Oregon Sea Grant Program Guide

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Sea Grant Oregon

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Oregon Sea Grant
Oregon State University
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Contents

Oregon Sea Grant

Oregon Sea Grant supports research and conducts education, communication, and outreach programs that contribute to the rational use and conservation of marine and coastal resources.

Begun in 1968, Oregon Sea Grant was one of the first—and is now the third largest—of a national network of 30 such university-based, state and federal partnerships. Although administered by Oregon State University, Oregon Sea Grant actively solicits and supports research, outreach, and education projects at other Oregon institutions of higher education.

Based at OSU's Corvallis campus, Sea Grant supports Extension agents and specialists stationed the length of the Oregon coast. The program also administers the Public Wing of OSU's Hatfield Marine Science Center in Newport.

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Oregon Sea Grant is more than a collection of projects. Research, extension, education, and communications elements of the program work together and complement each other. Sea Grant is determined to make a difference in the development and dissemination of knowledge, using innovative approaches, responding to needs, and collaborating with partners.

Research

Economic Leadersip

Biotechnology of Natural Resources

Multifaceted Drug and Agrichemical Discovery from Marine Algae (R/BT-24)

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Pioneering work by Gerwick and other researchers has shown marine algae to be rich sources of powerful chemical extracts that can reduce inflammation, promote healing, or even poison human and animal tissues. Gerwick and his team have compiled a "bank" of living algae collected from around the world and now propose to systematically analyze extracts from those sea plants—and others that will be gathered during the research period—for their potential use in medicine and agriculture.

Working in collaboration with the pharmaceutical industry, Gerwick plans to screen hundreds of new algal extracts for their anti-inflammatory, antiviral, and agrichemical activity, as well as their ability to bind with intracellular receptors (a quality which is important in the treatment of disease). When a particular extract appears promising, Gerwick will isolate its active compounds, analyze their molecular structure, and produce additional supplies of the material for further testing.

A Delivery System for DNA Vaccines for Aquaculture (R/BT-30)

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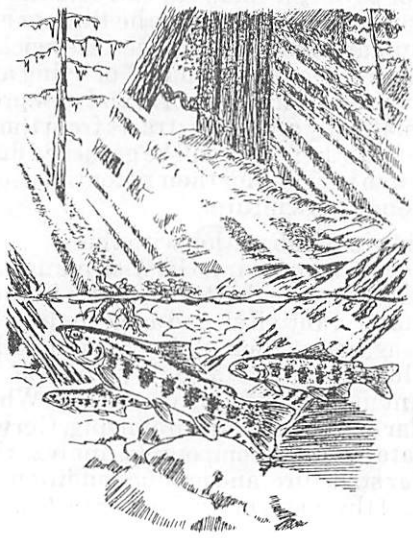
Leong is known worldwide for her work in developing genetically based vaccines for the treatment of fish diseases that can be devastating to aquaculture operations around the world. Through years of research, her team has developed an effective, DNA-based vaccine for hematopoietic necrosis virus (IHNV), a particularly troublesome fish-killing disease. At present, though, the only way to deliver the vaccine is by injection, and that's not a practical or cost-effective way to immunize young fish.

Leong will use her grant to develop a microscopic, acid-resistant coating for the vaccine material, one which would dissolve in water above a certain pH level. Such a system would allow vaccine to be added to the water in aquaculture rearing tanks so the young fish could be vaccinated by swimming through and ingesting the treated water.



Identification of Genetically Based Protective Responses against Infection by the Myxosporean Parasite, *Ceratomyxa shasta* (R/BT-31)

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Ceratomyxa shasta is a virulent parasite for many strains of salmon and trout, and a significant cause of fish mortality in the Pacific Northwest. It is related to parasites which cause lethal diseases in other North American fish stocks, including whirling disease and proliferative kidney disease.

The parasite is found only in certain river systems. Fish that live in those rivers, or migrate through them, develop some degree of natural immunity. However, this immunity can be overwhelmed by the high number of parasites that migratory fish encounter. In addition, salmon and trout stocked from nearby streams where the parasite is not found are highly susceptible to infection and will die in large numbers if transplanted to parasite-infested waters. Even if these susceptible fish survive, they present a danger to native fish because interbreeding decreases resistance to *C. shasta.*

Bartholomew and Fryer will test *Ceratomyxa*-resistant and susceptible strains of steelhead and rainbow trout and their offspring to determine how they are infected and how their natural defense mechanisms help fight off the infection. By identifying which factors increase the fishes' resistance to the parasite, the researchers believe it may be possible to increase fish survival by boosting those mechanisms or by selecting for the genes responsible for these traits.

