Sea Grant Oregon

Coastal Science
Serving Oregon

OREGON SEA GRANT 2010-2013

Strategic Plan

All photos © Oregon Sea Grant, except the following: pg. 2, © Tomi Devereaux-Earl; pg. 7, © Jim Folts; pg. 9 bottom, image courtesy of Submarine Ring of Fire 2006 Exploration, NOAA Vents Program; pg. 10, © Cindy Hanson; pg. 11 top, © Bill Wagner, *Washington State Magazine*; pg. 11, © Onno Husing, Oregon Coastal Zone Management Association; pg. 12, © Jane Lubchenco, Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO); pg. 14 bottom, © Jim Folts; pg. 15 right, © Gregory Auger, freelance photographer; pg. 15 bottom, © 2003 Monterey Bay Aquarium Research Institute; pg. 16 bottom, © Scott Mahon; pg. 17, © iStockphoto.com/RonTech2000; pg. 21, © Amy Kocourek/USFWS; pg. 22, © Parker Kendall; pg. 24, © Nancy Sturdevant.

This report was prepared by Oregon Sea Grant under award number NA06OAR4170010 (project number M/A-21) from the National Oceanic and Atmospheric Administration's National Sea Grant College Program, U.S. Department of Commerce, and by appropriations made by the Oregon State Legislature. The statements, findings, conclusions, and recommendations are those of the authors and do not necessarily reflect the views of these funders.

Stephen B. Brandt, Professor and Director
Oregon Sea Grant
Oregon State University
322 Kerr Administration Bldg.
Corvallis, OR 97331-2131
http://seagrant.oregonstate.edu
541-737-2714

February 2010
ORESU-Q-10-001

Contents

Introduction 4
Plan Development 4
Oregon, a Coastal State 5
Oregon Sea Grant 6

Goals 8
Strategic Goals 8
Improving Human Health and Safety Related to Ocean and Coastal Use 8
Promoting Social Progress and Economic Vitality 10
Enhancing the Sustainability of Coastal Ecosystems 10
Cross-cutting Goals 13
Informed and Engaged Society 13
Sound Science 15

Key Issue Areas 16
Multiple Uses and Spatial Planning 16
Oceans and Human Health 16
Watersheds and Water Resources 17
Community Resilience to Coastal Hazards and Climate Change 18
Fisheries and Seafood 18
Coastal Learning and Decision Making 19

Partnerships 20

Operational Guideposts and Program Character 22

The Way Forward 23

Introduction

Oregon Sea Grant's Strategic Plan for 2010–2013 is the overarching guiding document for the program. It defines the program's goals and strategies for addressing key issues important to Oregonians, the region, and the nation. The process of developing and publishing a strategic plan helps us focus and unify our thinking and communicate our priorities to our many partners and stakeholders. We look to this document to guide decision making and resource allocation and lead the program in achieving the greatest possible benefits.

Oregon Sea Grant is a statewide program headquartered at Oregon State University. The program was established in 1971 as one of the first 4 Sea Grant programs in the nation. It remains one of the 4 largest and most productive of the 32 programs nationwide. Oregon Sea Grant is committed to carrying out and supporting efforts that will make a difference, both in the way people perceive the ocean and its resources and in the way they act to use and conserve those resources. Oregon Sea Grant is an integrated program of research, education, extension, and communications that addresses critical needs of our state, region, and nation. Sea Grant engages partners and seeks a broad funding base that ensures the program becomes a leading national and regional creator of knowledge and a trusted provider of information.

OSG researchers, faculty, staff, and advisory council regularly come together for "All Hands" gatherings.

Oregon Sea Grant began 2009 with new program leadership, and we enter 2010 invigorated—seeking new opportunities for partnerships and funding, expanding our expertise, and growing our reputation as a leader in public engagement and as the preeminent marine research enterprise funding research throughout Oregon. This strategic plan builds on our longstanding program strengths while challenging us to be innovative as we address critical and emerging ocean and coastal issues. This plan guides our leadership and experienced faculty and staff to apply their diverse skills toward improving the health and well-being of Oregon's people, economy, and environment.

Plan Development

The Oregon Sea Grant Strategic Plan was shaped by advice from our 2005 Program Assessment Team and by lessons we have learned since then about how best to conduct the business of Sea Grant. In addition, we sought new ideas from our faculty and staff, assessed evolving needs in the region, and considered recent advances in science. The plan is, in part, shaped by the West Coast Regional Marine Research and Information Needs report (2009), Oregon State needs, and the NOAA National Sea Grant Strategic Plan. The West Coast regional report was the result of an Oregon Sea Grant-led effort, conducted in partnership with the Washington, California, and University of Southern California Sea Grant programs, which gathered input and recommendations from nearly 1,000 West Coast stakeholders. The report is intended to help organizations set priorities based on the most critical needs of stakeholders; it is therefore a valuable source of information for this strategic plan. Our strategic thinking is also shaped by our collaboration with the West Coast Governors' Agreement on Ocean Health.

This Oregon Sea Grant (OSG) strategic plan was developed with an all-inclusive approach, beginning with the designation of a steering committee charged with designing and facilitating a process that built on the regional effort, stimulated creativity and innovation, and exemplified integration of our extension, communications, education, and research program elements. The committee's initial concepts were refined through a two-day "All Hands" meeting of staff and the OSG Citizen Advisory Council. The meeting provided a venue for reflecting on past successes and challenges, advancing concepts for new initiatives to address critical and emerging concerns in Oregon and throughout the region, and identifying and exploiting opportunities to increase our positive impact.

The process continued with an OSG leadership retreat that focused on distilling the ideas generated at our "All Hands" meeting into three strategic goals and two cross-cutting goals. The program leadership also identified six key issue areas through which we approach our goals. For the next step, we assembled integrated staff work groups—each with a variety of technical and programmatic expertise—to develop specific objectives and methods that would achieve the beneficial outcomes in each of the key issue areas. The resulting implementation objectives, methods, anticipated outcomes, and measures of success appear in the *Oregon Sea Grant 2010–2013 Implementation Plan*, a companion to this document available on the Oregon Sea Grant Web site. This strategic plan was reviewed in draft form by a National Sea Grant Panel and several colleagues from Sea Grant, NOAA, the State of Oregon, and academic institutions.

Oregon, a Coastal State

Oregon is nestled in the heart of the Pacific Northwest, with over 360 miles of coastline defined to the north by the Columbia River and to the south by the California border. The rich coastal and ocean resources of the region have provided the foundation for Oregon's diverse collection of economies, communities, and coastal ecosystems. No matter where we live—in an urban, suburban, or rural environment—all Oregonians share common aspirations for their health and well-being, social and economic vitality, and sustainable coastal ecosystems.

