WEST COAST GOVERNORS' AGREEMENT on OCEAN HEALTH

WASHINGTON OREGON CALIFORNIA

Action Plan

THE OFFICE OF THE GOVERNORS
WASHINGTON, OREGON, AND CALIFORNIA

West Coast Governors' Agreement on Ocean Health Action Plan

Washington Governor Gregoire
Oregon Governor Kulongoski
California Governor Schwarzenegger

May 2008

May 2008

Dear West Coast citizens:

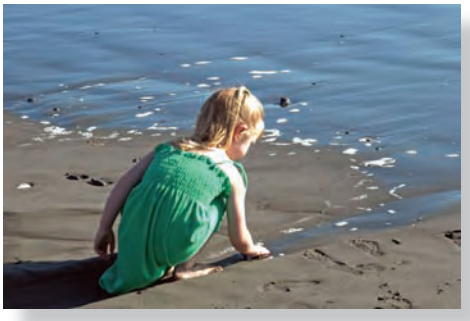
Waves on Ruby Beach
Photo Credit: Janet Lamont

Washington, Oregon, and California are linked in many ways: through the California Current large marine ecosystem, through the ships that travel between our ports, and through our economic dependence on fisheries and other resources that migrate along the West Coast. On September 18, 2006, we launched a regional collaboration to protect and manage the ocean and coastal resources along the entire West Coast of the United States. The *West Coast Governors' Agreement on Ocean Health* recognizes that Washington, Oregon, and California can achieve more by working together on issues important to all of us.

This plan sets out an ambitious vision for the health of our West Coast coastal and ocean resources, including clean coastal waters and economically and environmentally sustainable coastal communities. The plan contains specific actions that will help us achieve this vision. However, we recognize that we can't achieve this vision alone – we will need the assistance of the U.S. Congress, federal government, local governments, tribes, nongovernmental organizations, universities, and every citizen.

We are committed to accountability and have laid out timeframes for completion of each of the actions. We will regularly provide updates to the public, including a status report at the end of the first year of implementing our plan.

We encourage you to be involved with the activities of the *West Coast Governors' Agreement on Ocean Health*. Whether you make a living off the ocean and coast, you participate in annual coastal clean-up days, or you visit one of the spectacular aquariums on the West Coast, you are contributing to the vision of the *West Coast Governors' Agreement on Ocean Health*.



Child playing in the sand
Photo Credit: Janet Lamont

Sincerely,

Christine O. Gregoire
Governor of Washington

Theodore R. Kulongoski
Governor of Oregon

Arnold Schwarzenegger
Governor of California

Acknowledgments

The completion of the action plan would not have been possible without the dedication of a number of individuals across the three states.

Tidepooling
Photo Credit: Janet Lamont

In Washington:
Kathleen Drew, Washington Office of the Governor
Jennifer Hennessey, Washington Department of Ecology
Brian Lynn, Washington Department of Ecology
Washington State Ocean Caucus

In Oregon:
Jessica Hamilton, Oregon Office of the Governor
Oregon Ocean Policy Advisory Council

In California:
Brian Baird, California Resources Agency
Amy Boone, California Resources Agency
Valerie Termini, California State Coastal Conservancy
California Ocean Protection Council
California Ocean Science Trust

The states appreciate the support of the following colleagues:

Rebecca Pollock, National Oceanic and Atmospheric Administration (NOAA) Coastal Services Center
Rebecca Smyth, NOAA Coastal Services Center
Gabriela Goldfarb, Goldfarb Consulting

The feedback provided by the co-leads of the Federal Working Group* and their staff was also indispensable:

Usha Varanasi, Department of Commerce,
NOAA National Marine Fisheries Service
Tom Hom, Department of Commerce,
NOAA National Marine Fisheries Service
Fred Piltz, Department of the Interior,
Minerals Management Service
Alexis Strauss, U.S. Environmental Protection Agency, Region IX
Dan Pingaro, U.S. Environmental Protection Agency, Region IX

*Appendix B identifies participating agencies in the Federal Working Group

The F/V Moxie fishing at Port Orford Reef, OR
Photo Credit: Oregon Department of Fish and Wildlife

Finally, the states appreciate the time and support provided by Gerhard Kuska and James Connaughton at the White House Council on Environmental Quality.

Left watermark photo credit: Becky Stamski
Right watermark photo credit: Janet Lamont

Table of Contents

Aerial of Washington coast
Photo Credit: Olympic Coast National Marine Sanctuary

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*.

This action plan guides that partnership by recommending regionally significant actions to address issues common to all three states. These actions will be initiated within 18 months of the plan's release, and many will be completed in that time. The states will convene in 2008 to launch major activities.

Stinson Beach
Photo Credit: Philip H. Coblentz

The plan's actions include the following:

Create a National-Level Commitment to the Ocean: Urge the federal government to establish a national ocean trust fund with sufficient funds to support state and federal actions. This was the primary recommendation of the U.S. Commission on Ocean Policy and Pew Oceans Commission.

Mitigate and Adapt to Climate Change: Conduct a West Coast-wide assessment of anticipated impacts of climate change over the next several decades and set a plan for how to adapt to such changes.

Ensure Clean Coastal Waters and Beaches: Launch a West Coast-wide effort to address coastal water quality concerns by urging the federal government to fully fund polluted runoff programs; reducing polluted runoff through a variety of methods, including low impact development; developing predictive capabilities for harmful algal blooms and hypoxia events; reducing and preventing marine debris; and improving our ability to prevent and respond to oil spills.

Improve Coastal Air Quality: Press the International Maritime Organization (IMO) to adopt low sulfur fuel standards for vessels transiting the West Coast. These emissions contribute not only to air pollution, but also to the pollution of our coastal waters through deposition. The states will consider establishing a low sulfur control area under existing authority if the IMO process is not timely.

Poppies
Photo Credit: CA Dept. of Water Resources

Protect a Healthy Ocean and Coastal Habitats: Protect the health of coastal and ocean habitats by mapping ecological communities and human uses and identifying areas that will benefit from conservation measures; restoring estuarine habitats, including coastal wetlands, to achieve a net increase in habitats and their functions; and preventing establishment of non-native species by reducing pathways of introduction.

Implement Ecosystem-Based Management: Manage on an ecosystem-level by assessing the health of coastal and marine ecosystems and establishing strong standards and indicators for continued evaluation; sharing lessons, approaches, and tools; strengthening coordination among the three states and their representatives on the Pacific Fishery Management Council; and urging protection of species at the base of the food web, such as krill, that support the health and functioning of marine ecosystems.

Reduce Impacts of Offshore Energy Development: Ensure that offshore energy development is environmentally sustainable by opposing all new offshore oil and gas leasing, development, and production; evaluating the benefits and impacts of renewable ocean energy development; and developing a consistent state and federal regulatory approach.

Promote Citizen Ocean Awareness and Literacy: Improve ocean stewardship by integrating ocean science and conservation into environmental education curricula; and supporting public ocean awareness efforts and outreach to decision-makers at all levels.

Expand Ocean and Coastal Scientific Information, Research, and Monitoring: Advance scientific understanding of the ocean and coast by developing a regional research agenda; seeking federal support to fill marine research needs; urging full federal support for the long-term maintenance of ocean observing systems and monitoring assets; and completing a comprehensive seafloor map of all state waters of the West Coast.

Raft River
Photo Credit: Fred Sharpe

Work for Sustainable Coastal Communities: Help coastal communities become economically and environmentally sustainable by supporting working waterfronts through grant processes and federal assistance programs; ensuring adequate public access to working waterfronts and revitalizing waterfront communities; identifying the current economic conditions of coastal communities; and developing regional sediment management plans to increase beneficial use of sediment in an environmentally sensitive manner.

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 that they believe will be more effectively addressed through the collective effort of all three states. 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, a "healthy ocean" means that marine, coastal, and estuarine ecosystems, the watersheds that drain into these waters, the plant and animal communities therein, and the physical, chemical, and biological processes involved are diverse and functioning, and the economies and people dependent on them are thriving. A healthy ocean provides aesthetic, cultural, and recreational values. It also supports the character and quality of life of coastal communities and a vibrant, sustainable economy. 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 identified a global crisis of the oceans and an urgent need to act immediately. In their reports, they stressed 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 interconnected 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 all three states.

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

History of the Agreement

In addition to setting seven priority areas, the agreement also defined four immediate actions for the states to undertake together. These actions included:

Driftwood on a foggy beach
Photo Credit: Olympic Coast National Marine Sanctuary

- 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
- 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 addition to the four immediate actions above, the states committed to the development of a plan with specific actions to address the seven priority areas. 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 after close consideration of those public comments. Comments were conveyed 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 incorporating public comment, the plan was developed with the support of technical advisory teams made up of experts representing every state. The teams 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). Appendix B identifies the participants in the Federal Working Group. With the feedback of these federal partners, the states selected and refined actions that will be initiated within 18 months after the action plan's release.

Coastal community
Photo Credit: CA Dept. of Water Resources

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. Crosscutting themes, particularly for research and monitoring needs, are highlighted in text boxes. A vision statement, goals, and action summary are defined for each priority area, accompanied by an overview of the issues encompassed by the priority. An analysis of how each state (with the assistance of the federal government) is presently approaching the issues is provided, and specific findings of need or fact are described. Each section provides 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 the fact that many of the actions are requisites for supporting components of other actions. For example, the completion of seafloor maps for the West Coast (Priority Area 6) and a comprehensive geographic information system (GIS) characterizing habitat and human uses (Priority Area 2) will help establish baseline ocean health indicators (Priority Area 3) that are necessary for a better understanding of the status of West Coast ecosystems (Priority Area 6) and how they will respond to the impacts of climate change (Overarching Action 1).

Waves at Cape Perpetua
Photo Credit: John Meyer

Putting the Plan into Action

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 to accomplish the goals. In addition, the states will evaluate their programs and resources necessary to implement the actions in the plan.

The actions identified in this plan will be initiated over the next 18 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 a convening of *West Coast Governors' Agreement on Ocean Health* implementation partners, to be jointly held by the states and federal partners in 2008. The states will regularly provide updates to the public on the progress of implementing the action plan and will publish annual status reports.