Recruitment Variability in Black Rockfish (*Sebastes melanops*): Potential Effects of Adult Age on Offspring Survival (R/RCF-01)

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Older fish are rapidly disappearing from many fish populations off the Pacific coast. It makes sense: Any amount of fishing tends to reduce or even eliminate the oldest age classes from a given fish population. How does that affect the reproductive success and survival of the stock?

Berkeley and Markle have found that older black rockfish spawn earlier in the year than younger fish, thus extending the spawning season and increasing the chances of producing a strong year class. They also believe older fish may produce larger eggs of higher quality—and with better survival rates—than younger fish; removing those older fish may ultimately weaken the entire stock.

The researchers will test their hypotheses by collecting females and juveniles to determine whether the time of spawning is related to the age of the fish, and whether survival of offspring is related to the time of spawning. In addition, they will raise the larvae from both young and old females in the laboratory to find out if the offspring of older fish are better able to grow and survive. In the long run, the results of their work could provide industry and fishery managers with alternative management approaches that reduce the risk of overfishing.

Determinants of Fishing Strategies: An Empirical Study Using Trawl Logbooks (R/RCF-02)

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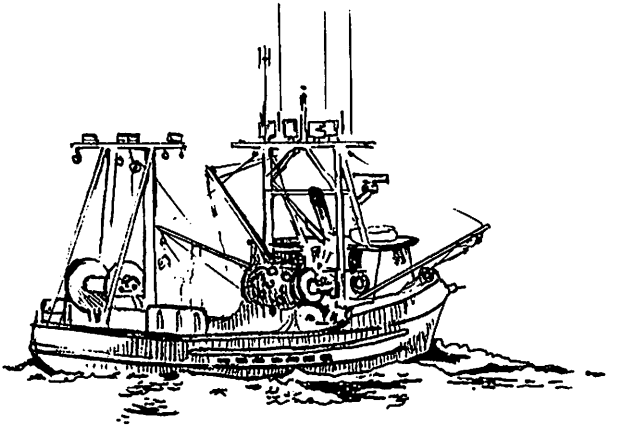
Trawl logbooks—which commercial trawl fishers are required to keep by various regulatory agencies—may be a gold mine of information for developing fisheries management strategies. Yet traditional stock assessment techniques have paid little attention to the data contained in those logbooks.

Sampson proposes to use logbook data to identify a set of groundfish trawlers whose catch figures match official landings statistics. Then he will analyze those logs to identify how various factors—trip limits, fish prices, past fishing patterns—affect the skippers' fishing strategies. He hopes to identify which strategies produce the greatest economic returns. The resulting statistical data should document how fishing strategies change over time, and provide a framework for understanding how those strategies might evolve in the future.



Developing a Bioeconomic Model of the Oregon Ocean Shrimp Fishery: An Integrated Marketing-Management Approach (R/RCF-03)

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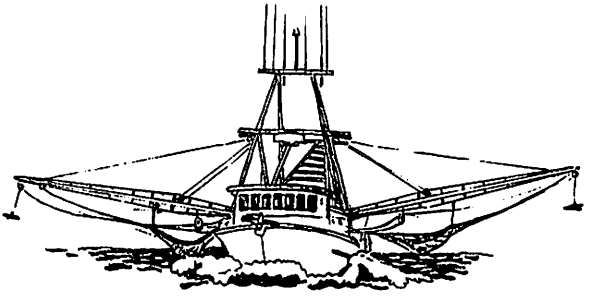
The pink shrimp fishery could benefit from a comprehensive management approach that incorporates issues such as market prices, product recoveries, and the costs and benefits of using excluder devices to reduce the bycatch of finfish.

Sylvia and Hannah will survey fishermen and processors and add the resulting data to more traditional, biological measures to produce a bioeconomic model of the pink shrimp fishery. The model will create a flexible framework for evaluating public and private management strategies and options.