While only about 225,000 of our nearly four million residents live in coastal counties, many Oregonians use, rely on, or benefit from our coastal region, which supports an almost $60 billion annual coastal and ocean economy driven by fisheries, agriculture, timber, tourism, and ocean industries. The state has pioneering land-use laws guided since 1977 by a statewide planning goal for ocean resources that seeks to conserve marine resources and ecological function for long-term benefits. In addition, the Oregon Beach Bill of 1967 guarantees public access to our beaches and today supports about two public beach access sites per mile of coastline.

The Yaquina Bay estuary is home to a large fishing fleet at Newport.

There is an astounding number of rivers and streams throughout Oregon that drain nearly all water from our 15 major watersheds into the Pacific Ocean. There are 22 major estuaries along the Oregon coast; each plays an important ecological role for many valued species such as salmon, rockfish, crabs, oysters, clams, shorebirds, and harbor seals. Headlands divide the Oregon coast into several sandy shore compartments, or littoral cells. The sandy dune-backed shoreline comprises most of our coastline. Rocky shores and islands make up many of the unique and picturesque landscapes of the Oregon coast. These biologically rich and visually dramatic shores have high value to Oregonians as places to recreate, relax, and learn. Climatic conditions, sea-level rise, storms, cyclical events such as the El Niño Southern Oscillation, and geologic forces continually shape the coast and can exacerbate risk to coastal people, economies, and environment.

In recent decades, ocean- and coastal-dependent communities have seen substantial changes in the size and composition of their populations. As populations increase, environmental pressure from coastal development and other human activities also increases. Historically dependent on the timber, agriculture, and fishing industries, the economies of our small coastal and coastal-adjacent communities are in transition and looking to diversify by capitalizing on other strengths such as natural beauty, clean air, temperate weather, authentic working waterfronts, and local culture—all of which attract people to the coast and support coastal economies. This variety of demands on coastal resources requires comprehensive management and planning to balance resource uses.

Ecologically rich, the Oregon coast is influenced by oceanic and atmospheric conditions and processes of the entire Pacific Ocean. Climate and ecological conditions are also affected on a regional scale by the California Current. Because Oregon is influenced by these large systems, we are also naturally linked to our neighbor states of Washington and California, as well as Alaska and Hawaii.

Oregon Sea Grant

Oregon Sea Grant's mission is to develop and support an integrated program of research, outreach, and education that helps people understand, rationally use, and conserve marine and coastal resources. Our activities respond to the needs of ocean stakeholders and act to stimulate the Oregon economy.

Oregon Sea Grant is a statewide program headquartered at Oregon State University. Sea Grant is a state-federal partnership, with the majority of its federal support coming from the National Oceanic and Atmospheric Administration. Funding for Sea Grant also comes from Oregon State University, other state and federal appropriations and grants, and contributions from local governments, industry, and other sources.

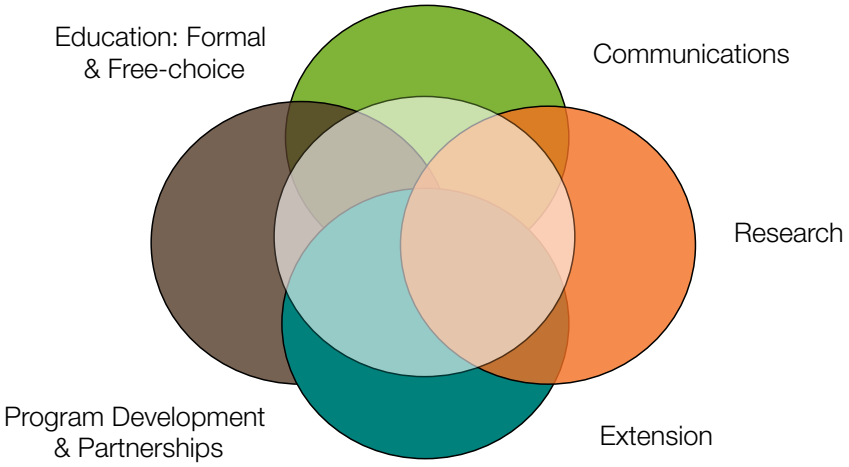
Oregon Sea Grant's highly competitive grants program is a preeminent marine research enterprise funding research in academic institutions throughout Oregon. This research addresses issues of high

importance and societal relevance, and places priority on prediction. The program stresses scientific excellence and meaningful collaboration with industry, agencies, communities, and other stakeholders.

Hatfield Marine Science Center Visitor Center is a living laboratory for the burgeoning study of free-choice learning.

Everything Oregon Sea Grant does is driven by an ethic of public service, and the program uses various and unique approaches to engage our constituents as a trusted broker of scientific information. The Oregon Sea Grant provides professional, technical, and public education and learning opportunities, as well as extension services through the Sea Grant Extension program—one of five program areas associated closely with Oregon State University Cooperative Extension. In addition, Sea Grant supports undergraduate and graduate students as "Sea Grant Scholars" to study important marine and coastal problems. Sea Grant also manages the Visitor Center of the Hatfield Marine Science Center as a public science learning facility and free-choice learning laboratory. An advisory council of marine industry and coastal community leaders provides continued external review of the program. Oregon Sea Grant extension, education, and communications staff work collaboratively to engage, listen to, inform, and assist a range of stakeholders, such as K–12 teachers and students, community and industry groups, conservationists, state resource managers, and the public, by developing and providing research-based information.

One Integrated Program



Goals

Oregon Sea Grant strives for a holistic approach that helps people anticipate, respond, and adapt to or avoid harmful effects. This requires an integrated scientific understanding of the interactions as well as an information-flow system that provides decision makers with the necessary scientific understanding. Our criteria for setting priorities are scientific excellence and societal relevance.

Program activities are geared toward achieving our primary strategic goals: (1) improving human health and safety related to ocean and coastal resource use, (2) promoting social progress and economic vitality, and (3) enhancing the sustainability of coastal ecosystems. The strategic goals are achieved through two cross-cutting goals: (1) creating an informed and engaged society, and (2) investment in and use of sound science. Our overarching goal is public service through science.

Strategic Goals

In general, the major stressors on coastal ecosystems are pollution, invasive species, resource and land use, extreme natural events, and climate change—all of which are strongly connected to increasing population and variability in the local, national, and global economies. These stressors can directly affect the health and safety of people, the sustainability of the ecosystem, and the economic and social systems of the surrounding communities. Our ability to understand and predict these impacts will be of upmost importance to our citizens. We have three strategic goals that encompass these issues and define the real relevance of OSG. These goals are interdependent, and progress toward any one goal will boost capabilities toward the others.

