GB458.8 .C63 1992

Coastal and Ocean Resources Planning

An Assessment
of Oregon's
Coastal and Ocean
Resource Issues
and
Management Capability

A Basis for Needed Program Changes
and Federal Coastal Management
309 Priority Funding Assistance

Prepared by the
Oregon Coastal Management Program
for the
Office of Ocean and Coastal Resources Management
National Oceanic and Atmospheric Administration
U.S. Department of Commerce

January 17, 1992

GB
458.8
.C63
1992

Contents

Section	Page
Executive Summary	iii
Introduction	1
Cumulative Effects of Development	3
Coastal Hazards	15
Wetlands	29
Ocean Resources	35
Low Priority Enhancements	45

Property of CSC Library

Executive Summary

An Assessment of Oregon's Coastal and Ocean Resource Issues and Management Capability

Oregon's Coastal Management Program (OCMP) has its roots in plans and policies developed in the early 1970s. In 1977, Oregon's program was the Nations's second to be approved under the federal Coastal Zone Management Act. The OCMP consists of three major elements: overall statewide planning goals, local government comprehensive plans and ordinances, and state agency programs.

Since 1977, all cities and counties have adopted comprehensive plans and ordinances, and state agencies have prepared plans and programs to carry out state planning goals to manage growth and protect coastal resources. The Department of Land Conservation and Development (DLCD), Oregon's coastal management agency, administers the statewide goals, coordinates the various coastal program elements, and assists local governments.

During the late 1980s Oregon's coast began to experience profound change. Some communities grew rapidly with an influx of retirees and recreational development. Others lost population as the timber industry shrank and mills closed. Demand for oceanfront building lots continued unabated along with requests for seawalls and riprap. Summer traffic counts on Highway 101 climbed while winter counts remained low. The possiblity of oil, gas and mineral development loomed offshore. Salmon returns to some coastal watersheds dropped while fishermen waited frustrated.

In early 1990, DLCD began a program to assess coastal growth issues and determine whether or how Oregon's Coastal Management Program could be improved. Some 230 questionnaires were sent to local governments, interest groups, and involved citizens seeking views on major resource management problems or issues. State agencies were also surveyed.

Fifty-two respondents identified a variety of management issues and problems. These fell into five major topics: population growth; economic development; ocean mineral development; watershed and ocean fish habitat; and Highway101 improvements. Many respondents suggested program changes or improvements.

Oregon's assessment was initiated well ahead of the "309" process begun by Congress in the 1990 Reauthorization of the Coastal Management Act. But the two programs dovetail. Responses to

US Department of Commerce
[illegible] Coastal Services Center Library
[illegible] South Hobson Avenue
Charleston, SC 29405-2413

DLCD's coastal questionnaire and state agency survey clearly show that four "priority enhancement" topics listed by Congress in Section 309 are of major concern to Oregon. These are: cumulative effects of development; coastal hazards; wetlands; and ocean resources. These are Oregon's priority topics because significant management problems exist. Survey results show that the other four 309 topics are not a high priority for Oregon because they are adequately addressed with existing programs.

High Priority Improvements

Cumulative Effects of Development

Oregon's coastline extends nearly 350 miles from the Columbia River to the California border. While the coastal zone extends from the crest of the Coast Range Mountains to the sea, the land available for development is mostly confined to a narrow strip along the ocean shore, on level remnant marine terraces, and on hillsides and filled lands next to coastal wetlands and streams. The available land base is further reduced by subtracting land owned by the state and federal government, agricultural lands, flood plains and commercial timber lands. Thus, Oregon's coastal development pressures are directed to a relatively small but very diverse and valuable land base.

Coastal growth creates more than physical impacts on the landscape and natural resources. There are impacts to the economic and social structure of the many small communities of the coast. The confluence of two opposing trends have created significant shifts in population in some communities. An influx of retirees, attracted by the high environmental quality and slower pace of life, has occured at a time when younger working families are leaving due to job losses in the traditional resource based industries. In all coastal areas, the increasing reliance on tourism, which depends on high environmental quality, means local economies are skewed to a three month summer period with earnings tending to the lower end of the wage scale. Finally, Oregon's coastal communities tend to be small and are overwhelmed by sheer numbers and scale of development proposals; they simply do not have the financial resources or technical expertise to evaluate these proposals and assess cumulative impacts.

§ Population Growth

Population growth and demographic changes have had significant impacts in some coastal communities. Lincoln County, on the central coast, and Curry County, just north of the California border, are "hot." Both had population increases of 10-15 percent. Even where poulation totals have stayed relatively stable, there are shifts in demographics as the retirement sector grows and the manufacturing sector shrinks. Retirement income ("transfer payments") is now the largest economic income sector on the coast. Increased tourism and related facilities, including displacement of full-time residents with weekend or vacation rental housing, is a second factor affecting coastal growth and housing availability. The result has been increased demands for social services, a loss of affordable housing and rapidly escalating land values.

- **Priority Program Enhancement: Provide technical assistance to local governments to plan for and manage development in the coastal zone, with emphasis on 1) demographics of retirement and tourist-based communities; 2) key growth areas; 3) service needs for a changing population structure; and 4) maintaining affordable housing.**

§ Infrastructure Needs

New development on the coast requires roads, sewage treatment facilities, and water supplies. In many small communities, growth has outsripped the capability of local governments to provide adequate services. Most communities on the Oregon coast, whether incorporated or not, have neither adequate public facilities to accomodate growth nor resources to plan for and finance needed services. Comprehensive plans and ordinances to manage growth need to be updated and include public facility plans to meet increased population.

Financing options are extremely limited due to cutbacks in available federal funds and a 1989 citizen initiative to limit local government property taxes.

- **Priority Program Enhancement: Prepare public facilities plans, identify funding mechanisms, and construct new facilities to accomodate new development while protecting environmental values through environmentally sensitive siting and design.**

§ Threats to Natural Resources

Development displaces coastal habitat and related natural resources. The increasing value of real estate along the oceanfront, around estuaries and lakes, and on forested coastal terraces makes more likely the development of habitat in areas previously considered too expensive or dangerous to develop. Resources affected by this conversion include wetlands, beach cliffs, beach sand supply, a variety of plant and animal species, including some which are threatened or endangered, and coastal watershed water quality.

- **Priority Program Enhancement: Improve protection of sensitive resources threatened by development pressure, particularly lands along the ocean shore, around lakes and estuaries, and along stream corridors.**

§ Planning for and Managing Cumulative Impacts

Coastal cities and counties will continue to plan for and monitor growth through the comprehensive plan process. The 1991 Oregon Legislature significantly strengthened state law requiring all cities and counties to keep plans current through a process known as Periodic Review. DLCD will work closely with each city and county on the coast to ensure that local plans are reviewed and updated in a timely manner to address impacts from development.

- **Priority Program Enhancement: Monitor the quantitative and qualitative changes in coastal natural resources and other "quality of life" indicators.**
- **Priority Program Enhancement: Assist coastal local governments to review and update comprehensive plans and ordinances to meet growth and changing conditions, including public facility plans, and improved policies and regulation of development in hazard, wetlands, and sensitive habitat areas.**

§ Water Quality

Oregon's *1988 Oregon Statewide Assessment of Nonpoint Sources of Water Pollution* shows that nearly all coastal streams are affected by at least one nonpoint source problem or another. Coastal lakes are subject to somewhat different stresses than the pollutants common in the coastal streams; some coastal lakes are plagued by plant growth fed by nutrients from surrounding septic tank drainfields. Although groundwater aquifers are not specifically affected by nonpoint source pollution today, they are vulnerable to the cumulative effects of future resource uses. The *Assessment* demonstrates that every nonpoint pollution problem originates from a land use or resource management action.

Much of the *Assessment* is based on observation and perception, rather than on verified data. Communities will not devote efforts to solve problems they don't believe exist.

- **Priority Program Enhancement: Increase the water quality monitoring network in coastal basins to substantiate and characterize nonpoint source problems identified in the 1988 *Assessment*, and to provide a basis for specific nonpoint source control programs or projects.**

Oregon's nonpoint water quality problems could be most effectively addressed at the basin, or watershed level. A watershed approach would use the resources and expertise of the existing sector-based programs. It would link land uses in the watershed to water quality, and would make effective use of citizen committees to build community understanding and support for water quality improvements. Limited staff and financial resources currently restrict opportunities to use a watershed approach. As a result, existing water quality programs are not well integrated into local comprehensive planning processes.

- **Priority Program Enhancement: Organize an integrated, comprehensive, *citizen-based* watershed approach to protecting water quality in coastal basins and target problem watersheds first.**

Local citizen committees are an excellent way to involve citizens in long term basin-wide monitoring and understanding of water quality problems, and in developing community support for water quality programs and non-regulatory solutions. To be successful, however, citizen-based programs require extensive education, information, problem identification, and consensus-building. Such lessons have been demonstrated in Oregon in the nationally recognized Coquille River basin project, part of the EPA Near Coastal Waters initiative.

- **Priority Program Enhancement: Establish citizen committees in coastal watersheds to foster community recognition of nonpoint source problems; to promote personal resource stewardship; and to build support for changes in comprehensive plans, local ordinances, watershed rehabilitation and enhancement projects, and public awareness.**
- **Priority Program Enhancement: Provide financial and technical support for a citizen-based watershed approach to protecting water quality.**

Developing effective programs to link nonpoint source pollution, water quality, and local comprehensive plans will face several obstacles even if the watershed approach is logical. First, local governments, which control land uses in coastal watersheds, have not historically been involved in preventing or reducing nonpoint source pollution. Second, state and federal programs to protect water quality are often mistrusted and unpopular at the local level. Finally, many of the activities in the coastal zone that result in nonpoint pollution are not subject to local (or state) permit reviews (for example, grazing on streambanks and erosion from grading or road building).

- **Priority Program Enhancement: Assist local government planning and development agencies to become more aware of opportunities to prevent nonpoint source pollution through local plans and regulations.**

Oregon has local comprehensive plans in place, technical expertise in water quality, and a record of innovative work with citizens in watershed pollution problems. However, Oregon is hampered in implementing this more comprehensive, citizen-based approach by a lack of financial resources.

- **Priority Program Enhancement: Financial assistance to local governments and state agencies to implement the federally-required Coastal Nonpoint Pollution Control Program. Oregon will use a comprehensive watershed approach, based on citizen involvement and community problem-solving, and will use various state and federal water quality control resources.**

Coastal Natural Hazards

The Oregon coast is an extremely dynamic environment where many natural forces and active geological boundaries meet. Development is constrained by many types of natural hazards, including erosion, landslides, tsunamis, flooding, storm surge, and earthquakes. Nevertheless, coastal property values have increased dramatically and homes, condominiums and motels are being built as close to the ocean's edge as possible with little regard for the geologic forces at work. As the least hazardous sites are developed, development is proposed for increasingly hazardous sites with attendant increase costs, both public and private.

Cities and counties are the level of government in Oregon which review and approve proposed development in their jurisdiction. Typically, most local governments are well prepared to review proposals in natural hazard areas. They lack technical or quality control standards to guide preparation or review of geotechnical consultant reports which accompany, and often justify, development proposals. Lack of review policies and standards leaves local governments without the ability to assure that hazards have been adequately identified, assessed or addressed in the project proposal. Local governments have no standards or procedures to ensure that hazard avoidance is the first option and structural solutions the last resort. As a result, individual developments are routinely approved with inappropriate protective structures.

- **Priority Program Enhancement: Assist local governments to develop and implement technical standards for geotechnical reports and standards for reviewing, analysing, and using geotechnical information in making decisions about development proposals.**

Public agencies must be able to incorporate new scientific understanding of underlying geologic processes into programs and plans to manage growth and development on the Oregon coast. Geologists have only recently confirmed that all of western Oregon is likely to experience a catastrophic subduction zone earthquake with especially severe consequences for the coast. Likewise, while some coastal landslide areas have been known for years, the existence of long-term, slow moving tension faults and landslide areas on coastal terraces has only recently been determined. Similarly, the detrimental effects of seawalls on beach sand supply and beach loss have been determined only in the past several years. Local governments and state agencies have not yet had time or technical expertise to use this new information to prepare new policies and amend plans.

- **Priority Program Enhancement: Provide new geologic information to local governments to ensure that comprehensive plans and ordinances and state agency programs address the potential for catastrophic earthquakes, tsunamis, ocean inundation, landslides, and other chronic natural hazards.**

Much of the information on natural hazards affecting the Oregon coast is new and few in the general public are aware of the risk. Those who have become aware have expressed an interest in knowing more and taking action to address potential effects. Further, as knowledge of natural hazards affecting the Oregon coast has improved and expanded, the need for local officials to have some level of technical expertise has increased.

- **Priority Program Enhancement: Increase the level and quality of information available to the public and to local officials about coastal natural hazards and their effect on existing and future coastal development through workshops, technical bulletins, audio-video presentations and other means.**

Wetlands

While Oregon's rugged coastal mountains receive upwards of 80 or more inches of rain annually, coastal wetlands are limited primarily to narrow flat river valley bottoms, estuaries, coastal lakes caused by sand dunes and certain bog areas on uplifted coastal terraces. Nearly eighty percent of Oregon's coastal wetlands have been lost, mostly as a result of diking and draining estuarine marshlands for agriculture. The remaining coastal wetlands are scattered and valuable.

In 1989, the Oregon Legislature enacted a major wetlands statute to coordinate the various wetland regulatory and planning programs which had developed over time. The new law requires the state to adopt a definition of wetlands consistent with federal law and develop a statewide wetlands inventory. Oregon currently relies on the National Wetlands Inventory (NWI) prepared by the U.S. Fish and Wildlife Service. This inventory is not sufficiently detailed to provide the kind of site-specific information envisioned by Oregon's wetland strategy. Because wetland regulation is related to land use, topography, streams, and other features, this inventory needs to be conducted and entered into a digital GIS format to allow better analysis and utilization by local governments and state and federal agencies.

- **Priority Program Enhancement: Prepare a coastal component of the statewide wetlands inventory with a computerized GIS data base to supplant the existing National Wetlands Inventory data.**

As a first step in implementing the 1989 wetlands law, an interagency program is preparing a methodology to assess the the unique functional values of wetlands in the Pacific Northwest. The methodology will be used to prepare a wetlands classification system. State and federal agencies will incorporate the methodology and classification system into their programs, policies and regulations. Local governments will use them to prepare wetland conservation plans or to meet Goal 5 requirements for identifying and protecting wetlands.

- **Priority Program Enhancement: Complete wetland assessment methodolgy and wetlands classification system as a basis for all state agency and local government programs to protect wetlands.**

Local governments are encouraged by the 1989 wetlands law to prepare wetland conservation plans. These wetland conservation plans are intended to provide local governments and state

agencies with an opportunity to consider protection of wetland resources in a broader planning and environmental context. An approved wetland conservation plan will become the basis for state permits and local development approvals and mitigation proposals under the statewide planning program. However, the extra costs to local governments of preparing a wetland conservation plan are an impediment to participation.

- **Priority Program Enhancement: Financial and technical assistance to local governments to prepare wetland conservation plans and incorporate these plans into local comprehensive land use programs.**

Restoration of coastal wetlands will focus on estuaries where most loss has occurred. The first step of such a program will be identifying estuarine areas appropriate for restoration. Then the wetlands methodolgy, above, and existing information on estuarine functions will be used to develop techniques and standards to guide actual restoration field work.

- **Priority Program Enhancement: Identify and prioritize estuarine areas for restoration to wetlands; develop standards and policies to guide restoration work in estuarine areas; use demonstration projects with monitoring to assess success.**

Because many coastal wetlands have been lost and serious development pressures continue to threaten those which remain, coordination between local governments and state agencies, such as DSL, DLCD and DEQ, is increasingly important. This state guidance to city and county officials can help ensure that local plans reflect water quality standards under the EPA, that local decisions on individual wetland development requests are considered in a broader coastwide context, and that statewide wetlands goals are met.

- **Priority Program Enhancement: Work with local governments to provide information, coordinate agency programs and policies and develop local ordinances and regulations to protect wetlands.**

Ocean Resources

Oregonians understand that the diversity, complexity and productivity of the coastal environment extends well into the ocean realm hidden beneath the waves. Marine life abounds from coastal streams and estuaries seaward across the continental shelf and down the continental slope. Human use is the greatest near the coastline where a variety of resources are most at risk, including marine mammals and seabirds, intertidal species, and clean ocean water. Offshore oil and gas and marine mineral development may not occur until the future, but other resource use conflicts and lack of detailed management programs threaten the health of Oregon's ocean environment and renewable marine resources.

The Oregon Legislature took action in 1987 and 1991 to establish ocean planning laws and allocate state resources to the task. A plan for ocean resource management within the 200 mile U.S. Exclusive Economic Zone off Oregon has been prepared and adopted by the state. This Ocean Plan emphasizes stewardship of ocean resources and protection of marine habitats. The state therefore has a sound legal and policy framework for addressing ocean resources management issues.

Oregon needs a more detailed plan and implementing programs for the state's territorial sea to address a variety of issues and problems raised during preparation of the Ocean Plan. An Oregon territorial sea plan, as required by the 1991 legislature, will provide a mandatory framework for local, state, and federal agency plans, programs, rules and regulations to manage ocean resources within Oregon's territorial sea. An Oregon territorial sea plan, when approved by NOAA/OCRM as part of Oregon's Coastal Management Program, will ensure that federal agency programs and decisions are consistent with the plan.

- **Priority Program Enhancement: Prepare and adopt a fully enforcable plan and implementing measures to manage Oregon's territorial sea resources, uses, and activities.**

Certain of Oregon's marine resources, chiefly marine mammals, seabirds, and rocky intertidal areas, are at risk from encroachment on critical or sensitive habitat and depletion or destruction of food resources. Some of these sites are habitat for migratory gray whales, the threatened Steller sea lion and other endangered species. Oregon must

develop interagency management plans and programs, public awareness and education efforts and mandatory enforcement measures where necessary to protect these resources.

- **Priority Program Enhancement: Adopt site specific management plans and protection measures for critical marine mammal and seabird habitat.**

Substantial improvement is needed in the scientific inventory information base necessary for Oregon to prepare and adopt a territorial sea plan and implementation measures, including administrative rules for Goal 19. Oregon has established an ocean resources geographic information system to store, retrieve, and analyse information from a variety of sources.

- **Priority Program Enhancement: Conduct coordinated ocean research programs to acquire needed information.**
  Improve ocean resources GIS capability to support ocean planning and management decisions.

Hundreds of Oregonians participated in preparation of the 1990 Oregon Ocean Resources Management Plan. Public support was crucial to 1991 legislation establishing an Ocean Policy Advisory Council and reqquiring a territorial sea plan. Oregonians want to remain involved in and continue to be informed and educated about ocean resources planning and management issues.

- **Priority Program Enhancement: Continue to provide citizens with information about ocean resources and opportunities to participate in ocean planning.**

The responsibility to manage the resources and values of the Pacific Ocean off Oregon is not limited to the state alone. Many federal agencies have responsibilities and authorities for resources and activities even inside Oregon's territorial sea. Protection and proper management of these resources is a shared responsibility whose costs must be born by both levels of government. These costs are not insignificant. But the loss of ocean resources would be even greater. Federal agencies must assist the State of Oregon, and all states, to protect a common resource.

- **Priority Program Enhancement: Cooperation and financial assistance from federal agencies, including the Office of Ocean and Coastal Resources Management, National Marine Fisheries Service, U.S. Fish and Wildlife Service, U.S. Geological Survey, Environmental Protection Agency, and the U.S. Army Corps of Engineers to plan, manage, and protect ocean resources.**

Low Priority Enhancements

The 309 Assessment also examined four other issues: public access, marine debris, special area management plans, and energy facility siting. While Oregon continues to implement programs aimed at all four, none are considered to be priorities for improvement at this time. Either significant problems do not exist, or there are effective mechanisms in place for dealing with them.

