to determine if the program can be expanded West Coast-wide since many species cross state and federal jurisdictions.

#### **Finding 6B**

*Coordinating information across the regional ocean observing systems in the California Current and major estuaries is necessary for a comprehensive understanding of ocean health.*

The West Coast ocean observing systems and regional associations are major resources for the states for obtaining essential regional information on ecosystem health, water quality, living marine resources, renewable ocean energy development, and responses to climate change.

## **Seafloor Mapping**

### **Finding 6C**

*Mapping the entirety of the state waters off the West Coast will provide critical information for protection of ecosystems and economic infrastructure.*

The availability of a comprehensive high-resolution bathymetric map for the West Coast is a limitation to addressing priority areas for both state and federal agencies. The states' efforts would benefit greatly from removal of present restrictions on accessibility of seafloor mapping data and improving overall data availability. Completion of a high-resolution, bathymetric map will aid the three states' efforts on tsunami modeling, habitat characterization and identification, spill tracking, alternative energy site selection, and other high priority management issues. Completing comprehensive seafloor maps will require a combination of state and federal resources; in particular, support from USGS and NOAA, and possibly contribution from other partners such as the private sector.

## **Actions**

### **Regional Marine Research**

#### **Action 6.1**

*Support the West Coast Sea Grant regional marine research needs process by identifying funding sources and partners for a sustained approach to ocean and coastal research.*

The three states are participating in developing a regional ocean and coastal research plan led by the West Coast Sea Grant institutions. While the Sea Grant process will take a longer time to fully develop, the three states have identified some regional priorities of concern. The states will prioritize and pursue joint efforts to fund regional scientific research projects where pooled resources or coordinated efforts will maximize the return on research investments to benefit all three states. In addition, the states will work with the four existing ocean observing systems collaborations along the West Coast, federal agencies, tribes, and academia to invest in monitoring to address priority issues. Initial regional priorities identified include harmful algal blooms, hypoxia, aquatic invasive species, ocean energy, and climate change.

*Timeframe:* The Sea Grant Regional Research Plan is anticipated for release in fall 2008. Other timelines may be identified in the final action plan.

### **Seafloor Mapping**

#### **Action 6.2**

*Complete a seafloor map of the bathymetry and habitat of all state tidelands and submerged lands out to three miles.*

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The three states seek to complete a seafloor map of Pacific Coast waters. Each state recognizes the need for a complete understanding of bathymetry and benthic habitat, but although mapping efforts are gaining momentum, fiscal constraints necessitate federal, academia, and private industry partnerships to move forward. To progress, the states will set joint standards, agree on common products, define high priority areas, and estimate a timeline for completion. They will communicate the regional need for a comprehensive seafloor map in a joint letter to the Subcommittee on Integrated Management of Ocean Resources (SIMOR) and will encourage the Department of Defense, USGS, NOAA, and other federal agencies to make existing seafloor mapping data accessible and to better coordinate data collection and sharing in state waters through such groups as the Interagency Working Group on Integrated Ocean Mapping. The states will ask NOAA to establish seafloor mapping as a programmatic goal and to ensure the states have adequate West Coast-based seafloor mapping resources, including hardware, to support these actions. The states collectively support legislation that would further these goals.

*Timeframe:* Complete seafloor map by 2020. Other timelines may be identified in the final action plan.

**Priority Area 7:  
Foster Sustainable Economic Development in Coastal Communities**

<b>Vision</b>	<b>Goals</b>
<i>Coastal communities are economically and environmentally sustainable over the long term.</i>	<ul style="list-style-type: none"><li>• Help coastal communities prepare for impacts associated with declining resource industries, climate change, and impacts of coastal hazards.</li><li>• Ensure regional sediment management efforts assist coastal communities with both the long term economic benefits associated with ports, harbors, beaches, and shoreline protection, as well as the ecological benefits of coastal and estuarine habitat.</li></ul>

**Issue**

The economic base for coastal communities is directly related to the health and sustainability of the coast and ocean, through fishing, recreation, tourism, transportation, ports and other activities. Many local coastal communities are struggling because some coastal dependent economic activities are in decline. At the same time, these local governments are challenged with maintaining critical coastal or port facilities and infrastructure. A principal challenge to states, tribes and local communities lies in accommodating increased development in the coastal zone and usage of ocean and coastal areas without degrading or diminishing the environmental goods and services offered by the marine ecosystem.

