

If you were to look at the coast of Oregon from a height of, say, a hundred miles, you might conclude that it is a nice, straight coastline. Although long, it would not appear from that altitude to have much complexity or variety. You wouldn't see huge bays like the Chesapeake or major cities like New York or Los Angeles. It is also likely that from a hundred miles up you would not see evidence of the rich and diverse natural resources that characterize the Oregon coast. Nor would you see the dozens of small and medium-sized communities that dot the coastline, each different and each dependent in some way on the coast's varied resources.

We not only see them. At Oregon Sea Grant we work every day to help people understand, use, and conserve those important resources in their complex surroundings. Since its creation 35 years ago, Oregon Sea Grant has supported research, education, and outreach to enhance the ocean's usefulness in the everyday lives of Oregonians.

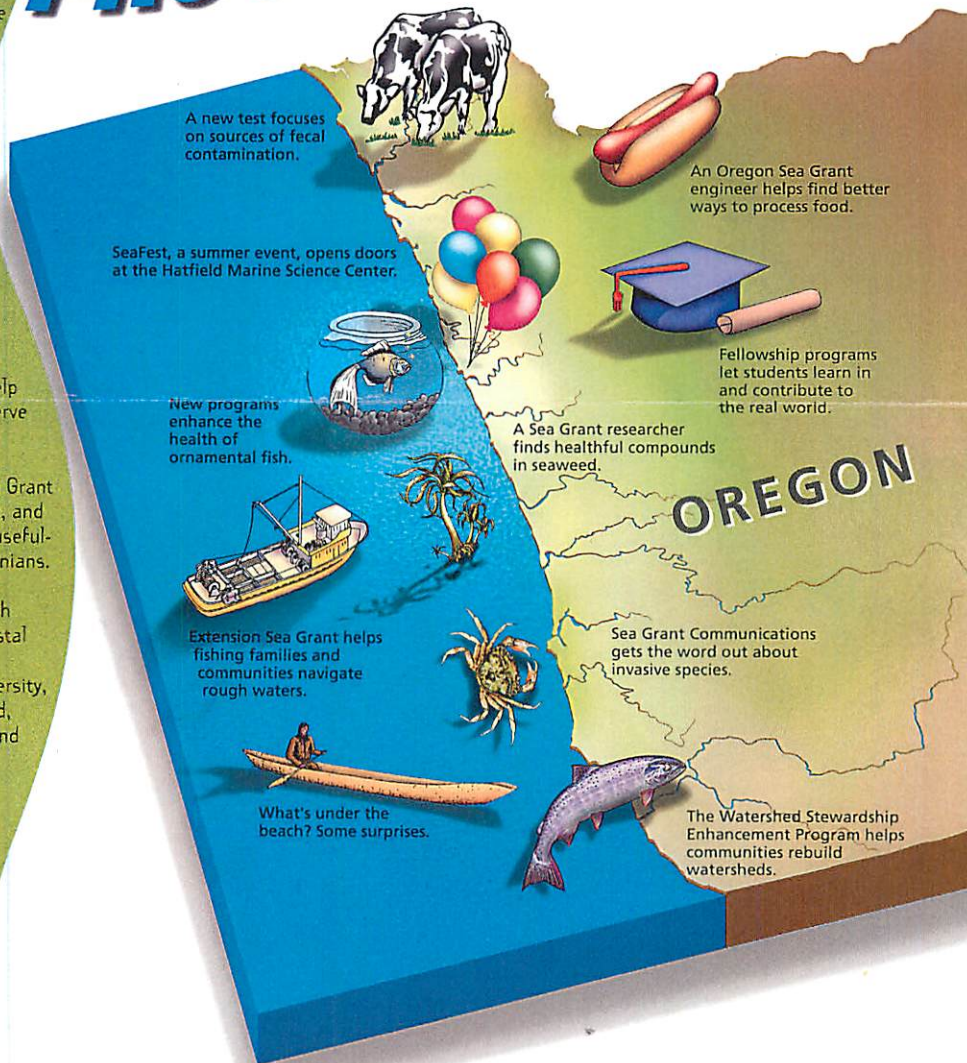
Oregon Sea Grant is one of 30 such programs at universities in all coastal and Great Lakes states in the U.S. We're based at Oregon State University, but our activities extend far beyond, throughout the state, the region, and even the nation.