§ Public Access

Ninety per cent of the Oregon coast is in public ownership: 262 miles of sandy beaches and 64 miles of rocky headlands. The other 10 percent is either estuary mouths or ocean shoreline in private ownership over which the public retains a paramount right of access. Thus Oregonians have legal access to virtually the entire length of the Oregon coast. In addition, there are 645 identified points of access to the ocean shore, 406 access points to estuarine shores, and 99 sites providing access to coastal lakes. Respondents to the coastal questionnaire did not identify public access as a priority management problem.

State and local governments are working on public access improvements within existing programs including the federal 306A program administered by DLCD, and boating facilities funded by the state Marine Board. Some coastal governments are adding new requirements to their comprehensive plans to protect existing public access sites.

§ Marine Debris

Oregon's Pacific Ocean shoreline receives its

share of debris brought ashore by winds and waves. For years, beachcombers have delighted in hiking the early morning beach after a storm to hunt glass floats from Japanese fishing vessels. Today, however, much of the debris is less romantic plastic debris. Twice a year thousands of Oregonians scour the beaches and collect tons of trash. However, available beach cleanup data suggests that Oregon has far less of a beach debris problem than other states. That perception is reinforced by response to the OCMP questionnaire which indicated that marine debris was not an important issue on the coast.

Nevertheless, various organizations are conducting "grass roots" programs to reduce or clean up debris in Oregon. For example, the port authorities in Astoria, Newport, and Charleston operate their own recycling and debris disposal programs for sport and commercial fishing vessels. Oregon's bottle recycling law, begun as a citizen ballot initiative, has reduced the "bottle" component of the state's beach debris.

§ Energy & Government Facility Siting

The siting of major energy and government facilities, often important to the state or nation as a whole, frequently stimulates local opposition. However, these facilities are not typically proposed for the relatively remote Oregon coast. Only two major energy facilities have been sited in the past twenty years, a liquified natural gas (LNG) storage tank on Yaquina Bay in Newport and a "wind farm" electric power facility at Whiskey Run north of Bandon.

Most "major" energy facilities are sited and regulated by the Oregon Energy Facility Siting Council (EFSC). State law does not allow local governments to veto the siting of facilities regulated by EFSC. However, state law requires EFSC to "coordinate" its decisions with affected local governments. This is done by EFSC appointing the local government as a "special advisory body" and requesting its comments.

§ Special Area Management Planning

Special area management plans are typically used where statewide or regional land use planning is not available to regulate land use, protect resources and resolve disputes. In Oregon, the entire coastal zone, from the crest of the Coast Range Mountains to the valleys to the ocean white with foam (apologies to Irving Berlin), is covered by comprehensive and coordinated "special area management planning". All lands and waters governed by coastal cities and counties are subject to local comprehensive land use plans. In particular, separate planning efforts were conducted for each of Oregon's 21 major estuaries as subcomponents of the comprehensive plans.

Introduction

Beginning in the spring of 1990, the department began a systematic examination of both coastal resource management problems and the desired future course of the Oregon Coastal Management Program.

We systematically surveyed other state agencies participating in the coastal program as to their areas of concern. We also sent out a questionnaire to over 230 local governments, interest groups, and involved citizens. We asked them to identify major resource management issues. The 52 respondents identified management issues associated with the following five major topics: population growth; economic development; offshore mineral development; fish habitat; and Highway101 improvements.

Since then, the department and other state agencies have begun to address some of these issues.

- The department is developing an "urban growth management" program to help communities grappling with rapid population growth.
- In April 1992, the department will cosponsor a 2-day conference on growth and development on the Oregon coast in Newport.
- Offshore oil and gas and hard mineral exploration has been halted off Oregon due to state policies urging a "go-slow" approach and because state-federal studies showed high biologic values and low mineral potential off the south coast.
- Concerns over Highway 101 are being addressed through an ambitious Highway101 corridor planning process involving local governments and citizens sponsored by the Oregon Department of Transportation.

Other major resource management issues identified by the coastal questionnaire need attention: protecting fish habitat, wetlands, and ocean resources; and addressing the cumulative effects of population growth, and planning to avoid coastal hazards. The department is working with other state and federal agencies and local governments to make sure that programs to address these priority issues are coordinated and cost-effective.

The "309" Program

Coincidentally, in October of 1990, Congress created the "309 Program". Oregon has a head start on qualifying for needed "309" funds because of our own early strategic planning and the circulation of the questionnaire on coastal resource management issues.

Assessment

Each of the eight 309 Program improvement issues is individually discussed below. For each, a legislative objective (the Congressionally stated objective of the 309 Program) is stated at the beginning of the discussion. The legislative objective is the overall standard against which the Oregon management program is being measured.

The legislative objective statement is followed by "resource assessment" and "management assessment" discussions. These discuss the status and trends of the resource and current management programs. The intent is to determine whether any problems exist and what general solutions may be possible.

Each assessment concludes with a summary and listing of priority program enhancements.

Based on responses to the coastal questionnaire and on state agency assessments, it appears that four of the 309 improvement issues are, in fact, of major concern to Oregon. These are: cumulative effects of development, coastal hazards, wetlands, and ocean resources. These are considered priorities because significant management problems exist.

At this point, it appears that the other four 309 Program issues are not high priorities for Oregon. The reason is that either no significant management problems exist or that Oregon already has effective mechanisms for dealing with public access, marine debris, special management plans, and energy facility siting.

Cumulative and Secondary Adverse Effects

Legislative Objective

Adopt procedures for assessing, considering, and controlling cumulative and secondary adverse effects of coastal growth and development. Include the collective effect of various individual uses and activities on coastal resources, such as on coastal wetlands and fishery resources.

Resource Assessment

The purpose of the assessment is twofold: (1) to assess major trends in use or development of coastal resources which may be affecting the health of the coastal environment and the livability of coastal communities; and (2) to assess whether management policies are adequate to control and manage these effects in the future.

Population Growth: The Leading Coastal Issue

Recent census data [1] show that Oregon's coastal zone experienced only a 2 percent overall population increase between 1980 and 1990. However, some counties and cities grew as much as fourteen percent in population. Furthermore, the Oregon Department of Transportation recently estimated an overall population growth for the coast of 15 percent over the next twenty years [7].

The effects and the management of population growth were the major issue raised by respondents to the department's coastwide questionnaire about coastal management issues. [8] This same problem was also the "most compelling finding" by an Oregon Sea Grant case study of coastal communities in transition.[3] While population growth is accepted as a reality, managing the pace of growth and making certain it occurs in appropriate locations is strongly felt. Respondents expressed concerns about the effects of growth that are spelled out in detail below: that growth

may overwhelm our ability to cope with it by exceeding the capacity of our infrastructure and affecting the housing supply. Respondents are concerned that the state and local governments develop and implement more effective tools to manage growth.

§ Demographics: Retirement and Tourism

Retirees are the principal component of the rapid population growth on Oregon's coast. Based on recent census data for Clatsop, Tillamook, Lincoln, Coos, and Curry counties, [1] the "sixty-five and above" age group increased by 33 percent between 1980 and 1990. That age group now makes up 19 percent of the coastal population. The combination of an attractive environment, affordable housing, reasonable tax rates and necessary supporting services makes coastal communities an attractive retirement location. The coast generally provides small town living opportunities with reasonable proximity to larger metropolitan areas. This trend is likely to continue or even increase given projected increases in the number of retirement age people and the likely continuing relative affordability of housing in coastal communities. Oregon proximity to California will also be a major factor.

Increased tourism is a second factor affecting coastal growth. The state's economic development strategy has required multi-county regions of the state to collaborate to develop and implement a common "regional strategy". All but one of the regions on the coast have selected tourism as the major component of their economic development strategy. This effort has and will continue to result in increased development of largely seasonal tourist oriented businesses and the development of a year-around "second home" weekend population.

§ Key Growth Areas

The effects of coastal development are apparent in all oceanfront communities, but they are most pronounced in the urban areas of Lincoln County and Curry County. These two counties have experienced the highest rates of growth on the coast—10 and 14 percent respectively since 1980.[1] They are likely to continue to receive the most pressure for new development .[7]

Curry County is popular because of its temperate climate, its oceanfront setting and its proximity to California. Lincoln County is especially popular because of its oceanfront setting, the availability of supporting services and its proximity to the Willamette Valley and Portland. The growth related problems these areas are experiencing are an indicator of problems likely to be faced by other coastal communities in the coming years as development pressures continue and accumulate.

§ Service Needs for a Changing Population

The increasing older population will create new and expanded needs for health care, transportation, housing, and related services which cater to the needs of the elderly. The state and coastal communities need a better long-range picture of the demographic makeup of coastal communities and the supporting facilities that are likely to be needed. Coordinated planning among local governments, health facility providers, and the state is needed to make sure that these needs are properly addressed.

§ Maintaining Affordable Housing

The increased popularity of the coast has reduced the supply of affordable housing. Prices and rent levels of existing housing units have been bid up by increased demand. Virtually all new housing is being built for middle- and upper-income buyers and renters. The cost of housing, particularly for average employees in the tourist industry, is becoming very expensive. Low-end housing is also being converted to second homes for out-of-town owners.

Infrastructure Needs

New development creates a need for new and expanded public facilities and services. Most of Oregon's coastal communities are small and have not experienced or successfully managed raid growth in the past. This creates both a need for new facilities and services and development of the capability at the local level to plan, finance and built needed facilities. These problems are aggravated by a statewide reduction in property tax rates which has reduced revenues traditionally available for facility construction.

Roads, sewer and water plants and other infrastructure to support new development may cause more damage to the coastal environment:

- Roads run along or cross the ocean shore, estuaries and coastal wetlands. Widening roads may unavoidably mean destruction of some sensitive areas.
- New sewage treatment plants generally must locate in low lying areas near existing development. Agriculture lands and wetlands have been lost to such development in the past.
- Coastal stream flows and fisheries can be hurt by dams and water plants which take water from streams as well as from new sewer plants which may overload streams with treated effluent.

Careful planning can reduce the need for improvements and their harm on the environment. For example, access management alone can reduce the need for highway or road widening. Innovative wastewater treatment techniques, such as constructing or enhancing wetlands to provide for tertiary wastewater treatment can accommodate new infrastructure in a way which is compatible with protection of the natural environment.

Existing state land use planning program rules require detailed public facility planning by cities with 2,500 or more population. These requirements may need to be revised or expanded to include smaller local governments, particularly those which cater to tourism.

Existing OCMP policies have assured that land is planned and zoned to provide for higher density and affordable housing. However more effort is needed to assure that affordable housing in fact gets built.

Development of Sensitive Lands

The increasing value of oceanfront real estate makes more likely the development of areas previously considered to expensive to develop. This is especially true of lands at the edge of coastal terraces, along the beach, and along coastal wetlands.

The existing OCMP program only allows development in hazardous areas if the development can be shown to be adequately protected from the hazard. There are growing concerns that existing plans and ordinances do not adequately assure that appropriate safeguards are in fact in place. At the same time, the state has gathered new information which suggests that hazards to oceanfront development from flooding, erosion and earthquakes may be greater than previously believed. As a consequence the state needs to reconsider its policies for development, particularly in hazardous areas. (This particular issue is discussed further in the Coastal Hazards section of this report.)

Development and Management Threats to Natural Resources

Natural resources in the coastal zone are under pressure from both land development and management practices on farm and forest lands.

Urbanization along the coast has resulted in increased pressure to develop along the ocean shore, rivers, and wetlands, and to convert farm and forest lands to urban uses. Filling of coastal wetlands and rivers has been substantially reduced but the long-term effects of past activities is not fully known. Also, concerns are increasing about more subtle effects, such as urban runoff on estuarine water quality. State and local governments need to more fully address these issues. Addressing these issues may involve:

- Revision of comprehensive plans during periodic review (either in response to new information or new state policy initiatives) such as wetland conservation plans.
- Revised statewide planning goal or rule requirements; particularly for regulating shoreline development and land use patterns.
- New or revised state agency authorities in response to specific problems or issues.

§ Beach Sand Supply

Development along the shoreline together with ongoing natural processes has resulted in placement of beachfront protective structures along many developed portions of the coast. Sea level rise and foreseeable erosion and flooding events make it a certainty that much of the presently developed coastline will be protected by revetments at some time in the future. Although the state policies prohibit revetments in undeveloped areas and limit them elsewhere, concerns remain that the

continued construction of revetments will increase erosion and narrowing of Oregon's beaches.

Many in the development community continue to question both the severity of potential flooding and erosion events and whether placement of revetments will harm the beach. An Oregon Sea Grant evaluation of current shoreline policies is underway.[2] This includes gathering additional information on the effects of shorefront protective structures on beach erosion.

§ Threatened & Endangered Species

Numerous threatened or endangered species are directly affected — either positively or negatively — by development activities along or near the ocean shoreline. One plant, the pink sand verbena, and one animal, the snowy plover, thrive only in open sandy areas along the ocean shore or beach. The snowy plover nests just above the high tide line and is potentially threatened by most kinds of human activity. Both the verbena and the plover have lost habitat as a result of the spread of European beachgrass (Ammophila arenaria) along Oregon's oceanfront over the last 50-75 years. The presence and spread of beachgrass has dramatically reduced the amount of open sand above the high tide line, crowding out both the plover and the verbena.

Remedial actions for both the plover and the verbena involve removing beachgrass. Ironically, habitat for both species has been most successfully enhanced through placement of sandy dredged material on the beach. Future remedial actions will likely build on this experience and may include eradication of European beachgrass in selected locations. However, locations must be carefully selected in order to avoid increasing the potential for flood or erosion damage to oceanfront buildings.

The silverspot butterfly and the marbled murrelet are endangered species which depend on old growth forest habitat located very near to the ocean. The murrelet, a very fast flying small bird, nests in trees in old growth and fishes along the nearshore. Little is known about the bird's population or habits, and future research is needed to know how to enhance the population. Most of the known nesting areas are in national forest lands along the coast. Consequently, the management of forest lands is an important factor affecting the bird's survival. Research on the murrelet and its habitat needs is in progress.

The silverspot butterfly requires a combination of old growth forests and salt-spray meadows for food and shelter. Salt spray meadows support certain flowers upon which the butterfly feeds. Residential and golf course development of the remaining open meadows are major conflicts. Habitat enhancement plans which preserve and enhance portions of the salt spray meadow for the butterfly are accepted and apparently effective ways to enhance butterfly habitat and allow for development. Butterfly habitat is known to exist and has been dealt with near Gearhart in Clatsop County and at Big Creek in Lane County.

Certain salmon species are the third group of organisms at risk from the cumulative and secondary effects of continued development. Native salmon stocks are threatened not by land development so much as by the cumulative effects of the following activities: (1) timber and agricultural management practices in coastal watersheds; (2) increased harvest pressure; and (3) construction of hydroelectric dams in the Columbia River watershed without adequate upstream and downstream passage facilities for the salmon. While management practices have dramatically improved, the cumulative effect of years of past abuse have brought many runs of salmon to the brink of extinction, which has motivated the federal government to consider a "threatened and endangered" designation.

The state has made major strides to address watershed management issues in the coastal zone. The Forest Practices Act has been and is being revised to provide adequate buffers along coastal streams and to implement other measures to minimize damage to fish habitat. The state's Salmon and Trout Enhancement Program — called STEP — has involved citizen groups in a stream-by-stream effort to restore habitat and reestablish successful runs of native fish. Minimum stream flows and instream water rights for fish are being established to protect fish runs and other instream uses. While more needs to be done on upland management practices, other factors beyond local and state control, such as international open ocean fishing practices and retrofitting hydroelectric dams with adequate fish passage facilities, are needed if these efforts are to succeed.

Water Quality

One important component of the cumulative and secondary effects of all activities in the coastal zone — not just development activities — is water quality. Water quality itself can indicate the severity of land and resource uses in the coastal zone. Rapid growth can indeed have adverse effects on water quality, but simple daily use of all resources and areas in the coastal zone also results in persistent water quality problems.

The coastal onshore hydrologic system is made up of rivers, estuaries, lakes, and groundwater aquifers. It can be thought of as a single, continuous, deep sheet of water — much or most of which is underground — that gravitates from the crest of a basin to the ocean by the easiest available path. So any activity that affects water quality in one part of the system invariably affects the remainder of the system downstream. The effect of a single "pollution event" on the whole system is usually minor, but the cumulative effect of thousands of such "events" could disrupt the integrity of the entire system, and thus threaten the life forms and communities it supports. The fact is, thousands of such events occur daily in Oregon's coastal basins.

Virtually all of Oregon's coastal waters are affected to some degree by pollution. Yet even within the network of resource management programs, some of this pollution can be ignored: pollution does occur naturally, and some pollution, while caused by human activities, does not affect water uses.

However, most pollution problems cannot be ignored. They either constitute health risks, reduce the vitality of aquatic life, or more generally restrict the ability to use the waters. Many nonpoint source (NPS) pollution problems — that is, the cumulative effects of thousands of minor pollution events — fall into this group: they simply cannot be ignored. Thus, a primary task in any strategy to reduce nonpoint source pollution will be to identify water quality problems that can be solved through a variety of individual and community efforts.

Nonpoint source pollution seriously affects several water bodies in Oregon's coastal basins. The *1988 Oregon Statewide Assessment of Nonpoint Sources of Water Pollution* [4] specifically identifies several nonpoint source problems — and their likely causes — in the coastal basins. However, much of the assessment is based on observation and perception, rather than on verified data. While confidence in the observations is high, the existence of problems still must be verified before the *Assessment* can be used as the basis for specific nonpoint source control programs or projects. Further, identified problems must be validated by communities before pollution control programs can anticipate success. In short, communities will not devote efforts to solve problems they don't believe exist.

The *1988 Assessment* shows that nearly all coastal streams are affected by at least one nonpoint source problem or another. Turbidity, erosion, sedimentation, and nutrients are the most prevalent nonpoint source problems in coastal streams. Many streams have insufficient stream structure. A few streams show high pathogen counts, elevated temperatures, or low dissolved oxygen.

The *1988 Assessment* also shows that coastal lakes are apparently subject to somewhat different stresses. According to the database, coastal lakes are more affected by pesticides and toxics than the pollutants common in the coastal streams. In addition, though, increased aquatic plant growth in some coastal lakes has been attributed to increased nutrients entering the lakes. And if aquifers are not specifically affected by nonpoint source pollution today, they are vulnerable to the cumulative effects of future resource uses.

The assessment indicates that the causes of nonpoint problems in coastal basins include surface erosion, landslides, road location, removal of vegetative cover, and a variety of water flow and channel alterations.

In general, nonpoint source water quality problems are land-based resource use problems which manifest themselves in the water. In addition to causes identified in the assessment are problems of failing septic systems or residential development that is too dense for the watershed; problems of using pesticides too close to the watercourse, or of not leaving a vegetative buffer between certain uses and the stream; problems of earth movement resulting from construction activities, or improper surface drainage of nutrient-

producing activities. The list could go on. In short, every nonpoint pollution problem has a land use or resource management cause.

In the context of community planning and development, many of these land use and resource management issues related to water quality have been overshadowed by the need to address more pressing cumulative impacts. Communities have been properly devoted to reducing point source pollution, slowing the division of farm and forest lands, halting the extension of urban services into rural areas, increasing the protection of estuaries and wetlands, and so on. Moreover, there have been fewer demands in the past to use coastal waters. Now, with the use of coastal resources in general — and coastal waters specifically — expected to increase dramatically in the 1990s, the cumulative effects of many apparently harmless activities must be addressed.