Along many parts of the Pacific Coast, another challenge is geographic isolation and the resulting reliance on highway transportation and port infrastructure to support the local economy. For example, small ports have difficulties obtaining funding for basic maintenance, such as harbor dredging, and have difficulty affording the expensive disposal of sediments that often contain legacy toxins.

A wide range of businesses depend upon access to the water and shorefront infrastructure to prosper. A vital waterfront economy includes seafood harvesters and processors, freight and fuel companies, marinas, boat builders, transportation ferries, cruise boats, and recreational outfitters. Coastal communities face a potential for losing the traditional waterfront businesses, such as fish markets and other water-dependent activities as they are replaced by homogenous shops and businesses that are unrelated to the coast. A number of the trends in coastal communities are already well documented. For instance: natural resource-based industries are declining while tourism is rising; both the commercial fishing and port industries are undergoing a trend toward consolidation and concentration; housing costs are increasing at a high rate and wages may not be keeping pace. This means that many of those who fill service jobs at the coast have difficulty paying for housing or commute from inland locations to poor-paying jobs.

Preserving and revitalizing working waterfronts can be achieved through establishing value-added businesses; supporting innovative water-dependent uses; providing opportunities for high quality, local seafood production and distribution; and promoting clean marinas and waterfronts.

**Clean Marinas**

Clean marinas are referred to  
in **Priorities 1 and 5.**

One critical element of coastal economies that has been altered by human activities is the amount of sediment (namely sand) carried to the coast and the transport of sediment along the coastline. Dam construction and urban development have reduced sediment supply washed downstream to the coast, while shoreline structures such as jetties, groins, and other hardening infrastructure can impede lateral movement of sand along the coast. This sand imbalance is causing sand-starved areas to erode more rapidly than would occur naturally. Erosion along the West Coast undermines the stability of important navigation structures, such as jetties, and leaves many areas more vulnerable to inundation during storms and high waters. Ultimately, the stability and sustainability of coastal communities is threatened.

**Climate Change Impacts**

Research and monitoring for the impacts of climate change on the coast is a highlighted need under **Priority 6**, as is the utility of seafloor maps for assessing shoreline change and coastal hazards, including tsunami and storm surge.

The effects of climate change contribute an added pressure to the impacts of human alterations of coastal systems. Economies of coastal communities across the nation are facing increased natural hazards and the implications of a changing climate. On the West Coast, communities are beginning to focus on increasing their resilience to these forces. Resilience refers to the ability to prepare for and adapt to ecological,

economic and cultural impacts to human and natural communities from events such as coastal flooding, tsunami, or to the longer-term effects of climate change.

## **Issue Analysis**

Federal, state and local governments are cooperating to provide data collection, grants, technology, decision-support tools, and training to coastal communities to address impacts of climate change, coastal hazards and declining fisheries. The primary outcome of these efforts is well-informed officials (local and state decision makers, emergency and floodplain managers, community planners, and coastal resource managers) who can take action on community hazard preparation and mitigation techniques. These coastal communities will be better prepared to respond to and rebound from changes to their community, and will be able to contain the escalating costs of extreme coastal events. Yet, too often coastal communities lack the resources to conduct detailed assessments or obtain the technical assistance necessary to accurately plan for predicted future changes such as sea level rise.

Development of waterfront property, if not properly planned, can alter the character of a coastal community, prevent public access to the ocean, and adversely affect local fishing businesses. California, Oregon, and Washington are witnessing increased development along their sensitive coastlines, some of which is altering the livelihood and character of waterfront

communities. There are existing programs in all three states that support working waterfronts and coastal-dependent businesses. One example of a developing tool to address the problem of limited funding for waterfronts and sustainable fisheries is the California Fisheries Fund. The Fund's primary objective is to provide a permanent source of capital for improving the conservation and financial performance of California's fisheries, protecting fish stocks and habitats, creating better jobs, improving profits, and revitalizing coastal communities. Under this program, ports, communities, and other organizations can obtain loans for infrastructure improvements such as increased off-loading capacity, ice machines, minor cold storage, or processing. Likewise, fishermen can apply for funding to transition to economically viable and environmentally sustainable fishing practices.

**Coastal Community Planning**

Coastal community planning and development training is an action identified in **Priority 2**. Based on individual community needs, the training can focus on growth alternatives, water quality, hazards, and climate adaptation.