This report gives a glimpse of what we do at Oregon Sea Grant. But, like the view of our coast from a hundred miles up, there's a lot more to us than that. To learn more, you'll have to get closer.

Robert Malouf
Director
Oregon Sea Grant

Oregon Sea Grant
2003

PROGRAM REPORT



Tim Miller-Morgan ORNAMENTAL FISH

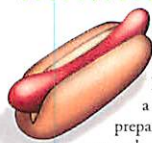
One of the fastest-growing hobbies in the United States is fish keeping. Almost 13 million households in the U.S. keep ornamental fish, and the total value of the industry in this country is more than \$1 billion annually. Yet the amount of scientific information on how to care for and raise fish that can cost tens of thousands of dollars is pretty slim and not well disseminated. When a Portland fish fancier pays \$10,000 for an exotic koi and puts it in his pond, only to lose more than \$100,000 worth of fish because of a disease carried by the new acquisition, it becomes clear that some basic help is needed.

That's the purpose behind the work of Tim Miller-Morgan, an Extension Sea Grant veterinarian at Oregon State University's Hatfield Marine Science Center in Newport. Miller-Morgan is building a program to improve the quality of ornamental aquatic animal health and husbandry in Oregon and the Pacific Northwest. The program has pieces aimed at each segment of the industry, from hobbyists to retailers, wholesalers, importers, and local veterinarians. Had the program been in place just a few years earlier, the hobbyist in the anecdote above or the person selling him the fish would have known to quarantine the new fish first to make sure it was healthy and did not pose a danger to others.

Miller-Morgan has helped the Associated Koi Clubs of America develop a program to train koi health advisors. These volunteers learn how to care for the popular ornamental fish and share that knowledge with other hobbyists. He and others are developing a



two-year professional aquarist training program at Oregon Coast Community College to train people for work in a wide variety of posts in the ornamental fish industry. In addition, he serves on the faculty of the OSU College of Veterinary Medicine, where he teaches courses in ornamental fish medicine.



Ed Kolbe THE ENGINEER IN THE KITCHEN

If you're preparing a meal for one or two people, maybe even a dozen, a cookbook might come in handy. But when you're preparing food for thousands or millions of people, you really want to have someone like Ed Kolbe working in your corner.

Kolbe is an Oregon State University adjunct professor of bioengineering and food science and technology, serving both the Oregon and Alaska Extension Sea Grant programs. Since the mid-1970s, he has been a mainstay of Oregon Sea Grant's work in seafood processing research and outreach. Through his work with the Food Innovation Center in Portland and the OSU Seafood Lab in Astoria, Kolbe has helped develop innovations in processing and packaging that will bring the Pacific Northwest's seafood to the rest of the world.

During 2002, he was part of a multidisciplinary group that received a patent for a new way of using radio waves to heat packaged surimi seafood. The rapid and uniform increase in temperature enabled effective pasteurization without overheating and damaging food quality. Because of their lower frequency, radio waves can be used more effectively than microwaves, which tend to heat unevenly. The radio waves can also be "tuned" to resonate more efficiently with the food being heated, and the frequency can be changed to follow the changing resonance as the temperature of the food rises. Although it was first designed to work with surimi seafood, the process holds potential for use in processing a wide variety of vegetables, meats—from hot dogs to lunch meat—and other foods.

Kate Field TRACKING DOWN CONTAMINATION

Fecal contamination of watersheds is a serious problem worldwide, but standard tests reveal only whether water is contaminated with feces. They do not reveal what animal is the source. At Oregon State University, Kate Field has developed a test that not only confirms the existence of fecal pollution in a fraction of the time it takes standard tests, but can pinpoint the source.