Management Assessment

Implementation of Oregon's coastal management program is resulting in the refinement of policies and techniques for managing cumulative effects of coastal development. However, more needs to be done.

The state and local government efforts described below provide an opportunity to pursue cumulative effects issues. The department, as the state's lead agency for coastal management, has a key role to play in coordinating and integrating these efforts. Coordination and integration can assure that the efforts do not work to cross purposes.

Population Growth Pressures

The department has completed a detailed analysis of urban growth patterns around the state including the Brookings area. The results of this study show that substantial amounts of residential development are continuing to occur just outside of urban growth boundaries despite policies which encourage development to occur within the boundaries. The department is now beginning to develop proposals for rule and statute changes to implement the results of this study.

More information is needed on the unique demographic character of the Oregon coast and its implications for future planning. We know the current trends for retirement and tourist development on the Oregon coast. We need an analysis of state, regional, and national trends in these areas to know if rates of growth in these industries will remain the same, grow more rapidly, or slack off. We then need to translate this information into an assessment of planning needs, such as for public facilities planning, for maintaining affordable housing, and for protecting and enhancing the coastal environment. The existing program provides a mechanism for local governments to update their plans in response to this new information — through periodic review.

The department is continuing its assessment of coastal issues with local governments, state agencies, and other groups and interests involved in the coastal management program. This ongoing effort will provide a basis for discussion and further efforts to refine coastal program policies to better address cumulative effects of development.

Other agencies are also involved in long-range planning efforts to better address cumulative effects of development. The Division of State Lands (DSL) is encouraging local governments to develop wetland management plans. DSL will also be assessing wetland trends statewide to establish regional priorities for wetland mitigation and restoration projects (see wetlands discussion below.)

The Oregon Department of Transportation (ODOT) is developing a corridor plan for the Pacific Coast Highway, Highway 101. Planning issues facing Highway 101 mirror the broader coastal agenda. Coastal population growth and especially expanded tourism place new demands on the coast's major transportation route. These demands must be sorted out in a way which maintains and enhances the coastal environment.

The Governor's priority for promotion of "Livable Communities" is also an important planning effort which parallels the coastal program. "Livable Communities" is intended to address the is-

sues of rapid population growth in a way which accommodates growth but retains the quality of life to which people have grown accustomed.

A minimum response to the "Livable Communities" initiative would be to monitor and collect data on the changes in coastal natural resources due to population growth. Specific measures or indicators could be established which could be used to research the status, trends, and forecasts for key "adverse effects areas". Data on certain parameters are currently being collected, such as population and demographic patterns. What is needed are data related to quality of life and to natural resource quality; such as acres of wetlands and riparian habitat; and development in hazardous areas. As another example, the Oregon Progress Board has recommended numerous data collection parameters that could be used to monitor coastal natural health .[8] These measures monitor clean air, water, and land, as well as agricultural lands, forest lands, wetlands, and endangered species.

Achieving the "Livable Communities" objectives in the face of shrinking public funds will be a challenge. One potential solution may be an increased use of qualified citizen volunteers to perform many of the needed planning tasks. This is a positive manifestation of the dramatic increase in the retirement section of the coastal population during the last decade. A recent Oregon Sea Grant case study of coastal communities in transition [3] provided the following conclusion regarding volunteerism:

> *One of the things that this study discovered was that the subject coastal communities have the potential to take advantage of currently underutilized human capital. That is to say, new residents who have recently settled in these communities bring with them many skills and unique capabilities. Particularly among the retired population, individuals with strong technical and professional backgrounds can make significant and meaningful contributions to the community's economic and social milieu. Leaders in these communities must find innovative ways to draw these new citizens into positive contributions, the provision of public services and support of community activities.*

Water Quality Programs

§ State Agencies

Oregon's system for addressing water quality problems is the responsibility of several programs within the Oregon Department of Environmental Quality (DEQ). DEQ participates as a full "networked" partner in the Oregon Coastal Management Program. Among other responsibilities, DEQ administers programs for groundwater quality, water quality in lakes and estuaries, and for nonpoint source pollution control .[5] DEQ's programs reflect distinctions between the components of the hydrologic system for reasons of convenience and familiarity.

DEQ's water quality programs perform the following differing functions: water quality monitoring; water quality assessments; water body prioritizing; research, planning, and education; and coordination among other programs and agencies. Each distinct water quality program contributes to these statewide planning and coordination functions. As a result, the state uses limited resources to address severe problems and to protect particularly valuable waters.

Oregon's Nonpoint Source Management Plan identifies and sets priorities for work tasks that are to be accomplished as staff and budget resources allow. With additional financial resources, emphasis on problems in coastal basins could be increased. The increased coastal emphasis could result in the creation and support of citizen committees to monitor water quality, the identification of specific water quality problems, and the identification of water quality-related changes needed in local comprehensive plans and their implementation.

DEQ has twice produced statewide assessments of nonpoint pollution problems, the most recent of which was completed in 1988 .[4] The assessments provide an excellent starting point for community discussions on nonpoint problems. But unfortunately, when most local comprehensive plans were being developed, the cumulative water quality impacts of land uses were overshadowed by more immediate problems. So at this point, the *Assessments* have only been referenced by or incorporated into a few coastal comprehensive plans.

The *1988 Assessment* must be updated or supple-

mented before it can become a basis for community decisions about water quality problems. However, state and local agencies do not have the resources required to extend water quality monitoring programs so as to help identify and address basin-wide nonpoint source problems. So Oregon's water quality strategy is to work on the most difficult problems first, and to immediately protect high-quality waters. Given the limited resources compared to the magnitude of problems, any broad effort to further identify and control persistent water quality problems will have to rely on extensive education, information, problem identification and consensus-building. Since Oregon's local water quality projects invariably rely on public and local government participation, citizen committees provide an excellent opportunity to begin long-term basin-wide citizen monitoring programs.

Oregon's nonpoint source control program currently relies on "designated management agencies" for its implementation. These agencies are typically involved directly in managing a resource, whether by regulation, leasing, or technical assistance. Thus agencies are in an excellent position to use — or require the use of — "best management practices" for reducing nonpoint source pollution. For example, the Oregon Department of Forestry, the Oregon Department of Agriculture, and the Bureau of Land Management are all involved in nonpoint source pollution control by virtue of their work with forest and agricultural land management. Many state and federal agencies are involved in addressing the cumulative water quality effects of coastal resource uses. However, only one — DEQ — has the reduction of water pollution as its primary responsibility.

DEQ also has a water quality program for small coastal lakes. The lakes program is currently characterizing the limnology of seventeen coastal lakes, so that water quality can be correlated with land uses in lake watersheds. The current objective of the lakes program is to synthesize current knowledge about coastal lakes into a model that can be used by local planning officials to determine the optimum level of different land uses in a lake watershed. Protection of coastal lakes receives more attention in local comprehensive plans than do riverine nonpoint problems, but this is probably due to the fact that lake shores are under tremendous development pressure. Nonetheless, local plan policies and provisions to protect lake water quality now need to be updated with new water quality and land use data.

DEQ recently completed one of only three near-coastal water quality demonstration projects in the nation. The project focused on the Coquille River basin, where nonpoint sources contributed to water quality degradation. The Coquille project was built on extensive public involvement in the form of a Community Advisory Committee. The committee helped identify problem areas, participated in monitoring activities, and advised DEQ of practical solutions to the identified problems. The committee is now developing a "Strategic Watershed Plan", which will identify priorities for the next decade. Since point source problems in the basin have now been rectified, the more complex nonpoint source problems are being evaluated to determine the highest priorities for future projects.

The Near Coastal Waters demonstration project successfully developed and supported a citizen-based approach to solving water quality problems. It provides one model for continued citizen-based coastal water quality improvement programs in coastal basins. It also demonstrates that community support and understanding are critical to the success of nonpoint source pollution control programs.

In summary, Oregon's state-level water quality programs are structured, first, according to water body type; second, to address specific water quality problems; and third, to participate in a process to identify water quality priorities statewide. Limited financial resources have resulted in a strategy of addressing only the worst water quality problems, and of restricting the use of the more effective citizen-based watershed approach. The different programs are not well integrated into the local comprehensive planning process. The separate programs are effective at addressing identified water quality problems, and they provide a strong foundation for an integrated "watershed approach" to water quality problems at the local level.

§ Local Governments

Three factors complicate the involvement of local planning and development authorities in nonpoint source pollution control.

First, local governments have not historically been involved in the reduction of nonpoint source pollution. Local authorities do review a considerable number of land use and development activities, but their review has traditionally been restricted to the protection of other community values. Minimizing urban sprawl, maintaining land in viable blocks for farm and forest uses, and prohibiting the inappropriate use of shorelines, among many other issues, have all required considerable resources at the local level.

Second, state- and federally-driven programs to protect community values can be unpopular at the local level. They can be seen as the imposition of solutions on problems that don't exist. Oregon's experience has been that the only valid way to manage an environmental protection program is to organize a citizen-based process that results in a community's definition of its problems. This lesson has been learned in both the water pollution and local comprehensive planning programs.

Finally, many of the activities in the coastal zone that result in nonpoint pollution are not subject to local (or state) permit reviews. Virtually thousands of everyday activities affect water quality as a matter of course. Lawn fertilizer, pet wastes, used crankcase oil and antifreeze, and improperly stored household chemicals are common pollutants whose use or disposal are, appropriately, not regulated by water quality officials. It is not administratively or politically possible to regulate all of these activities.

Thus there are three significant challenges to reducing the cumulative effects on water quality of land and resource uses in the coastal zone:

- Helping local planning and development authorities become more vigilant for opportunities to prevent nonpoint source pollution.
- Providing integrated state-level support for a citizen-based watershed approach to protecting water quality.
- Increasing public awareness of the water pollution that results from a variety of individual activities.

Finally, an effective nonpoint pollution control program must represent the coordinated efforts of several agencies to address problems systemically at the local level

§ New Federal-State-Local Programs

Congress recently passed legislation which can make for a closer working partnership between DEQ's various water quality programs and the Oregon coastal program. The legislation amended the Coastal Zone Management Act to add the Coastal Nonpoint Pollution Control Program. It is also called the "Section 6217" program, named after the section of the amending legislation.

The "6217" program is likely to use "management measures" to control the introduction of nonpoint source pollutants into coastal waters, particularly from agriculture, forestry, and urban sources. Since many of the measures identified by federal agencies may already be in use in Oregon's present water quality control programs, Oregon's strategy in meeting the federal mandate will rely heavily on community information and problem-solving efforts. The coastal nonpoint source control will provide Oregon with an opportunity to integrate various state and federal water quality control resources — expertise, grants, data, programs, and project contacts — into a systemic watershed approach to address persistent coastal water quality problems.

Priority Program Enhancements

The category of cumulative and secondary effects is a priority for OCMP improvement.

The major process for refinement of Oregon's coastal program remains the periodic review and update of city and county comprehensive plans. The department will provide leadership through its work on urban growth management policy revisions. It will also work closely with the relevant state, local, and federal efforts mentioned above to assure that they are aware of other efforts and are fully incorporated in local plan updates.

Population Growth Pressures

Oregonians are concerned about the future of the Oregon coast. They wonder what their communities and environment will be like 50 years from now. They recognize that the beauty, natural resources, and way of life of the coast will continue to lure new residents and businesses. At the same time they also recognize that this continued growth could destroy or alter the very qualities and values of the coast they know and love.

Increasing year-around population growth, a high seasonal and weekend influx of tourists and second home owners, and the depopulation of formerly viable timber-based communities have all increased demands for social services and caused a loss of affordable housing. New development has created a need for new and expanded public facilities, like roads and sewer treatment plants. The siting of such facilities can cause the loss of sensitive fish and wildlife habitat.

The increasing value of oceanfront real estate makes more likely the development of areas previously considered too expensive to develop due to natural hazards or the mitigation of environmental damage. Residential development has been occurring outside of urban growth boundaries, often on agricultural and forest lands. Numerous "threatened and endangered" plant and animal species have been losing habitat due to development activities.

Several improvements could be made to the Oregon Coastal Management Program:

- **Develop better information on economic and demographic trends to assure development needs are accommodated with minimal loss of sensitive lands and resources. State agencies and local governments need an analysis of state, regional, and national trends in these areas to know if rates of growth in these industries will remain the same, grow more rapidly, or slack off. We then need to translate this information into an assessment of planning needs, such as for public facilities planning, for maintaining affordable housing, and for protecting and enhancing the coastal environment. NOTE: Fortunately, Oregon law empowers the Coastal Program, through the Periodic Review process, to require the updating of plans to respond to this new information. A full discussion of periodic review will be provided in the Strategies.**
- **Develop and refine tools to better manage and control urban development in the coastal zone. For example, small tourist communities on the coast could be encouraged to do public facility planning.**
- **Increase the use of qualified volunteers to perform needed studies, analyses, and other planning activities.**
- **Provide better protection of sensitive resources threatened by development pressure, particularly lands along the ocean shore.**
- **Encourage environmentally sensitive siting and design of new public facilities in the coastal zone, particularly sewer and water facilities and roads.**
- **Monitor the quantitative and qualitative changes in coastal natural resources and other "quality of life" indicators caused by the cumulative effects of increasing population growth.**

Water Quality

A recent state water quality assessment shows that nearly all coastal streams are affected by at least one nonpoint source pollution problem. Many coastal lakes are also affected, and groundwater aquifers are in danger. However, lack of staff and financial resources have prevented state water quality managers from making more use of effective citizen-based watershed management approaches. Consequently, current state-level water quality programs are fragmented among different "hot spot" pollution problems, and are not well integrated in local comprehensive planning processes.

Several improvements could be made to the Oregon Coastal Management Program:

- **Verify the existence of nonpoint source problems. This will allow the Assessment to be used as the basis for specific nonpoint source control programs or projects. Further, identified problems must be validated by communities before pollution control**

programs can anticipate success.

- **Increase the water quality monitoring network in coastal basins. A primary task in any strategy to reduce nonpoint source pollution will be to identify water quality problems that can be solved through a variety of individual and community efforts.**
- **Review, supplement, and substantiate the data on nonpoint source pollution problems in coastal basins.**
- **Increase emphasis on an integrated, comprehensive approach — a watershed approach — to protecting water quality in coastal basins.**
- **Target problem watersheds and water quality problems in coastal basins.**
- **Increase community perception and recognition of nonpoint problems in coastal watersheds.**
- **Increase coordination and integration of water quality programs and land use planning programs at the local level. The Near Coastal Waters demonstration in the Coquille River basin provides one model for a citizen-based water quality improvement program. Community support and understanding are critical to the success of nonpoint source pollution control programs.**
- **Help local planning and development authorities become more vigilant for opportunities to prevent nonpoint source pollution.**
- **Provide integrated state-level support for a citizen-based watershed approach to protecting water quality.**
- **Increase public awareness of water pollution that results from a variety of individual activities.**
- **Increase financial resources to implement the federally required Coastal Nonpoint Pollution Control Program. Oregon's strategy will rely heavily on community information and problem-solving efforts. Oregon will integrate various state and federal water quality control resources — expertise, grants, data, programs, and project contacts — into a comprehensive watershed approach to solving persistent coastal water quality problems.**

References

1. Center For Population Research & Census. Population Estimates For Oregon, 1980-1990. Portland State University. Portland, Oregon. March 1991.

2. Good, James. "Draft Shore Protection and Oceanfront Land Use Practices In Oregon: A Critique". Oregon State University. Corvallis, Oregon. 1991.

3. Martin, Michael et al. Coastal Oregon Communities In Transition: A Case Study Approach. Oregon State University. Corvallis, Oregon. July 1991.

4. Oregon Department of Environmental Quality. "1988 Oregon Statewide Assessment of Nonpoint Sources of Water Pollution". Portland, Oregon. August 1988.

5. Oregon Department of Environmental Quality. "1990 Water Quality Status Assessment Report (305b Report)". Portland, Oregon. (no date)

6. Oregon Department of Land Conservation & Development. "Analysis of Coastal Questionnaire Responses". Salem, Oregon. July 1991.

7. Oregon Department of Transportation. "Draft Demographic & Economic Forecasts, 1990-2012". Salem, Oregon. August 1991.

8. Oregon Progress Board. Oregon Benchmarks: Setting Measurable Standards For Progress. Salem, Oregon. May, 1990.

Coastal Hazards

Legislative Objective

Prevent or significantly reduce threats to life and destruction of property by eliminating development and redevelopment in high hazard areas, managing development in other hazard areas, and anticipating and managing the effects of potential sea level rise.

Resource Assessment

The Oregon coast is subject to a spectrum of natural hazards associated with processes that occur across a range of spatial and temporal scales. For the purpose of discussion, a distinction can be made between "catastrophic" and "chronic" coastal natural hazards.

Catastrophic hazards are those which are regional in scale and scope. Instantaneous events, such as earthquakes, tsunamis, and hurricanes, fall into this category. Although the occurrence of such events may be infrequent, their effects are severe. Events more gradual in nature, but which have severe region-wide effects, such as sea level rise and subsidence, also fall into the catastrophic hazard category.

In contrast, chronic hazards are those which are local in scale and scope. River and ocean flooding, beach and dune erosion, sea cliff recession, and landsliding are events that fall into this category. Being local in nature, the effects of chronic hazards are generally less severe. However, their wide distribution and frequent occurrence makes them a more immediate concern.

The nature of both catastrophic and chronic hazards that affect the Oregon coast is described below.

Catastrophic Hazards

§ Earthquakes, Coseismic Subsidence, Tsunamis

The regional tectonic setting of the Oregon coast is that of a convergent margin, where the oceanic Juan de Fuca Plate plunges below the continental North American plate at the Cascadia subduction zone. Seismic activity in both plates represents some risk, however the greatest potential for a

major catastrophic earthquake event in the Pacific Northwest is associated with subduction zone seismicity.[18]

Although there is no historical record of a major catastrophic earthquake event in the Pacific Northwest, a body of evidence very recently has been developed which strongly suggests that major subduction zone earthquake events do occur along the Oregon coast. This evidence includes the discovery in Washington and Oregon estuaries of sedimentary sequences consisting of marsh deposits overlain unconformably by intertidal muds and/or tsunami-derived sands.[2, 5, 6, 8] These deposits, suggestive of rapid subsidence and marine inundation, exhibit affinities to those produced in response to the 1960 Chilean and 1964 Alaskan subduction zone earthquakes. Other evidence for major subduction zone earthquake events includes submarine "turbidity current" deposits. Such landslide-induced deposition has been shown to have occurred simultaneously over large distances, suggesting triggering by a single large scale seismic event.[1, 18] Geodetic data, which indicate that uplift is occurring and strain is accumulating along the entire length of the Oregon coast, also suggest that seismic activity accompanies subduction.[18, 25, 26] Finally, native American legends and archaeological evidence are consistent with a history of major catastrophic earthquake events in the Pacific Northwest.[18, 27]

Radiocarbon dating of buried marsh deposits, tree ring dating, and sedimentation rates, have all been employed to estimate how often major earthquake events occur in the Pacific Northwest. Estimates obtained from such analyses suggest that the last major catastrophic earthquake event occurred approximately 350 years ago, the average return interval is on the order of every 300-500 years, and return intervals range from periods as short as 270 years to as long as 850 years[1, 3, 18, 19] These observations have led investigators to conclude that there is a distinct possibility that a major catastrophic earthquake event could happen in Oregon in the near future.