Traditionally, coastal sediments (i.e., sand) are managed on a project-by-project basis. This results in inefficient use of resources and missed opportunities for beneficial uses of sediment. For these reasons, the U.S. Commission on Ocean Policy recommended developing strategies for managing sediment regionally. Increasingly, West Coast states are working to use clean (i.e., non-toxic) sediment as a resource to replenish sediment deficient areas, restore the balance to sediment processes, create and restore habitats, and protect important navigation infrastructure and coastal communities. To do so, the three states are moving toward managing sediment regionally. In this case, regions are not defined as West Coast-wide, but vary depending upon physical processes transporting the sand. As these regions overlap state boundaries, however, it is logical for the states to learn from each other, to share experiences on appropriate strategies, policies, and tools, and to engage the appropriate federal agencies to pursue regional sediment management. Regional sediment management will result in increased beneficial use of dredged sediment, more efficient decision-making, more stable beaches and shorelines, restored habitats, and protected coastal communities and infrastructure.

***Sediment Management in Oregon and Washington***

Historically, sediment flowing from the Columbia River provided sand for the beaches of northwest Oregon and southwest Washington. Reduction in sediment reaching the coast has resulted in eroding beaches and shoals that support key jetties at the mouth of the river. To solve sediment management issues in the Lower Columbia River, the Governors of Oregon and Washington are supporting the development of a regional sediment plan with other key partners. They are pursuing this work through the Lower Columbia Solutions Group, a bi-state, multi-stakeholder, consensus-based team. Partners include the U.S. Army Corps of Engineers, local ports and coastal communities, other federal and state agencies, the fishing industry, environmental interests, and other non-governmental organizations. Over the past several years, the Lower Columbia Solutions Group has successfully pursued several projects and studies related to sediment management and received funding support from a variety of its member organizations, including both states. However, the group requires additional funding to initiate the multi-year regional sediment planning effort.

In addition to this momentum, the Washington State Ocean Policy Work Group recommended that Washington pursue regional sediment management to improve beneficial use of sediment. At the mouth of the Columbia River, pilot projects to use sediment beneficially have increased information on sediment processes associated with dredged material disposal, improved working relationships, and established a longer-term vision for expanding and routinely maximizing the beneficial use of sediment.

***Sediment Management in California***

In 1999, California established the California Coastal Sediment Management Workgroup, a partnership of federal and state agencies focused on developing and implementing the California Coastal Sediment Master Plan to protect, restore and enhance California's sediment and beach resources. In total, partners provided \$1.2 million to initiate this effort. Development of the regional sediment management plan for California is ongoing. The state, U.S. Army Corps of Engineers, and their partners intend to improve regional navigation and coastal program performance by developing an effective, comprehensive statewide approach to solve complex sediment problems of beaches, shorelines, coastal wetlands, and coastal watersheds as it relates to the beneficial reuse of dredged material from navigation channels and other sources.

## **Findings**

### **Working Waterfronts and Sustainable Coastal Economies**

**Finding 7A**

*A variety of economic and environmental factors have led to the decline of working waterfronts along portions of Washington, Oregon, and California.*

Working waterfronts provide a link between land and sea that is critical to sustaining a varied and thriving coastal economy. State and local governments are looking for ways to maintain these working waterfronts, particularly in rural communities that are highly dependent upon them. There are programs in place to revitalize these waterfront communities that could be enhanced and expanded.

**Finding 7B**

*The National Ocean Economics Program houses data on ocean resources and economies that is not available elsewhere, and may be used to establish socioeconomic trends in many coastal areas.*

Establishing initial socioeconomic baselines for West Coast coastal communities will provide the foundation for identifying future ocean economic trends. It will identify the states' additional data needs, and indicate to federal agencies (e.g., the Bureau of Labor Statistics) the data required to complete valuable socioeconomic assessments.

### **Sediment Management**

**Finding 7C**

*States have traditionally addressed sediment management on a case-by-case or issue-by-issue basis and have rarely used regional approaches to address the issue.*

All three states have emerging regional sediment management processes moving forward, but thus far no West Coast-wide commitment to regional sediment management.

**Finding 7D**

*Sediment management has implications for the coastal economy.*

In addition to supporting various habitats and marine species, sediment availability and transport are important drivers of the physical appearance and behavior of the coastline. Changes to sediment availability impact beaches, tourism, marina infrastructure, and vessel traffic. Erosion affects critical existing coastal structures, such as jetties. Dredging of ports and harbors may expose toxic sediment, which is difficult to dispose of.