Development of a HACCP-Based Quality System for Albacore Tuna and Pacific Whiting (R/SF-17)

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Federal seafood safety regulations require seafood processors to create and implement Hazard Analysis and Critical Control Point (HACCP) plans to assure product safety. Morrissey and Sylvia will examine the feasibility of introducing HACCP-based quality assurance systems into onboard handling and refrigeration in the albacore and whiting fisheries. Their goal is to develop a quality assurance system that begins when the fish is caught and continues through the point of sale.

Their research will include time-temperature monitoring of onboard handling and refrigeration processes, including superchilling, and testing fish for spoilage, appearance, and other measures of quality. The researchers hope to link onboard handling practices to final product quality, safety, and marketing strategies, ultimately improving the market for albacore and Pacific whiting.

Protein Recovery by Adsorption on Chitosan-Polyanion Networks (R/SF-18)

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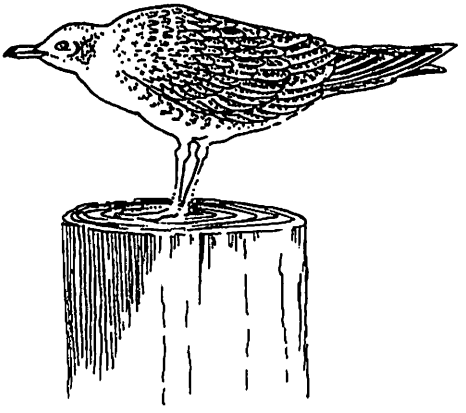
Chitosan, extracted from the shells of crustaceans, is a versatile substance with many promising uses in waste management, medicine, food processing, and biotechnology. The substance is especially useful for separating solids from liquids, especially when "natural" compounds are demanded. However, chitosan has its limitations; it can recover only negatively charged particles, and its use is not cost-effective in many situations.

Torres will investigate a modified chitosan form, chitosan-polyanion complex, to determine how it compares to pure chitosan for recovering proteins from wastewater. A commercially feasible application would help reduce waste and waste-disposal costs for shrimp, surimi, dairy, poultry, beef, corn, and soybean processors. An effective recovery system would also benefit local communities and the environment by reducing the load on sewage treatment systems.



Fish Sauce: A Value-Added Product from Pacific Whiting and an Ultimate Solution for By-Products (Solid Fish Waste) (R/SF-19)

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Thousands of tons of fish protein are literally washed down the drain by seafood processors each year, especially in the manufacture of surimi, a versatile fish paste produced by repeatedly washing minced raw fish. Park and Lundahl want to explore the possibility of recovering some of that waste fish to create fermented fish sauce, a popular condiment in many Asian cuisines.

Working with scientists from the Rayong Fish Sauce Company in Thailand, the OSU researchers will use waste from Pacific whiting, produced by Oregon surimi plants, to brew fermented fish sauce and then conduct chemical and sensory analyses to compare the resulting product with commercially available fish sauces. Park and Lundahl see fish sauce as a potential value-added product that could increase whiting processors' profits while reducing their solid waste disposal costs.

Strengthening Community-of-Interest Networks to Extend Education to Regional Communities of Place (A/EC-05)

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Conway and Goblirsch were part of Oregon Sea Grant's innovative 1995–1998 Adapting to Change multidisciplinary project, which sought to apply university research and outreach tools to the practical needs of fishing families, communities, and regions. That effort helped encourage the formation of the Women's Coalition for Pacific Fisheries, a regionwide, multigear, multifisheries network dedicated to supporting the West Coast fishing industry and its participant families and communities.

In this project, Conway and Goblirsch—along with three Fishing Family Coordinators who are themselves part of the fishing community—will help WCPF continue to build the skills it needs to serve the varied communities that make up the region's fishing industry. Specific project components include a coastwide newsletter, educational activities, and development of a new on-line communication and networking tool called "Heads Up."

Coastal Ecosystem Health and Public Safety

Coastal Ecosystems

Rearing by Juvenile Salmon in Recovering Wetlands of the Salmon River Estuary: Functional Development with Marsh Age (R/ECO-02)

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Breaching dikes to allow the tides to flow back into historic marshlands is one of the few viable options many areas have for restoring large coastal wetlands. The strategy has the potential to return large tracts of land to their historic role as a productive juvenile salmon habitat. But few studies have been conducted to determine whether the strategy will work in the long term.