Improving Human Health and Safety Related to Ocean and Coastal Use

Oregon's coastal region provides numerous benefits and risks to human health and safety. Fresh, nutritious, locally caught seafood; clean air and water; and diverse recreational opportunities that complement the natural beauty of our shores are clear benefits. The relationships between ocean conditions and human health and safety are strong. Oregon coastal communities and upland users of coastal resources, however, are also exposed to a growing number of health and safety risks. Primary concerns in coastal communities include at-sea safety, erosion effects, coastal storms, earthquakes or tsunamis, beach contamination, harmful algal blooms, and drinking-water safety. Of additional concern are the slower changes associated with climate change, such as sea-level rise and reduced access to fresh water. During catastrophic events, transportation corridors that connect coastal communities to essential services such as health care and food can become impassable, isolating communities from these services at a time when they are most needed. Additional health and safety concerns throughout the state and region relate to the risks and benefits of consuming regionally caught and cultured seafood.

OSG will seek to improve health and safety for coastal communities by building on our history of success in advancing understanding, and thereby predictability, of the biological and physical drivers of hazards. We will emphasize research that helps us understand the relationship between ocean conditions and human health and safety and improves predictions of hazardous events (both locally and regionally), and innovative study of the effects of coastal storms and tsunamis on social and ecological systems. Predictive approaches are essential to reducing the risks to human health and safety. We plan to continue our pioneering efforts to educate and inform the public about risks and increase its

preparedness. In addition, we will intensify work with local communities to ensure they have increased resilience to the disturbances associated with coastal hazards and threats to human health or safety and can adapt to long-term changes through improved planning to mitigate risks.

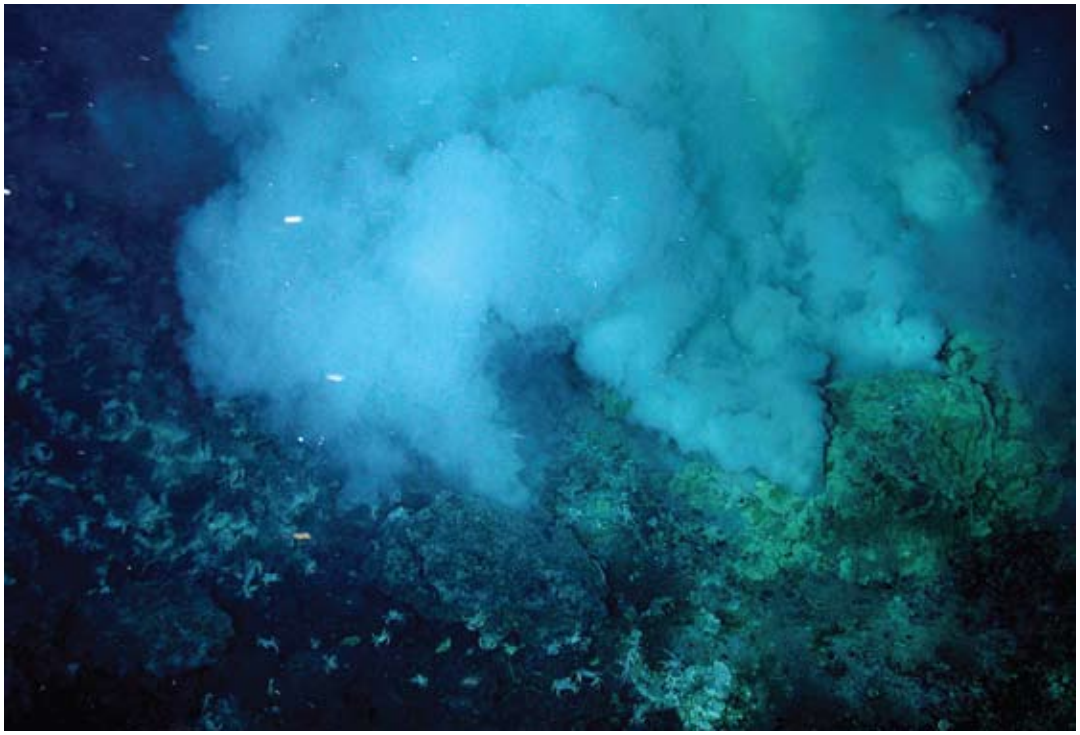
OSG has long addressed seafood safety concerns through supporting research that seeks to improve safety and the health benefits derived from local and regionally caught and cultured seafood products, via research on causes of seafood contamination as well as improved seafood monitoring, processing, and preparation techniques. We will continue to support this area of expertise and augment our education programs to address the links between safe seafood and human health.

FOCUS IN THE FIELD

Tsunami public education efforts bring research findings to communities, resulting in engaged clientele, decision makers, and agencies, which then take actions to identify risks and implement hazard mitigation and adaptation processes.

Oregon Sea Grant researchers are exploring deep-sea vents for bioactive natural products that may provide treatments for infectious diseases.

.



Promoting Social Progress and Economic Vitality

Economies of Oregon coastal communities are in transition. Those that have historically depended upon timber, agriculture, and fishing are looking to diversify by capitalizing on other strengths such as natural beauty, clean air, temperate weather, authentic working waterfronts, and local culture—all of which attract people to the coast and support tourism and burgeoning retirement communities. However, these relatively new and different economic stimulators are sometimes perceived as threats to the very cultural fabric around which they are based. Furthermore, substantial changes in coastal community population size and composition have introduced new challenges, such as maintaining family-wage jobs and the well-trained workforce necessary for continued economic productivity and support of civic services. Stresses to the environment such as climate change, changes in fisheries, coastal hazards, and aquatic invasive species also put significant strain on coastal economies and social progress. New uses of the region's coasts, such as marine reserves and wave energy installations, will also affect the social-economic well-being of coastal communities and the ecosystem services of the region.

Visitor-attracting educational opportunities, such as those offered by the Oregon Coast Aquarium, are becoming an important part of coastal communities as economies change.

In recent years OSG has emphasized efforts that seek to understand how to balance multiple uses of ocean space and coastal resources. As marine spatial planning progresses nationally and regionally, we will continue to conduct research to understand and predict the interactions of these stresses and will also enhance our partnerships with communities, conservationists, industry, and regulatory and management agencies to develop fair public processes that encourage full participation when potentially conflicting or competing uses of ocean and coastal space are a concern.

We will work directly with communities to assist them in understanding ecosystem services of ocean and coastal environments and in being entrepreneurial in developing their economies and ensuring that long-term benefits (and costs) from coastal development, conservation efforts, and offshore energy development are understood and realized. OSG will focus even more on advancing understanding of the social and economic consequences of transitioning economies, environmental changes, long-term climate change, and hazardous events to improve local planning and adaptation.