**Actions**

**Working Waterfronts and Sustainable Coastal Economies**

**Action 7.1**

*Support local planning efforts for working waterfronts to promote sustainable fisheries and prioritize coastal dependent businesses and infrastructure through grant processes and federal assistance programs.*

The states endorse innovative coastal-dependent business opportunities for high quality local seafood production and distribution, clean marinas, and waterfronts. To accomplish these activities and move forward effectively, the states will share lessons learned to date on related efforts, and will contact other coastal states to learn about their programs to revitalize waterfronts. This will enable the states to consider a broader set of tools for coastal communities such as the California Fisheries Fund and opportunities for sustainable fishery certification, such as through the Marine Stewardship Council.

*Timeframe:* Initiated within 18 months of release of the final action plan.

**Action 7.2**

*Establish baselines for coastal economies and promote sustainable coastal community development.*

The three states will assist communities with sustainable economic development by collaborating with NOAA to complete a West Coast Coastal and Ocean Economies Baseline and Historic Trends Report using data from the National Ocean Economics Program (NOEP). The report will provide an analysis of the coastal counties' demographics and ocean dependent uses, and will develop the economic indicators for evaluating trends. The Report will also be useful for identifying data gaps in NOEP data necessary for further economic analyses.

*Timeframe:* Initiated within 18 months of release of the final action plan.

## **Regional Sediment Management**

### **Action 7.3**

*Develop regional sediment management plans to maximize beneficial use of sediments (i.e., sand) to protect and maintain critical community economic and environmental infrastructure.*

The states will continue progress on regional sediment planning efforts. The states will partner with the U.S. Army Corps of Engineers to advance regional sediment management efforts by state and federal agencies, including necessary federal policy changes, and will seek investments in these efforts. Specifically, the states will seek improvements to the national dredging policy that support collaborative tri-state efforts to resolve conflict and establish a sustainable regional sediment management plan. On a local level, small ports often have legacy toxic sediments that are expensive to dispose of and, in contrast to larger ports with high tonnage, host a high number of users but not a large amount cargo measured by weight. To facilitate their ability to secure funds for routine dredging, the states encourage revision of the U.S. Army Corps of Engineers' policies to allow alternative forms of criteria. The states will also partner with federal agencies to leverage resources for effectively addressing legacy pollutants.

*Timeframe:* Ongoing. Additional efforts initiated within 18 months of release of the final action plan.

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**Appendix A  
Table of Actions and Timeframes**

<b>Issue and Action #</b>	<b>Action</b>	<b>Activities</b>	<b>Timeframe</b>
<b>Sustained National Support</b>	<i>Encourage the establishment of a national Ocean Trust Fund that would support ocean and coastal management efforts for state and federal government agencies.</i>	<ul style="list-style-type: none"> <li>- Urge the Administration and the California, Oregon, and Washington Congressional delegations to consider establishing a dedicated source of revenues for ocean and coastal management.</li> </ul>	Completed within six months of release of the final action plan.
<b>Facing the Effects of Climate Change</b>	<i>Collaborate on a West Coast-wide assessment of shoreline changes and anticipated impacts to coastal areas and communities due to climate change over the next 30-50 years and work together to develop actions to mitigate and adapt to the impacts of climate change and related hazards.</i>	<ul style="list-style-type: none"> <li>- Engage with academia and local, state, and federal government agencies to model impacts to the West Coast under various likely climate change scenarios.</li> <li>- Agree on the same frame of reference for predicting and responding to shoreline changes from storm surges and sea level rise.</li> <li>- Continue to pursue activities enhancing mitigation and adaptation to climate changes and related coastal hazards.</li> </ul>	Initiated within 18 months of release of the final action plan.
<b>Polluted Runoff</b>			
<b>Action 1.1</b>	<i>Work with the Administration and the U.S. Congress to provide adequate funding for coastal water quality programs to reduce polluted runoff, and enhance monitoring and enforcement of water quality regulations to improve the health of West Coast coastal waters.</i>	<ul style="list-style-type: none"> <li>- Support continued funding for the Coastal Non-point Source Pollution Control Program, Section 319 of the Clean Water Act, and the BEACH Act.</li> <li>- Support reauthorization of the BEACH Act with expansion of allowable uses of funds, such as source identification.</li> <li>- Advocate for continued funding and expansion of the West Coast Estuary Initiative.</li> </ul>	Ongoing.
<b>Action 1.2</b>	<i>Make Low Impact Development (LID) a priority for the West Coast by focusing future grant and incentive programs to state and local governments on this objective.</i>	<ul style="list-style-type: none"> <li>- Examine and share incentive-based programs to support local government efforts for community planning using LID principles.</li> <li>- Collaborate on grant programs and share lessons learned to effectively provide incentives and assistance for communities to pursue activities aimed at reducing the impacts of development in coastal areas.</li> <li>- Coordinate with NOAA and local governments to bring coastal community planning and development training to six</li> </ul>	Initiated within 18 months of release of the final action plan. Training will be conducted by summer 2009.