Based on Pacific Northwest geodetic data and analogies to other great subduction zone earthquakes (e.g. Alaska, Mexico City, and Peru), investigators have suggested that the magnitude of a subduction zone earthquake event in the Pacific Northwest is likely to be in the Mw 8.0 to 9.1 range.[18, 20] Damage from such an event would not only include that resulting from ground shaking, but also that resulting from earthquake-induced liquefaction, landsliding, subsidence, and tsunami. Madin[18] has outlined a scenario for such an event. At the onset, severe ground shaking occurs for several minutes. During this time, amplification and liquefaction effects occur in areas of unconsolidated, saturated sediment. Massive ancient landslides are reactivated. Significant structural damage to buildings, and the closure of roads and bridges all along the coast would result from the occurrence of these events alone.

Rapid, coastwide subsidence on the order of 0.5-1.5 meters also occurs in association with the subduction zone earthquake. Although flooding associated with subsidence would occur immediately in some low-lying areas, the effects of subsidence are more likely to be manifest over the longer term as increased flooding and coastal erosion during storms. This scenario is further complicated by the likely occurrence of locally generated tsunami arriving at the coast within a half hour after initial ground shaking. A study by Hebenstriet[9] estimates the size of such a tsunami to be on the order of 6-12 meters in height prior to run up. Maximum destruction from such a tsunami would occur along the shorelines of bays, estuaries, and low lying sand barriers. These areas would experience immediate flooding and erosion.

As Madin[18] notes, the possible occurrence of such a catastrophic event is undoubtedly a concern for emergency managers, land-use planners, and public officials of coastal communities. Many communities critical facilities, such as schools, hospitals, and emergency response centers, are located in areas that are likely to be damaged by an earthquake or associated tsunami. Yet, most people remain unaware that the possibility of a magnitude 8 or greater earthquake even exists, let alone the truly catastrophic nature of such an event.

- **NEED: Support efforts that lead to the refinement of our scientific understanding of the nature of major subduction zone earthquake events. In particular support research efforts that further the understanding of areas along the Oregon coast that are most vulnerable and how impacts**

in these areas can be minimized. Support efforts to increase public awareness of the likelihood and nature of a major earthquake event in the Pacific Northwest.

With respect to tsunamis, the import of nonlocally-generated tsunamis should not be overlooked. The most common source of significant tsunamis reaching the Oregon coast comes from earthquakes in and around Alaska. Although the occurrence of such tsunamis along the Oregon coast is sporadic and unpredictable, two have struck the coast in recent years. This includes the tsunami generated by the Good Friday Alaska earthquake in 1964, the largest recorded tsunami to hit the Oregon coast. During this event, four drownings and $700,000 in damage occurred. The damage involved the washing of logs and driftwood into motel units and the temporary flooding of low-lying areas.

- **NEED: Support efforts that lead to the refinement of our understanding of which areas are most vulnerable to a tsunami, and what impacts a tsunami is likely to have in these areas.**

§ Sea Level Rise-Subsidence

The occurrence of a major subduction zone seismic event and its accompanying effects are only part of the cycle of tectonic activity that occurs at the convergent margin. The extremely brief periods of sudden change that characterize a major seismic event are separated by extended periods of gradual earth movement. During these quiescent intervals uplift of the coastal margin occurs as strain accumulates prior to its release in a major seismic event.

Recent investigations suggest that, although uplift is occurring along the entire length of the Oregon coast, elevation changes are not uniformly distributed. The smallest rate of uplift has occurred along the central Oregon coast. Higher rates of uplift have occurred along both the northern and southern Oregon coast.[12, 25, 26] These differential rates of uplift become significant when the effects of present-day sea level rise are superimposed upon them. Komar[12] examined the rate of land-level change relative to the changing global sea level. He found the northern and southern Oregon coasts to be rising faster than the rate of rising sea level by about 0.1-0.2 mm/yr. In contrast, the central Oregon coast is being submerged by the rising sea at a rate of about 1-2 mm/yr. As Komar points out, these rates are small when compared to those common along the East and Gulf coasts. Further, much of the Oregon coast is fronted by sandy sea cliffs rather than low lying costal barriers. As a result, inundation and shoreline retreat accompanying sea level rise are less of a direct threat to Oregon coastal communities than they are to those situated on the East and Gulf coasts.

Although local tectonic conditions moderate the potential threats to coastal Oregon associated with sea level rise, the coastwide differences described above have been shown to affect the patterns of coastal erosion.[12] For example, Komar and Shih[16] have examined the relationship between the extent of cliff erosion and relative sea level changes. They found that the greatest amount of sea-cliff recession has occurred on the central Oregon coast where the rate of relative sea level rise is the greatest. Apparently, the cliffs in this area are subject to more frequent direct wave attack and as a result their buffering capabilities are minimized. Should an accelerated rise in global sea level occur during the next century in response to greenhouse warming, such effects would be magnified.

- **NEED: Monitor research on global sea level rise, particularly as it pertains to the accelerated rates and effects of sea level rise. Support efforts to refine our knowledge of local effects of sea level rise. As such knowledge increases, public awareness of global-sea level rise can be augmented.**

§ Hurricanes

The Oregon Coastal Zone is at little to no risk from the hazards associated with hurricanes. However major storms, with hurricane force winds and 7 meter high breaking waves, batter the coast almost every winter.[12] The beach and upland erosion, ocean and riverine flooding, and property damage associated with these events is considered below.

Chronic Hazards

A prominent feature of chronic natural hazards along the Oregon coast is their variety, both

within and between the headland-bounded littoral cells that together makeup the Oregon coast. Episodic beach and dune erosion is the major problem in some littoral cells. Commonly such erosion varies spatially as well as temporally. Homes at one end of a littoral may succumb to storm waves, while at the same time homes at the other end of the same cell face burial due to sand inundation. At any given time, erosion within an entire littoral cell may be concentrated at single site located at the head of a rip current embayment. In other littoral cells, or other parts of littoral cells, the major problem is landsliding and sea-cliff recession. In these areas wave-induced beach erosion per se may be a contributor to such problems, but be a minor problem in and of itself. The myriad of events that fall under the category of chronic hazards act cumulatively. However, their effects are discussed independently below.

§ Coastal Flooding-Storm Surge

According to the Federal Emergency Management Agency (FEMA), the five coastal counties of Coos, Clatsop, Tillamook, Lincoln, and Curry have nearly every type of flood hazard found in the Northwest. In the three northern counties (Clatsop, Tillamook, and Lincoln), flood hazard areas are nearly all developed. Most of this development occurred before the adoption of flood hazard regulations. In 1990, both Tillamook and Clatsop counties were declared disaster areas by President Bush as a result of coastal and riverine flooding.[4]

Flooding on the Oregon coast is attributable to several factors including heavy rainfall, steep topography, low bedrock permeability, and extensive flood plains. Catastrophic flooding is projected by FEMA as the 100 year flood. FEMA forecasts the 100 year flood based on historical information on rainfall and a detailed analysis of flooding patterns in each community. Each municipality on the coast is subject to a 100-year flood. Along the ocean shore the 100 year flood level forecast is derived from information on high tides and wind-driven storm waves. The projected elevation of such a flood along the Oregon coast varies depending on shoreline characteristics, and ranges from 19-29 feet above mean sea level.

§ Beach and Dune Erosion

Erosion on the Oregon coast is confined mainly to the stormy winter months. The high winter waves coupled with high water levels return to the offshore the sand that has accumulated on beaches and dunes during the summer period of low waves. Changes in the direction of wind and littoral drift within the "closed" littoral cells are an integral part of this seasonal cycle.[10, 12] Southerlies, which move sand towards the northern ends of the littoral cells, are dominant in the winter. Northerlies, which move sand towards the southern ends of the littoral cells, are dominant in the summer.

Shifts in storm paths and temporary rises in sea level associated with the with El Niño events, have been shown to exacerbate the seasonal patterns of erosion and accretion.[11, 13, 15] Specifically, all along the Oregon coast following the 1982-83 El Niño, accretion was found to have occurred at the northern ends of pocket beaches while the southern ends experienced major erosion. Erosion experienced at Alsea spit is directly attributable to the northward deflection of the channel that occurred during the 1982-83 El Niño. Additionally, erosion problems that still continue at Netarts Spit have been attributed in part to the depletion of sand from the nearshore zone that occurred when the same 1982-83 El Niño event swept sands into Netarts Bay. Also, Good[7] has found a direct correlation between peaks in shore protection structure activity and El Niño events.

During winter storms large rip currents are a characteristic feature of nearshore circulation along the Oregon coast. Rip currents may exacerbate shoreline erosion locally, by hollowing out shoreline embayments in the process of funnelling sand offshore. Erosion in the lee of rip currents can be very rapid, removing up to 100 feet of property in two or three weeks. A major episode of erosion that occurred at Siletz Spit in 1972-73 and involved the loss of homes and subsequent armoring of the spit has been clearly associated with rip currents.[10] Similarly, rip currents are likely to have contributed to erosion that occurred at Nedonna Beach in 1977-78 and Netarts Spit since 1982-83.[15, 21]

Although beach and dune erosion is generally associated with storm events, other factors have also played a role. The earliest erosion problems on the Oregon coast were associated with the construction of jetties at the entrances to bays and es-

tuaries.[10] A notable example of erosion due to jetty construction is the severe erosion and breaching of Bayocean spit opposite Tillamook Bay. Construction of the north jetty led to drift interruption. This caused the beach to accrete on the north side of the jetty and erode on the south side of the jetty. In the process the community of Cape Meares experienced major losses to erosion and the resort community of Bayocean Park was completely lost to the sea.

Although erosion associated with the winter storm phase of the seasonal beach cycle is a primary concern, the import of hazards resulting from accumulation of sand on beaches and dunes primarily during the summer months should not be neglected. At Pacific City, one home has been completely buried by sand. Sand inundation currently threatens homeowners at this and several other locations on the north coast. The practice of using European beach grass for dune stabilization may be a contributing factor to the sand inundation problem.

§ Sea Cliff Recession

Many Oregon coast beaches are backed by uplifted sea cliffs composed of unconsolidated Pleistocene marine sandstones overlying older seaward-dipping Tertiary silt and mudstones. Development in many coastal communities is located in these areas and therefore cliff recession is a significant problem in these areas. Half of the central Oregon coast, for example, is undergoing cliff erosion and slope failure of some kind. The recent loss of four developments in this area is attributable to landslide activity.[24]

Sea cliff recession in the form of landslides, slumps, and sloughing results from a combination of effects. Heavy and prolonged winter rains saturate the porous sandy unconsolidated sediments. They then become susceptible to sliding along their seaward-dipping, relatively impermeable, basal mudstone contact. Storm waves, particularly when concentrated at rip embayments, contribute to this instability by removing sediment from the base of the cliffs as well as under-cutting the cliffs themselves. Development, including excavation and alteration of drainage patterns that accompany site preparation, also contributes to slope instability in some instances. In other instances, cliff recession results simply from the erosion that accompanies physical weathering of unconsolidated cliff surfaces. The creation of beach graffiti on cliff surfaces even plays a significant role in accelerating cliff erosion processes in some heavily used areas.[16]

In some littoral cells, the primary source of sand comes from these eroding cliffs. The customary response of a private property owner in Oregon faced with eroding oceanfront property is to install some type of shore protection structure (riprap revetment or seawalls). The installation of these structures essentially "locks-up" new sources of sand to the beach. Rising seas in our heavily developed marine terrace-backed beaches may ultimately result in the loss of sandy ocean beach, especially during the winter months.

- **NEED: Encourage coordinated research efforts that lead to an increased understanding of the suite of chronic natural hazards that affect the Oregon coast. NOTE: Particular attention should be given to those efforts that address inter- and intra-littoral cell process variability and its effects on coastal stability in an integrated manner. Augment academic research by volunteer or other types ofdata collection and inventory efforts. Increase public awareness of chronic natural hazards.**

Management Assessment

Policy Framework

The statewide land use planning program in Oregon, administered by the Department of Land Conservation and Development, has required cities and counties to adopt comprehensive land use plans and zoning ordinances to implement statewide goals. Three of these goals contain policies which govern the location of new development along the ocean shore. The general objectives of the policies contained within these goals are to direct development away from hazardous areas, preserve and restore protective func-

tions of the natural shoreline, and prevent or minimize threats to existing populations and property from coastal hazards.

§ Statewide Planning Goal 7 (Areas Subject to Natural Disasters and Hazards)

This goal requires that development not be planned or located in areas of known hazards or subject to natural disasters without appropriate safeguards. The goal defines hazardous areas as areas that are subject to natural events that are known to result in death or endanger the works of man, such as stream flooding, ocean flooding, erosion and deposition, landslides, earthquakes, weak foundation soils or other hazards unique to local or regional areas. Plans are based on an inventory of known areas of natural disasters and hazards. It is important to note that Goal 7 does not prohibit development in areas subject to natural hazards, rather, it recommends limits on the density or intensity of uses based on the degree of hazard present, and requires that appropriate safeguards be used when locating development in hazardous areas.

§ Statewide Planning Goal 17 (Coastal Shorelands)

This goal requires that land use plans implementing actions and permit reviews consider critical relationships between coastal shorelands and resources of coastal waters, and of the geologic and hydrologic hazards associated with coastal shorelands. Coastal cities and counties have been required to inventory coastal shorelands areas, including those areas adjacent to estuaries, the ocean and coastal lakes, areas subject to flooding, coastal headlands, and areas of geologic stability for lands within 1000 feet from the shoreline. At a minimum areas subject to ocean flooding, lands within 100 feet of the ocean shore and 50 feet of an estuary or coastal lake must be identified as coastal shorelands. In local plans policies and uses of these areas have been established according to standards in the goal. Goal 17 also requires that land use management practices and nonstructural solutions to problems of erosion and flooding be preferred to structural solutions. Where shown to be necessary, water and erosion control structures must be designed to minimize adverse impacts on water currents, erosion and accretion patterns. This goal also requires the maintenance, and where appropriate the restoration and enhancement of riparian vegetation.

§ Goal 18 (Beaches and Dunes)

This goal sets specific standards for regulating new development in beach and dune areas. The goal prohibits residential developments and commercial and industrial buildings on beaches, active foredunes, on other foredunes which are conditionally stable and that are subject to ocean undercutting or wave overtopping (areas of erosion or velocity flooding) and on interdune areas (deflation plains). Development in these areas and in other beach and dune areas can only occur when it can be shown that the proposed development is adequately protected from any hazards and adverse impacts are minimized.

Under Goal 18, riprap and other structural means of erosion control are only allowed on shorelines that were developed by January 1, 1977. For the purposes of this goal requirement, development is defined as houses, commercial and industrial buildings, and vacant subdivision lots which are physically improved through construction of streets or the provision of utilities to the lots, or areas where special exceptions have been approved. Even in "developed" areas, shore protection structures are permitted only when it can be shown that visual impacts and impacts on adjacent property are minimized, beach access is maintained, and long-term or recurring costs to the public are avoided.

Under Goal 18, the breaching of foredunes is prohibited, except for temporary breaching in emergencies, such as to drain floodwater from upland areas. Dune grading in oceanfront velocity flood zone (V-zones) is also prohibited by the federal flood plain management program. Dune grading or sand movement necessary to maintain views or prevent sand inundation is allowed under Goal 18, but only if the area is committed to development or is part of an urban growth boundary, and then only as part of an overall foredune management plan. Requirements on what must be considered and included in a dune management plan are identified in the goal.

§ The Oregon Ocean Shore Law (ORS 390.605 -770) and Removal/Fill Law (ORS 196.800 -990)

In addition to the statewide planning goals, these

two laws are also relevant to managing development on hazardous coastal areas, as they jointly regulate the installation of shore protection structures. The ocean shore law, or the "Beach Bill", requires that a permit be obtained from the Department of Parks and Recreation for all "beach improvements" west of a surveyed beach zone line. The beach zone line was established at the 16 foot elevation as surveyed in the late 1960's and can only be changed through a legislative amendment. The removal/fill law and implementing regulations contain specific standards and requirements for riprap and other bank and shore stabilization projects. Administered by the Division of State Lands, jurisdiction extends on the Pacific ocean shore to the line of established upland vegetation or the highest measured tide, whichever is greater. These laws contain standards including those which require that alternatives to structural shore protection methods be considered and adverse impacts to adjacent properties be minimized. Further, permit decisions are required to be consistent with provisions of the local comprehensive plan.

Policy Evaluation

Coastal cities and counties have responded to these goals, statutes, and rule mandates with plan provisions and implementing ordinances that regulate development in hazardous areas through a variety of techniques. These techniques include hazard overlay zoning, beach and dune overlay zoning, site-specific geologic report requirements, setbacks, and density bonus awards to developers who avoid hazardous areas. The effectiveness of these techniques and the policies they are intended to implement, with respect to the objectives of directing development away from hazardous areas, preserving and restoring the protective functions of natural shoreline features, and preventing or minimizing threats to existing populations and property, is considered below.

Each of the flood-prone municipalities has addressed flood hazards under Goal 7. Local zoning ordinances have been adopted which meet or exceed the Federal Emergency Management Agency (FEMA) flood plain standards. It is interesting to note that the FEMA velocity flooding area (V-zone) standards do not prohibit development in areas subject to ocean flooding. They prescribe standards to alleviate the flood hazard and are intended to reflect the appropriate hazard level for insurance purposes, whereas Oregon's Goal 18 requirements do prohibit development in areas subject to wave overtopping. This includes those areas identified on flood insurance rate maps as V-zones. Problems have arisen because V-zone maps are cursory in some areas and outdated in others.

- **NEED: Improve or update flood insurance rate "V-zone" maps.**

With respect to hazard avoidance and mitigation, the effectiveness of Goal 7 is predicated upon two critical assumptions: (1) that local jurisdictions are able to accurately identify these hazards and adequately asses the risks to proposed development; and (2) that "appropriate safeguards" can and have been instituted which adequately mitigate the hazard.

With the exception of flood hazards, Goal 7 has not been very effective in either preventing development from locating in known hazard areas or in providing adequate safeguards. Most communities identified the most obvious or well known hazards and established hazard overlay zones. In most of these zones, developers are required to have site-specific geotechnical reports prepared as a precursor to development. However, there is little control of the quality of the geotechnical reports. There are no minimum standards for the types of information to be included in these reports. There is no independent or other peer review of these reports. There are no requirements for a registered geologist/certified engineer to demonstrate competency in coastal processes or coastal engineering. (There have been cases where developers have "shopped around" for the desired technical recommendation). As a result, decisions on whether development should occur in a known hazardous location or whether structural solutions to shoreline erosion are necessary, tend be deferred until a later time. Local governments are put in the position of relying on the professional opinion of the developer-hired geologist or engineer as the sole basis for such a decision.