The research team will study a breached-dike wetland on Oregon's Salmon River estuary to determine where salmon habitats are developing, and how quickly. Comparing the area to a similar, but unaltered, wetland, they will investigate how many young salmon are present, what they are eating, and other indications of habitat recovery. The outcome should be an assessment of how breached-dike wetlands compare with the real thing as a habitat for young salmonids.

Effects of Endocrine Disrupting Chemicals on Immune System Function in Estuarine Fishes (R/ECO-03)

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A particularly troubling aspect of water pollution is the presence of chemicals that mimic or block the action of hormones in fish and other animals. Since the endocrine system and its hormones interact with an animal's entire system, these chemicals can play havoc with a fish's immune system, weakening the animal and leaving it susceptible to disease.

Schreck, Leong, and Fitzpatrick will deliberately expose chinook salmon sex cells, eggs, embryos, and juveniles to endocrine-disrupting chemicals similar to those already found in polluted estuaries. They will study the developing fish in an effort to find out just how the chemicals affect their health. In addition, the team plans to collect starry flounder from estuaries known to be polluted by these chemicals, as well as from clean sites, to determine whether endocrine disruption is occurring in the wild. Their goal is to shed some light on why Oregon's stocks of estuary-dependent fish are declining.

Biotechnological Methods to Distinguish the Sources of Fecal Pollution in Estuarine Waters (R/ECO-04)

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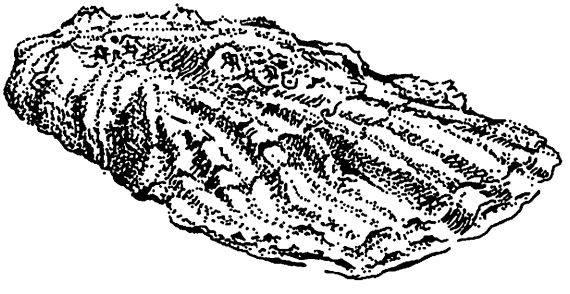
Animal and human feces are an increasingly troublesome source of pollution in some coastal estuaries, including Tillamook Bay, an area rich with dairy farms. Fecal pollution poses significant human health risks and also threatens the area's shellfish industry. But it's often difficult to tell whether the pollution is coming from cows or humans, and controversy over that question has blocked many efforts to correct the problem.

Field plans to test two novel methods for distinguishing cattle from human fecal contamination, each of which uses a different biotechnological tool to create genetic fingerprints of specific strains of fecal bacteria found in Tillamook Bay. Unlike previous methods, these tests will not rely on growing indicator organisms, but will measure the gene patterns directly from water samples. Once gene patterns are identified, the researcher will work with the Oregon Department of Environmental Quality—which routinely samples and monitors the bay—to see exactly where these fecal markers are turning up, and when.



Development of an Ornithine Decarboxylase Assay as a Measure of Recent Growth in Pacific Salmonids (R/ECO-05)

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Richard D. Ewing
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Fisheries managers need to know how fast fish in a particular stock are growing so that they can set reasonable harvest limits and other regulations to protect the species. But current growth-measuring systems use radioactive material, and many managers lack the expertise, equipment, or licenses it takes to use them.

Li and Ewing are trying to develop a growth-measurement system that allows managers to take a small sample of tissue—a fin clip, for instance—from a live fish and use enzymes, rather than radiation, to analyze it for chemical substances which are known to correlate with juvenile salmon growth rates.

Education and Human Resources

Resource Management

Library Outreach and Information Services in Ocean and Coastal Law (E/RM-01)

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The Ocean and Coastal Law Library, long supported by Oregon Sea Grant, has one of the most extensive collections of publications on coastal and marine law and policy in the Pacific Northwest. Besides allowing the library to add key materials to its collection, this grant will allow automation of the library's card catalog so that the entire collection can be searched via the University of Oregon's on-line library catalog, accessible to the public via the World Wide Web.

National Strategic Investments

Biotechnology

Expression Vectors for Genetic Immunization of Fish (R/BT-28-NSI)

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Standard viral vaccines have had only limite success in protecting fish against disease, particularly in hatcheries and aquaculture operations where illness can spread rapidly an wipe out entire generations of fish. Leong is a pioneer in the development of DNA-based fish vaccines, which show great promise for solvin the problem.