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		interested West Coast communities (two in each state).	
<b>Harmful Algal Blooms and Hypoxia</b>			
<b>Action 1.3</b>	<i>Exchange information between experts in all three states on management tools and techniques to promote development and operation of predictive capabilities of harmful algal blooms and hypoxia. Support the expansion of ocean observing system monitoring efforts amongst the three states for these purposes.</i>	<ul style="list-style-type: none"> <li>- Explore the development of predictive capabilities for alerting ocean users and resource managers of HAB and hypoxia events by holding a HAB workshop in conjunction with federal partners to reach consensus on the present state-of-knowledge and prioritize the information needed by decision makers to lessen the impacts of the HAB events on humans and critical marine resources.</li> <li>- Improve the general understanding of hypoxic events and their impacts along West Coast by working with federal, state and academic experts to record and track incidences.</li> </ul>	HAB workshop will be held in 2008. Other timelines may be identified in the final action plan.
<b>Marine Debris</b>			
<b>Action 1.4</b>	<i>Establish baseline estimates of marine debris and derelict gear off the West Coast and set reduction goals. Support state and federal policies for achieving marine debris reduction goals.</i>	<ul style="list-style-type: none"> <li>- Agree on baselines established by assessing data collected by clean up programs, state and federal agencies, and nonprofit organizations.</li> <li>- Identify a target reduction level to achieve by various prevention and clean-up measures, and will partner with and pursue resources from the NOAA Marine Debris Prevention and Removal Program.</li> <li>- Share lessons learned from existing and emerging state and federal programs and guidelines to pursue safe and effective debris and gear removal.</li> <li>- Evaluate existing activities such as the annual coastal clean-up day and litter prevention programs in order to effectively expand marine debris reduction activities.</li> </ul>	Initiated within 18 months of release of the final action plan.
<b>Maritime Shipping Emission Controls</b>			
<b>Action 1.5</b>	<i>Urge the International Maritime Organization to adopt the U.S. proposal which sets stringent emission standards for ocean going vessels.</i>	- Work with the U.S. EPA to gain approval for the U.S. proposal to the IMO to set international standards requiring either the use of 0.1% distillate fuels within a certain distance of the coastline and while in port or a range of technologies resulting in equivalent emission reductions.	Work with the U.S. EPA to gain approval of the IMO subcommittee in April 2008.

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<b>Habitat Protection and Restoration</b>			
<b>Action 2.1</b>	<i>Document, describe, and map ecological communities throughout West Coast waters and characterize existing human uses of those areas.</i>	- Continue to build upon the existing knowledge base of ecological communities and develop geographic information systems (GIS) for the entire West Coast. Completing the information databases will require the significant assistance of federal agency, nonprofit, and university partners. The states will also work with fishermen and tribes to identify and characterize habitats.	GIS will be complete by 2012. Other timelines may be identified in the final action plan.
<b>Action 2.2</b>	<i>Restore estuarine habitats, including coastal wetlands, to achieve a net increase in habitat and their function by at least ten percent over the next ten years.</i>	- In cooperation with local, state, and federal agencies, nongovernment entities, and stakeholders, the three states will work to restore estuarine habitats along the West Coast, with a goal of attaining a net increase in habitat and function, by supporting existing restoration programs. - Support the establishment of benchmarks and indicators to evaluate progress.	Ongoing, with benchmarks and ultimate goal reached by 2018.
<b>Marine Invasive Species</b>			
<b>Action 2.3</b>	<i>Focus efforts on eradicating non-native cordgrasses (genus Spartina), which are transported between the three states on ocean currents.</i>	- Prioritize the complete eradication of Spartina cordgrasses along the West Coast and will share strategies and lessons learned for effective removal. - Cooperate on preventing and eradicating other species that affect multiple states, and will prioritize existing and new threats.	Ongoing. Plan for full eradication of Spartina by 2018.
<b>Ecosystem-based Management</b>			
<b>Action 3.1</b>	<i>Examine ongoing community-based efforts using ecosystem management principles in all three states and share lessons learned from these initiatives in order to encourage effective ecosystem-based management efforts across the West Coast.</i>	- Share information on existing community-based EBM projects as part of an information-sharing network across states for effectively putting EBM into practice. This effort will facilitate the exchange of lessons learned and will cultivate local, state, and federal agency coordination for regional-level ecosystem management across the West Coast.	Establish West Coast EBM Network during 2008. Other timelines may be identified in the final action plan.
<b>Action 3.2</b>	<i>Assess physical, biological, chemical, and socio-economic factors in ecosystem health across the West Coast to establish standards and</i>	- Support the development of an integrated ecosystem assessment (IEA) for the West Coast, with the assistance of the federal government.	IEA workshop will be held in fall 2008. Other timelines may be identified in the final action plan.