Unfortunately, there are several examples illustrating the failure of this policy. The most notable is the condominium constructed on an active landslide at "Jump-off Joe" in Newport.[23, 24] Despite a geotechnical report asserting the site

could be stabilized, foundation failure forced the condemnation and ultimate demolition of the building before construction was even completed. Other examples of homes that were constructed on active landslides following recommendations of site-specific geotechnical investigations and that were subsequently damaged or destroyed include Cedar Shores, Beachland Estates, and the Woodell residence.[24]

- **NEED: Develop and implement specific criteria to ensure that local jurisdictions, through quality controlled site-specific geotechnical reports, are able to accurately identify hazards and adequately assess the risks to proposed development. Increase the local officials' technical expertise in evaluating hazards and the quality of geotechnical reports.**

Goal 7 requires that development not be located in known hazard areas without "appropriate safeguards". However, this term is not defined at the state level. Similarly, although Goal 17 states a preference for land use management practices and nonstructural solutions to problems of erosion, the goal language is vague and does not constitute a requirement, per se, to use nonstructural solutions. Consequently, although a series of "soft" options (such as setbacks, relocation, renourishment, vegetative enhancement and dune building) may be available, implementing ordinances in the local plans lack any requirement to demonstrate that such options have been properly evaluated and ruled out as a means to mitigate the hazard prior to approval of a "hard" option such as riprap revetments and seawalls.[17]

There is a strong indication that Oregon's land use management policies as currently implemented have actually increased the proliferation of engineered shore protection structures. In the Siletz littoral cell, for example, it has been shown that "hard" protected beach front increased from 14 percent in 1967 to 42 percent today[7] An emergency, either perceived or real, has usually been reached by the time structural shoreline stabilization is required. As a result, state and federal regulatory agencies' requirements to consider alternative solutions and assure that adverse impacts are minimized are often overlooked. Thus, despite a stated policy preference for land use management practices and nonstructural solutions to problems of erosion, the "appropriate safeguard" of choice for development in an area susceptible to erosion is the installation of an engineered shore protection structure. Even under the best of circumstances, the review standards for shoreline protection structures are vague. Also, because little attention is paid to shoreline protection structures after their approval, the effectiveness of these structures over time is unknown. While these structures continue to be installed, it is only recently that there has been any attempt to evaluate their individual or cumulative impacts on sand supply, beach erosion, or public access and beach safety.

- **NEED: Develop and implement specific requirements to ensure that hazard avoidance takes precedence over hazard mitigation as an appropriate safeguard in the location of new development. Develop and implement requirements to ensure that nonstructural solutions to shoreline erosion are employed when they can be shown to adequately protect development already established in hazardous areas. Provisions insuring that adverse impacts and cumulative effects are adequately evaluated before shoreline protective structures are emplaced should form an integral part of any such "appropriate safeguards/alternatives" requirements. Encourage research efforts aimed at evaluating the individual or cumulative impacts of shore protection structures on sand supply, beach erosion, public access and beach safety. Analyze hazard areas in association with increasing coastal populations, development patterns, and practices need to be analyzed.**

Hazard avoidance, through the application of coastal construction setbacks for development along the oceanfront, is a preferred "appropriate safeguard".[7, 17] State policies that prohibit new development on beaches and dunes which are subject to wave overtopping and undercutting also restrict development in other hazardous areas. However, they do not prescribe a setback. Some jurisdictions have prescribed setbacks. Good[7] found in the Siletz littoral cell that 44 percent of the new homes constructed encroached upon the recommended oceanfront setback line. This has occurred in part because these setbacks, which are

determined on a case-by-case basis, have been waived upon receipt of a developer-hired registered geologist/certified engineer geotechnical report. Problems with this approach were noted above.

Even in instances where prescribed setbacks have been observed, they have not been completely successful. Good[7] found in the Siletz littoral cell that 30 percent of the lots that encroached upon the required construction setback subsequently required a shore protection structure, while only 15 percent of the lots that complied with the setback requirements subsequently required a shore protection structure. While Good's results show that lots where setbacks were followed have not had as many problems as those that have encroached seaward, he suggests that the problems experienced by both groups demonstrate that the setback provisions are unrealistic. Results of a recently completed FEMA-funded Department of Geology and Mineral Industries pilot project on historical erosion rates appear to confirm Good's suggestion. Apparently, because erosion along the Oregon coast is episodic, highly localized, and often results from a combination of effects, it has been difficult to determine accurate erosion rates and, therefore, appropriate setbacks. A gradual retreat-based methodology for determining setback may be applicable to East and Gulf coasts, but has not been found to be applicable in Oregon.

- **NEED: Develop a methodology to determine appropriate oceanfront coastal construction setbacks, and implement in local ordinances. NOTE: The development of such a methodology is a necessary prerequisite to the development and implementation of effective "appropriate safeguards/alternatives" requirements referred to earlier.**

Under Goal 18, foredune management planning has had limited success. Frustration with the vagueness of policies, prohibitive costs for acquisition of the required technical expertise, and the lack of local enforcement and/or inadequacy of enforceable ordinance has left communities facing sand inundation problems with little incentive to carry out foredune management plans.

Goal 18 policies allowing dune grading under prescribed circumstances were adopted in 1984. However, only one foredune management plan has been approved since that time. This plan was the result of a pilot dune management study at Nedonna Beach that the department conducted. Intensive dune management at Nedonna Beach, that has included grading, has not damaged the integrity of the foredune or increased the potential for flooding. Rather, a wider, more continuous foredune has been created that is likely to provide enhanced ocean storm and flood protection. Two communities have recently prepared draft foredune management plans. Although the lessons learned from Nedonna Beach pilot project were incorporated into a "how-to" dune management guidebook as a means of facilitating foredune management plans, the department has had to and is continuing to prepare further guidance for these two communities on what needs be addressed in a foredune management plan.

Despite Goal 18 restrictions on foredune grading in the absence of an acknowledged foredune management plan, a number of property owners have illegally graded dunes to maintain the views from their oceanfront homes. Some have done so without any permission, while others have exceeded terms of approved permits.

- **NEED: Eliminate the ad-hoc alterations by individual property owners, by supporting community preparation of foredune management plans. Increase technical assistance on dune management policies and techniques, the development of volunteer groups that can assist in the cost-effective collection of necessary baseline data, and the preparation of model enforcement ordinances.**

It is apparent from much of the preceding discussion that a coastal shorelands designation has not always provided the high level of protection intended in the goals. As noted above, many of the oceanfront portions of the goal requirements are vague, and consequently there are few effective implementing ordinances in the local plans. With few exceptions, development along the oceanfront (except for beaches and dunes) seems to be treated essentially the same as development anywhere else in the state. As a result, development has not been prevented from occurring in some hazardous coastal areas and little regard has

been given to the unique values of coastal shorelands.

Compounding this problem is the fact that, much of the coast was developed to some extent prior to adoption of the goals and acknowledgment of the local comprehensive plans. Under the Goal 2 "exceptions " process, areas which were built and committed to development have been exempted from certain other goal requirements. As a result, development has been allowed to infill in previously "developed" yet unbuilt and potentially hazardous areas.

A recommendation following from the recently held Coastal Natural Hazards conference in Newport is that special area management planning, in the form of littoral cell management plans, be considered for coastal shorelands. Such special area management plans already exist for estuaries in Oregon. The idea of littoral cell management planning is appealing because it would provide a mechanism whereby distinct segments of coastal shoreland, with related characteristics, could be given detailed consideration in a coordinated manner. The need for such detailed, coordinated management is likely to increase as increasing development demands clash with conservation goals.

The concept of littoral cell management is appealing for another reason. It could provide the basis for the implementation of a more comprehensive policy framework of coastal zone management. Oregon's policies governing the location of new development along the ocean shore were developed in the 1970s. It is apparent from the resource assessment above that the scientific understanding and appreciation of the diversity of coastal natural hazards has greatly improved in the ten to twenty years since those policies were adopted. As a result, policy gaps exist in Oregon's coastal zone management framework.

The multiplicity and interdependency of processes controlling chronic hazards such as beach erosion and cliff recession were not appreciated at the time the goals were developed. The role of plate tectonics was just beginning to be revealed. The importance of these discoveries to earthquake hazards in Oregon is only just beginning to be understood. Most people have yet to become aware of the possibility of a magnitude 8 or greater earthquake, and a thorough examination of policies and practices that may need to be applied to areas susceptible to the hazards associated with a major earthquake event is yet to commence.

Greenhouse warming and global sea-level rise are concepts that were probably unheard of at the time the goals were first being considered. It was not until 1989, that the Oregon Department of Energy began a coordinated effort to identify possible impacts on the state from global warming and recommend how the state should respond. A report, *Possible Impacts on Oregon from Global Warming*, was prepared and recommendations for actions were developed in 1990. One of the proposed actions was to "assist local governments, especially on the coast, to review and improve comprehensive plans to consider fully the effects of sea level rise and to take actions to direct private development and public facilities an away from areas that may be flooded or affected by sea level rise." However, communities and state agencies have not yet factored global warming and rising sea levels rise into their decision-making because they lack of available resources needed to affect change.

It should be noted that a coastal natural hazards policy working group, comprised of local scientists, local government officials, state regulatory agencies, private property owners, and environmental organizations among others is being formed to examine natural hazards policy in Oregon. This group intends to evaluate the effectiveness of existing policy and policy implementation in light of new scientific information. Problem areas will be identified, including research and information needs, and suggested policy options and implementation procedures will be developed.

- **NEED: Provide more precise, coordinated, and comprehensive management of coastal natural hazards in Oregon. Focus immediate improvement on effective implementation of existing policies and the expansion of hazard inventories. Develop and implement policies that enhance and expand the existing coastal hazards management framework, including a review of recommendations stemming from broad-based, independent efforts to evaluate and improve the existing framework.**

Priority Program Enhancements

Managing coastal natural hazards is a priority for OCMP improvement.

Development on the Oregon coast is threatened by many types of natural hazards, including erosion, landslides, tsunamis, flooding, storm surge and earthquakes. State and local policies governing the development of property bordering the ocean coastline and the installation of shore protective structures have attempted to direct development away from hazardous areas, preserve and restore protective functions of natural shoreline features, and prevent or minimize threats to existing populations and property from coastal hazards.

Program improvement needs have been identified through out the body of this text. These identified needs can be grouped into three general categories: 1) policy development and implementation; 2) technical knowledge and inventory information; and 3) communication and education. The paramount need is to make progress on the policy development and implementation front. However, it is recognized that success cannot be achieved on this front without making progress in the other two. For policies to be effective, they must have a sound technical base and broad public acceptance. "Needs" in each of the three improvement categories are summarized briefly below.

Policy Development and Implementation

Little quality control exists in the preparation of site-specific geotechnical reports. As a result, hazards are not always adequately identified. When hazards are identified, hazard mitigation involving structural solutions is the preferred safeguard. As a result increasing amounts of the shoreline are being armored with little attention to the adverse impacts and cumulative effects of these actions. Further, recent advances in scientific understanding of the coastal natural hazards that affect Oregon have not been integrated into the existing management framework. Priority program enhancements include the following:

- **Develop and implement quality control criteria for site-specific geotechnical reports to ensure that local jurisdictions are able to accurately identify chronic hazards and adequately assess the risks they pose to proposed development.**
- **Develop and implement a detailed "appropriate safeguards/alternatives" analysis procedure to ensure that hazard avoidance takes precedence over hazard mitigation, structural solutions to shoreline erosion are tried as a last resort, and the consideration of adverse impacts and cumulative effects is an integral part of any such procedure.**
- **Develop and implement new policies that enhance and expand the existing coastal hazards management framework and lead to more precise, coordinated, and comprehensive management of coastal natural hazards in Oregon.**

Technical Knowledge and Inventory Information

The distinct possibility that a major subduction zone earthquake could occur at any time has only recently been discovered. As a result, little detailed information is known about areas which may be susceptible to earthquakes as well as other catastrophic hazards. Also, methodology applied elsewhere to determine oceanfront setbacks has been found to be of limited use along the Oregon coast. Finally, little is known about the adverse impacts and cumulative effects of structural shore protection methods on the Oregon coast. Priority program enhancements include the following:

- **Improve understanding of which areas in Oregon are most vulnerable to major subduction zone earthquake events, tsunamis, and sea level rise, and how adverse effects in these areas can be minimized.**
- **Improve understanding of chronic natural hazards that affect the Oregon coast, and develop methodologies to determine appropriate oceanfront coastal construction setbacks from these hazards.**
- **Improve understanding of the individual or cumulative effects of shore protection**

structures on sand supply, beach erosion, public access, and beach safety.

Communication and Education

Because much of the information on natural hazards affecting the Oregon coast is so new, few people are aware of the risk they face. Those who have become aware have expressed an interest in knowing more and doing something. Further, as knowledge of natural hazards affecting the Oregon coast has improved and expanded, the demand on local officials to have some level of technical expertise has increased. Priority program enhancements include the following:

- **Increase public awareness of the entire spectrum of coastal natural hazards that affect the Oregon coast.**
- **Increase public involvement in policy evaluation and data collection efforts.**
- **Increase local officials' level of technical expertise in chronic natural hazards that affect the Oregon coast.**

References

1. Adams, J., 1990. Paleoseismicity of the Cascadia subduction zone: Evidence from turbidites off the Oregon-Washington margin. Tectonics 9:569-583.

2. Atwater, B.F., 1987. Evidence for great Holocene earthquakes along the outer coast of Washington State. Science 236:942-944.

3. —- and Yamaguchi, D.K., 1991. Sudden, probably coseismic submergence of Holocene trees and grass in coastal Washington State. Geology 19:706-709.

4. Currin, George. September 10, 1991 letter from FEMA to Rocky McVay, Curry County Board of Commissioners.

5. Darienzo, M.E. and Peterson, C.D., 1988. Coastal Neotectonic field trip guide for Netarts Bay, Oregon. Oregon Geology 50:99-106.

6. —-, 1990. Episodic tectonic subsidence of late Holocene salt marshes, Northern Oregon central Cascadia Margin. Tectonics 9: 1-22.

7. Good, J.W., 1991. Shore protection and oceanfront land use practices in Oregon: A critique. Proceedings of the Coastal Natural Hazards Conference, Newport, Oregon (in press).

8. Grant, W.C. and McClaren, D.D., 1987. Evidence for Holocene subduction earthquakes along the Northern Oregon Coast. EOS 68:1239.

9. Hebenstriet, G.T., 1988. Local Tsunami Hazard Assessment for the Juan De Fuca Plate Area. U.S.G.S. National Earthquake Hazard Reduction Program report, 87p.

10. Komar, P.D., 1979. Physical processes and geologic hazards on the Oregon coast. Beaches and Dunes Handbook for the Oregon Coast, Oregon Coastal Zone Management Association, Newport, Oregon.

11. —-, 1986. The 1982-83 El Niño and erosion on the coast of Oregon. Shore and Beach 54:3-12.

12. —-, 1991. Ocean processes and hazards along the Oregon coast. Proceedings of Coastal Natural Hazards Conference, Newport, Oregon (in press).

13. —- and Enfield, D.B., 1987. Short-term Sea-level changes and coastal erosion. In Sea Level Fluctuations and Coastal Evolution. Nummedal, D., Pilkey, O.H., and Howard, J., ed. SEPM Special Pub. #41:17-27.

14. —- and Good, J.W. 1989. Long term erosion impacts of the 1982-82 El Niño on the Oregon coast. Proceedings of the Sixth Symposium on Coastal and Ocean Management 3785-3794.

15. —-, Good, J.W., and Shih, S.M., 1989. Erosion of Netarts Spit, Oregon: Continued Impacts of the 1982-83 El Niño. Shore and Beach 56:11-19.

16. —- and Shih, S.M., 1991. Sea-Cliff erosion along the Oregon coast. ASCE Conference Coastal Sediments '91, Seattle.

17. Kraus, N.C. and McDougal, W.G., 1991. Shore protection and engineering with special reference to the Oregon coast. Proceedings of Coastal Natural Hazards Conference, Newport, Oregon

(in press).

18. Madin, I., 1991. Seismic hazards on the Oregon coast. Proceedings of Coastal Natural Hazards Conference, Newport, Oregon (in press).

19. Peterson, C. D., Darienzo, M.E., and Clough, C., 1991. Recurrence intervals of coseismic subsidence events in Northern Oregon bays of the Cascadia margin. Final Technical Report to the Oregon Department of Geology and Mineral Industries 7/9/91.

20. Pezzopane, S.K., Weldon, R.J., Johnson, A.G., and Scofield, D.H., 1991. Seismic acceleration maps from Quaternary faults and historic seismicity in Oregon: Final Technical Progress Report to the Oregon Department of Geology and Mineral Industries 7/9/91.

21. Redfern, Roger. 1986. Nedonna Beach Foredune Management Study: Technical Report, Oregon Department of Land Conservation and Development.

22. Rosenfeld, C.A et al., 1985. Alsea Bay Interim Report. Oregon State University.

23. Sayre, W.O. and Komar, P.D., 1988. The Jump-Off Joe landslide at Newport, Oregon: history of erosion, development and destruction. Shore and Beach 57:15-22.

24. —, 1989. The construction of homes on four active landslides in Newport, Oregon: Unbelievable but true! Proceedings of Sixth Symposium on Coastal and Ocean Management, ASCE, Charleston.

25. Vincent, P., 1989. Geodetic deformation of the Oregon Cascadia Margin. M.S. Thesis, Univ. of Oregon, Eugene 86p.

26. Weldon, R.J., 1991. Active tectonic studies in the United States, 1987-1990. U.S.:National Report to International Union of Geodesy and Geophysics 1987-1990, Contributions in Geophysics, Am. Geophys. Union 890-906.

27. Woodward, J., 1990. Paleoseismicity and the archaeological record: Areas of investigation of the Northern Oregon coast. Oregon Geology 52:57-65.

Wetlands

Legislative Objective

Protect, restore, or enhance existing coastal wetlands base or create new coastal wetlands.

Resource Assessment

Despite the fact that Oregon's mountainous coastal region can receive more than 80 inches of rain a year, there are only limited wetlands in the region. The rugged mountains of Oregon's coastal zone are incised by youthful stream networks which carry runoff rapidly to narrow river valleys and then to sea through estuaries which are drowned river mouths. Early settlers found that almost all the level land even remotely suitable for farming or settlement was on the narrow flood plains of coastal rivers or the marshlands surrounding coastal estuaries. Thus, these native wetland areas, both freshwater and saltwater, were the first to be diked, drained and converted to agricultural or other uses.

Estuaries have a variety of wetland plant and animal communities, depending on the reach of tide (salinity), inflow of freshwater, and current velocity. Technically, estuarine wetlands include high salt marshes furthest from the main channels and which may be flooded only during highest tides or storm conditions, low salt marshes which are inundated on a daily basis, tide flats which are alternately drained and flooded with the daily change of tides, and eelgrass beds which provide a distinct, productive habitat within the tidelands. The value of these estuaries has been well studied; they provide significant spawning, rearing or feeding areas for a variety of marine fish and shellfish. The plants in the surrounding marshes turn solar energy into food energy, the engine which drives biological productivity of the entire estuary.

Oregon's estuaries have suffered the brunt of wetland losses. It is estimated that nearly 90 percent of documented coastal wetlands losses are a result of diking for agriculture.[2] Only the Columbia River estuary has had a detailed evaluation of estuarine habitat changes,[6] and to date, no accurate statewide inventory of historic losses of coastal wetlands has been compiled. Since the implementation of local estuary management plans through

the Oregon Coastal Management Program, the loss of estuarine wetlands has virtually stopped. Of the 19,500 acres of tidal marsh in Oregon only 113.2 acres (0.6 percent) is designated for development.

Freshwater wetlands are found along the margins of coastal river floodplains where diking and draining was not completed, around lakes formed by sand dunes where the aquifer rises and falls seasonally, and certain bogs on level, uplifted marine terraces with hard clay soil which prevents percolation and drainage to the water table below the "hard pan." Each of these freshwater wetlands provide different habitats which support unique assemblages of plants and animals.

Management Assessment

Legal Foundation

Oregon's wetlands policy is guided by two fundamental state statutes, a federal law, and Oregon's statewide planning goals.

Responsibility for implementing wetlands policy is divided among the Division of State Lands (DSL), the Department of Land Conservation and Development (DLCD), the Department of Environmental Quality (DEQ), the Department of Fish and Wildlife (ODFW), and local governments through comprehensive plans and ordinances. DLCD is responsible for coordination among all agencies.