But before regulatory agencies and the indu will accept genetic immunization, work needs be done to develop and test expression vectors- substances which carry the vaccine into the r tissues in the animal's body for immunizatior occur. Leong and Kim plan to develop and tes number of potential expression vectors for immunizing rainbow trout fry.

Outreach

Coastal Economic Development

National Sea Grant Marina Network: Enhancing the Economic and Environmental Sustainability of the Marina Industry (Oregon Sea Grant Component) (A/EC-4/NSI-OUT)

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MarinaNet is a nationwide project of the Sea Grant Extension Program to improve communication and information sharing among universities, the marina industry, regulatory agencies, and other related interests.

Oregon Sea Grant's share of MarinaNet funding will allow it to continue development of the MarinaNet World Wide Web site (http://seagrant.orst.edu/crt/mnet.html), with the intention of turning it over to an industry group within the next two years. The Oregon program also maintains the network's electronic mail discussion groups, will explore collaborative opportunities for distributing a multimedia boating safety program through private industry and other Sea Grant programs, and will produce videotapes on boating safety and low power radio as its share of the project.

Coastal Ecosystem Restoration Pilot Project (A/ECO-1-NSI-OUT)

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Local watershed councils are key players in the Oregon Governor's Salmon Restoration Plan, a ground-breaking approach to protecting a threatened species. But while such groups have been given new importance, many are struggling to become effective organizations. Similar groups in other states find themselves in the same situation.

This Extension Sea Grant pilot project will develop training materials, exercises, learning tools, and other material to help local restoration groups build their skills and capacity to incorporate sound science into their on-the-ground restoration projects.

The materials will be tested at workshops in Oregon, Louisiana, and New York, and then improved based on feedback from participants.

West Coast Ballast Water Initiative: An Outreach Program to Improve Ballast Management (A/NIS-4-NIS-OUT)

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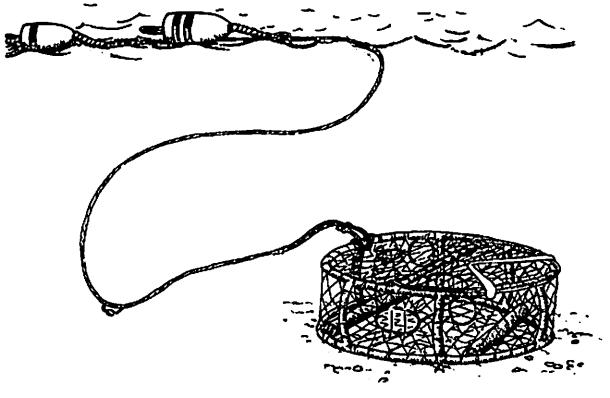
Oregon is taking part in a three-state effort to better educate the public about aquatic "nuisance" species and to inform the shipping industry about how potentially harmful creatures can be carried from port to port in ships' ballast water.

With partners in California and Washington, Oregon's Extension Sea Grant leader, Jay Rasmussen, will help develop a publication highlighting aquatic nuisance issues on the West Coast, organize forums to present research information to the industry, and produce a newsletter highlighting new developments in ballast technology.



Biological Invasions of Cold-Water Coastal Ecosystems: Ballast-Mediated Introductions in Port Valdez/Prince William Sound, Alaska (R/NIS-01)

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Alaska's Port Valdez/Prince William Sound receives the third-largest annual volume of ballast water in the U.S., discharged by tankers and other ships arriving in the port. Ballast water, which ships take on in one port and discharge in another, is known to be one way that troublesome aquatic nuisance species spread.

Chapman will seek to determine to what extent nonindigenous species may be moving into the sound from ballast water and other sources, such as barnacles and other organisms that foul the ships' hulls and sea chests. He will analyze how well such organisms survive in the Sound's high-latitude, cold-water environment and will sample tanker ballast before and after their voyages to determine whether the source of the water or the length of the voyage affects the nuisance species' survival.

Extension

Extension is the outreach arm of Oregon Sea Grant. A team of marine agents, most of them affiliated with the Oregon State University Extension Service, delivers advice, assistance, and informal education to coastal people, businesses, and communities as local needs and issues arise.