The three states are aware that many actions identified in the plan will accomplish multiple objectives. In addition to crosscutting efforts already recognized, overlapping solutions will become evident during implementation activities. Communication and coordination between the states and partners are paramount to success. Various workgroups will need to collaborate to avoid redundancies and recognize efficiencies.

Finally, it is critical that the initiatives undertaken to implement the action plan are closely coordinated with the three states' coastal management programs and water, fish, and wildlife resource management agencies throughout the implementation process. Many of the actions identified will be most effectively implemented only with the participation of these programs.

Pacific Grove painter, Monterey Peninsula
Photo Credit: Robert Holmes/CalTour

Potential Partners

Washington, Oregon, and California look forward to collaborating with many entities to successfully carry out activities identified in the action plan. Potential partners that may have specific interests in implementation activities include the following:

- Tribal communities
- Local government agencies
- State coastal programs and resource management agencies
- Federal government agencies
- National Estuary Programs
- National Estuarine Research Reserves
- National Marine Sanctuaries and other marine parks, reserves, and monuments
- Ocean observing system Regional Associations and the

Pacific Coast Ocean Observing System
- Other nongovernmental organizations
- Universities and academia
- Public citizens and interested stakeholders
- Marine industries and businesses (e.g., shipping, fishermen, shellfish growers, ports, etc.)
- Members of the private sector

The states acknowledge that this is not an exhaustive inventory of those who may support the action plan. Convening in 2008 will provide the states an opportunity to create a comprehensive list of partners that will work together to implement the action plan.

Venice Beach, swimmers
Photo Credit: Robert Holmes/CalTour

Overarching Action 1: A Call for Sustained National Support

The U.S. Commission on Ocean Policy, Pew Oceans Commission, and the Joint Ocean Commission Initiative all 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, ongoing 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.

Sandy river mouth
Photo Credit: Fred Sharpe

Therefore, the West Coast Governors call for the 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 Washington, Oregon, and California 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 that do not require new taxes and outlined ways to allocate funds to the states and to federal ocean agencies.

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

Overarching Action 2: Preparing for the Effects of Climate Change

Memorial Lighthouse, Trinidad
Photo Credit: Robert Holmes/CalTour

The three states recognize the inevitability of impacts on ocean and coastal resources from climate variations and long-term climate changes. Climate change results in changes in storm activity and sea level, which alter the shoreline. It also influences ocean currents, upwelling, water temperature and chemistry, and ecosystem stability. Climate effects will impact marine species distributions and abundances from kelp forests to marine mammals to plankton species at the base of the food chain. In addition to global warming, the release of carbon dioxide to the atmosphere leads to ocean acidification, which has the potential to dissolve the shells of some marine organisms or reduce their ability to form shells. As a result, ocean acidification can result in the death of or injury to marine life. The impacts of climate change 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 focus initial efforts, in collaboration with the federal government, on a West Coast-wide assessment of shoreline changes and anticipated impacts to coastal areas and communities due to climate change over the next several decades, and work together to develop actions to mitigate and adapt to the impacts of climate change and related coastal hazards.*

To model impacts to the West Coast under various likely climate change scenarios, the states will engage with academia,

nongovernmental entities, local, state, and federal government agencies, and the private sector, and will use the same frames of reference [1] for predicting and responding to shoreline changes from storm surges and sea level rise. In addition, the states will continue to develop climate scenarios of the likelihood and severity of changes in factors such as precipitation, average temperatures, and number of extreme heat days. To conduct the West Coast-wide assessment, the states will align their methodologies and tools to facilitate information exchanges across the region.

Timeframe: Initiated within 12 months of release of the final action plan.

Sonoma County, beach at the mouth of the Russian River
Photo Credit: Robert Holmes/CalTour

1 That is, models appropriate for providing inputs and assessing regional climate changes, and scenarios published for greenhouse gas emissions.

Priority Area 1: Ensure Clean Coastal Waters and Beaches

Action Summary ☆

Washington, Oregon, and California will launch a West Coast-wide effort to address coastal water quality concerns through the following actions:

- **Urge the federal government to fully fund polluted runoff programs.**
- **Reduce polluted runoff through a variety of methods, including low impact development.**
- **Develop predictive capabilities for harmful algal blooms and hypoxia events.**
- **Reduce and prevent marine debris by augmenting clean-up and removal efforts, expanding recycling programs, enforcing litter laws, and increasing public education and outreach.**
- **Improve our ability to prevent and respond to oil spills.**
- **Seek low sulfur fuel standards for marine shipping to improve coastal air quality (emissions contribute to water pollution).**

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 stormwater from coastal landscapes into the ocean. Chemicals and pharmaceuticals in treated waste are discharged into rivers, estuaries, and the sea. Metals from vehicle exhaust are found in stormwater runoff that ultimately reaches the ocean. 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.

In recognition of the importance of several key West Coast estuaries, the National Estuary Program established six programs along the West Coast: Puget Sound, lower Columbia River, Tillamook Bay, Morro Bay, San Francisco Bay, and Santa Monica Bay. Furthermore, in 2006, U.S. EPA designated Puget Sound and the Columbia River Basin as two of seven Great Water Bodies in the country. Despite these critical designations as national treasures, poor water quality plagues many areas of the West Coast.

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 changes to ocean circulation and upwelling, as well as excess nutrients from human activities. 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 in humans and illness and death in marine species. Just one harmful bloom event can cost millions of dollars to local coastal economies. According to the Oregon Department of Fish and Wildlife, a 2003 razor clam closure at Clatsop Beach caused by domoic acid (a HAB toxin) cost the local communities $4.8 million.

Vision

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.

Goals

- **Improve coastal water quality by reducing water pollution through better stormwater management, pollution source detection and reduction, and other strategies to reduce polluted runoff.**
- **Decrease the number of beach/coastal closure days and reduce the area affected by these closures over time.**
- **Prevent future oil spills from vessel traffic and oil transfer operations, and improve spill response efforts to avoid environmental damage.**

Coastal economies are also affected by oil transportation, the benefits, risks, and impacts of which are shared by the three states. All three states meet a great part of their energy needs through shipping of Alaska North Slope crude oil from the Trans-Alaska Pipeline System. California and Washington both have large refinery complexes that convert crude oil to refined products. Massive quantities of crude oil are shipped both through the Strait of Juan de Fuca and through the coastal zones of all three states as the oil is transported to refinery ports. As a result, the three states have mandates to protect environmental, cultural, and economic resources from oil spills.

Oceangoing vessels can also be sources of air pollution and can contribute to nonpoint source pollution along the shore. Emissions from large vessels transiting the coast and activities in ports and harbors are a growing concern for the three states. Air pollution can influence water quality, since air pollutants enter coastal rivers and the ocean from rain. In addition, significant local impacts to water quality can occur in and near marinas because of 1) the congregation of recreational and commercial boats at marinas, 2) the activities that often occur at marinas, and 3) the physical location of marinas in and near the water (often located in sheltered areas with limited water movement or flushing). 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. The main sources are developed areas, marinas, air pollution, agriculture, forestry practices, modification of shorelines and streams, and degradation of wetlands and other vegetated coastal habitats.

Low Impact Development

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

To various degrees, the states are seeking to address these issues through the Coastal Nonpoint Source Pollution Control Program (Section 6217 of the Coastal Zone Act Reauthorization Amendments), the Nonpoint Source Management Program, and the stormwater National Pollutant Discharge Elimination System permit program (Sections 319 and 402(p) of the Clean Water Act, respectively). One approach to successfully manage stormwater is to implement low impact development (LID) measures. LID is a method of land development and redevelopment 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. These efforts must be expanded to successfully reduce polluted runoff in growing urban areas.

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 underfunded. Incompatible data collection formats contribute to a general time lag in reporting data and synthesizing findings.

Harmful Algal Blooms and Hypoxia

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

Resource managers and public health officials may lack the data to form 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

To address the increasing incidence of HABs along the nation's coastline, NOAA, EPA, and the National Aeronautics and Space Administration (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. In Oregon, NOAA works with local partners to research the oceanographic conditions that contribute to toxic algae blooms as well as the role that upwelling plays in the population dynamics of HAB species in the state's coastal waters.

In addition to these programs, which 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.

Crab pots and garbage collected in the Olympic Coast Cleanup
Photo Credit: Rich Littleton

Marine Debris

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 from Puget Sound over 1,245 derelict crab pots and more than 600 derelict fishing nets covering approximately 170 acres of marine habitat. 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.

An estimated 3,900 derelict nets and as many as 14,000 derelict crab pots remain in Puget Sound and the Straits of Juan de Fuca. 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.

Pacific white-sided dolphin
Photo Credit: Michael Richlen

In Oregon, the Department of Fish and Wildlife in partnership with the 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 committee will release a report on recommended policy changes to implement the resolution by spring 2008. In addition, the OPC funded a pilot derelict gear removal program in the Channel Islands that removed 10 tons of fishing gear, and is considering expanding that program.

Also this year, NOAA formally created a marine debris program and increased funding dedicated to research and removal. Pursuant to the Marine Debris Research, Prevention and Reduction Act, NOAA maintains a clearinghouse of information on debris location and source identification.

Oil Spills

At present, the three states' response to oil spills operates under two different Regional Response Plans. Washington must consider the potential for international impacts with Canada, and California must consider transboundary impacts with Mexico. To bridge gaps between these two plans, the Pacific States/British Columbia Oil Spill Task Force has established a management framework, sets oil spill priorities, and adopts annual work plans. The three West Coast states actively participate in the forum, which also includes Hawaii, Alaska, and British Columbia.

Oil slick from the 2005 Milky Way spill
Photo Credit: Barbara Blackie

The task force developed a strategic plan for 2004-2009 and a working annual plan for 2007. The Governors recognize and support the task force's efforts, which include the following:

- Determining spill trends and causes through the use of a regional database
- Preventing spills during transfers of bulk cargo or fuel oil, spills from sunken vessels, and waste oil dumping
- Improving operating standards on tank barges and of salvage and rescue capabilities
- Reviewing the implementation status of the West Coast Offshore Vessel Traffic Risk Management Project recommendations
- Ensuring timely and effective responses to requests for places of refuge
- Demonstrating oil spill response capabilities in transboundary areas
- Improving preparedness and response to non-tank vessel spills
- Improving oiled wildlife care

Vessel Emissions

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, the region could achieve major decreases in emissions associated with adverse health impacts. 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 oceangoing vessels beyond those initially set out by Annex VI.