Instead of focusing on fecal coliform, the test developed by Field looks for different bacteria associated with feces. Field, an associate professor of microbiology, chose *Bacteroidetes*, a group of anaerobic bacteria (bacteria that grow without oxygen). Using a process called polymerase chain reaction, she created millions of copies of a particular gene. In those copies, she looked for specific markers, sequences diagnostic for particular species.

By isolating the genetic markers for different species, Field can now examine water samples for the presence of the diagnostic genetic markers. The comparison should reveal the source, and the test takes no longer than a day or two, compared to as long as a month for the standard fecal coliform test.

Field has recently tested her methods in the Tillamook Bay estuary, where repeated outbreaks of fecal contamination have left dairy farmers and urban interests in a deadlock over the source of the contamination. Although Field found human fecal pollution in samples from urban areas, the test proved that the majority of fecal pollution in the watershed was ruminant, not human. The test may soon become a standard around the world.

Roberta Hall and Curt Peterson NEW IDEAS ON THE BEACH



Two projects sponsored by Oregon Sea Grant are changing the way we think about the coast, both its past and its future. Work by Roberta Hall and by Curt Peterson is changing the model of Oregon's coastal history.

This past summer, a team led by Hall, a professor of anthropology at Oregon State University, rocked the archaeological and anthropological world with news that they found evidence that humans had visited the Oregon coast thousands of years earlier than had previously been believed. Their work lends credence to the theory that early visitors to North America arrived here, not only via a land bridge from Asia across the Bering Straits, but possibly also by boats along the coast. After two years studying the geological evidence, Hall and geologist Loren Davis chose a site in Boardman State Park, on the southern Oregon coast, and in August discovered traces of human visitation more than 10,000 years ago—more than 2,000 years older than the earliest known archaeological sites on Oregon's coast. This project is partnered with the Coquille Indian Tribe's studies of how landscape changes have affected south-coast settlement.

Peterson, a professor in the department of geology at Portland State University, has teamed with a broad range of researchers in a Sea Grant-funded study that re-examines how Pacific coastal sand dunes were formed. Using the latest radar technology to see

through the sand, his team has altered our understanding of the coastal plain landscape. Most important, his team has discovered that large tracts of the Oregon coastal plain are covered by prehistoric dunes, which have been forested for thousands of years. The study addresses the ages of dune formation, dune slope stability, and dune groundwater chemistry. Their discovery has important repercussions in terms of where it is prudent to build and develop in coastal areas. Land-use officials and developers will be looking closely at the dunal landscape maps produced by the coastal researchers.



Bill Gerwick FINDING MEDICINE IN SEAWEED



To most people, seaweed is just the slimy stuff that coats seaside rocks or flutters in a tide pool. To William Gerwick, an OSU professor of pharmacy, it's a treasure trove of biochemicals

that holds promises for producing better crops and healthier animals and for solving some of the secrets of human disease. Gerwick has spent a career investigating marine algae and their biochemical components, searching for substances that might be used in medicine, agriculture, and industry. Consistent support from Oregon Sea Grant helped Gerwick take the time to do the laborious work involved in unlocking the biochemical secrets of growing things.

Gerwick has been studying algae since his undergraduate days at the University of California at Davis and conducted his doctoral research on the subject in 1981 at Scripps Institution of Oceanography. His focus is the unusual and highly bioactive natural products many algae—particularly the blue-green marine algae known as cyanobacteria—produce as part of their own biological processes. One of his important findings was the discovery that marine algae metabolize various polyunsaturated fatty acids into substances remarkably similar to prostaglandins and leukotrienes—hormones that play important roles in human and other mammalian immune systems. What the algae are doing with such powerful substances is another topic, but they appear to help ensure the algae's survival.

Gerwick's major focus has been on how such plant-based chemicals might be used to improve human and animal health. Besides the chemicals that mimic immunohormones, Gerwick has discovered substances that act as anti-inflammatory agents; still others are powerful toxins that might be useful as pesticides or cancer cell toxins.