Agents and specialists alike also focus on broader national and global issues, from seismic hazards to declining fisheries. Many conduct their own research projects and collaborate with other Sea Grant researchers. (A \ ESG-3)

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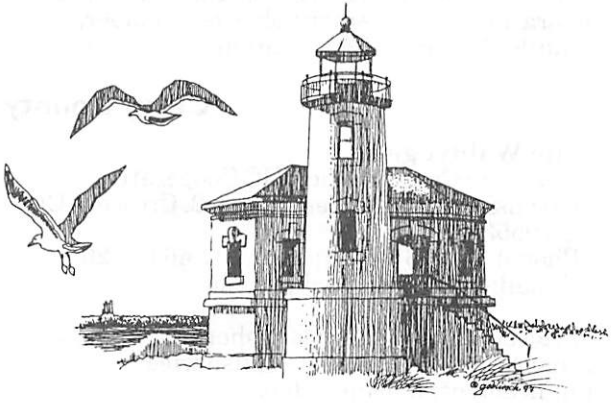

Extension Marine Agents

Extension marine agents are stationed in county offices of the Oregon State University Extension Service and affiliated with academic departments on the OSU campus. Each agent is responsible for developing and delivering outreach and education programs to meet local needs and issues. Agents also serve statewide audiences with their own areas of expertise, ranging from marine safety to watershed management and restoration.

Clatsop County

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Projects and specialties: salmon aquaculture; ecotourism; Columbia River fishing issues; coastal and Native American history and culture. Member, Lower Columbia Water Quality Commission

Coos County

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Projects and specialties: coastal watershed restoration; limited entry fisheries. Member, Coquille Watershed Association

Curry County

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Projects and specialties: fisheries management/salmon issues; fisheries enhancement; marine safety

Lincoln County

Ginny Goblirsch
Lincoln County Office, OSU Extension Service, 29 SE. 2nd St., Newport OR 97365
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Projects and specialties: fishing family issues, marine vessel safety

Marion County

Derek Godwin
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Projects and specialties: watershed restoration

Portland Metro

Paul Heimowitz
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Projects and specialties: aquatic ecosystem health; nonindigenous species

Tillamook County

John Faudskar
Tillamook County Office, OSU Extension Service, 2204 Fourth St., Tillamook OR 97141
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Projects and specialties: oyster culture; Tillamook Bay National Estuary Project

Extension Specialists

Oregon Sea Grant specialists work in specific fields of marine and coastal concern: economics, education, coastal resources, and others. They provide support to Sea Grant marine extension agents and conduct their own related academic research, as well as generating practical, specialized information for use by agents and the public.

Coastal Resources

Jim Good
104 Ocean Admin Bldg., Corvallis OR 97331-5503
Phone: 541-737-1339; Fax: 541-737-2064
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Projects and specialties: coastal zone management; natural hazards management; estuary, wetland, and watershed management; waterfront community development; coordinator, OSU Graduate Program in Marine Resource Management

Community Development and Outreach

Pat Corcoran
213 Ballard Extension Hall, Oregon State University, Corvallis OR 97331
Phone: 541-737-1421; Fax: 541-737-2563
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Projects and specialties: watershed coalition support (organizational skill building); community economic development; community leadership training; workshop design and facilitation

Flaxen Conway
213 Ballard Extension Hall, Oregon State University, Corvallis OR 97331
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Projects and specialties: resource-dependent communities and how they adapt to change

Marine Economics

Susan Hanna
H. John Heinz III Center for Science, Economics and the Environment, 1001 Pennsylvania Avenue, NW 735S, Washington, D. C. 20004
Phone: 202-737-6307; Fax: 202-737-6410
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Note: Susan Hanna is serving a two-year appointment with the H. John Heinz III Center for Science, Economics and the Environment in Washington, D.C.

Marine Education

Vicki Osis
OSU Hatfield Marine Science Center, Newport OR 97365
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Projects and specialties: teacher education; marine science curriculum development

Bill Hanshumaker
OSU Hatfield Marine Science Center, Newport OR 97365
Phone: 541-867-0167; Fax: 541-867-0320
E-mail: Bill.Hansumaker@hmsc.orst.edu

Projects and specialties: programs, exhibits and interpretive material for Marine Science Center Public Wing; field trips, classes, and other public education activities.