Green Ports and Clean Marinas

Air and water quality at ports and marinas are also addressed in *Priority Area 7* through Green Ports and Clean Marinas programs. Boater education for best practices at marinas is incorporated in *Priority Area 5*.

Findings

Water Quality

Finding 1A

Stormwater and nonpoint sources of pollution, or polluted runoff, are the most significant sources of water pollution along the West Coast, impairing marine life in estuaries, bays, and nearshore waters.

Measuring water quality samples
Photo Credit: Janet Lamont

Although systems to address polluted runoff have been in place for years, a renewed commitment among federal, state, and 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 (Section 6217 of the Coastal Zone Act Reauthorization Amendments). The Governors are pleased to see that Congress provided $3.9 million in the fiscal year 2008 omnibus spending bill (up from $0 the prior fiscal year) and hope the President's budget request for fiscal year 2009 includes continued and expanded support up to the $10 million dollars that the Governors requested for this program. The states will continue to advocate for secured federal funding sources to address polluted runoff, including greater funding for the Nonpoint Source Management Program, the stormwater National Pollutant Discharge Elimination System permit program (Sections 319 and 402(p) 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.

Seattle waterfront
Photo Credit: Hugh Shipman

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

Polluted runoff can be reduced using low impact development (LID) strategies that 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. The Puget Sound Partnership and the Lower Columbia River Estuary Partnership have done extensive work supporting LID. For example, the latter has assisted communities in reviewing codes and ordinances to improve stormwater management and permit compliance. They maintain a website with local examples of stormwater techniques and specific technical information. The California Ocean Protection Council initiated a review of LID

application in other states and the policies and barriers affecting the use of LID strategies in California, which is expected to be complete in the spring of 2008.

Harmful Algal Blooms 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 are also necessary to understand the connection between the increasing occurrence of hypoxia events, nutrient pollution, and climate change.*

Hypoxia measuring equipment is deployed
Photo Credit: Olympic Coast National Marine Sanctuary

With advance notice of HAB and hypoxia 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 2007, a massive HAB event occurred along the central and southern California coast, caused by the diatom *Pseudo-nitzschia*. The state monitoring program detected 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.

Existing programs conduct research and provide critical monitoring data. 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.

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.

Derelict Gear Prevention

Employing the assistance of fishermen and other industry experts may help prevent derelict gear. Debris location and source identification could be included in regional and cooperative fishery research programs (see *Finding 6A*), as well as mapping programs *(Priority Area 6)*.

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 encompasses the California Current on its eastern boundary. Preliminary data from the Algalita Marine Research Foundation show a five-fold increase in the last 10 years. There is currently no method for removing the estimated 3.5 million tons of plastic debris in the gyre. It is now believed that most 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. Not only is it expensive for fishermen to replace gear that they have lost at sea, but lost or abandoned gear can have an economic impact on fisheries. In Puget Sound alone, the Northwest Straits Commission estimates that derelict crab pots may be killing more than 740,000 pounds of Dungeness crab per year worth approximately $1.2 million. This loss represents approximately 30% to 40% of the average annual commercial catch of Dungeness crab in Puget Sound that has ranged from 1.8 to 2.3 million pounds per year in recent years[2]. Marine debris and derelict gear create a visual blight on the coast, represent a threat to populations of marine fish, wildlife, and coastal and ocean-dependent economies, and in certain circumstances, may pose a public health threat.

Tanker
Photo Credit: Olympic Coast National Marine Sanctuary

Oil Spill Prevention and Response

Finding 1E

Programmatic improvements to oil spill prevention and response efforts are needed. Agencies and industry must work together to prevent oil spills, responding aggressively and appropriately when they occur.

The November 8, 2007, oil spill from the container ship *Cosco Busan* in San Francisco Bay illustrated that large spills are not always from oil tankers. As West Coast ports receive more goods from Pacific Rim trade, large ships with great amounts of fuel will continue to threaten the shore with oil spills. When considered with the spill potential originating from barges containing millions of gallons of oil being towed offshore, there is an omnipresent need for vigilance in oil spill prevention. The ability to respond rapidly and effectively to releases when they occur is critical for protecting marine habitat and

2 Northwest Straits Commission. 2007. A Cost-Benefit Analysis of Derelict Fishing Gear in Puget Sound, Washington. *Report by Natural Resource Consultants, Inc*. Seattle, WA.

lessening impacts to wildlife and to access and use of waterways and the shoreline.

Several studies have documented that the West Coast has inadequate vessel salvage and ship rescue capability. Washington State dedicated significant time researching the need for an emergency rescue and salvage tug at the west end of the Strait of Juan de Fuca. The state-funded rescue tug *Gladiator* was recently dispatched and provided the necessary safety escort for a disabled container ship that was struck by a large ocean swell. The Coast Guard directed the ship to obtain a tug escort before proceeding into the Strait of Juan de Fuca.

The West Coast states are each deploying surface current mapping technologies which, in addition to providing real-time oil spill data movements, create predictive capability by forecasting trajectories. These technologies and their benefits have been validated by state and federal agencies both in simulated oil spill exercises and in the *Cosco Busan* incident.

Mapping Surface Currents

Data collected by ocean observing systems, including surface currents, are discussed in *Priority Area 6*.

Air Quality and Aerial Deposition

Finding 1F

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.

Emissions from oceangoing 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 20 years. By 2030, the U.S. EPA estimates that out of all U.S. mobile emission sources, oceangoing 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.

Common murres
Photo Credit: Mary Sue Brancato

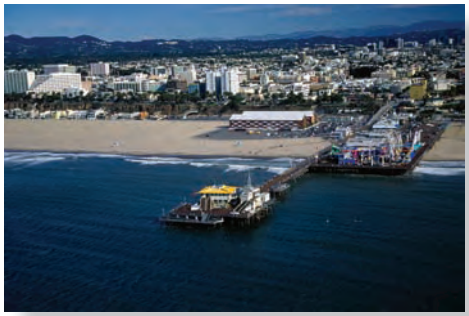
The U.S. government recently submitted a proposal to the IMO that would set much more stringent standards for particulate matter, nitrogen oxides, and sulfur oxides. The U.S. proposal is a flexible approach requiring the use of 0.1% distillate fuels within a certain distance of the coastline and while 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 the Governors prefer an international solution through the IMO process, they 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 government's 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 full 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.*



Community along California coast
Photo Credit: CA Dept of Water Resources

Enhancing monitoring and enforcement of state and federal water quality laws requires continued funding for the Coastal Nonpoint Source Pollution Control Program (Section 6217 of the Coastal Zone Act Reauthorization Amendments), the Nonpoint Source Management Program, the stormwater National Pollutant Discharge Elimination System permit program (Sections 319 and 402(p) of the Clean Water Act, respectively), and the BEACH Act. Specifically, the states support reauthorization of the BEACH Act with sufficient funding and 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. Other programs relevant to managing or mitigating polluted runoff include the Coastal Zone Management Act coastal enhancement grants, land acquisition programs such as NOAA's Coastal and Estuarine Land Conservation Program, and U.S. Department of Agriculture-funded programs to reduce agricultural erosion and runoff.

Timeframe: Ongoing. Additional efforts will be initiated within six months of release of the final action plan.

Action 1.2

Combat polluted runoff through a variety of methods including low impact development (LID) and sharing strategies employed for existing and planned incentive programs to state and local governments on this objective.

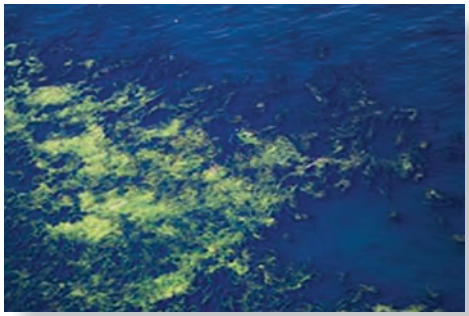
Mouth of the Copalis River
Photo Credit: Olympic Coast National Marine Sanctuary

Numerous government and private efforts to reduce polluted runoff are ongoing. For example, some communities currently use treatment systems to clean stormwater before it is discharged to the ocean. This can effectively remove some pollutants, but others remain untreated. LID may be able to prevent the entry of some pollutants into the watershed by allowing stormwater to penetrate the ground. The states will examine incentive-based programs that encourage local governments to use LID strategies in community planning. 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 and redevelopment in coastal areas. The states will work with the American Planning Association and state and local planning agencies to accomplish this objective, and will support the incorporation of LID and climate change impacts into local coastal plans.

In addition, 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



Algal bloom seen from above
Photo Credit: Olympic Coast National Marine Sanctuary

Action 1.3

Exchange information among 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 among 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 the West Coast by working with federal, state, and academic experts to record and track incidences.

Timeframe: HAB workshop will be held in 2008.

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, including debris prevention through expanded recycling, improved trash maintenance, public education, and enforcement of litter laws.

Marine Debris on the beach
Photo Credit: Craig Shuman

The states will identify marine debris 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 coastal 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 and identify ways to effectively expand marine debris reduction efforts.

Several recent initiatives across the West Coast have called for a significant reduction in marine debris and the institution of prevention measures. Based on the efforts of existing committees and programs, the states will work together to pursue improvements in public sanitation and maintenance, increased public education and outreach to fishing industries, enforcement of litter laws, and the expansion of recycling programs for plastic materials and fishing line and nets.

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

Oil Spill Prevention and Response

Action 1.5

★ *Ensure adequate oil spill prevention, preparedness, and response capabilities on the West Coast and enhance federal and state collaboration. Develop additional capacity for rescue and salvage operations.*

Coast Guard helicopter responds to oil spill
Photo Credit: Katie Brenkman

The three states will renew their commitment to adequate oil spill prevention, preparedness, and response capabilities through the policy coordination framework, priorities, and work plans developed by the Pacific States/British Columbia Oil Spill Task Force. The Task Force 2004-2009 Strategic Plan sets forth ambitious goals for oil spill prevention, preparedness, and response. The three states have signed an oil spill memorandum of cooperation to work on these issues together and to renew their commitment to support oil spill prevention and response efforts initiated through the task force.