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	<i>indicators for ocean health.</i>	- In concert with state and federal agencies, local and tribal governments, NGOs, and academia, the states will hold a joint workshop in late 2008 to discuss existing efforts along the West Coast. The workshop will also aim to determine what other information is required (e.g., high resolution remote sensing data, seafloor maps, and ocean observing system data) to advance ecosystem management approaches.	
<b>Action 3.3</b>	<i>Strengthen coordination between the three state representatives on the Pacific Fisheries Management Council.</i>	- The three state representatives on the Pacific Fisheries Management Council will enhance communication and cooperation in support of regional fisheries management as appropriate.	Ongoing.
<b>Offshore Oil and Gas Operations</b>			
<b>Action 4.1</b>	<i>Continue to oppose new oil and gas leasing, development, and production in ocean waters off the West Coast.</i>	- Continue to oppose any proposals by Department of the Interior or legislation under consideration by the U.S. Congress that would facilitate new oil and gas development off the West Coast.	Ongoing.
<b>Alternative Environmentally Sustainable Energy Development</b>			
<b>Action 4.2</b>	<i>Explore the feasibility for offshore alternative ocean energy development and evaluate the potential environmental impacts of these technologies.</i>	<ul style="list-style-type: none"> <li>- Support efforts by the Federal Energy Regulatory Commission (FERC), the Department of Energy (DOE) and the Minerals Management Service (MMS) to coordinate and clarify regulatory processes between state and federal waters.</li> <li>- Collaborate with the FERC, DOE, and MMS to evaluate the potential benefits and impacts of renewable ocean energy projects off the West Coast, as well as developing the long-term regulatory structure for removal or expansion of activities.</li> <li>- Support the collection of baseline environmental, social, and economic information on ocean resources and existing activities that would be affected by offshore development (see Priorities 3 and 6).</li> <li>- The three states and the federal government will host a workshop</li> </ul>	The workshop on offshore energy will be held in early 2008. Other timelines may be identified in the final action plan.

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		<p>in early 2008 to consider the issues surrounding offshore energy development, explore the feasibility of a West Coast-wide approach and consistency of state and federal regulatory programs, and begin drafting a regional plan.</p> <ul style="list-style-type: none"> <li>- Send a letter to SIMOR and, in cooperation with MMS and FERC, to the Department of Energy to pursue federal assistance for the workshop.</li> </ul>	
<b>Ocean Awareness and Literacy</b>			
<b>Action 5.1</b>	<i>Integrate ocean science and conservation into expanded environmental education curricula by encouraging changes to education content standards enhancing ocean literacy.</i>	<ul style="list-style-type: none"> <li>- Explore avenues for creating or expanding K-12 ocean education curriculum in schools and seek opportunities for hands-on educational experiences for children.</li> <li>- Pursue a partnership with the Centers for Ocean Sciences Education Excellence (COSEE), the Southwest Marine/Aquatic Educators Association and Northwest Aquatic and Marine Educators chapters of the National Marine Educators Association (NMEA), the Pacific Education Institute, and others.</li> </ul>	Initiated within 18 months of release of the final action plan.
<b>Action 5.2</b>	<i>Support outreach efforts to decision-makers at all levels and encourage improvement and expansion of volunteer programs such as clean marina initiatives.</i>	<ul style="list-style-type: none"> <li>- Support outreach efforts to decision-makers at all levels</li> <li>- Improve communication between education centers along the West Coast to help expand opportunities for public awareness and citizen science activities.</li> <li>- Request adequate federal funding and expansion of environmental education.</li> </ul>	Initiated within 18 months of release of the final action plan.
<b>Regional Marine Research</b>			
<b>Action 6.1</b>	<i>Support the West Coast Sea Grant regional marine research needs process by identifying funding sources and partners for a sustained approach to ocean and coastal research.</i>	<ul style="list-style-type: none"> <li>- Continue participating in developing a regional ocean and coastal research plan led by the West Coast Sea Grant institutions.</li> <li>- Prioritize and pursue joint efforts to fund regional scientific research projects where pooled resources or coordinated efforts will maximize the return on research investments to benefit all three states.</li> <li>- Work with the four existing ocean observing systems collaborations along the West</li> </ul>	The Sea Grant Regional Research Plan is anticipated for release in Fall 2008. Other timelines may be identified in the final action plan.