OSG is poised to accelerate understanding of the social, cultural, economic, and linguistic factors that influence participation in civic services, educational programs, and decision making. OSG will improve its education, outreach, communications, extension, and engagement activities to ensure that its programs are accessible and effective for people of all backgrounds, cultures, and economic strata.

Enhancing the Sustainability of Coastal Ecosystems

Oregon's coastal ecosystems (watershed, estuarine, shoreline, nearshore, and offshore) are among the most productive in the world, yielding a bounty of benefits such as fisheries, tourism, alternative energy sources, and habitat for species such as gray whales. These benefits are the foundation for coastal

FOCUS IN THE FIELD

When the $110 million west coast shellfish industry was threatened by the bacteria Vibrio tubiashii, *Sea Grant researchers quickly went to work and developed water-treatment solutions that protect shellfish farms from contamination.*

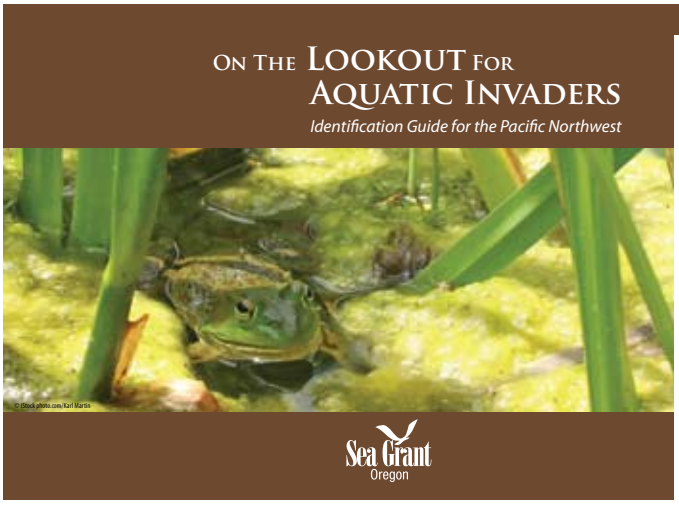
Sea Grant Extension agents and specialists engage coastal communities, researchers, and the wave energy industry to ensure open communication and information sharing.

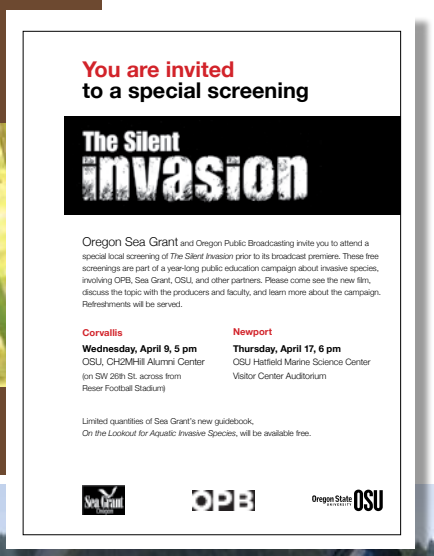
life and are near to the hearts of all Oregonians. These ecosystems face an ever-growing number of challenges from natural and anthropogenic stressors such as erosion, habitat modifications, aquatic invasive species, hypoxia, and climate change. These stressors can put excessive strain on coastal ecosystem functioning and ecosystem services and reduce our ability to sustainably use and benefit from all our coast has to offer.

OSG will continue to advance knowledge and understanding of integrated coastal ecosystem structure and function through targeted research that builds capacity to forecast ecosystem conditions so that communities dependent on coastal resources can plan for and adapt to changes. By linking these efforts with Oregon Sea Grant extension, communications, and education programs, we hope to enhance our constituents' ability to base their decisions on sound ecosystem science.

FOCUS IN THE FIELD

In 2009 Oregon Sea Grant partnered with Oregon Public Broadcasting and others in "Stop the Invasion," a media- and public-engagement effort to prevent, detect, and control the spread of invasive species.





You are invited
to a special screening

The Silent invasion

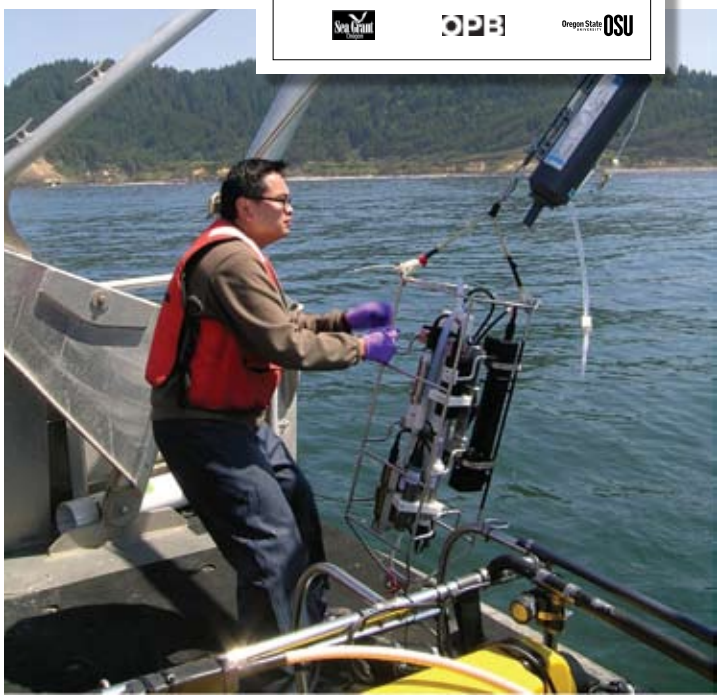
Oregon Sea Grant and Oregon Public Broadcasting invite you to attend a special local screening of *The Silent Invasion* prior to its broadcast premiere. These free screenings are part of a year-long public education campaign about invasive species, involving OPB, Sea Grant, OSU, and other partners. Please come see the new film, discuss the topic with the producers and faculty, and learn more about the campaign. Refreshments will be served.

Corvallis
Wednesday, April 9, 5 pm
OSU, CH2MHill Alumni Center
(on SW 26th St. across from Reser Football Stadium)

Newport
Thursday, April 17, 6 pm
OSU Hatfield Marine Science Center
Visitor Center Auditorium

Limited quantities of Sea Grant's new guidebook, *On the Lookout for Aquatic Invasive Species*, will be available free.

Oregon Sea Grant researchers are working to understand the causes of hypoxia and its effect on nearshore ecosystems.



Cross-cutting Goals

The Sea Grant Program has two cross-cutting goals that form the foundation of all our work.