§ 1989 Senate Bill 3

The 1989 Oregon Legislature enacted Senate Bill 3 to ensure that the many different wetland programs and responsiblities of the different state and federal agencies and local governments were coordinated. This law clarified the relationship between wetlands planning and the regulatory permitting process and provided a coordinated approach to wetlands management. Key provisions of the statute include

- a requirement to define "wetlands" consistent with that used under the Clean Water Act by the COE and that the state use a single, uniform method for marking wetland boundaries;
- a requirement that the DSL establish and maintain an inventory of the state's wetlands. DSL is currently using the National Wetlands Inventory (NWI) produced by the U.S. Fish and Wildlife Service which is not as detailed as needed, especially on the coast;
- the option for local governments to prepare and adopt wetland conservation plans as part of their comprehensive plans to provide a basis for future permits and protection;
- the presumption that estuary plans previously adopted by coastal local governments comply with the legislative standards for wetland conservation;
- exemptions for normal farming and ranching activities in already altered wetlands;
- a requirement for the state to adopt standards for mitigation of wetland loss.

§ 1971 Removal-Fill Law

Since 1971, Oregon has regulated both removal and filling of material within waters of the state under the authority of the state Removal-Fill Law. This law requires a permit from DSL for the removal, filling, or altering of 50 cubic yards or more of material within waters of the state, including wetlands. The state's regulatory coverage of waters was extended to tidal wetlands in 1974 and nontidal wetlands in 1986. In recent years, attention has shifted to freshwater wetlands. The Removal-Fill law provides for

- evaluation of cumulative impacts when permits are reviewed by DSL;
- administrative rules for certain exemptions;
- creation of artificial wetlands to compensate for damage to existing wetlands;
- conditions on Removal-Fill permits to require buffers, setbacks and other measures to protect wetlands;
- compensation to the state for damages under a permitted activity, including restoration of

degraded wetlands;

- civil, criminal, and adminstrative enforcement of the law, including fines up to $10,000 per day.

The strength in the Removal-Fill Law is that it is easily understood and applied, unlike the Section 404 standards of the federal Clean Water Act. However, there are a few "gaps" in wetlands protection under the Removal-Fill Law. When no permit is involved, the law does not give DSL explicit authority to require buffers to protect wetlands and or regulate the removal of vegetation from a wetland. Also, drainage of wetlands is not regulated unless at least 50 cubic yards of material are altered while draining. This has been a problem in instances in which the functions and values of wetlands have been seriously impacted by drainage even though less than 50 cubic yards of material were altered.

§ Section 404 of the Clean Water Act

This is a federal law adminstered by the U.S. Army Corps of Engineers. Oregon could, but has not, assumed responsibility of the Section 404 permitting process. However, the COE and DSL have a joint application process that coordinates required state and federal permits. Recent proposed changes to the Federal Manual for Identifying and Delineating Jurisdictional Wetlands, has resulted in confusion about the permitting process. As of January 1, 1992, Oregon elected to evaluate permits under the 1989 federal manual while the COE is using a 1987 manual, pending adoption of a proposed 1991 manual.

§ Mitigation Banking

In 1987, the Oregon Legislature enacted a statute to provide for mitigation banks and create wetland sites in advance of future permitted wetland losses. Operation of the mitigation bank system is a responsibility of the Division of State Lands. To date, the state has established one 38 acre mitigation bank in the Lower Columbia River Estuary. This mitigation bank process has not been put into wide effect due to a lack of funds.

§ Statewide Planning Goals

Oregon's statewide planning goals provide specific policy direction to local governments and state agencies for identifying and protecting wetlands. These goals are implemented through local government plans and provide both a process and an actual regulatory framework for wetland protection. On the coast, three goals are of particular importance to coastal wetlands:

- Goal 5, Open Spaces, Scenic and Historic Areas and Natural Resources, broadly requires local governments to identify the "location, quantity, and quality" of wetlands, evaluate their significance, and adopt measures to protect them. Few local governments have had the resources to fully carry out the inventory process envisioned under Goal 5.
- Goal 16, Estuarine Resources, has provide the policy basis for local governments to prepare and adopt estuary management plans based on the delineation of various estuarine habitat areas. This estuary plan approach has resulted in protection of all but a few percent of Oregon's remaining estuarine wetlands.
- Goal 17, Coastal Shorelands, directs local governments to conserve, protect, and, where appropriate, restore or develop coastal shorelands which include the majority of wetlands previously diked for agricultural or commercial uses.It is anticipated that, as more plans are developed and the advantages of this process become well understood, many more jurisdictions will choose to develop plans. As described later, Oregon has received some federal grant money to pass on to local jurisdictions which wish to begin wetland conservation plans.

An Integrated State Program

Oregon statute requires the integration and coordination of statewide planning goals, local comprehensive plans and state and federal regulatory programs in an effort to promote the protection, conservation and best use of wetland resources.

Several state agencies, DSL, DLCD, DEQ, and ODFW, have joined with federal agencies and local governments to develop an integrated statewide wetlands management strategy. The state has received a grant from EPA to help this process.

Oregon's wetlands strategy, once implemented, will help local, state, and federal agencies in-

volved in wetland regulation and management to more effectively coordinate and provide mutual support among various programs. The strategy will embody the recommendations of the National Wetlands Policy Forum to achieve no net loss of wetlands and will provide for public input to gain local public support for the program. The components of this comprehensive and integrated wetlands management strategy include the following:

§ Wetland Assesement Methodology

Existing methodologies to evaluate and classify wetland functional values have been developed based primarily on East Coast literature and conditions.(f) Development of a unified methodology focused on the Pacific Northwest region is critical to effective implementation of wetland conservation plans and mitigation requirements. An interagency technical team has been convened to prepare this new methodology

§ Wetland Classification System

The completed assessment methodology will be employed to classify the state's wetlands according to site-specific wetland inventory type, functions and values, landscape level attributes and risk factors. This classification system will be developed by an interagency technical team with input and guidance from local governments and technical experts.

The wetlands classification system will be incorporated into state wetlands regulations and will be used by all state agencies and local governments to identify and protect wetland resources. Wetland mitigation, protection, and management policies and regulations will be based on wetland value classes.

§ Local Wetland Conservation Plans

City and county governments play a pivotal role in identifying and protecting wetlands through local comprehensive plans. Under 1989 Senate Bill 3, local governments are encouraged to perpare wetland conservation plans that plans for wetland protection, surrounding land uses and site-specific permit issues may be addressed at the same time. These plans will contain a detailed inventory and assessment of wetlands and will designate wetland areas for protection, conservation or development. Wetland conservation plans will also provide for full replacement through mitigation of any planned wetland losses.

Wetland conservation plans are optional and are developed through a cooperative effort involving the local community, DSL, DLCD, other state and federal agencies, and interested citizen groups and individuals. At the current time, four coastal communities are developing wetland conservation plans. Several other jurisdictions wish to develop plans also, but do not have financial resources to do so. State agencies are also hampered in their participation in this process due to resource limitations.

§ Wetland Water Quality Standards

Oregon, like all states, must develop water quality standards for wetlands by the end of fiscal 1993 to meet federal Clean Water Act and U.S. EPA regulations and guidelines. The Oregon Department of Environmental Quality (DEQ), with EPA grant assistance, will establish wetlands water quality criteria and set beneficial uses for each wetland class consistent with the state's wetland assessment methodology and wetlands classification system. Standards will initially be narrative but will be refined to include biological and numerical criteria when available. Anti-degradation policies, use designations and water quality criteria will also be developed specifically for wetlands and incorporated into state water pollution regulations.

§ Water Quality Monitoring and Disturbed Wetlands Evaluation

Oregon is seeking to bolster the scientific credibility and reliability of its wetland conservation strategy. DEQ, with funding assistance from EPA, is developing water quality data to assist in evaluating the function of disturbed wetlands and monitoring how well the assessment methodolgy relates to water quality. Data is being collected in three areas: disturbed sites; representaive sites in the classification system; and sites statewide to test the assessment methodology.

Public Information

Information to the public and local government officials is crucial to Oregon's strategy. Both DLCD and DSL are producing technical and program information materials about wetland planning and management in Oregon. DLCD is publishing a tecnical bulletin to aid local governments to planning for wetland resources and DSL is producing information about the new wetland inventory

standards, how to develop a wetland conservation plan, and about wetland restoration. Oregon State University Sea Grant Program is rewriting its publication "Obtaining Permits for Wetland and Waterway Development," designed for prospective permit applicants.

In addition to printed materials, eight public workshops were held statewide by DSL, in conjunction with DLCD, to explain wetlands science and regulation to local planners, realtors, developers, attorneys, interested citizens, and personnel from affected agencies. These workshops found widespread interest, were well attended and revealed a need to expand this sort of outreach.

Priority Program Enhancements

Wetlands management is a priority for OCMP improvement.

Oregon's coastal wetlands are especially in need of protection and restoration; approximately 80 per cent of original wetlands have been lost, primarily to agricultural uses around estuaries. Oregon's coastal local governments are well suited to identify and protect local wetland resources through comprehensive plans and ordinances but require technical and financial assistance through the coastal management program. Citizens in coastal communities can play a significant role in wetland conservation both on a community and a personal basis.

Oregon' state wetlands strategy will, when fully implemented, coordinate several state and federal statutes, various state agency programs and local government comprehensive plans and regulations. Oregon's 1989 comprehensive wetland law aims to ensure no net loss of wetlands and requires completion of wetland inventories, development of a wetlands classification system, preparation of local wetland conservation plans, restoration of lost wetlands, wetland water quality standards and other measures. However, many of these program elements are not yet developed because of a lack technical and financial resources available to the state.

Several improvements to the Oregon Coastal Program could be made:

- **Prepare a coastal component of the statewide wetlands inventory with a computerized GIS data base to supplant the existing National Wetlands Inventory data.**
- **Complete wetland assessment methodolgy and wetlands classification system as a basis for all state agency and local government programs to protect wetlands.**
- **Financial and technical assistance to local governments to prepare wetland conservation plans, incorporate these plans into local comprehensive land use programs, and involve citizens in wetland protection.**
- **Identify and prioritize estuarine areas for restoration to wetlands; develop standards and policies to guide restoration work in estuarine areas; utilize demonstration projects with monitoring to assess success.**
- **Work with local governments to provide information, coordinate agency programs and policies and develop local ordinances and regulations to protect wetlands.**

References

1. Adamus, P.R., and L.T. Stockwell. 1983. A Method for Wetland Functional Assessment: Volume I. Critical Review and Evaluation Concepts. 181 pp.

2. Boule', M.E., and K.F. Bierly. 1987. "History of Estuarine Wetland Development and Alteration: What Have We Wrought"? The Northwest Environmental Journal 3(1):43-62.

3. Fishman Environmental Services. 1987. Estuarine Mitigation Evaluation Project: Mitigation Site Evaluation Notebook. Department of Land Conservation and Development and the Division of State Lands.

4. Oregon Department of Land Conservation and Development. 1987. The Oregon Estuary Plan Book. 126 pp.

5. Oregon Division of State Lands and Oregon Department of Parks and Recreation. 1989. Oregon Wetlands Priority Plan. 75 pp.

6. Thomas, Duncan W. 1983. "Changes in Columbia River Estuary Habitat Types Over the Past Century." Report to CREST. 51 pp.

7. Akins, G.J., and C.A. Jefferson. 1973. Coastal Wetlands of Oregon. Oregon Coastal Conservation and Development Commission. Florence, Oregon.

Ocean Resources

Legislative Objective

Plan for the use of ocean resources.

Resource Assessment

At the very western edge of North America, squeezed between rugged coast range mountains and the vast dynamo of the Pacific Ocean, the Oregon coast is a visually stunning, ecologically diverse, and environmentally rich landscape. For three hundred twenty miles, these forested coastal mountains, incised by narrow, winding valleys, provide a visual backdrop and an economic mainstay for Oregon's coastal communities. This coastline, world-renowned for its scenic beauty, supports a thriving tourist industry and attracts increasing numbers of new residents. Broad estuaries ringed with saltmarshes, long sandy beaches, cobble-strewn pocket coves, high rocky cliffs, offshore rocks and reefs, sand dunes, and meandering coastal streams weave a dense, complex environmental pattern in this beautiful, ecologically diverse region.[1]

Oregonians are beginning to understand that the diversity, complexity, and productivity of this coastal environment extends to the ocean realm hidden beneath the waves. The geologic collision which shaped Oregon's coastline formed a narrow continental shelf over which sweep the complex currents of the Pacific Ocean. In this sixty mile-wide zone, ocean currents interact with river runoff, respond to winter storms and summer winds, flow over underwater hills and create a biological environment which is richly productive, heavily used, but only faintly understood.[4]

Marine life abounds from the shore across the entire shelf and down the continental slope. Close to shore, human use ... and abuse ... is greatest. The rocks, islands and underwater reefs provide a mix of abundant habitat for fish, shellfish, plants, mammals and seabirds. Farther out, a multitude of fish and shellfish thrive on the broad sand and mud-covered plains, around rugged canyons and rocky banks, and in the unseen layers of water far below the surface. Oregon's ocean fishermen take their catch virtually everywhere over the continental shelf and slope during all seasons of the year.[9] Marine mammals and sea birds routinely leave their shoreside rookeries and forage far off-

shore at the shelf's edge.

Marine scientists have pieced together a broad outline of this complex environment puzzle but are missing many pieces, especially knowledge about the impacts of human use. The ocean does not yield its secrets easily; marine scientific research is time-consuming and costly. Governments at all levels, local, state and federal, are not yet attuned to the need to investigate and manage ocean resources on a sustained, comprehensive, coordinated basis.

But in the mid 1980s, Oregonians came to understand that the State of Oregon must take the initiative to plan, management and protect ocean resources off the coast of Oregon or see them lost.

The ocean encompasses a variety of distinct resource categories with related management regimes and needed program changes. This assessment groups these resources into six different resource topics and combines both a resource assessment and management assessment for each topic.

A Biologically Rich Marine Environment

§ Description

The ocean environment off Oregon is itself, in all its complexity, a resource. Within this environment many distinctive oceanographic conditions (e.g. seasonal upwelling of cool, nutrient-rich waters; the Columbia River freshwater plume; energetic winter storms) interact to create rich, primary marine food web supporting the biological productivity of the Oregon ocean.[1] This productivity extends from coastal estuaries 35 to 80 miles seaward across the continental margin.[9] The area is periodically affected by warm water pulses known as El Niño which originate in the tropical western Pacific Ocean and which induce significant changes in marine productivity and species composition. The Oregon ocean area is an "ecotone," a broadly fluctuating boundary area between the colder subarctic waters to the north and warmer waters off California.[6]

§ Management Issues

The primary ocean management issue facing Oregon (and all states and federal agencies), is the lack of sufficient scientific inventory information to prepare management plans, establish resource programs, and adopt enforceable measures to carry out plans and protect resources.

Some information is available to form a management framework and make broad preliminary decisions. But substantial new field work is required to obtain scientific inventory information sufficient to prepare a territorial sea plan, special area management plans, resolve site-specific resources or use conflicts and adopt rules and regulations.

The need for additional scientific information off Oregon is widely and commonly recognized by marine scientists and agency managers throughout the region.[4,6,8,12] In 1988, the Department of the Interior Minerals Management Service held a three-day symposium on Environmental Studies in the Oregon/Washington OCS planning area. That symposium concluded that the region is biologically rich, environmentally complex, and that agencies do not have fundamental information necessary to plan for OCS leasing or make subsequent exploration or development decisions. Major research and study recommendations were developed on a wide variety of marine resources and conditions.[4] In 1990, the Pacific Northwest OCS Task Force, a joint task force of Department of the Interior, the states of Oregon and Washington, and northwest Indian tribal fish commissions, approved an environmental studies program prepared by a scientific advisory committee which addressed the broad and pervasive data gaps in the region.[8]

Federal marine research programs have not historically been oriented toward management needs of most concern to states on the nearshore continental shelf. Basic bathymetric and geophysical reconnaissance of the Exclusive Economic Zone, focused far offshore and in deep ocean, provides little information useful to nearshore management problems. Oregon's ocean resources planning and management efforts have been frustrated by lack of information to address difficult management issues in the nearshore area.[3,9]

- **NEED: A coordinated effort among federal agency marine research and management, state research and management programs and academic research programs to maximize research effort and support a variety**

of information needs.

- **NEED: Improved scientific inventory information to support ocean resources planning and management, including:**
  - **detailed bathymetry (bottom topography) of the territorial sea with emphasis on rocky reef areas;**
  - **delineation of seafloor habitat areas, including rocky reefs, cobble fields, gravel beds, sandy bottoms, mud bottoms;**
  - **characterization of seasonal and annual changes in nearshore ocean currents, interchanges with estuaries, topographic effects of headlands, banks and reefs;**
  - **description of habitat requirements and identification of areas used for breeding, rearing, and feeding of marine mammals and seabirds, with emphasis on threatened or endangered species;**
  - **the distribution and abundance of key fish, shellfish, and plant resources, with emphasis on habitat interrelationships;**
  - **information on existing ocean uses and conflicts with wildlife or other resource uses;**
  - **seasonal migration, distribution and abundance of fishes, mammals and birds;**
  - **characterization of species-habitat relationships.**

Diverse Marine Fisheries

§ Description

A variety of habitat conditions and seasonal oceanographic fluctuations provide the basis for a diverse fish population. More than 80 species of marine fish are caught off Oregon including salmon, halibut, tuna, Pacific whiting, pink shrimp, Dungeness crab, Dover and English sole, ling cod, black cod, several varieties of rockfish, and other "groundfish" species. Commercial and recreation ocean fisheries provides nearly 20 percent of coastal earned income.[1,9]

§ Management Issues

Oregonians want and expect a healthy marine fishing industry. Hearings on offshore oil, gas and minerals revealed overwhelming support for conservation and development of renewable, living resources. Yet there is little systematic information and understanding of marine habitats to support diverse and increasingly complex ocean fisheries management.[9] Mapping of fish catch areas in computer GIS format displays information on catch but does not show spawning, nursery, or recruitment areas. Increasing demand for fish products means more fishing pressure on existing stocks, development of new fisheries for previously unexploited stocks and potential conflicts among fishing sectors and other ocean "users." State and federal agencies frequently make fisheries allocation decisions with inadequate information and fishery agencies have historically focused on regulation of catch rather than management of habitat. State and federal agencies currently lack regulations or management programs for new or exotic species.[2]

- **NEED: Improved information base on:**
  - **population dynamics, life histories, spawning, rearing, and recruitment of commercial fish stocks and relationship to marine habitat areas;**
  - **predator-prey and trophic relationships to support commercial fish stocks;**
  - **distribution, abundance, life histories, and population dynamics of nearshore invertebrates and plants of potential commercial or recreational interest.**
- **NEED: Management programs for harvest of marine fish and invertebrates not previously harvested, including aquaculture and introduction of new species.**
- **NEED: Management techniques and programs to address conflicts and interactions among fisheries sectors and with threatened or endangered wildlife.**
- **NEED: Marine habitat research areas of representative habitat types to better understand the role of specific habitats in overall fisheries production.**

Important Seabird Habitat

§ Description

Oregon's nearshore area (within three miles) has

approximately 1400 rocks and islands; 33 of these have been identified in the Oregon Ocean Resources Management Plan as sensitive habitat for birds or mammals. Although Oregon's coast is about one-quarter of U.S. Pacific coastline length, over one-half of all seabirds breeding along the Pacific coast do so on Oregon's rocks, islands, and headlands. Several bird species are listed as "threatened" or "endangered" and require special management consideration. In addition, ocean upwelling and the Columbia River plume make rich offshore bird feeding areas.[9]

§ Management Issues

Increasing threats to seabird habitat sites from people include disturbance from trespass on foot, close overflight by military and civilian aircraft (including sight-seeing tour flights), fishing or diving activities in waters adjacent to rocks, and personal water craft. Specific management problems vary from site to site.[9] Fragmented jurisdictions and responsibilities among several state and federal agencies requires close coordination and cooperation.[2] Education and information to the public is crucial to reducing trespass and intrusion. Funds are lacking in all agencies to respond to seabird issues.