The states agree to work together to help state agencies seek delegated authority from the U.S. Coast Guard to share responsibilities for vessel and oil transfer facility inspections and plan reviews. Where specifically qualified and where resources allow, state agencies will augment and support U.S. Coast Guard forces by providing additional inspections and oversight of routine and higher risk operations that can lead to oil spills. This will reduce the risk of oil spills by increasing the awareness and compliance by vessel and facility operators, and will foster collaborative inspection efforts where agencies have concurrent jurisdiction or interests.

The states also encourage the U.S. Coast Guard to adopt the effective salvage and firefighting rules that have been in process for 15 years.

Further, the states urge the development of additional West Coast rescue and salvage capabilities in areas where Pacific Rim shipping activities place highly sensitive coastal areas at risk from oil spills.

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

Maritime Shipping Emission Controls

Action 1.6

Urge the International Maritime Organization (IMO) to adopt the U.S. proposal which sets stringent emission standards for oceangoing vessels.

Commercial ship on Washington coast
Photo Credit: Olympic Coast National Marine Sanctuary

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 ships use either 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 states recognize that the IMO process may take a significant period of time and may not result in a timely resolution to the issue. Based on the progress of the lengthy IMO process, the states will consider establishing the sulfur emissions control area under the authority of the existing treaty as soon as the U.S. ratifies it.

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

Action Summary ★

Washington, Oregon, and California will protect healthy ocean and coastal habitats through the following actions:

- **Characterize coastal and marine habitats in a comprehensive geographic database.**
- **Identify key habitats that could benefit from additional or innovative coastal habitat conservation.**
- **Restore coastal and estuarine communities to increase habitat and their function.**
- **Prevent future establishment of non-native species by reducing pathways of introduction.**
- **Eradicate non-native cordgrasses (genus *Spartina*).**

Issue

Pacific Coast ecosystems contain many unique habitats, such as the rocky intertidal zone, estuaries, and nearshore 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, offshore 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 marine 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 and water temperature, chemistry, 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 recreational 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[3].

Vision

Estuarine, marine, and coastal habitats are ecologically healthy and allow for public enjoyment and sustainable use.

3 Pimentel, D., L. Lach, R. Zuniga, and D. Morrison. 2000. "Environmental and Economic Costs of Nonindigenous Species in the United States." *Bioscience* 50:53-65.

Goals

- **Identify key habitats to protect and restore along the West Coast.**
- **Restore estuarine habitats and their function.**
- **Eradicate invasive *Spartina* cordgrasses coast-wide.**

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 European green crab (*Carcinus maenas*), Chinese mitten crab (*Eriocheir sinensis*), quagga and zebra mussels (genus *Dreissena*), cordgrasses (genus *Spartina*), and *Caulerpa taxifolia*. The 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 various 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. For example, 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. Coast-wide eradication efforts could substantially reduce or eliminate *Spartina* and will provide lessons for eradicating other invasive species.

Forage Species

The importance of protecting forage species such as krill, sardines, herring, and smelts that are prey for marine life higher in the food chain is also highlighted in *Priority Area 3*.

The principal 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, 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 that are more comprehensive than federal requirements. These include unified regulations (with some variations) regarding the exchange of ballast water for vessels traveling between domestic ports. 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.

Aquatic Invasive Species

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

Findings

Key Regional Habitats

Finding 2A

The identification of key marine and estuarine 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 that 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. Characterization would support ecosystem-level policies for maintaining healthy populations of species with critical ecological roles.

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 Area 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, 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.

Researcher sorts invasive species samples
Photo Credit: Olympic Coast
National Marine Sanctuary

Marine Invasive Species

Finding 2C

The battle to eradicate marine invasive species can no longer be fought effectively state by state since shared waters circulate along the entire West Coast.

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[4] 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 successes in eradication in some areas present an opportunity for the states to implement a successful West Coast-wide eradication effort.*

4 Howard, V., M. Pfauth, M. Sytsma, and 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.

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, Willapa Bay, 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, as well as Boundary Bay and the Frazer River delta in British Columbia.

European green crabs are an invasive species in Washington waters
Photo Credit: Oregon Sea Grant

Actions

Habitat Protection and Restoration

Action 2.1

★ *Document, describe, and map marine and estuarine ecological communities throughout West Coast waters, characterize existing human uses of those areas, and establish measures to ensure effective habitat protection.*

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 (see Priority Area 6) 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. The states will identify key habitats that could benefit from additional or innovative coastal habitat conservation.

Timeframe: The GIS database, with key human uses and habitat data, will be in place by 2012. Seafloor mapping will be added to the database on an ongoing basis and completed by 2020.

Cooperative Research

Seafloor mapping and cooperative research with academia and ocean users such as fishermen and tribes are also referred to in Priority Area 6.

Action 2.2

Restore estuarine habitats, including coastal wetlands, to achieve a net increase in habitat and their function by at least 10% over the next 10 years.

In cooperation with local, state, and federal agencies, nongovernmental 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.

San Francisco, Golden Gate Bridge with ship
Photo Credit: Robert Holmes/CalTour

Marine Invasive Species

Action 2.3

Prevent the future introduction of marine invasive species.

The states will support the efforts of the Pacific Ballast Water Group and existing state teams to coordinate their ballast water policies. They will cooperate to prevent the spread of invasive species by reducing pathways of introduction such as ballast water, vessel hulls of commercial ships and recreational boats, and boat trailers traveling across state boundaries.

Timeframe: Ongoing.

Action 2.4

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

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. While the states recognize that other invaders are problematic, progress is being made with Spartina removal and eradication is possible. The states will set priorities for eradicating other existing and new threats that affect the three states.

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

Conducting a plankton tow for invasive species
Photo Credit: Olympic Coast
National Marine Sanctuary

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

Action Summary ★

Washington, Oregon, and California will support the implementation of ecosystem-based management through the following actions:

- **Share lessons, approaches, and tools to manage resources on an ecosystem level.**
- **Assess the health of coastal and marine ecosystems and establishing strong standards and indicators for continued evaluation.**
- **Strengthen coordination among the three states and their representatives on the Pacific Fishery Management Council and supporting jointly agreed upon measures.**
- **Urge protection of species at the base of the food web, such as krill, that support the health and functioning of marine ecosystems.**

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 boundaries while acknowledging political

Vision

A healthy, thriving, and resilient marine and coastal ecosystem along the entire West Coast that supports a range of human activities

borders. 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 help define problems, incorporate scientific, social, and economic 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 now 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 northeastern 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 supported by a diversity of habitats relied upon by wildlife, and produces a range of 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 on following page), are needed to identify how human and natural factors change the ecosystem and what results different 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.

Efforts are presently underway to support various aspects of putting EBM into practice. For example, the California Current EBM Initiative is working to advance the science needed for EBM along the West Coast by evaluating and preparing the scientific information required to support effective implementation. However, to date, the laws and

Goals

- **Promote a strong foundation of knowledge for ecosystem-based management using indicators of health.**
- **Strengthen coastal communities' ability to engage in ecosystem-based management initiatives.**

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 on-line 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.

West Coast Integrated Ecosystem Assessments

NOAA is currently beginning 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. NOAA is also embarking on an IEA along the entire California Current to connect geographically specific efforts. A variety of other areas along the West Coast, including the Columbia River estuary, San Francisco Bay, Monterey Bay and Southern California, face a similar array of complex issues. IEAs may provide baseline information and indicators to assess future changes to the ecosystem.

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 below).

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

The Humboldt Bay Ecosystem Program, coordinated by the California Sea Grant office in Eureka, 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.

In these places, agencies and stakeholders are already partnering to identify specific EBM objectives and address the obstacles to attaining those goals.

The six West Coast National Estuary Programs are another example of ongoing EBM efforts. The National Estuary Programs have employed a regional-scale ecosystem approach and collaboration since their inception. For example, the Lower Columbia River Estuary Partnership study area includes two states, several tribes, 11 counties, 31 municipalities, 38 school districts, over 150 agencies of different levels of government, and hundreds of nongovernmental organizations. A key role for the effort is to coordinate these efforts to protect the health of the watershed and the recovery of threatened and endangered species.

Fishery Management

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 Fishery 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 coast-wide policy guidance.

Forage species play a key role in maintaining healthy and sustainable marine communities, and are an elemental component of EBM. These species include marine fish and invertebrates such as krill, sardines, herring and smelts. All three West Coast states recognize the importance of krill and prohibit its harvest. The PFMC Fishery Ecosystem Plan will more fully recognize the role of forage species in fisheries management and long-term ocean health.

Forage Species

The importance of forage species is mentioned in *Priority Area 2.*

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.

Kids play on New Brighton beach
Photo Credit: CA State Parks

Finding 3B

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

The assessment of the health of regional ecosystems will be difficult without analyses that consider various components of ecosystem integrity. 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.

Crab boats
Photo Credit: Oregon Department of Fish and Wildlife

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.

Finding 3D

Forage species such as krill are vital links in the food chain and play an essential role in maintaining ecosystem health. Precautionary measures should be taken to ensure their protection.

Following action by the Pacific Fishery Management Council and in a precautionary attempt to protect the base of the food web, NOAA approved the amendment to the Coastal Pelagic Species Fishery Management Plan (CPSFMP) to prohibit krill harvesting off the

West Coast. The proposed rule was subsequently rejected by the White House Office of Information and Regulatory Affairs.

Actions

Action 3.1

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

Lophelia pertusa with Rosethorn and Redbanded rockfish
Photo Credit: Olympic Coast National Marine Sanctuary

Several communities are currently working toward 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 a nascent information-sharing network 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.

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, nongovernmental organizations, 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, ocean observing system data, and ecological forecasting models) to advance ecosystem management approaches.

Bixby Bridge, Big Sur, California
Photo Credit: CA Dept of Water Resources

Timeframe: IEA workshop will be held in fall 2008.

Action 3.3

Strengthen coordination among the three states and their representatives on the Pacific Fishery Management Council (PFMC). Look for opportunities to support united votes by the PFMC; for example, the states support the amendment of NOAA Fisheries' Coastal Pelagic Species Fishery Management Plan (CPSFMP) to prohibit the taking of krill in Pacific waters off the West Coast.

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.