Informed and Engaged Society

A major Sea Grant cross-cutting goal is to help create and enhance an informed and engaged, ocean-literate society that understands the cultural, ecological, and economic value and vulnerabilities of our coast and how our actions may influence the coast. OSG strives to support public and private actors in their decision making. We engage stakeholders in conducting and applying coastal research that meets the needs of our state and region. We also assist communities of interest and communities of place in identifying, co-generating, and using the best available science to anticipate, prepare for, and adapt to actual and predicted changes.

PacificFishTrax is one of many tools OSG uses to engage the public in making informed decisions.

An informed and engaged society demands science-based resource-management decisions and participates in public decision making. Sea Grant efforts strive to ensure that public and private decision makers have effective access to all current coastal science and information and are environmentally aware, enabling well-informed decisions regarding coastal issues.

We believe that while the "best available natural science" is certainly necessary to foster good decision making, it is not sufficient. The best-available social science must be used as well. Our efforts extend beyond public education and outreach to include more respectful and more successful models that focus on listening and learning from and engaging others with whom we are trying to communicate about "expert" knowledge.

Indeed, how people learn in out-of-school settings and make decisions are active fields of research and application in OSG. We will continue to invest in appropriate, creative education and learning programs for all ages so that our program can maximize its impact. We will advance the Hatfield Marine Science Center Visitor Center as a world-class educational and free-choice learning facility and an ideal venue for learners of all ages to gain hands-on experiences, expanding their knowledge and understanding of coastal science and coastal issues.

Through our Sea Grant Scholars program we will support undergraduate and graduate students in their marine science studies by strengthening academic and professional advising and networking and training students to link research with societal needs.

In recent years, Sea Grant has become a critical partner of state agencies and local communities in designing transparent public processes that emphasize full, trusted, and meaningful participation in public decision making by a range of stakeholders. Our cadre of Extension specialists (many of whom live and work in coastal counties) lead this engagement. Our ability to engage stakeholders in learning, understanding, and applying the best-available science to decision making make us poised to build further collaborations and partnerships that improve decision making.

We will continue to increase communications capacity through development of Web and other digital tools that further expand knowledge and understanding of marine and coastal issues among scientists, policy makers, and management professionals, as well as students, visitors, and the public at large. Our efforts will extend beyond providing critical educational media, tools, and programs. We will advance the art and science of learning and communication to constantly improve our own methods and to inform the international community of learning professionals.

FOCUS IN THE FIELD

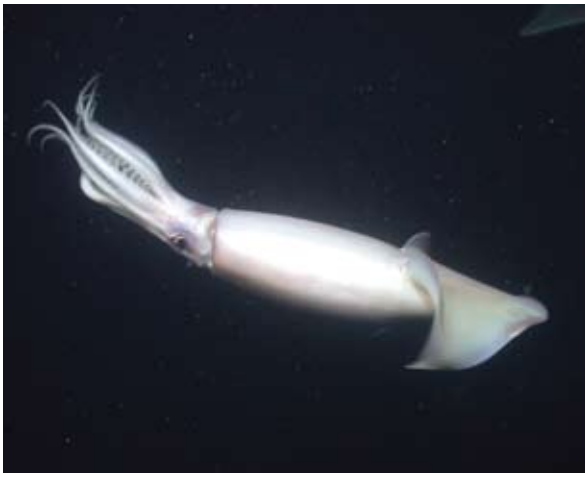
Oregon Sea Grant Extension held listening-and-learning community forums that engaged hundreds of coastal stakeholders in developing a process and guidance for marine reserve site selection.

Oregon Sea Grant's Visitor Center at the Hatfield Marine Science Center uses new and cutting-edge technology and geo-visualization tools like the Magic Planet (a spherical display for digital data about planetary dynamics) to teach the public about ocean processes and to advance the science of free-choice learning.

.

FOCUS IN THE FIELD

Oregon Sea Grant researchers conduct field and laboratory experiments to improve predictive capabilities related to the movement of materials between the outer surf zone and the inner continental shelf.



Oregon Sea Grant researchers are working alongside fishermen to determine the extent of Humboldt squid in Oregon and understand their effect on commercial fisheries.

.

Sound Science

OSG is a pioneering supporter of sound coastal science with high societal relevance, via competitive grants to innovative researchers who demonstrate scientific excellence with superior and complementary education and outreach. We will continue to support excellent and high-priority scientific research that meets the needs of stakeholders and is fully integrated with our outreach programs. Our researchers are invested in the application of their research results to improve knowledge, understanding, and decision making relevant to critical coastal-management questions. We will cultivate our existing capacity in this area and work to advance predictive research that enhances understanding of how our social and ecological systems will change over time and in response to environmental drivers.

In addition, OSG has demonstrated significant skill and success in collaborative research programs that take a holistic look at large-scale and long-term coastal issues. We will increase our focus on multidisciplinary and multi-institutional partnership efforts, such as examining the human dimensions of marine and coastal uses and climate change and discovering and implementing regional approaches, when they are likely to be more successful than locally applied solutions.

Key Issue Areas

The OSG program elements (administration, research, communications, extension, and education) function in an integrated way to address our goals. We focus our approach in six key issue areas that are particularly relevant to the Oregon coast and the region. In each of these areas, a comprehensive approach that addresses human health and safety factors, ecosystem sustainability issues, and economic vitality and social progress must be taken. We also recognize that these issues, like our goals, are interdependent.

Multiple Uses and Spatial Planning

Demand for ocean space and pressure on ocean resources are rapidly increasing. New uses of ocean space, such as alternative energy development and marine reserves, have provoked ocean and coastal stakeholders to become more involved in planning and decisions related to allocation of ocean space. These conditions create a culture of competition and highlight the critical need for knowledge and understanding about how current ocean uses affect each other and how they cumulatively affect the environment. Two new uses being considered in Oregon are marine reserves and renewable energy. OSG will focus effort on filling critical gaps in knowledge through interdisciplinary research that seeks to understand social, economic, and ecological aspects of multiple uses of ocean space and implement spatial management based on sound science. We will serve the state and region as a trusted broker by working in partnership with government, industry, and NGOs to develop processes for engaging diverse interests in solution-oriented and science based planning for use of ocean space and through training and facilitation of improved communication among user groups. We will help seek innovative and practical solutions for ocean use conflicts including engagement of a wide range of stakeholders in decision making.