- **NEED: Buffer zones, seasonal closures or other appropriate management techniques to protect the unique resources of specific rocks, islands or reef complexes from disturbance and environmental degradation.**
- **NEED: Coordinated efforts among affected state and federal agencies to ensure that existing rules, regulations, and programs are used to the maximum extent possible.**

Endangered Marine Mammals

§ Description

The waters, rocks, islands, headlands and remote sandy beaches of the Oregon coast and territorial sea are important habitat for many marine mammals. Gray whales are an increasingly familiar sight from coastal vantage points during winter and spring migration; some appear to be year round residents, feeding in rocky nearshore reef areas. Other whales, blue, sperm, minke, and humpback migrate past Oregon farther offshore. Orcas sometimes feed on fish, seals and sea lions near the mouths of estuaries. Two species of sea lions, the Steller (northern) and California, harbor seals and a few but increasing number of elephant seals haul out or breed along the Oregon coast. Porpoise and dolphins live in ocean waters over the continental shelf and beyond. Several rock and island areas, including Rogue, Orford and Simpson reefs on the south coast and Three Arches Rocks on the north coast are crucial rookery, resting or feeding sites for sea lions and seals. These and other rock and island sites are probably remnants of much larger and more diverse habitat along the Oregon coast.[1,7,9]

§ Management Issues

All marine mammals on Oregon's coast are protected under the federal Marine Mammal Protection Act. Some are listed under federal law as "threatened" or "endangered," including Steller sea lions, elephant seals, and gray whales.

Steller sea lions represent a unique management challenge for the State of Oregon. Oregon's population of these sea lions, which live on rocks and islands within the state's territorial sea as part of the Oregon Islands National Wildlife Refuge, appears to be relatively stable and healthy. However, precipitous decline in the Steller population in Alaska has resulted in listing the species as threatened throughout its range. Continued population decline in Alaska will result in listing as endangered.[11] Several of Oregon's Steller habitat sites are the focus of urchin fishery activities and are attractive for other fisheries, including recreational users, as well. Oregon must work closely with federal agencies to devise programs to protect and manage Oregon's Steller sea lion populations.[9]

In addition, other rocks and islands with relatively easy shoreline access have significant human trespass and consequent problems with disturbance or harassment of mammals, especially during summer pupping periods. Non-regulatory management (education and awareness) are crucial if shoreline sites are to be protected as more and more people move to or visit the Oregon coast.[9]

- **NEED: An interagency management plan for critical habitat areas of the Steller sea lion, including rock and reef haulout and rookery areas, feeding areas and interac-**

tions with other ocean users, including commercial and recreational fisheries, aircraft overflight and human trespass.

- **NEED: Buffer zones, seasonal closures and other management techniques to protect the unique resources of specific rocks, islands or headlands from disturbance and environmental degradation.**
- **NEED: Coordinated efforts among affected state and federal agencies to ensure that existing rules, regulations, and programs are used to the maximum extent possible.**

Sensitive Shoreline Areas

§ Description

Oregon's coast has numerous rocky intertidal areas easily accessible at low tide. These intertidal areas contain dense, diverse assemblages of marine plants and animals unique to the intertidal zone. Many of these sites are within or adjacent to designated state parks.[1,9]

§ Management Issues

Tide pools are very attractive to coastal visitors because they offer a glimpse of life beneath the sea. Several sites, near heavily traveled U.S. Highway 101, are readily accessible during extreme low tides of summer when there are many visitors to the Oregon coast. Some sites receive overwhelming numbers of visitors and are being destroyed or severely damaged by foot traffic and ignorant collecting. A variety of management and protection measures, including area closures, signage, alternative education opportunities and information sites, have been proposed but all will require coordinated programs with adequate funding to achieve.[9]

- **NEED: Coordinated, interagency, site specific management plans and regulations to protect intertidal areas.**
- **NEED: Increased public information materials and programs to educate coastal visitors about tidepool resources and need for protection.**

Clean Ocean Water

§ Description

Oregon's ocean waters are relatively clean. Oregonians want to keep them that way. They are swept by the southward-flowing California Current during the summer which is displaced along the nearshore in winter by a north-flowing Davidson Current.[1] There appears to be significant interchange between estuaries and the nearshore ocean. The Columbia River transports sediments and pollutants into the Pacific Ocean and creates a surface plume of freshwater far offshore in the summer.[4] Other coastal rivers, the Umpqua, Siuslaw, Nehalem, Coquille, Coos and numerous smaller coastal streams also deliver pollutants and sediments to the nearshore marine environment.

§ Management Issues

There is very little information on existing marine water quality conditions, little or no monitoring and no standards for judging impacts to marine water quality. A few cities and industries (pulp mills) discharge treated effluent directly into the ocean. All others discharge into estuaries or rivers. Increasing coastal population will require increased sewerage capability. Questions of whether ocean outfalls are more desirable than estuarine outfalls and the conditions for siting outfalls are complex and unanswered. Neither the state nor the federal government has a program to establish baseline parameters for monitoring marine water quality.[9] The discharge of foreign ballast water from large cargo ships into estuaries raises the issue of whether and under what conditions discharge into the ocean would be preferable. There is virtually no information on background conditions of either estuarine or ocean waters to make decisions.[8,9]

- **NEED: Water quality baseline data for selected ocean sites.**
- **NEED: Data on estuarine and nearshore ocean exchange, including pollutant discharge.**
- **NEED: Standards for evaluating marine water quality and regulating the placement and discharge of municipal sewerage into the nearshore marine environment.**

Management Assessment

Oregon has a broad framework for planning and managing ocean resources. This framework is composed of state laws, agency programs, plans, a process, political commitment and public support. However, this framework needs to be filled in with more specific plans, implementation measures and better information to effectively manage and protect Oregon's ocean resources. The elements of Oregon's ocean management program include:

Statewide Planning Goal 19 Ocean Resources

Oregon's long-standing commitment to ocean resources protection and management was reflected in the work of the Oregon Coastal Conservation and Development Commission which, in 1975, adopted a policy of managing continental shelf resources.

In 1977, Oregon's Coastal Management Program was approved by the Secretary of Commerce as meeting the requirements of the federal Coastal Zone Management Act of 1972. The OCMP contains Statewide Planning Goal 19, Ocean Resources which, in addition to a broad policy statement, includes two major requirements: 1.) that local, state or federal decisions about the use of ocean resources must give priority to the long-term benefits of living marine, renewable resources over use of nonliving, nonrenewable resources, and 2.) that ocean resource decisions, including agency programs and plans, must be based on scientific "inventory information" sufficient to describe and understand the impacts of the proposed activity.

Goal 19 has been broadly interpreted and applied through the Oregon Ocean Resources Management Plan (below). Goal 19 has not been implemented through administrative rules because of lack of necessary information (see Resource Assessments, above).

- **NEED: Administrative rules to carry out Goal 19, Ocean Resources.**

§ *The Oregon OCEANBOOK*

In 1985 the Department of Land Conservation and Development published The Oregon OCEANBOOK,[1] a comprehensive overview of the geologic and oceanographic setting and living marine resources of the Pacific Ocean off Oregon. Written and illustrated for the lay reader, the OCEANBOOK provided a synthesis framework for understanding more detailed scientific information about ocean resources or evaluating impacts from future ocean uses. Preparation of the OCEANBOOK was supported with federal funds under the coastal zone management program.

- **NEED: Update and expansion of the OCEANBOOK to reflect improved understanding of Oregon's marine resources and environment.**

§ Oregon Ocean Resources Management Act of 1987

The 1987 Oregon Legislature, through Senate Bill 630, enacted the Oregon Ocean Resources Management Act (now Oregon Revised Statutes 196.405-196.515[4]) and created the Oregon Ocean Resources Management Program. The purpose of the program is to plan for the coordinated, comprehensive management of ocean uses and resources off the Oregon coast. The law includes legislative policies for ocean management, including a primary policy which articulates in law the meaning of statewide planning Goal 19, Ocean Resources. The legislation created a Task Force, required it to assess ocean resources, their uses and management and prepare a plan for managing ocean resources. The plan was required to be adopted by the Land Conservation and Development Commission as part of Oregon's Coastal Management Program.

§ The Oregon Ocean Resources Management Task Force

The Task Force created under Senate Bill 630 was broadly representative. Seven state agencies, three public members, representatives of local governments, fishermen, oil and mineral industries, ports and Indian tribes were appointed. Federal agencies were invited to participate and several provided crucial assistance. Hundreds of citizens were directly involved through workshops and public hearings. Hundreds more received a periodic newsletter of activities and information.

The Task Force turned its attention first to issues of oil and gas development raised by proposed federal OCS Lease Sale #132.[5] It reviewed available information about ocean resources and conditions and concluded that Oregon's biologically productive and highly dynamic ocean is not the place for oil and gas development. This conclusion eventually led to the President's June, 1990, cancellation of an oil and gas lease sale scheduled for 1992. The Task Force also found that Oregon needs far more scientific information to allow future marine mineral exploration.

Of greater consequence, however, the Task Force heard directly from hundreds of citizens, fishermen, scientists, state and federal agency resource specialists that Oregon's ocean resources are imperiled by overuse and misuse, uninformed management decisions, lack of adequate regulation and uncoordinated programs among state and federal agencies even if there is no oil, gas or mineral development.[9]

The Task Force learned that increasing numbers of people use the ocean, especially nearshore, for commercial or recreational harvest of fish, shellfish, and marine plants. Oregon's coast hosts more and more people pursuing a variety of marine recreation. Growing coastal cities must dispose of additional municipal sewage into estuaries or ocean. Ships and barges, some hauling oil, chemical or toxic cargoes, ply this nearshore area and into coastal harbors. Marine mammals and seabirds, including the threatened Steller sea lion, are under increasing pressure from human disturbance.

§ Oregon Ocean Resources Management Plan

The Task Force prepared an Ocean Resources Management Plan[9] which was adopted by the Land Conservation and Development Commission in late 1990 as part of the Oregon Coastal Management Program. The Ocean Plan has not been submitted to NOAA/OCRM for approval under the federal Coastal Management Act; however, the Oregon Department of Justice has determined that the Ocean Plan is binding on state agencies. The plan addresses uses, resources, and management within the 200-mile U.S. Exclusive Economic Zone, establishes broad policies and makes numerous specific recommendations to improve management and protection of Oregon's ocean resources.

The Ocean Plan contains two principle recommendations:

- Oregon must address growing demands on ocean resources through a coordinated ocean policy council under the leadership of the Governor and linked to Oregon's coastal management program,
- Oregon must prepare a plan for managing the ocean resources and uses within the state three-mile territorial sea.

§ Senate Bill 162: The Ocean Policy Advisory Council

The 1991 Oregon legislature accepted the recommendations of the Task Force and established the Oregon Ocean Policy Advisory Council with a dual mission: to prepare a territorial sea plan for Oregon and to coordinate management of ocean resources within Oregon's territorial sea.[10] The legislature mandated that state agencies must act consistently with the plan once the plan is adopted as part of Oregon's coastal management program. Thus, the territorial sea plan will, itself, constitute a mandatory, enforceable mechanism for managing ocean resources. Likewise, when the territorial sea plan is approved by NOAA/OCRM as an amendment to Oregon's federally approved Coastal Management Program, it will provide an enforceable standard for determining whether federal agency programs and activities are consistent with Oregon's ocean management program. The territorial sea plan will also provide the basis for the Department of Land Conservation and Development to adopt administrative rules to implement statewide Goal 19, Ocean Resources.

- **NEED: A plan for Oregon's territorial sea as a framework for local, state, and federal agency programs, rules and regulations.**
- **NEED: Approval by NOAA/OCRM of the territorial sea plan as an element of Oregon's Coastal Management Program.**
- **NEED: Administrative rules, special area management plans, educational programs and other agency programs to carry out the territorial sea plan.**

§ Research and Information Development

Neither state nor federal agencies have adequate scientific baseline and inventory information to prepare management plans and programs or specific implementation measures such as rules, regulations, or standards to protect and manage Oregon's ocean resources.[9] Under statewide planning Goal 19, Ocean Resources, local, state and federal units of government are required to acquire inventory data to support plans and programs. During preparation of the Ocean Plan 1987-1990, Oregon discovered the following:

- available information on ocean conditions, environment, and resources is often unavailable, sparse, fragmented, imprecise, out of date or limited to relatively small areas;
- specific resource management problems cannot be defined or resolved through new laws, rules, regulations or programs without far better information than currently available; and
- information has not been gathered in a systematic way to support management decisions.

The Oregon Department of Fish and Wildlife (ODFW) has taken the lead in identifying and coordinating new studies of ocean resources and environment off Oregon. In 1989, ODFW completed a two year effort to prepare an overall research plan for the management of living marine resources over the continental margin.[6] This comprehensive strategy was developed in cooperation with an interagency advisory panel and technical commenters from throughout the region. The plan lays out broad strategies to minimize environmental risk and describes detailed studies to describe ecosystem processes, assess biological resources, and understand environmental effects. In turn, this plan has become the foundation for a more focused integrated study of nearshore marine habitats and reef communities of southern Oregon.[12] This integrated study will be the framework for a variety of academic and state and federal agency studies in the region.

In addition to working toward obtaining new ocean information, Oregon has built an integrated computerized ocean information system to store, retrieve, synthesize and analyses information. This system is located within the state Geographic Information System (GIS) Service Center. The Oregon legislature has appropriated funds over three successive bienniums to support the state's ocean GIS capability. In addition, Oregon has developed a working relationship with NOAA's Strategic Assessments Branch to utilize the COMPAS information management system developed for use within NOAA and by cooperating states. In both cases, development of an information base useful for regional or local scale planning and management is hampered by deficient data, as outlined above.

- **NEED: Additional scientific inventory and resource information as listed in Resource Assessments, above, and as described in the research plans of the Oregon Department of Fish and Wildlife. Information gaps are extensive and will take time and funds to fulfill.**
- **NEED: Commitments by federal agencies with marine resource management responsibilities affecting Oregon's territorial sea to increase data gathering and research efforts and to coordinate these with the Oregon ocean resources management program.**
- **NEED: Increased coordination between Oregon's ocean resources GIS and all branches of NOAA to enhance Oregon's information base for management and to improve NOAA's data base about Oregon's ocean resources**

§ Public and Agency Support

Several factors contributed to the success of Task Force and subsequent legislative action creating an Ocean Policy Advisory Council. A crucial element was the participation in all phases of the Task Force work by many citizens, from the coast as well as statewide. This involvement heightened public awareness and provides a base of support for work on Oregon's territorial sea to improve protection and management of ocean resources. Similarly, all affected state agencies and many federal agencies seized the opportunity to enhance or build programs to address their resource responsibilities and participated fully throughout the Task Force process. This interagency cooperation and coordination has built a common understanding and high level of trust for working on is-

sues within Oregon's territorial sea.

- **NEED: Continued and expanded public awareness of ocean resource issues and the planning process.**
- **NEED: Opportunities for public participation in all phases of the ocean planning process.**
- **NEED: Improved outreach to schools, libraries, organizations, and local governments to provide informational materials about Oregon's ocean resources program**

Priority Program Enhancements

Ocean resources use planning is a priority for OCMP improvement.

Oregonians place high value on a healthy marine environment and productive ocean resources. This is reflected by legislative action in 1987 and 1991 to establish ocean planning laws and allocate state resources to the task and by the participation and interest of citizens in the 1987-1990 ocean planning process. Oregonians want to remain involved in and continue to be informed and educated about ocean resources planning and management issues.

- **Priority Program Enhancement: Continue to provide citizens with information about ocean resources and opportunities to participate in ocean planning.**

Oregon has a sound legal and policy framework for addressing ocean resources management issues but needs a more detailed plan and programs for the state's territorial sea to address a variety of issues and problems. An Oregon territorial sea plan, as required by the legislature, will provide a mandatory framework for local, state, and federal agency plans, programs, rules and regulations to manage ocean resources within Oregon's territorial sea. An Oregon territorial sea plan, when approved by NOAA/OCRM as part of Oregon's federally-approved Coastal Management Program, will ensure that federal agency programs and decisions are consistent with the plan.

- **Priority Program Enhancement: Prepare and adopt a plan and implementing measures to manage Oregon's territorial sea resources, uses and activities.**

Certain of Oregon's marine resources, chiefly marine mammals, seabirds, and rocky intertidal areas, are at risk from encroachment on critical or sensitive habitat and depletion or destruction of food resources. Oregon must develop interagency management plans and programs, public awareness and education efforts and mandatory enforcement measures where necessary to protect these resources.

- **Priority Program Enhancement: Adopt site specific management plans and protection measures for critical marine mammal and seabird habitat.**

Substantial improvement is needed in the scientific inventory information base necessary for Oregon to prepare and adopt a territorial sea plan and implementation measures, including Administrative Rules for Goal 19.

- **Priority Program Enhancement: Conduct coordinated ocean research programs to acquire needed information.**
- **Priority Program Enhancement: Improve information management capability to support ocean resources planning and management decisions.**

The responsibility to manage the resources and values of the Pacific Ocean off Oregon is not limited to the state alone. Many federal agencies have responsibilities and authorities for resources and activities even inside the territorial sea. Protection and proper management of these resources is a shared responsibility whose costs must be born by both levels of government. These costs are not insignificant. But the loss of ocean resources would be even greater. Federal agencies must assist the State of Oregon, and all states, to protect a common resource.

- **Priority Program Enhancement: Cooperation and financial assistance from federal agencies, including the Office of Ocean and**

Coastal Resources Management, to plan, manage, and protect ocean resources.

References

1. Parmenter, Tish, and R. Bailey. The Oregon OCEANBOOK. Department of Land Conservation and Development. Salem, Oregon. 1985

2. Good, James, and R. Hildreth. Oregon Territorial Sea Management Study. Oregon State University. Corvallis, Oregon. 1987.

3. 1987 Oregon Legislature. Senate Bill 630. Salem, Oregon. 1987.

4. Minerals Management Service. PROCEEDINGS: Conference/Workshop on Recommendations for Studies in Washington and Oregon Relative to Offshore Oil and Gas Development. Los Angeles, California. 1988.

5. Oregon Ocean Resources Management Task Force. Interim Report to the Joint Legislative Committee on Land Use. Portland, Oregon. 1988.

6. Bottom, Daniel l., et al. Management of Living Marine Resources: A Research Plan for the Washington and Oregon Continental Margin. Oregon Department of Fish and Wildlife, Portland, Oregon. 1989

7. Cicin-Sain, Biliana, et al. Improving Ocean Management Capability in the Pacific Coast Region: State and Regional Perspectives. National Coastal Resources Research and Development Institute. Newport, Oregon. 1990.

8. Technical Subcommittee, Pacific Northwest OCS Task Force. Environmental Studies for Washington and Oregon Relative to Lease Sale Planning Area 132. Seaside Oregon. 1990.

9. Oregon Ocean Resources Management Task Force. The Oregon Ocean Plan. Portland, Oregon. 1991.

10. 1991 Oregon Legislature. Senate Bill 162. Salem, Oregon. 1991

11. National Marine Fisheries Service. Final Revision: Recovery Plan for the Steller Sea Lion. Seattle, Washington. 1991.