The three states fully support the PFMC action and NOAA's efforts to take precautionary steps to protect species at the base of the food

web. The three states urge NOAA to continue to seek means to protect krill, including from potential overharvest.

Timeframe: Initiated within six months of release of the final action plan. Additional efforts to strengthen coordination will begin within 12 months of release of the final action plan.

An Oregon Department of Fish and Wildlife biologist measures a spot prawn aboard a commercial fishing boat
Photo Credit: Oregon Department of Fish and Wildlife

Priority Area 4: Reduce Adverse Impacts of Offshore Energy Development[5]

Action Summary

Washington, Oregon, and California will ensure that offshore energy development is environmentally sustainable through the following actions:

- **Oppose all new offshore oil and gas leasing, development, and production.**
- **Evaluate the benefits and impacts of renewable ocean energy development.**
- **Develop a more consistent, effective, and efficient state and federal regulatory approach to renewable ocean energy development.**

Issue

The three states have determined that new offshore oil and gas development in ocean waters along the West Coast is unacceptable because of 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

5 For the purposes of the agreement and the action plan, the states are only considering priority offshore development activities related to energy production.

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, use of those sites, as well as clarification of the authorities, regulatory policies, and permitting processes for marine renewable 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.

Vision

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 is appropriately and safely considered along the West Coast.

Goal

State and federal agencies work from a shared strategy to ensure that if future offshore energy development activities along the West Coast occur, that they are comprehensively planned to increase renewable energy generation while minimizing negative impacts to marine ecosystems and coastal communities.

Status of Ocean Energy in Washington

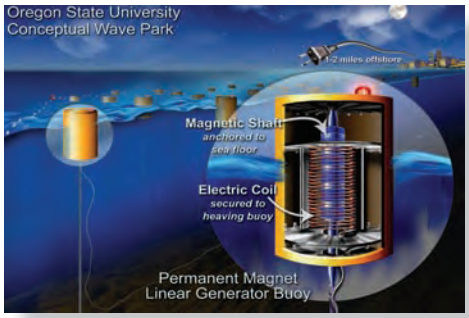
In 2005, Washington passed landmark legislation promoting the use of renewable energy sources; in 2006, voters passed legislation mandating 15% of new energy generation from a portfolio of renewable technologies. Washington has a market for alternative energy with a generally robust demand system and green energy purchase options. Now, officials must develop the regulatory framework for this expanded portfolio of sources. To date, 10 preliminary permits have been issued by FERC to study tidal energy production in Puget Sound and other major estuaries. FERC recently issued a conditional license for Finavera Renewables Ocean Energy, Ltd.'s wave energy demonstration project in Makah Bay on Washington's outer coast. This project is the furthest along in the licensing process, but several authorizations are still yet to be finalized.

Status of Ocean Energy in Oregon

Oregon now has eight 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 that identifies and provides a framework for resolving specific issues and concerns. Stakeholders have worked for six months toward 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 held a scientific workshop in October 2007

on the ecological effects of wave energy development in the Pacific Northwest. 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.



Wave Energy Diagram
Photo Credit: Oregon State University

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 1% of 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 several proposed energy development projects for wave energy in Mendocino, Humboldt, and Sonoma Counties and 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 informal public workshops (the first of which was held in late October 2007 in Eureka) to hear concerns from ocean users, including fishermen and other concerned stakeholders.

Ocean Energy

Research and monitoring for alternative ocean energy technologies are a highlighted need under *Priority Area 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.

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 examining technologies to harness energy from ocean currents, waves, and tides, and have received proposals to move forward on development. The states recognize that planning at the local level, engaging citizens, and harmonizing all levels of government is critical. With leveraged funding from the federal government, the states support comprehensive research and monitoring of alternative energy sites. Further, comprehensive planning across the region, instead of site-by-site planning, is necessary.

Oil rig
Photo Credit: Shane Anderson

Actions

Offshore Oil and Gas Development

Action 4.1

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

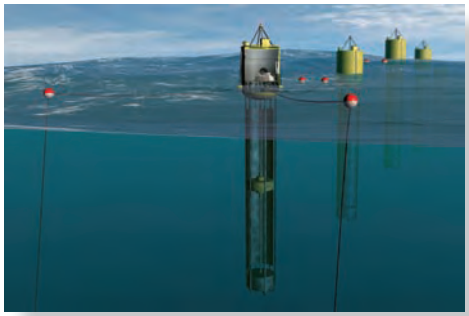
The three Governors reaffirmed their position in a September 29, 2006 letter to the President and the U.S. Congress. They will continue to oppose any proposals by the Department of the Interior or legislation under consideration by the U.S. Congress that would facilitate new oil and gas development off 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.



Design of a wave buoy array
Photo Credit: Finavera Renewables

The three states will support efforts by the 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 FERC, DOE, and MMS to evaluate the potential benefits and impacts of renewable ocean energy projects off the West Coast, as well as develop 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 Priority Areas 3 and 6).

The three states and the federal government will host a workshop in 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 DOE pursuing federal support for the workshop.

Timeframe: The workshop on offshore energy will be held in 2008.

Priority Area 5: Increase Ocean Awareness and Literacy Among Citizens

Action Summary ★

Washington, Oregon, and California will increase citizens' ocean literacy through the following actions:

- **Augment environmental education curricula with ocean science and conservation content and hands-on experiences.**
- **Support public ocean awareness efforts and outreach to decision-makers at all levels.**

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. As the commission pointed out, the American public currently 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[6].

> *"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."*
>
> *– U.S. Commission on Ocean Policy*[7]

6 Belden, Russonello, Stewart, and American Viewpoint. 1999. *Communicating about Oceans: Results of a National Survey*. Washington, D.C.: The Ocean Project

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

Vision

The West Coast has an informed citizenry that understands the value of ocean and coastal resources, processes, and ecosystems and acts consistently to conserve and enhance them.

Many 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 those at Año Nuevo State Reserve in California and Haystack Rock in Oregon. Visitor centers and aquariums provide focal points for public education and opportunities for self-directed learning, while programs such as the international Reef Check effort, 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.

Each of the programs described above individually reaches a target audience daily. 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 scale 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 to raise general ocean awareness. The Puget Sound Partnership will be launching a major education effort around the 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. A marine science curriculum was developed by the Oregon Institute of Marine Biology for public schools along the southern Oregon coast. The Institute has engaged school districts in ocean studies and provided long-term professional development opportunities for K-6 teachers.

Beyond these public ocean education efforts, 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.

Aquariums in the tri-state region attract over five million visitors annually, who choose to learn about the ocean and its resources by their visit. These institutions are an invaluable resource for educating the public about ocean health.

Goal

Promote and share ocean education opportunities with the entire population to elevate stewardship of coastal and marine resources and awareness of the connections among the ocean, our health and our economic well-being, and between the impacts of our activities and ocean health.

Marine Debris and Clean Marinas

Marine debris is addressed in *Priority Area 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 *Priority Areas 1* and *7*.

Findings

Ocean Awareness and Literacy

Finding 5A

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

Beach teaching
Photo Credit: Olympic Coast National Marine Sanctuary

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.

Finding 5B

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, nongovernmental entities, academia, and the private sector. Most of these programs are not linked or coordinated in a systematic way. The creation of inventories of the range of existing environmental education sources in each state would help determine how to support and where to enhance existing programs.

With support from the Consortium on Ocean Research and Education, the Aquarium of the Pacific developed the first regional ocean literacy content in the U.S. and presented four other forums ranging from maritime literacy to communicating ocean science. The knowledge gained from these forums and similar efforts could be extended to each of the three states.

Playing in the sand
Photo Credit: CA State Parks

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 curricula in schools and seek opportunities for hands-on educational experiences for children. To do so, the states will pursue partnerships with COSEE, Sea Grant institutions, 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. The states will request adequate federal funding and expansion of environmental education.

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

Action 5.2

Support ocean awareness efforts for the public and for decision-makers at all levels and encourage improvement and expansion of self-directed learning institutions and volunteer programs.

Newport Beach, marina
Photo Credit: Robert Holmes/CalTour

The states will seek to improve communication among education centers along the West Coast to help expand opportunities for public awareness and citizen science activities. The states will support existing ocean literacy programs and the expansion of initiatives such as clean marina initiatives, and encourage partnerships of self-directed learning institutions with the formal K-12 education system.

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

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

Action Summary ★

Washington, Oregon, and California will expand ocean and coastal scientific information, research, and monitoring through the following actions:

- **Develop a regional research agenda in partnership with the four Sea Grant programs and seek federal support to fill marine research needs.**
- **Urge full federal support for the long-term maintenance of ocean observing systems and monitoring assets.**
- **Complete a comprehensive seafloor map of all state waters of the West Coast.**

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 because

Vision

A sustained research and monitoring program for the entire West Coast that provides timely and relevant information to support coastal and ocean management programs.

of research processes required for robust scientific conclusions. Additionally, ecosystem-based management often requires synthesis of information 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 substrate, relief, geology, 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.

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 joint priorities for research and monitoring to obtain a more complete 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.

Regional Marine Research

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 were held in all three states in 2007 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 businesses; marine conservation groups; tribal, state, and local governments; resource managers at both the state and federal levels; and any person or group who depends on

Goal

- **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.**

Goals

- Improve understanding of existing and emerging issues that affect ocean health and the drivers of change so that ocean and coastal managers have necessary information to make appropriate management decisions.
- Map the seafloor bathymetry and habitat of all state tidelands out to three miles by 2020.

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.

Ocean Observing and Long-term Monitoring

The three West Coast Regional Associations of the Integrated Ocean Observing System (IOOS) are centers of expertise providing data and information for local, regional, state and federal managers. IOOS is a nationally coordinated and regionally implemented system of data providers and data users. It represents an important collaboration for achieving many of the information requirements in this action plan, including timely oil spill response, understanding HABs and other water quality issues (see **Priority Area 1**), and siting and monitoring ocean energy development (see **Priority Area 4**). Collaboration among the three Regional Associations is essential for developing the appropriate scale of observation necessary for an ecosystem approach to management and enabling the forecasting tools to address climate change.