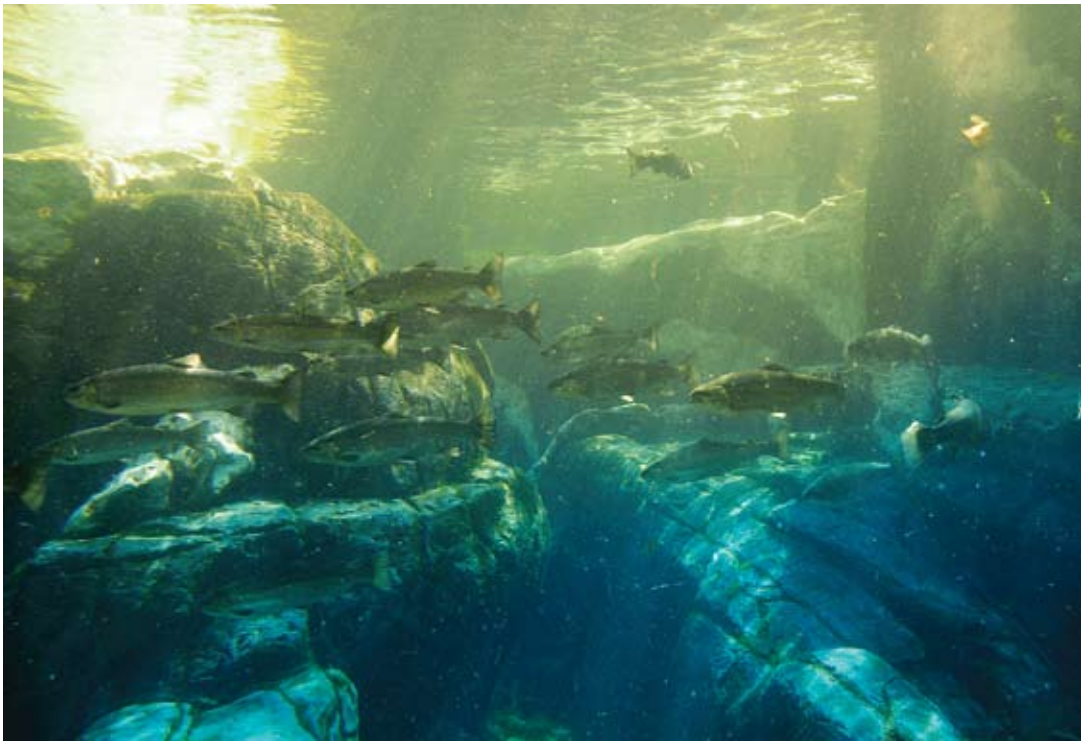
Oceans and Human Health

Human health and safety are undeniably linked to the health of our ocean and coastal ecosystems, which provide benefits such as clean water, seafood, marine-derived pharmaceuticals, and recreational opportunities. Safety is also important, particularly for recreational users and commercial fishermen. Conversely, threats to ocean and coastal health, such as harmful algal blooms, pollution, aquatic invasive species, and fish disease, can increase risks to humans who use and rely on coastal and ocean resources. OSG will support research that seeks to assess and expand knowledge of biophysical processes that drive ecological conditions affecting human health and safety, improv-

ing forecasting of those conditions and developing and improving public notification and response strategies. Funded research will move beyond understanding to forecasting threatening conditions, with an emphasis on developing applications that provide early warning systems and reduce overall risks. We will support ocean exploration and the discovery of new drugs and other products that can enhance human health and our economy. We will use our communications and extension capabilities to increase public knowledge about human health benefits, and about risks related to ocean and coastal use. Through extension efforts we will work with coastal and coastal-dependent communities to identify and monitor ocean conditions that pose a risk to human health and safety. We will respond to these issues by leading the development of warning systems, risk mitigation, and improved biosecurity, and by helping citizens determine how to reduce their own impact on coastal health and to improve water quality of nearshore and estuarine systems.

Watersheds and Water Resources

Oregon's salmon-bearing watersheds are under the pressure of a growing human population and land use that often results in changes in water quality, habitat, and water rights issues. Watersheds also can provide a pathway for invasive species and breeding grounds for fish diseases. Oregon Sea Grant will target research on better defining the relationships between climate change, upland and coastal land use, restoration efforts, and other changes and downstream impacts to coastal communities and ecosystems, and on preventing and mitigating the impact of aquatic invasive species. Engaging the general public and groups such as local governments, outdoor hobbyists, agriculturalists, rural and urban landowners, and woodland managers in solution-focused initiatives may help to sustain watershed health and conserve water resources. Oregon Sea Grant will advance understanding of the roles of natural hydrology, riparian ecology, and safe and sustainable land use and development, and provide training and capacity building that helps protect a safe and clean water supply. Oregon Sea Grant will also promote social progress and economic vitality by strengthening regional partnerships and facilitating improved decision making with regard to watersheds and water resources and providing a better understanding of the economic impacts and effective management or prevention of aquatic invasive species.



Community Resilience to Coastal Hazards and Climate Change

The coastal areas of Oregon in recent decades have experienced considerable population and development pressure, which is expected to continue. During the same period, coastal Oregon has seen an increase in the frequency and intensity of winter storms, which have brought record storm damage, flooding, shoreline erosion, and bluff failures. Just off the coast, the Cascadia subduction zone poses the very real risk of a high-magnitude earthquake and a severe tsunami. Climate change also has the potential to increase the risks associated with erosion, flooding, sea-level rise, compromised water quality, invasive species, and oceanographic changes that could affect aquatic life, including commercial fisheries. Coastal residents and leaders are struggling to understand and respond to the confluence of these trends.

Model of Seaside, OR used by Sea Grant researchers to understand impacts of tsunamis.

Rural Oregon coastal communities may be more vulnerable and less resilient to climate change than metropolitan areas, because of a lack of overall institutional resources and a greater economic dependence on natural resource systems. Critical needs for addressing local natural hazards include a better understanding of coastal processes, assessment of local vulnerability to current and projected impacts, identification and setting of priorities on adaptation strategies, and ongoing help implementing those strategies. It is also important to identify the social and economic barriers to hazards and climate change preparation. Oregon Sea Grant supports physical and social science research to better understand, predict, and adapt to hazards and climate change. Additionally, Oregon Sea Grant will help local residents and leaders build understanding and capacity to plan for and implement hazard response and adaptation strategies critical to the economy, health, and safety of coastal residents and visitors.