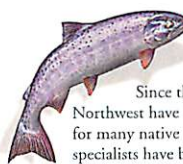
Communications SPREADING THE WORD

The title of Oregon Sea Grant's recent award-winning video tells the story of why the agency has a communications program—*You Ought to Tell Somebody*.

That video focuses on the problem of invasive species. It explains how biological invasions have become a serious problem worldwide. Aquatic invasive species, such as the European green crab, can be stopped, but only through early detection and a quick response. This educational video gives an overview of the problem and provides identification and natural history information about one significant Northwest threat, the Chinese mitten crab, which is already a scourge in California. In 2002, *You Ought to Tell Somebody*, a cooperative project between Oregon Sea Grant Communications and Extension Sea Grant, brought home three national awards.

As the title suggests, it's not enough to know things about the ocean or science. If you don't reach out and communicate that information to others, its value is limited. Researchers and extension agents are working hard on Sea Grant-sponsored projects and programs, and they often do their own outreach to colleagues and clientele, but for many members of the public, the Communications office is the source of Sea Grant information. Take *You Ought to Tell Somebody*. More than 1,600 copies have been distributed so far.

To view an excerpt of this video, go to <http://seagrant.oregonstate.edu/sppubs/videos/tellsomebody.html>. While you are visiting our Web site, browse the wide range of information we make available.



WSEP REACHING OUT TO REPAIR

Since the late 1970s, populations of native salmon in the Pacific Northwest have dropped sharply, raising the specter of imminent extinction for many native populations. Oregon Sea Grant's Extension agents and specialists have been at the heart of an increasingly intense effort to understand and reverse the salmon decline, restoring the species to ecological health and sustainable harvest levels.

Sea Grant's focus has been on teaching people how to do restoration in their own communities. The Watershed Stewardship Education Program (WSEP), in collaboration with OSU Extension Forestry and Agriculture staff, has developed a curriculum to help local watershed councils form effective partnerships, understand their watersheds, and develop strategies for enhancing or restoring them.

WSEP's statewide work formed the basis for a national outreach initiative—a book on coastal restoration—funded by the National Oceanic and Atmospheric Administration, Sea Grant's parent agency. The publication, the *National Coastal Ecosystem Restoration Manual*, was a collaboration between Sea Grant programs in Oregon, New York, and Louisiana, drawing on much of the expertise of the WSEP. Also available from Oregon Sea Grant is *Going with the Flow*, a 40-page booklet providing basic information to help landowners, watershed groups, and resource professionals implement successful enhancement projects and management plans that ultimately improve fish habitat and water quality.



SeaFest OPENING DOORS AT HMSC

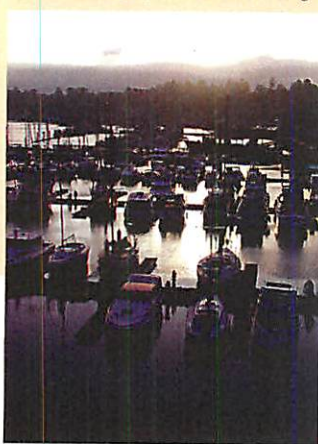
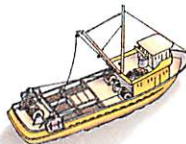
What goes on behind the scenes at OSU's sprawling Hatfield Marine Science Center in Newport? Sea Grant, which manages the popular Visitor's Center, wanted to show the world all the great science that goes on at the center, which houses both federal and state marine research and regulatory agencies. To do so, they launched SeaFest, a free, one-day open house featuring tours, lectures, family activities, food, fun, and displays. The inaugural edition in 2002 was a huge success, far bigger than any of the planners anticipated.