Ocean observing systems measure physical ocean parameters such as salinity, temperature, sea level, surface waves, currents, and ice concentration; chemical variables including water column contaminants, dissolved inorganic nutrients, and dissolved oxygen; and biological factors such as species and their abundance. In addition to these variables, which are required to characterize the marine environment, additional observations are needed to help quantify other drivers of change on a local, regional, and national scale. This includes meteorological data (wind speed and direction, temperature, pressure, precipitation, humidity), terrestrial information (river discharge), and human health and use (seafood contamination, water column concentration of human pathogens).

While all these variables are high priority across the nation, the design and implementation of regional observing systems will be guided by state and regional priorities based on socio-economic and ecological considerations unique to each region. For instance, along the West Coast, surface current measurement has become a high priority. The West Coast is a national leader in measuring and using surface current information in decision-making from outfall design to oil spill response.

Ocean Observing System Regional Associations of the West Coast

NANOOS (*www.nanoos.org*)
Northwest Association of Networked Ocean Observing Systems

CeNCOOS (*www.cencoos.org*)
Central and Northern California Ocean Observing System

SCCOOS (*www.sccoos.org*)
Southern California Coastal Ocean Observing System

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 many of the agreement's seven priorities. There are a large number of management challenges that would be served by mapping the seafloor along the West Coast.

Three of the primary challenges associated with completing a seafloor map for the West Coast are 1) identifying and securing funding

sources to get comprehensive seafloor mapping accomplished; 2) developing uniform mapping standards within and across the three states; and 3) designing and completing a uniform map product. The status of seafloor mapping in each state is described in the following paragraphs.

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 Area 1*)**
- **Locate submerged debris or cultural resources (*Priority Areas 1, 2*)**
- **Increase the knowledge base for essential fish habitats and other key habitats (*Priority Areas 2, 3, 6*)**
- **Assist in siting offshore infrastructure, such as pipelines, energy facilities, communication cables, and ocean observatories (*Priority Areas 4, 6, 7*)**
- **Give insight to shoreline processes and impacts from storms (*Priority Area 7*)**
- **Support tsunami, storm surge, and earthquake hazard assessments (*Priority Area 7*)**
- **Establish baselines for monitoring environmental change (*Priority Areas 2, 3, 7*)**

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, the U.S. Navy, and USGS). Presently there is an agreement between NOAA and the U.S. Navy that regulates the acquisition, control, and dissemination of high-resolution bathymetry, substrate, and relief data within a security zone off Washington and

northern Oregon. This significantly restricts data collection and publication of results. 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. To better understand the status of mapping efforts and remaining gaps, Washington co-hosted a Washington Seafloor Mapping Workshop in January 2008.

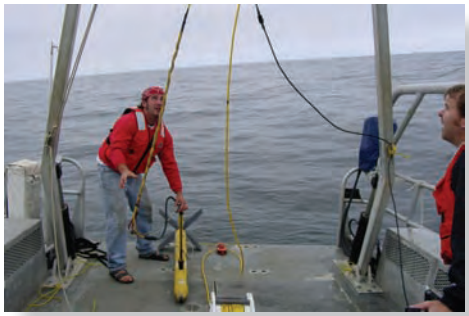
Habitat mapping station onboard ship
Photo Credit: Olympic Coast National Marine Sanctuary

Status of Seafloor Mapping in Oregon

In 2006, over 20 Oregon-based marine scientists signed a Scientific Consensus Statement for Mapping the Oregon Territorial Seafloor. The statement asserted the critical importance of implementing a plan to map Oregon's 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 (ODFW) in state waters. In total, less than 5% of Oregon's territorial sea (within the three nautical mile limit) has been mapped using current technology. However, new ocean uses and designations coming to the forefront in Oregon (e.g., wave energy, marine reserves) and the need to better understand tsunami hazards have recently highlighted the need for a complete map of the seafloor, and another legislative effort is anticipated for the 2009 session. Like Washington, Oregon also hosted a seafloor mapping workshop in early 2008.

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 universities and state 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 and in October 2007 approved $15 million in funding, pending legislative appropriations in future budget years.



Deploying sidescan sonar equipment for habitat mapping
Photo Credit: Olympic Coast National Marine Sanctuary

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. 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 members 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 will identify these issues and 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. The states would benefit from the establishment of opportunities for state agencies to engage in collaborative science partnerships that provide ecological and social science data.

Ocean Observing and Long-term Monitoring

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.

Ocean observation team
Photo Credit: Olympic Coast National Marine Sanctuary

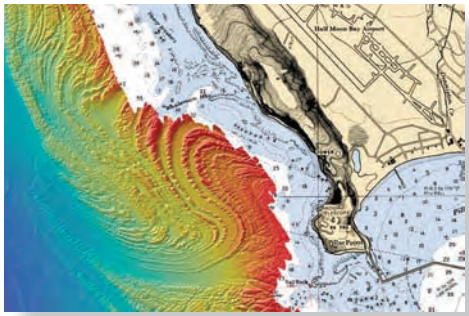
Understanding the status and trends of resource abundance is a high priority for planning and resource management organizations.[8] Long-term monitoring is required to achieve this priority. The move toward EBM increases the need for monitoring efforts, particularly to answer questions about inter-species and species–habitat relationships.

The West Coast ocean observing systems, which include PaCOOS and the three 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. Data management, accessibility, and product development are critical foundational activities. Observing system groups must provide information in a manner useful for various management applications. At a recent workshop in California, managers and ocean observing experts concluded that a forum is needed to determine what information managers need, identify how it would be presented best, and create a vision for translating

8 Coleman and Hershman, 2007. "Compilation of Identified Marine Research Needs for the U.S. West Coast since 2000: Research Overview and Tentative Findings." An unpublished survey of 45 planning and resource management reports.

observations to meet managers' needs. Lessons learned from the California experience may assist efforts by NANOOS and coastal managers in the Pacific Northwest.

Seafloor Mapping



High resolution seafloor map of Mavericks, San Mateo County, California
Photo Credit: California Coast State Waters Mapping Project

Finding 6C

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

Along the West Coast, state and federal agencies lack comprehensive high-resolution seafloor maps including benthic substrate, relief, bathymetry, habitats, and geology, which limits their ability to address priority areas. The states' efforts would benefit greatly from removal of present data restrictions and declassification of existing data for high-resolution bathymetry and related products between the U.S. Navy and NOAA. This would improve the accessibility and availability of existing seafloor mapping data and the ability to forge partnerships for efficient future mapping efforts. Completion of a high-resolution seafloor map and associated products will aid the three states' efforts in modeling tsunamis, characterizing and identifying marine habitats, selecting alternative energy sites, identifying geological hazards and sediment transport pathways, enhancing safe and efficient marine transportation, and managing other high priority issues. Finishing 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

Develop a regional research agenda in partnership with the four Sea Grant programs and seek federal support to fill marine research needs identified.

Oregon State University cruise members review research results
Photo Credit: Sherr Lab, COAS, OSU

The Sea Grant programs from Washington, Oregon, California, and Southern California are developing a Regional Research and Information Needs Plan for the California Current Large Marine Ecosystem. A series of workshops and an on-line survey gathered stakeholder input to ensure that a wide range of users, managers, researchers, and educators expressed their needs and capabilities and the needs of their respective ocean and coastal constituencies. Data collected are categorized according to seven central themes that reflect national ocean research priorities established by the Joint Subcommittee on Ocean Science and Technology: social and economic vitality of coastal communities; coastal natural hazards; human health; ecosystem dynamics, quality and connectivity; ocean's role in climate variability; marine transportation and security; and ocean education and environmental literacy.

The Sea Grant programs will identify relevant and actionable research and information needs across these priorities for the entire West Coast region. To accomplish this, the Sea Grant programs are closely coordinating with the three West Coast states. The research plan will be released during the fall of 2008. The three states will pursue joint funding for regional research projects where pooled resources or coordinated efforts will maximize the return on investments to benefit all three states.

Timeframe: The Sea Grant Regional Research Plan is anticipated for release in fall 2008.

Ocean Observing and Long-Term Monitoring

Wildlife watching
Photo Credit Olympic Coast
National Marine Sanctuary

Action 6.2

Support full federal funding for the long-term maintenance of ocean observing systems and monitoring assets along the West Coast for the development of products that address management needs.

The three states encourage adequate federal funding be provided for the regional associations and PaCOOS to support the long-term maintenance of existing ocean observing and monitoring assets and infrastructure. The states will work to create a cohesive vision for the application of ocean observing systems to coastal management issues. The states support the development of a West Coast-wide strategic approach by the ocean observing community to expand, update, and maintain observing systems operations, and encourage the development of an integrated information system that has comparable data and is easily accessible for scientists, resource users, and managers. The states will explore the possibility of partnering with PaCOOS, the NOAA IOOS office, and others to accomplish this objective.

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

Seafloor Mapping

Action 6.3

Complete a seafloor map of the bathymetry, benthic substrate, relief, geology, and habitat of all state tidelands and submerged lands out to three miles.

Basketstar on the seafloor
Photo Credit: Olympic Coast National Marine Sanctuary

The three states seek to complete a seafloor map of Pacific Coast waters. Each state recognizes the need for a complete understanding of the seafloor, 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 all existing seafloor mapping data accessible, including declassifying data, 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, personnel, and infrastructure to support these actions. The states collectively support legislation that would further these goals.

Timeframe: Complete seafloor map by 2020.

Priority Area 7: Foster Sustainable Economic Development in Coastal Communities

Action Summary ★

Washington, Oregon, and California will help coastal communities become economically and environmentally sustainable through the following actions:

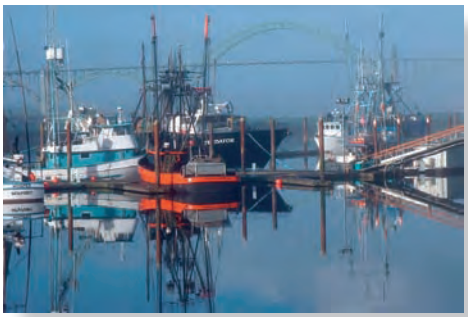
- **Support working waterfronts through grant processes and federal assistance programs.**
- **Ensure adequate public access to working waterfronts and revitalize waterfront communities.**
- **Develop regional sediment management plans and supporting national policies to increase beneficial use of sediment in an environmentally sensitive manner.**
- **Assist small ports in effectively remediating sediment pollutants.**
- **Promote and expand environmentally responsible operations and infrastructure at ports and harbors.**

Issue

The economic base for coastal communities is directly related to the health and sustainability of the coast and ocean, through fishing, shellfish aquaculture, 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.