Fisheries and Seafood

Oregon's coastal history, culture, and economy are shaped by our productive fisheries. OSG addresses fisheries challenges by integrating the tools of extension, education, and research to improve understanding and management of fishing and aquaculture practices. Our programs are cooperative and interdisciplinary, incorporating experiential knowledge of the fishing community to enhance understanding and science-informed management of sustainable, commercially valuable fish stocks and ecosystems that support them. Our research focus is on understanding the relationships between habitat, physical forces (e.g., climate change, currents), food webs (including invasive species and disease), and fish production to enhance sustainability of coastal ecosystems. OSG plays a critical role in

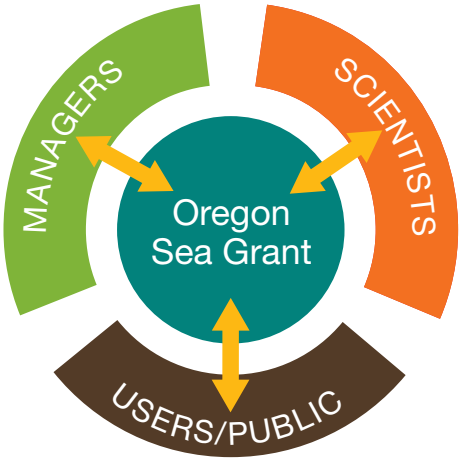
building partnerships and helping businesses and communities self-organize, thereby increasing the efficacy of citizen engagement in fisheries-related decision making and management. In addition, we educate our constituents about historical and current fisheries practices and management, to advance the understanding of fisheries throughout the state. OSG also works to maximize locally realized benefits of Oregon seafood by enhancing seafood product development, food safety and handling, and other programs that advance consumer awareness and ability to make healthy choices related to seafood consumption.

Coastal Learning and Decision Making

Public and private organizations make substantial investments in "ocean education" programs that provide various learning opportunities for students, adult audiences, and ocean-management and -policy decision makers. These efforts to improve ocean literacy often operate under the assumption that learning is a simple, linear process, moving from awareness to knowledge to behavior change, and that increased knowledge leads to decisions that favor stewardship and preservation of our ocean and coastal resources. However, the links between learning, knowledge, and behavior change are neither simple nor direct, as decades of research in the cognitive, decision, communication, and learning sciences attest.

OSG works to advance ocean literacy through research that seeks to identify and understand the links between learning and behavior change. We use the results of our investigations to create easily adaptable strategies that organizations can use to more effectively link learning to decision making and behavior change. In addition, we make special efforts to identify and reach out to underserved audiences. We use this research to update and improve our ability to help Sea Grant be of greater relevance and benefit to society. Advancing the science and application of free-choice learning and decision making should lead to reductions in risk behaviors related to hazards, climate change, coastal development and land use, fishing and seafood, and coastal recreation. It also should result in improvement in public understanding of the ocean's influence on people and our influence on the ocean and provide people with the tools to incorporate stewardship into their daily lives.

Partnerships

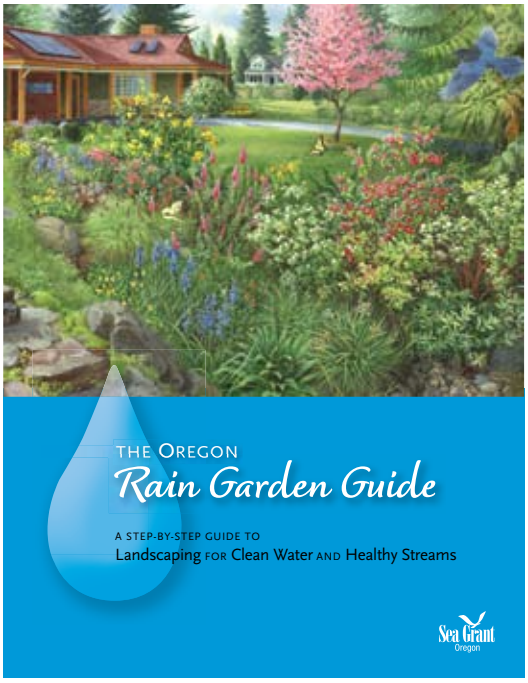


Oregon Sea Grant has long valued and invested in partnerships and collaborative efforts. Our ability to achieve our goals will be dependent upon our ability to maintain and enhance partnerships within the academic community; with local, state, and federal agencies; with other Sea Grant programs; and with the broader stakeholder community on a statewide and regional basis. Our intent is to invigorate partnerships in every aspect of the work we do and to lead a number of new initiatives at the local to national level. We choose partners who expand our range of talents, capabilities, and resources to address issues and opportunities that could not be addressed by any one organization alone. We also invest in research and projects with collaborative approaches that will build new partnerships and grow existing ones. We recognize that neither ecosystem functioning nor economies respect political boundaries and that some research and management needs can be addressed effectively only through a regional approach.

Our program was built on the foundation of a state-federal partnership. We continue to be successful in part because of our longstanding partnerships. On the federal level, we will continue to align and collaborate with NOAA, NOAA's National Sea Grant, Federal Ocean priorities and with other Sea Grant programs based in coastal and Great Lakes states and seek new opportunities in emerging areas such as alternative energy, marine spatial planning, observing systems, human health, climate change, and invasive species.

Many of the coastal issues facing the state are regional in scope and can best be dealt with at the regional level. OSG is closely partnered with and actively participates in our regional governance structure under the West Coast Governors' Agreement on Ocean Health and organizations such as the Northwest National Marine Renewable Energy Center and the Partnership for Interdisciplinary Studies of Coastal Oceans. The West Coast Governors' Agreement seeks to advance the states' mutual interests, and it underscores the importance of managing activities that affect our oceans on an ecosystem basis. There are several ongoing initiatives that provide opportunities for OSG to maximize our contribution and positive impact. Oregon, Washington, and California Sea Grant programs have partnered to develop a regional research and information needs assessment based on stakeholder input. OSG will continue to work with our Sea Grant partners, the West Coast Governors' Agreement, and the NOAA Western Region to seek out additional opportunities.

OSG collaborates with federal and state agencies on salmon recovery.



Left: The Oregon Rain Garden Guide was produced by OSG in partnership with the Oregon Environmental Council, and local soil and water conservation districts.

Right: OSG Scholar Amanda Gladics is working with Oregon Department of Fish and Wildlife and local fishermen to develop low cost methods to track fluctuations in fish populations based on seabird diet.

At the state level, OSG has a long history of partnering with state agencies, including the departments of Fish and Wildlife, State Lands, Land Conservation and Development, Geology and Mineral Industries, and Water Resources. The Governor's appointed Ocean Policy Advisory Council works with the public to make recommendations on issues such as developing marine reserves in the territorial sea. The Sea Grant director serves as the chair for the associated Scientific and Technical Advisory Committee. Oregon's coastal legislators join together as a caucus to address issues shared by coastal districts. In 2009 the state legislature created the Nearshore Research Task Force to improve overall coordination on nearshore issues and to identify and address statewide nearshore priorities. The Sea Grant director is a standing member of the Task Force and was elected as its chair. The state has become a national leader on many coastal issues and is home to the Oregon Climate Change Research Institute and the Northwest National Marine Renewable Energy Center, among other centers and cooperative institutes. Finally, Oregon coastal communities are closely intertwined with the health of our marine resources, which motivates Sea Grant to work with counties, cities, community groups, and individual stakeholders to actively and energetically participate in shaping state and regional policy and planning.