12. Oregon Department of Fish and Wildlife. DRAFT: Integrated Study of Nearshore Marine Habitats and Reef Communities of Southern Oregon. Newport, Oregon. 1991

Low Priority Enhancements

Public Access

Legislative Objective

Attain increased opportunities for public access to coastal areas with recreational, historical, aesthetic, ecological, or cultural value. Include consideration of current and future needs for public access.

Resource Assessment

Along Oregon's 362 miles of ocean shoreline, there are 262 miles of sandy beaches and 64 miles of rocky headlands which are accessible to the public and set aside for public use.[6] That amounts to 90 percent of the ocean shore. This extraordinary situation was created by the 1967 Oregon Beach Bill. That legislation established public ownership of the intertidal area and a public easement to the "dry land" area below the vegetation line.[8]

The Oregon Beach Bill created "lateral" access along the ocean shore. "Perpendicular" access is needed to allow the public to get to the shore from the uplands. Oregon enjoys 645 points of "perpendicular" public access along its ocean shoreline.[1]

Another 406 sites and 99 sites exist for "perpendicular" access to coastal estuaries and coastal lakes respectively.[1]

Another assessment of the current adequacy of public access to coastal water bodies is the department's recent OCMP questionnaire. It included "public water access" as one of the 28 management issues to be ranked for improvement. Public access was ranked a distant 15th for improvement.[4]

Management Assessment

§ Laws

As mentioned above, Oregon's "beach law"[8] established lateral public access along 90 percent of the state's ocean shore. The beach law was subsequently challenged in state courts and its constitutionality was upheld at the state's highest court level.[11]

There is a current case in state court which will give the court another opportunity to affirm the beach law. This is the "Stevens" case. It involves a proposed motel seawall which would encroach on the privately-owned area of public easement created by the beach law. State and local agencies

denied the needed permits, and the applicant appealed on grounds of an unconstitutional "taking". The defendant state government was upheld at the trial court level. Currently, the case is being appealed to the Court of Appeals, and most likely to the Supreme Court. Oral argument before the Appeals Court will occur near the end of February 1992. The department will continue to monitor this case and its implications on public access to the ocean shore.

In 1984, the department amended the statewide planning goal #17 for coastal shorelands.[3] The amendment addresses public access to all coastal water bodies. It requires two things. First, existing public access in coastal shorelands must be "retained or replaced if sold, exchanged or transferred." Second, if a shoreland "right-of-way" is vacated to allow redevelopment, public access must be provided across the affected site. Local government's are incorporating this new requirement into their comprehensive plans. This is being done during the scheduled periodic reviews of local plans.

§ Acquisition

Public access site acquisition and improvement on Oregon's coast is an ongoing activity by several agencies.

In 1989, the department and the Department of Parks and Recreation, a full partner in the Oregon Coastal Program, produced a detailed inventory of all public access sites to the ocean shore, estuaries, and coastal lakes.[1] State Parks is analyzing the inventory data to identify priority areas for further access acquisitions. Unfortunately, this exercise has stalled for lack of adequate staff resources within Parks' budget.[2]

Several other state agencies have been funding site acquisitions and improvements during the last biennium. The department, for example, used $192,000 in federal "306A" grants to local agencies to acquire or improve eight access projects[5] between 1989-91. The State Marine Board provided $688,000 in state and federal funds for 12 improvement projects on the coast.[10] The Department of Fish & Wildlife acquired six access sites for $95,000, constructed six boat ramps, and received two donations of land for access, including a 145-acre parcel with one mile of river frontage valued at $210,000.[9]

§ Access Management Plan

As mentioned above, the Department of Parks & Recreation is developing an Oregon Beach Access Plan.[2] As part of that planning effort, State Parks and the department produced an inventory of coastal access sites in 1989.[1] Since then, State Parks has been using the inventory data to identify priority acquisition sites to provide increased or improved public access. A preliminary but unpublished draft has been produced. Additional work is needed to calculate acquisition costs, land use effects, local comprehensive plan compatibility, etc. Unfortunately, agency budget cuts have reduced the staff level for this effort and it is currently "on the back burner".[2]

§ Protection of Resources and Property Rights

Natural resources are protected from damage due to human access in the same manner as from any other land use covered by the Oregon Coastal Management Program. In addition, Oregon's recently adopted Ocean Plan[7] requires access to be "restricted, if necessary, to protect endangered, threatened, and sensitive species or their habitats".

Conclusion

Public access is not a priority for OCMP improvement.

Oregon does not lack for public access to its coastal water bodies. State law and ongoing acquisition programs have provided a great deal of access. In addition, minor refinements are being made to the existing programs. For example, local comprehensive plans are being amended to protect existing public access. Also, a limited amount of new access acquisition and development is happening through programs at the department and at State Parks.

Marine Debris

Legislative Objective

Reduce marine debris which enters the nation's coastal and ocean environment. Manage uses and activities which contribute to the entry of such debris.

Resource Assessment

Oregon's recently published *Ocean Plan*[3] provides the following general description of the marine debris problem in the state:

"Nondegradable debris, such as plastic and glass, enters Oregon's ocean from a variety of sources. Prior to the recent MARPOL agreement to reduce marine debris..., the primary source was the dumping of garbage at sea by domestic and foreign merchant marine vessels, military vessels, commercial fishing vessels, cruise ships, and recreational vessels. Even though the amount of debris from vessels is decreasing under MARPOL, much plastic remains at sea. Rivers also bring debris from urban areas and highways. Beach users contribute marine debris by littering."

One measure of the marine debris problem in Oregon is the types and quantities of debris collected from the state's beaches. In the fall of 1990, 44,007 pounds of debris were collected from 135 miles of Oregon's beaches during the national beach cleanup campaign.[1] That represents an average of 326 pounds of debris per mile of Oregon shoreline. Within the 50 states and District of Columbia, the national average was 703 pounds of debris collected per mile.[1] Comparing the average cleanup rates for Oregon and the nation, one can conclude that Oregon's beaches that day were 54 percent cleaner than the national average. Of course, such a conclusion assumes that Oregon beach cleaners were as efficient as those in the rest of the nation (they may even have been more efficient).

Another measure of Oregon's marine debris problem is the response to the OCMP questionnaire (see questionnaire description above). Actually, this is more a measure of people's perception of a problem. Respondents ranked "marine debris" a distant 16th out of 22 suggested coastal management issues. Most of the support for this ranking came from "citizen activist" respondents rather than local governments or coastal business interests.

Management Assessment

Oregon's place in the "marine debris story" is, of course, well known. The now international beach cleanup program began here in 1984.[1] A pilot recycling program started at the Port of Newport for the commercial fishing fleet has served as a model for dozens of similar recycling efforts at other ports on the West coast and throughout the nation. The nation's first of nine state "bottle bills" began here, and has reduced the "bottle" component of the state's beach debris.[1]

Today, the above activities continue. Once a year in the fall, the Oregon Department of Fish and Wildlife and one or more nonprofit organizations sponsor a beach cleanup day. Data on quantity and type of debris are collected and forwarded to the nongovernmental Center For Marine Conservation for tabulation.

In the spring, another beach cleanup day occurs. This one is sponsored in part by the Oregon Department of Parks & Recreation. They provide cleanup equipment and publicity to support the largely local cleanup efforts. Unfortunately, no data are collected during this cleanup.

Regardless of the real effect of these cleanup efforts on reducing the "debris stream", they serve an invaluable function of maintaining public awareness and of giving the public a sense of "doing something about it".

Concerning "debris prevention", the port authorities in Astoria, Newport, and Charleston operate their own recycling and debris disposal programs for sport and commercial fishing users. These are locally initiated programs; they are not required or funded by state government. The types of debris being retrieved include cardboard, metal, wood, wire and cable, plastic, and nets.[5] Unfortunately, no quantitative data are available.

Another debris prevention effort is the Net Recycling Program being conducted by the Marine Habitat Project of the Pacific States Marine' Fisheries Commission.[6] This program is operating in ports from Alaska to California; Astoria is the single Oregon port participating. The program is using federal Saltonstall-Kennedy grants and EPA grants to set up economically efficient recycling mechanisms for used fishing nets. Grant monies are also being used for net recycling research at Oregon State University. The university's engineering department has been contracted by the Marine Habitat Project to develop an efficient technological means for separating gillnets by the type of nylon resin used in their manufacture. Such separation will greatly improve the nets economic value to potential plastics recycling operators.

A third debris prevention mechanism in Oregon is the state's littering laws. ORS164.775 et seq. virtually prohibits any debris discharge in state waters or on the beaches. Enforcement is done by the state police department and the local police departments. In 1990, no enforcement actions by local departments were reported.[2] During the same period, the state police reported 9 enforcement cases; in 1989, there were 15 cases.[2]

The Department of State Police has also increased its instruction and direction given to coastal police cadets and game personnel regarding enhanced enforcement in the bays and ocean.[2]

The littering enforcement data above suggest that enforcement is not an effective tool against marine debris proliferation. Public education is often used as an alternative to regulation. Education efforts by OSU Sea Grant were a significant part of the successful effort with the pilot recycling project at the Port of Newport. However, OSU Sea Grant is not conducting any marine debris education activities as part of its current 1991-93 programming.[4] Marine debris education has been taken on nationally by the Center For Marine Conservation.

Within Oregon state and local governments, there is no agency with a mission or mandate to "manage" marine debris.

Conclusion

Marine debris is not a priority for OCMP improvement.

Oregon's pioneering efforts in marine debris management were developed without assistance from the OCMP. Furthermore, the "grass roots" nature and spirit of those pioneering efforts are being perpetuated in the ongoing marine debris programs and, again, without an OCMP requirement. There is no reason to spoil this success by a government mandate of "marine debris prevention" through the state's coastal management program.

Available beach cleanup data suggests that Oregon has significantly less of a debris problem than the rest of the nation. That perception is reinforced by respondents to the OCMP questionnaire who did not feel marine debris was as important an issue as many others on our coast. Nevertheless, debris reduction programs are being carried on in the state without OCMP or other government mandates.

Special Area Management Planning

Legislative Objective

Prepare and carry out special management plans for important coastal areas.

Resource Assessment

The entire Oregon coastal zone, from the mountains to the valleys to the ocean white with foam (apologies to Irving Berlin), is covered by "special area management planning".

City and county comprehensive land use plans have been developed for all of the upland area in the coastal zone. These plans comply with Oregon's statewide land use planning program requirements for state agency coordination, citizen involvement, and natural resource protection. In particular, separate planning efforts were conducted for each of Oregon's 21 major estuaries as sub-components of the comprehensive plans. All

of these plans have been approved by the federal government as part of the Oregon Coastal Management Program.

Within the marine portion of Oregon's coastal zone, another "special area management plan" has been adopted. It is the Oregon Ocean Plan.(1)

Management Assessment

The comprehensive planning statutes(4) remain applicable to all land use actions in the coastal zone. This means that the comprehensive planning process will remain as the basic framework in which to resolve future land use conflicts.

Territorial sea planning also has a mandate to continue. Recent state legislation(3) created the Oregon Ocean Policy Advisory Council, and requires the council to produce a more specific territorial sea management plan.

The management of wetlands in the coastal zone and the rest of the state can now by handled through another type of "special area management plan". The 1989 Legislature authorized "wetland conservation plans" to be created for site specific wetland areas by local governments and the Oregon Division of State Lands which regulates wetland alterations.(2) The wetland protection requirements of Statewide Planning Goal 5 (Natural Resources) have been incorporated in the wetland conservation law.

Conclusion

Special area management planning is not a priority for OCMP improvement.

Special area management planning is already being done in Oregon. The state has a long tradition of resolving its land and water use disputes through coordinated and collaborative decision making which involves all affected parties. This process and, indeed, this attitude are continuing.

Energy & Government Facility Siting & Activities

Legislative Objective

Adopt procedures and enforceable policies which will help the siting of energy and government facilities and activities which may be of greater than local significance.

Resource Assessment

§ Major Facilities

The siting of major energy facilities in Oregon is regulated by the Oregon Energy Facility Siting Council (EFSC). The following facilities are regulated (ORS469.300):

- Electric power generating plant (non-nuclear fuel), capacity greater than 25,000 kw;
- Nuclear power plant, capacity greater than 25,000 kw;
- Any nuclear facility other than a nuclear power plant;
- High voltage transmission lines greater than 10 miles in length, greater than 230,000 volts, and crossing a local government boundary;
- Solar collecting facility using more than 100 acres of land, or generating more than 25,000 kw of power;
- Liquid fossil fuel pipeline at least six inches in diameter and five or more miles in length;
- Natural or synthetic gas pipeline at least 16 inches in diameter and five or more miles in length;
- Geothermal pipeline at least 16 inches in diameter and five or more miles in length; and
- Synthetic fuel plant which converts any natural resource to a fuel equivalent of 2.0 x 10^9 Btu of heat per day (this would include oil refineries).

The EFSC siting process is exempt from the "state agency coordination" and the "comprehensive plan compatibility" requirements of the statewide land use planning program.(4) This means that a local government cannot "veto" an

EFSC-regulated facility through its comprehensive plan. It is the state's policy that the siting of these major facilities be consolidated at the state level and to be consistent with "state" policies regarding energy and environmental protection (ORS469.310).

Nevertheless, EFSC is required to "coordinate" its decisions with local governments. To do this, EFSC must solicit comments from affected local governments (ORS469.350(3)) and appoint the affected local government as a "special advisory body" (ORS469.480(1)).

Since EFSC was created in 1971, there has been only one application filed for an EFSC site certificate in the Oregon coastal zone. That was a pilot project wind power electric generation power plant in Curry County, and it was approved in 1983.(3)

§ Other Facilities

All other types and sizes of energy and government facilities are subject to the statewide land use planning program. This means that the facilities must meet local comprehensive plan and zoning ordinance requirements as well as state agency regulatory requirements. The local and state agency requirements, in turn, reflect requirements in the statewide land use planning goals of the Land Conservation & Development Commission. There are no requirements in the statewide planning goals or in other statutes of state agencies that would allow a state agency to override a local government veto of a proposed energy or government facility.

In 1991, the department contracted a study of regional and statewide facility siting in Oregon.(2) One finding of the study is that "the existing land use system, with a few exceptions, has responded to regional/statewide facility needs".(2) The study further indicated that "there are options available to improve facility siting and avoid pressures to override the land use process".(2)

There have been isolated incidents in the recent past where the Oregon legislature was compelled to adopt short term "supersiting" legislation for specific uses or facilities. Examples have included regional prisons and light rail mass transit in the Portland area. In each case, the purpose of the legislation was to preempt local governments' facility siting authorities. All such legislation has since "sunsetted", and is no longer in effect.

Management Assessment

§ Considering Facility Needs

The department is developing new administrative rules for public facility siting. This will be for public facilities other than those regulated exclusively through EFSC. The new rules will build on the concepts and recommendations provided in the department's 1991 study mentioned above.(1) One of the major concepts being developed is a "certificate of need". Under this concept, a petition would be filed with the Land Conservation & Development Commission to certify a regional/statewide need for a specific project.(2)

For EFSC-regulated facilities, the EFSC administrative rules (OAR Chapter345) require findings of need for the facility to obtain a site certificate from EFSC.

§ Allow Siting and Protect Natural Resources

The siting , construction and operation of EFSC-regulated energy facilities must be in "compliance with ... air, water, solid waste, land use and other environmental protection policies of this state" (ORS469.310). EFSC administrative rules (OAR Chapter345) carry out this mandate. In addition, EFSC has designated broad geographical areas of the state as to their suitability or unsuitability for the siting of thermal (nuclear and fossil fueled) and geothermal power plants (OAR345-40). Suitability is based on the degree of a "substantial deterrent" to siting, on the degree of conflicting uses, and on the ability to mitigate adverse effects (OAR345-40-012).

All energy and government facilities not regulated by EFSC are covered by the statewide planning program and the regulations of resource protection agencies in the same manner as any other land use. As described above, the department has begun the process of amending its administrative rules for local government siting of public facilities. The revised rules will likely contain specific requirements to evaluate alternative sites based in part on natural resource effects.(1)

Conclusion

Energy and government facilities and activities

siting are not priorities for OCMP improvement.

The above assessment does not indicate that a problem exists. There is no evidence of any facilities of "greater than local interest" being denied by local government. The existing mechanism are adequate. Nevertheless, improvements are being made to the program; the department is amending its administrative rules for local siting of public facilities not regulated by EFSC.

References

Public Access

1. Benkendorf Associates Corp. Inventory of Oregon Coastal Beach Access Sites. Prepared for the Department of Land Conservation & Development and the Department of Parks & Recreation. Salem, Oregon. March 31, 1989.

2. Bond, Peter. Oregon Department of Parks & Recreation. Personal communication, 10 October 1991.

3. Oregon Administrative Rules, Chapter660, Division15.

4. Oregon Department of Land Conservation & Development. "Analysis Of Coastal Questionnaire Responses". Salem, Oregon. July 1991.

5. _____. Field Guide: Oregon's Coastal Resources Management Improvements Sites, 1990/91 Edition. Salem, Oregon. 1991.

6. Oregon Department of Parks & Recreation. Oregon's Beaches: A Birthright Preserved. Salem, Oregon. September 1977.

7. Oregon Ocean Resources Management Task Force. The Oregon Ocean Plan. Oregon Department of Land Conservation & Development. Salem, Oregon. 1991.

8. Oregon Revised Statutes. Chapter 390.605 et seq.

9. Rawlins, Wayne. Memorandum, "Realty Section Biennial Report". Oregon Department of Fish & Wildlife. Portland, Oregon. 10 September 1991.

10. Rhodehamel, Ron. Oregon Marine Board. Personal communication, 8 October 1991.

11. State ex rel Thornton v. Hay. 254 OR 584; 462 P2d 671 (1969).

Marine Debris

1. Center For Marine Conservation. Cleaning North America's Beaches: 1990 Beach Cleanup Results. Center For Marine Conservation, Washington, DC, 1991.

2. Oregon Department of State Police. SJR14 Compliance Report to State Legislature. State Police General Headquarters, Salem, June 5, 1991.

3. Oregon Ocean Resources Management Task Force. The Oregon Ocean Plan. State of Oregon, Salem, Oregon, 1991.

4. Oregon Sea Grant. Oregon Sea Grant Program Plan For 1991-93, Volume 2. ORESU-P-91-004. Oregon State University, Corvallis, Oregon, May 15, 1991.

5. Pacific States Marine Fisheries Commission. "Port Recycling Systems". PSMFC, Marine Habitat Project, Depoe Bay, Oregon, 1990.

6. _____. "Net Recycling Program". PSMFC, Marine Habitat Project, Depoe Bay, Oregon, undated.

Special Area Management Planning

1. Oregon Ocean Resources Management Task Force. The Oregon Ocean Plan. Oregon Department of Land Conservation and Development. Portland, Oregon. January 1991.

2. Oregon Laws of 1989, Chapter 837.

3. Oregon Laws of 1991, Chapter 501.

4. Oregon Revised Statutes, Chapter 197.

Energy & Government Facility Siting & Activities

1. Blanton, Dale. Department of Land Conserva-

NOAA COASTAL SERVICES CENTER LIBRARY
3 6668 14104 4133

tion & Development. Personal communication. 1 October 1991.

2. Dorman, White & Company, et al. "Siting Process For Facilities And Projects Of Regional Or Statewide Significance." Prepared for the Department of Land Conservation & Development, Salem, Oregon. July 1991.

3. Meehan, Tom. Oregon Department of Energy. Personal communication, 27September 1991.

4. Oregon Land Conservation & Development Commission. "State Agency Coordination Certification Order 91-CERT-750". 29April 1991.