Port of Newport
Photo Credit: Oregon Department of Fish and Wildlife

A wide range of businesses depend on 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. A number of these 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 low-paying jobs.

Preserving and revitalizing working waterfronts can be achieved through comprehensive land use planning efforts, as well as establishing value-added businesses; supporting innovative water-dependent uses; providing opportunities for high-quality, local

Vision

Coastal communities are economically and environmentally sustainable over the long term.

seafood production and distribution; and promoting clean marinas and waterfronts.

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 Area 6*, as is the utility of seafloor maps for assessing shoreline change and coastal hazards, including tsunamis and storm surges.

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 ability to prepare for and adapt to ecological, economic, and cultural impacts to human and natural communities from events such as coastal flooding or tsunamis, or the longer-term effects of climate change.

For example, the San Francisco Bay Conservation and Development Commission (BCDC) is working with other agencies as part of the Joint Policy Initiative to revise present development and infrastructure policies. The objective of the initiative is to proactively plan for the expected impacts of sea level rise and other climate change-related factors in the bay area.

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 such as local and state decision-makers, emergency and floodplain managers, community planners, and coastal resource managers. These individuals 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, recreational and

Goals

- **Help coastal communities prepare for impacts associated with declining resource industries, climate change, and impacts of coastal hazards.**
- **Ensure regional sediment management supports coastal community efforts to realize long-term economic benefits as well as ecological benefits.**
- **West Coast ports and marinas provide services that enable ships to lessen their impacts to the marine environment and atmosphere.**

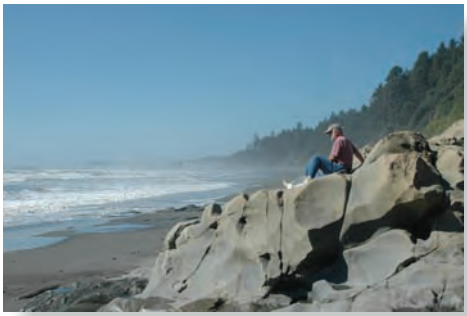
tourism activities, and coastal-dependent businesses. One example of a developing tool to address the problem of limited funding for waterfronts and sustainable fisheries is the California Fisheries Fund. The fund's primary objective is to provide a permanent source of capital for improving the conservation 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 Area 1. Depending on individual community needs, the training can focus on growth alternatives, water quality, hazards, and climate adaptation.

In addition to working waterfronts and coastal and ocean-dependent industries, the coastal economy is driven by physical characteristics of the coastline itself. The present understanding of sediment budgets is poor. Traditionally, coastal sediments 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 on physical processes transporting the sand. Since these regions overlap state boundaries, 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 in an environmentally responsible manner. 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.



Watching the tide
Photo Credit: Janet Lamont

Sediment Management in Oregon and Washington

Historically, sediment flowing from the Columbia River provided sand for the beaches of northwestern Oregon and southwestern 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 nongovernmental 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. As a member of the Lower Columbia Solutions Group, the Lower Columbia River Estuary

Partnership has provided funding to assess upland disposal issues and begin development of a regional sediment management planning process. However, both the partnership and the Lower Columbia Solutions Group require additional funding to complete the upland disposal facility siting and initiate the multi-year regional sediment planning effort.

Bixby Creek Bridge, Monterey County
Photo Credit: Robert Holmes/CalTour

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 by 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.

Port of Ilwaco
Photo Credit: Jennifer Hennessey

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 that could be enhanced and expanded to revitalize struggling waterfront communities. The states can encourage port activity while ensuring a smaller environmental impact. For example, Green Ports and Green Marinas programs are environmentally and economically viable programs.

Finding 7B

The National Ocean Economics Program (NOEP) houses data on ocean resources and economies that are not available elsewhere, and may be used to establish socio-economic trends in many coastal areas.

Establishing initial socio-economic 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 socio-economic assessments. As a next step, the states need a coast-wide analysis describing the relationship between long-term sustainable management of coastal resources and the resilience of the coastal economy. A credible valuation of coastal marine ecosystem services is essential to complete this study.

Sand erosion
Photo Credit: Olympic Coast National Marine Sanctuary

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.

In recognition of the importance of managing sediment as a system, improving efficiency, and increasing beneficial uses of sediment, all three states have emerging regional sediment management processes moving forward based on coastal processes.

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.

Commercial Fishing Boats
Photo Credit: Olympic Coast National Marine Sanctuary

The states endorse innovative coastal-dependent business opportunities for high-quality local seafood production and distribution, clean marinas, and waterfronts. In addition, the states commit to support their Coastal Zone Management programs' work on coastal-dependent uses to ensure adequate access to working 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

Promote and expand environmentally responsible operations and infrastructure at ports and harbors, such as through Green Ports and Clean Marinas programs. Support revitalization efforts for struggling ports.

The three states will develop, promote, and expand realistic green ports concepts, including services that provide for waste oil reception, solid waste and wastewater removal from ships, and lower air emissions at major West Coast ports, as well as incentives to reduce waste oil dumping at sea.

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

Santa Cruz Beach Boardwalk
Photo Credit: Robert Holmes/CalTour

Action 7.3

Assess the health and economic vitality of coastal communities by identifying current economic conditions.

The three states will assist communities with sustainable economic development by collaborating with NOAA and the National Ocean Economics Program (NOEP) to complete a West Coast Coastal and Ocean Economies Baseline and Historic Trends Report using data from 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. The states recognize there are gaps in NOEP data, both in sector and location data, and support efforts to augment the database.

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

Regional Sediment Management

Action 7.4

Develop regional sediment management plans that increase beneficial use of sediment in an environmentally responsible manner to protect and maintain critical community economic and environmental infrastructure.

Life at the edge of the ocean
Photo Credit: CA Dept of Water Resources

The states will continue progress on regional sediment planning efforts and will consider and minimize potential environmental impacts of sediment uses. The states will partner with the U.S. Army Corps of Engineers to advance regional sediment management efforts by state and federal agencies, including seeking necessary federal policy changes and 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 of 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 to effectively address legacy pollutants.

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

Appendix A: Table of Actions and Timeframes

Issue and Action No.	Action	Activities	Timeframe
Sustained National Support	*Call for the establishment of a national ocean trust fund that would support ocean and coastal management efforts for state and federal government agencies.*	- Urge the Administration and the Washington, Oregon, and California congressional delegations to consider establishing a dedicated source of revenues for ocean and coastal management.	Initiated within six months of release of the final action plan.
Facing the Effects of Climate Change	*Focus initial efforts, in collaboration with the federal government, on a West Coast-wide assessment of shoreline changes and anticipated impacts to coastal areas and communities due to climate change over the next several decades, and work together to develop actions to mitigate and adapt to the impacts of climate change and related coastal hazards.*	- Engage with academia, nongovernmental entities, local, state, and federal government agencies, and the private sector to model impacts to the West Coast under various likely climate change scenarios. - Use the same frame of reference for predicting and responding to shoreline changes from storm surges and sea level rise. - Align methodologies and tools to facilitate information exchanges across the region.	Initiated within 12 months of release of the final action plan.
Polluted Runoff			
Action 1.1	*Work with the Administration and the U.S. Congress to provide full 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.*	- Support continued funding for the Coastal Nonpoint Source Pollution Control Program (Section 6217 of the Coastal Zone Act Reauthorization Amendments), the Nonpoint Source Management Program, and the stormwater National Pollutant Discharge Elimination System permit program (Sections 319 and 402(p) of the Clean Water Act, respectively) and the BEACH Act. - Support reauthorization of the BEACH Act with sufficient funding and expansion of allowable uses of funds, such as source identification. - Advocate for continued funding and expansion of the West Coast Estuary Initiative.	Ongoing. Additional efforts will be initiated within six months of release of the final action plan.

Issue and Action No.	Action	Activities	Timeframe
Action 1.2	*Combat nonpoint source pollution through a variety of methods including low impact development (LID) and sharing strategies employed for existing and planned incentive programs to state and local governments on this objective.*	- Examine incentive-based programs that encourage local governments to use LID strategies in community planning. - 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. - Work with the American Planning Association and state and local planning agencies, and support the incorporation of LID and climate change impacts into local coastal plans. - Coordinate with NOAA and local governments to bring coastal community planning and development training to six interested West Coast communities (two in each state).	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 among 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 among the three states for these purposes.*	- Explore the development of predictive capabilities for alerting ocean users and resource managers of HAB and hypoxia events. - Hold a HAB workshop in 2008 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. - Improve the general understanding of hypoxic events and their impacts along the West Coast by working with federal, state, and academic experts to record and track incidences.	HAB workshop will be held in 2008.

Issue and Action No.	Action	Activities	Timeframe
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, including debris prevention through* *expanded recycling, improved trash maintenance, public education, and enforcement of litter laws.*	- Identify marine debris baselines, established by assessing data collected by clean-up programs, state and federal agencies, and nonprofit organizations. - Identify a target reduction level to achieve by various prevention and clean-up measures, and partner with and pursue resources from the NOAA Marine Debris Prevention and Removal Program. - Share lessons learned from existing and emerging state and federal programs and guidelines to pursue safe and effective debris and gear removal. - Evaluate existing activities such as the annual coastal clean-up day and litter prevention programs in order to effectively expand marine debris reduction activities. - Pursue improvements in public sanitation and maintenance, increased public education and outreach to fishing industries, enforcement of litter laws, and the expansion of recycling programs for plastic materials and fishing line and nets.	Initiated within 18 months of release of the final action plan.
Oil Spill Prevention and Response			
Action 1.5	*Ensure adequate oil spill prevention, preparedness and response capabilities on the West Coast and enhance federal and state collaboration. Develop additional capacity for rescue and salvage operations.*	- Renew commitment to adequate oil spill prevention, preparedness and response capabilities through the policy coordination framework, priorities, and work plans developed by the Pacific States/British Columbia Oil Spill Task Force - Help state agencies seek delegated authority from the U.S. Coast Guard to share responsibilities for vessel and oil transfer facility inspections and plan reviews. Where specifically qualified and where resources allow, state agencies will augment and support U.S. Coast Guard forces by providing additional inspections and oversight of routine and higher risk	Initiated within 18 months of release of the final action plan.