In the early meetings, planners hoped for a thousand attendees but made sure they included provisions for more. And it's a good thing they did, because more than 3,000 people (the local newspaper estimated the number at more than 5,000) showed up to learn not just what we know about the sea, but how we learned it. Surveys of those who came showed that people really did come for the science. The lab tours and lectures were among the top attractions. Plans are already well under way for the next SeaFest. Organizers are looking for the right combination of activities to ensure that SeaFest becomes a highlight of summer at the Oregon coast.



Extension AGENTS OF CHANGE

Things aren't the same today at sea—or on shore, for that matter—for Oregon's fishing families. Change is the constant, and it's making life difficult for families and the communities that depend on the incomes they derive from the sea. Falling harvest levels, concern over a disaster in groundfish populations, and strict new rules on where and how many fish can be caught are a few of the factors causing hardship. Helping to navigate those impacts and steer the fishing community toward the future is part of the work of Oregon Extension Sea Grant.



Coastal Extension Sea Grant agents such as Ginny Goblirsch in Lincoln County and Stephen Theberge in Clatsop County keep an eye on trends, collaborating with other agency and industry partners to help the industry understand the changes. Oregon Sea Grant also offers the *Heads Up!* Web site (at www.heads-up.net/). *Heads Up!* provides an exchange of timely, important information that will ultimately support the industry's transition to the future.

Coastal Extension Sea Grant agents are involved in many other activities—things as varied as conducting workshops on sardine processing, providing information on seafood safety, helping beleaguered fishing families plan their finances, and working with ports and marinas to explain the need for more recreational boating moorages.

Fellowships LEARNING IN THE REAL WORLD



For Sidney Howard and Laura Snow, the good part is just starting. The science and policy they've been studying as Oregon State University graduate students are becoming even more concrete to them as they serve as two of this year's 36 recipients of the national Dean John A. Knauss Policy Fellowships, in Washington, D.C. Howard is working at the U.S. State Department, and Snow is at the U.S. Environmental Protection Agency.

The Knauss fellowship allows outstanding young scholars with an interest in policy decisions affecting marine, ocean, and Great Lakes resources to spend one year in Washington, D.C., learning and polishing the skills needed for leadership and research. The program matches highly qualified graduate students with hosts in the legislative branch, the executive branch, and other institutions in the Washington, D.C., area.

The Knauss fellowship, which was founded in 1979, is named in honor of one of the National Sea Grant College Program's founders, former NOAA Administrator John A. Knauss. It is just one of the opportunities through Oregon Sea Grant's programs that allow qualified students to get into the policymaking arena, giving promising young people a chance to participate in marine science and policy, to get real-world experience while preparing for the future. Other programs include the NOAA Coastal Services Center Coastal Management Fellowship and Oregon Sea Grant's natural resource fellowships and legislative fellowships.

Management Team

Robert Malouf
Director
541-737-2714

Jay Rasmussen
Associate Director and
Extension Sea Grant Program Leader
541-867-0368

Joe Cone
Assistant Director for Communications
541-737-0756

Jan Auyong
Assistant Director for Programs
541-737-5130 (Corvallis)
541-867-0233 (Newport)

Evelyn Paré
Fiscal Operations Manager
541-737-3209

Jon Luke
Visitor Center Manager
Hatfield Marine Science Center
541-867-0357

Oregon Sea Grant
322 Kerr Administration Bldg.
Oregon State University
Corvallis, OR 97331-2131
Phone: 541-737-2714
Fax: 541-737-7958

Advisory Council

Don Barth, Retired bank president
Past commissioner, OR Fish and Wildlife Commission
Board member, Yaquina Bay Economic Foundation

Kirk Beiningen, Retired,
OR Department of Fish and Wildlife

Anne Berblinger, Economic Development Administration,
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Marine Discovery Tours

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Merritt Tuttle, Retired,
National Marine Fisheries Service

Allan Rumbaugh, General Manager,
OR International Port of Coos Bay

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

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This publication was funded by the National Sea Grant College Program of the U.S. Department of Commerce's National Oceanic and Atmospheric Administration, under NOAA grant number NA16RG1039 (project number M/A-1), and by appropriations made by the Oregon State legislature.