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		Coast, federal agencies, and academia to invest in monitoring to address priority issues.	
<b>Sea Floor Mapping</b>			
<b>Action 6.2</b>	<i>Complete a seafloor map of the bathymetry and habitat of all state tidelands and submerged lands out to three miles.</i>	<ul style="list-style-type: none"> <li>- Complete a seafloor map of Pacific Coast waters. Fiscal constraints necessitate federal, academia, and private industry partnerships to move forward.</li> <li>- Set joint standards, agree on common products, define high priority areas, and estimate a timeline for completion.</li> <li>- Communicate the regional need for a comprehensive seafloor map in a joint letter to the Subcommittee on Integrated Management of Ocean Resources (SIMOR) and will encourage the Department of Defense, USGS, NOAA, and other federal agencies to make existing seafloor mapping data accessible and to better coordinate data collection and sharing in state waters through such groups as the Interagency Working Group on Integrated Ocean Mapping.</li> <li>- Ask NOAA to establish seafloor mapping as a programmatic goal and to ensure the states have adequate West Coast-based seafloor mapping resources, including hardware, to support these actions.</li> <li>- Support legislation that would further these goals.</li> </ul>	Complete seafloor map by 2020. Other timelines may be identified in the final action plan.
<b>Working Waterfronts and Sustainable Coastal Economies</b>			
<b>Action 7.1</b>	<i>Support local planning efforts for working waterfronts to promote sustainable fisheries and prioritize coastal dependent businesses and infrastructure through grant processes and federal assistance programs.</i>	<ul style="list-style-type: none"> <li>- Endorse innovative coastal-dependent business opportunities for high quality, local seafood production and distribution, and clean marinas and waterfronts.</li> <li>- Share lessons learned to date on related efforts.</li> <li>- Consider a broader set of tools for coastal communities such as the California Fisheries Fund and opportunities for sustainable fishery certification, such as through the Marine Stewardship Council.</li> </ul>	Initiated within 18 months of release of the final action plan.
<b>Action 7.2</b>	<i>Establish baselines for coastal</i>	- Assist communities with	Initiated within 18

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	<i>economies and promote sustainable coastal community development.</i>	sustainable economic development by collaborating with NOAA to complete a West Coast Coastal and Ocean Economies Baseline and Historic Trends Report using data from the National Ocean Economics Program (NOEP). The report will provide an analysis of the coastal counties' demographics and ocean dependent uses, and will develop the economic indicators for evaluating trends.	months of release of the final action plan.
<b>Regional Sediment Management</b>			
<b>Action 7.3</b>	<i>Develop regional sediment management plans to maximize beneficial use of sediments (i.e., sand) to protect and maintain critical community economic and environmental infrastructure.</i>	<ul style="list-style-type: none"> <li>- Continue progress on regional sediment planning efforts.</li> <li>- Partner with the U.S. Army Corps of Engineers to advance regional sediment management efforts by state and federal agencies, including necessary federal policy changes, and will seek investments in these efforts. Specifically, the states recommend improvements to the national dredging policy that support collaborative tri-state efforts to resolve conflict and establish a sustainable regional sediment management plan.</li> <li>- To facilitate the ability of small ports to secure funds for routine dredging, the states encourage revision of the U.S. Army Corps of Engineers' policies to allow alternative forms of criteria.</li> <li>- Partner with federal agencies to leverage resources for effectively addressing legacy pollutants.</li> </ul>	Ongoing. Additional efforts initiated within 18 months of release of the final action plan.