Issue and Action No.	Action	Activities	Timeframe
		operations that can lead to oil spills. - Encourage the U.S. Coast Guard to adopt the effective salvage and firefighting rules that have been in process for 15 years. - Urge the development of additional West Coast rescue and salvage capabilities in areas where Pacific Rim shipping activities place highly sensitive coastal areas at risk from oil spills.	
Maritime Shipping Emission Controls			
Action 1.6	*Urge the International Maritime Organization (IMO) to adopt the U.S. proposal, which sets stringent emission standards for oceangoing vessels.*	- 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.
Habitat Protection and Restoration			
Action 2.1	*Document, describe, and map marine and estuarine ecological communities throughout West Coast waters, characterize existing human uses of those areas, and establish measures to ensure effective habitat protection.*	- 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. - 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. - Identify key habitats that could benefit from additional or innovative coastal habitat conservation.	The GIS database, with key human uses and habitat data, will be in place by 2012. Seafloor mapping will be added to the database on an ongoing basis and completed by 2020.

Issue and Action No.	Action	Activities	Timeframe
Action 2.2	*Restore estuarine habitats, including coastal wetlands, to achieve a net increase in habitat and their function by at least 10% over the next 10 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 supporting existing restoration programs. - Support the establishment of benchmarks and indicators to evaluate progress.	Ongoing, with benchmarks and ultimate goal reached by 2018.
Marine Invasive Species			
Action 2.3	*Prevent the future introduction of marine invasive species.*	- Support the efforts of the Pacific Ballast Water Group and existing state teams to coordinate their ballast water policies. - Cooperate to prevent the spread of invasive species by reducing pathways of introduction such as ballast water, vessel hulls of commercial ships and recreational boats, and boat trailers traveling across state boundaries.	Ongoing.
Action 2.4	*Focus efforts on eradicating non-native cordgrasses (*genus Spartina*), which are transported between the three states on ocean currents, as a pilot coast-wide eradication.*	- Prioritize the complete eradication of Spartina cordgrasses along the West Coast and will share strategies and lessons learned for effective removal. - Set priorities for eradicating other existing and new threats that affect the three states.	Plan for full eradication of Spartina by 2018.
Ecosystem-Based Management			
Action 3.1	*Examine ongoing community-based efforts using ecosystem management principles in all three states and share lessons learned from these initiatives to encourage effective ecosystem-based management efforts across the West Coast.*	- Share information on existing EBM projects as part of a nascent information-sharing network 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.	Ongoing. Establish West Coast EBM Network during 2008.

Issue and Action No.	Action	Activities	Timeframe
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.*	- Support the development of an integrated ecosystem assessment (IEA) for the West Coast, with the assistance of the federal government. - In concert with state and federal agencies, local and tribal governments, nongovernmental organizations, 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.	IEA workshop will be held in fall 2008.
Action 3.3	*Strengthen coordination among the three states and their representatives on the Pacific Fishery Management Council (PFMC). Look for opportunities to support united votes by the PFMC; for example, the states support the amendment of NOAA Fisheries Coastal Pelagic Species Fishery Management Plan (CPSFMP) to prohibit the taking of krill in Pacific waters off the West Coast.*	- The three state representatives on the Pacific Fisheries Management Council will enhance communication and cooperation in support of regional fisheries management as appropriate. - Urge NOAA to continue to seek means to protect krill, including from potential overharvest.	Initiated within six months of release of the final action plan. Additional efforts to strengthen coordination will begin within 12 months of release of the final action plan.
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.*	- 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.

Issue and Action No.	Action	Activities	Timeframe
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.*	- 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. - Collaborate with FERC, DOE, and MMS to evaluate the potential benefits and impacts of renewable ocean energy projects off the West Coast, as well as develop the long-term regulatory structure for removal or expansion of activities. - 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). - 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. - Send a letter to SIMOR and, in cooperation with MMS and FERC, to the Department of Energy to pursue federal assistance for the workshop.	The workshop on offshore energy will be held in 2008.
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.*	- Explore avenues for creating or expanding K-12 ocean education curricula in schools and seek opportunities for hands-on educational experiences for children. - Pursue a partnership with the Centers for Ocean Sciences Education Excellence (COSEE), Sea Grant institutions, 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. - Request adequate federal funding and expansion of environmental education.	Initiated within 18 months of release of the final action plan.

Issue and Action No.	Action	Activities	Timeframe
Action 5.2	*Support ocean awareness efforts for the public and for decision-makers at all levels and encourage improvement and expansion of self-directed learning institutions and volunteer programs.*	- Improve communication among education centers along the West Coast to help expand opportunities for public awareness and citizen science activities. - Support existing ocean literacy programs and the expansion of initiatives such as clean marina initiatives, and encourage partnerships of self-directed learning institutions with the formal K-12 education system.	Initiated within 18 months of release of the final action plan.
Regional Marine Research			
Action 6.1	*Develop a regional research agenda in partnership with the four Sea Grant programs and seek federal support to fill marine research needs identified.*	- Continue working with the Sea Grant programs to identify research and information needs across the West Coast. - Pursue joint funding for regional scientific research projects where pooled resources or coordinated efforts will maximize the return on research investments to benefit all three states.	The Sea Grant Regional Research Plan is anticipated for release in Fall 2008.
Ocean Observing and Long-Term Monitoring			
Action 6.2	*Support full federal funding for the long-term maintenance of ocean observing systems and monitoring assets along the West Coast for the development of products that address management needs.*	- Encourage adequate federal funding be provided for PaCOOS and the regional associations to support the long-term maintenance of existing ocean observing and monitoring assets and infrastructure. - Create a cohesive vision for the application of ocean observing systems to coastal management issues. - Support the development of a West Coast-wide strategic approach by the ocean observing community to expand, update, and maintain observing systems operations, and encourage the development of an integrated information system that has comparable data and is easily accessible for scientists, resource users, and managers. Explore the possibility of partnering with PaCOOS, the NOAA IOOS office, and others to accomplish this objective.	Initiated within 18 months of release of the final action plan.

Issue and Action No.	Action	Activities	Timeframe
Seafloor Mapping			
Action 6.3	*Complete a seafloor map of the bathymetry, benthic substrate, relief, geology, and habitat of all state tidelands and submerged lands out to three miles.*	- Complete a seafloor map of Pacific Coast waters. Fiscal constraints necessitate federal, academia, and private industry partnerships to move forward. - Set joint standards, agree on common products, define high priority areas, and estimate a timeline for completion. - Communicate the regional need for a comprehensive seafloor map in a joint letter to the Subcommittee on Integrated Management of Ocean Resources (SIMOR). Encourage the Department of Defense, USGS, NOAA, and other federal agencies to make existing seafloor mapping data accessible, including declassifying data, and to better coordinate data collection and sharing in state waters through such groups as the Interagency Working Group on Integrated Ocean Mapping. - Ask NOAA to establish seafloor mapping as a programmatic goal and ensure states have adequate West Coast-based seafloor mapping resources, including hardware, personnel, and infrastructure, to support actions. - Support legislation that would further these goals.	Complete seafloor map by 2020.
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.*	- Endorse innovative coastal-dependent business opportunities for high-quality, local seafood production and distribution, clean marinas and waterfronts. - Commit to continue their work on coastal-dependent uses to ensure adequate access to working waterfronts through their Coastal Zone Management programs. - Share lessons learned to date on related efforts and 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.	Initiated within 18 months of release of the final action plan.

Issue and Action No.	Action	Activities	Timeframe
Action 7.2	*Promote and expand environmentally responsible operations and infrastructure at ports and harbors, such as through Green Ports and Clean Marinas programs. Support revitalization efforts for struggling ports.*	- Develop, promote, and expand realistic green ports concepts, including services that provide for waste oil reception, solid waste and wastewater removal from ships, and lower air emissions at major West Coast ports, as well as incentives to reduce waste oil dumping at sea.	Initiated within 18 months of release of the final action plan.
Action 7.3	*Assess the health and economic vitality of coastal communities by identifying current economic conditions.*	- Assist communities with sustainable economic development by collaborating with NOAA and the National Ocean Economics Program (NOEP) to complete a West Coast Coastal and Ocean Economies Baseline and Historic Trends Report using data from NOEP.	Initiated within 18 months of release of the final action plan.
Regional Sediment Management			
Action 7.4	*Develop regional sediment management plans to maximize beneficial use of sediment in an environmentally responsible manner to protect and maintain critical community economic and environmental infrastructure.*	- Continue progress on regional sediment planning efforts and consider and minimize potential environmental impacts of sediment uses. - Partner with the U.S. Army Corps of Engineers to advance regional sediment management efforts by state and federal agencies, including seeking necessary federal policy changes and 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. - 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. - Partner with federal agencies to leverage resources to effectively address legacy pollutants.	Ongoing. Additional efforts initiated within 18 months of release of the final action plan.

Appendix B

Federal Working Group

Salmon River
Photo Credit: John Meyer

Federal Working Group Co-leads:

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Department of Commerce

National Oceanic and Atmospheric Administration

Department of the Interior

Minerals Management Service
U.S. Fish and Wildlife Service
National Park Service
Bureau of Land Management
U.S. Geological Survey

Environmental Protection Agency

Region 9
Region 10

Army Corps of Engineers

Department of Agriculture

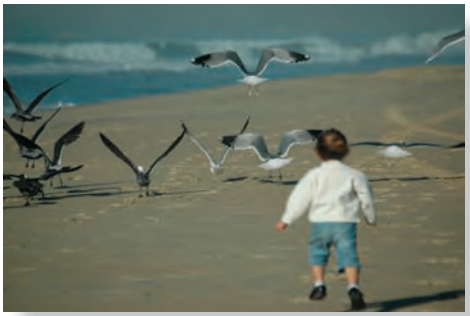
Department of Defense
U.S. Navy

Department of Energy
Wind and Hydropower Technology Program
National Renewable Energy Laboratory

Department of Homeland Security
U.S. Coast Guard

Department of State
Office of Oceans Affairs

Federal Energy Regulatory Commission



Chasing seagulls
Photo Credit: Nikki Chow