Oregon Sea Grant will work strongly to further its academic partnerships within Oregon State University and throughout the state. Our host, Oregon State University, is our primary partner and has strong capabilities in coastal and marine sciences and engineering, spread across eight academic colleges and multiple Centers, Institutes, and Programs. OSG faculty is spread across seven colleges within OSU through academic appointments. OSG will continue to work with university leadership and to enhance collaboration, cooperation, and coordination among the units to address key marine issues and opportunities. OSG will lead a new OSU Marine Council toward this end. OSG will seek to strengthen our partnerships, research funding, and student sponsorship throughout other Oregon institutions of higher education. Recent participants in the program include the University of Oregon, Oregon Health and Science University, Portland State University, and Eastern Oregon University. In addition, OSG will maintain close relationships with several research facilities on the Oregon coast, including the OSU Seafood Laboratory in Astoria, the OSU Hatfield Marine Science Center in Newport, and the Oregon Institute of Marine Biology in Charleston.

Overall, OSG will strive to provide both a leadership and catalyst role to enhance partnerships at all levels to help meet the needs of coastal stakeholders.

Operational Guideposts and Program Character

Oregon Sea Grant is committed to scientific excellence and societal relevance. Our mandate is to assess the needs of the coastal stakeholders and provide them with the best scientific information. We define coastal stakeholders as anyone who studies, uses, manages, or has an interest in the coast, and we consider them all partners. We combine the tools of communication, education, research, and extension in an integrated way to maximize our capabilities and effectively address the needs of these stakeholders.

The reputation of Oregon Sea Grant as a trusted broker of scientific information is critical to our mission. We carry out our mission with a strong sense of responsibility for maintaining and nurturing the program's remarkable reputation for quality, productivity, and impartiality. Our people avoid conflicts of interest—or even such an appearance. We must take an unbiased approach when facilitating the sharing of information between the scientific community, resource users, and the public. We work to preserve our relationship with each of these groups to enhance our ability to effectively reach our goals.

Oregon Sea Grant carefully considers choices about how to best use our limited resources. The research that we fund must meet the highest standards of competitive peer review and evaluation.

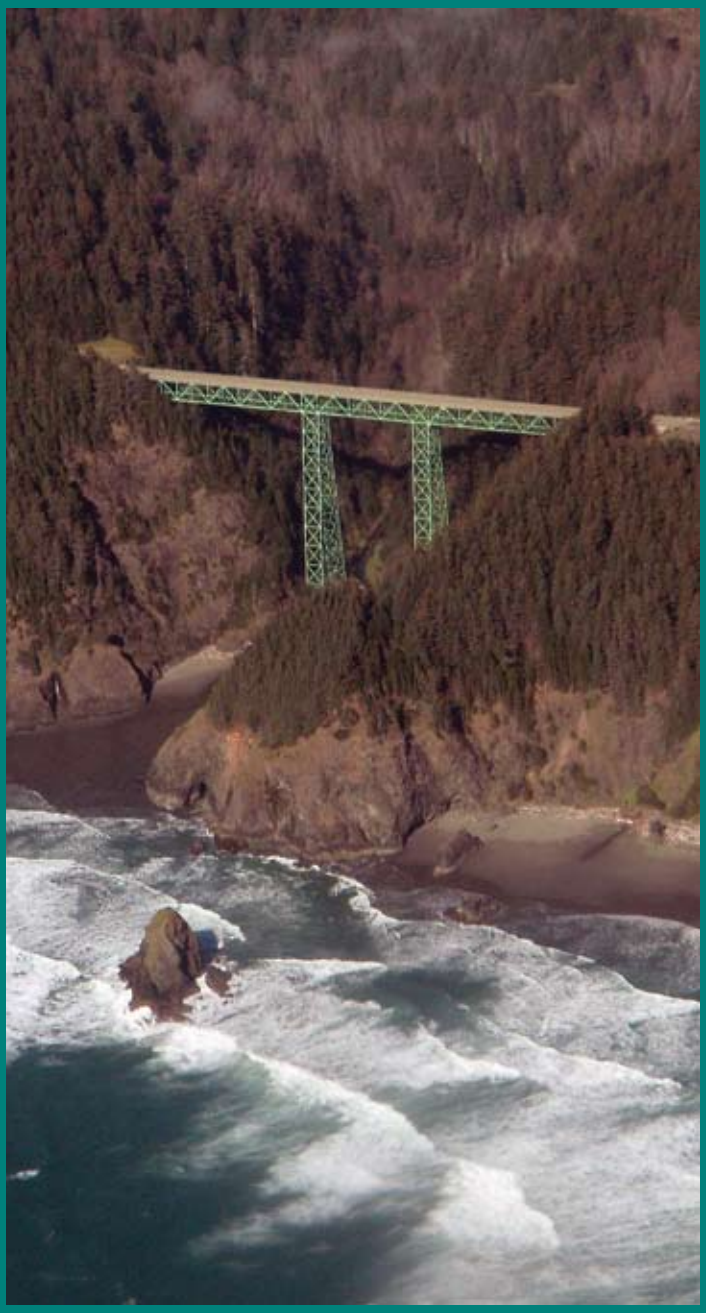
We are prepared, however, to take risks to catalyze innovation and technology that solve critical ocean and coastal issues, make significant strides in understanding of coastal ecosystems, or improve human health and well-being.

Oregon Sea Grant is action-oriented and adaptable. We anticipate a range of possible futures and will continue to maintain the organizational agility necessary to quickly respond to emerging issues by investing in timely scientific research, educating the public, and engaging stakeholders in decision-making processes.

The people of Oregon Sea Grant are our most valued asset. We strive to provide a rewarding work environment and to encourage the personal and professional growth of all our staff, regardless of role or position.

The Way Forward

This Strategic Plan guides our program and sets Oregon Sea Grant in motion to enhance its leadership role in addressing ocean and coastal challenges facing Oregon, the region, and the nation. We do this through our signature approach that integrates research, extension, communications, and education. Oregon Sea Grant will revisit this plan—and its companion, the Implementation Plan—often to ensure that the organization is maintaining focus, staying alert to new trends and opportunities, and progressing toward its goals.



Oregon Sea Grant
Oregon State University
322 Kerr Administration Bldg.
Corvallis, OR 97331-2131

http://seagrant.oregonstate.edu
541-737-2714

ORESU-Q-10-001