Marine Mammals

Bruce Mate
OSU Hatfield Marine Science Center, Newport OR 97365
Phone: 541-867-0236; Fax: 541-867-0128
E-mail: Bruce.Mate@hmsc.orst.edu

Projects and specialties: use of satellite transmitter technology to track whale and dolphin migration, determine critical habitats, and study dive behavior; federal marine mammal protection laws

Marine Trades, Recreation, and Tourism

Bruce DeYoung
209 Bexell Hall, Oregon State University,
Corvallis OR 97331
Phone: 541-737-1455; Fax: 541-737-3804
E-mail: sgbiz@bus.orst.edu

Projects and specialties: recreational moorage management and safety; marina management and marketing; relationship marketing techniques; information technology (low-power radio; World Wide Web)

Seafood

Ken Hilderbrand
OSU Hatfield Marine Science Center,
Newport OR 97365
Phone: 541-867-0242; Fax: 541-867-0138
E-mail: Ken.Hilderbrand@hmsc.orst.edu

Projects and specialties: HACCP (Hazard Analysis and Critical Control Point) seafood safety regulations; value-added seafood products (smoked fish, etc.); control of histamines in albacore tuna; refrigeration applications

Marine Fisheries

Hal Weeks
Lincoln County Office, OSU Extension Service,
29 SE 2nd St., Newport OR 97365
Phone: 541-265-3463; Fax: 541-265-3887
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Projects and specialties: marine fish and fisheries

Regional Fisheries Engineering

Ed Kolbe
Extension Sea Grant, 1200 NW Naito
Parkway, Suite 520, Portland OR 97209-2800
Phone: 503-725-2380; Fax: 503-229-6584
E-mail: kolbee@engr.orst.edu

Projects and specialties: now filling a new regional position (shared by Sea Grant programs in Washington and Alaska). Kolbe specializes in at-sea refrigeration; quality control in frozen seafood storage; and surimi seafood texture and processing problems.

Marine Science Center Public Wing

At OSU's Hatfield Marine Science Center in Newport, Sea Grant brings state-of-the-art technology to education about the ocean and coastal environment.

Sea Grant public education specialist Bill Hanshumaker has helped transform the Public Wing into a hands-on, high-tech learning center. Marine education specialist Vicki Osis, meanwhile, uses many tools—from satellite TV broadcasts to the World Wide Web—to help equip K-12 teachers with the skills and resources to bring marine science to young minds across the country.

The Public Wing's educational programs reach more than 5,700 students every year, and thousands more are reached by teachers trained under Osis' tutelage.

The public at large, meanwhile, uses the Public Wing's free exhibits as a portal to learning about ocean and coastal science and as a window on the research conducted by scientists stationed at the Marine Science Center.

Public Wing Director (TBA in 1999)
Hatfield Marine Science Center
Newport OR 97365-5296
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Communications

In many ways, communicating is what Oregon Sea Grant is all about: bringing research-based information to people who need it and can put it to use.

We do that through an increasingly wide variety of media, from "how-to" pamphlets and brochures to technical reports, research papers, and conference proceedings; from educational videos to radio broadcasts.

The communications staff also maintains World Wide Web sites for Oregon Sea Grant and the national Sea Grant MarinaNet project, as well as dozens of electronic mailing lists that help Sea Grant staff across the country communicate with each other and with coastal constituents. (M\A-12)

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Advisory Council

Oregon Sea Grant's Advisory Council helps ensure that research and outreach programs address the needs and priorities of Oregon's ocean and coastal communities, businesses, and policymakers.

Council members, appointed for three-year terms, meet periodically to help set program priorities, offer advice on specific proposals and give counsel to the program's administrative staff.

Don Barth
Retired, formerly with SeaTowne Realty
Newport OR

Kirk Beiningen
Retired, formerly with Oregon Department of Fish and Wildlife
Oregon City OR

Anne Berblinger
Economic Development Administration,
U.S. Department of Commerce
Portland OR

Ralph Brown
Commercial fisherman
Brookings OR

Ellie Dumdi
Board of County Commissioners, Lane County
Junction City OR

Basil Edmunds
Retired, formerly with
Oregon Department of Economic Development
Garibaldi OR

Russ Heggen
Retired magazine publisher
Eugene OR

Nancy Leonard
Board of Commissioners, Lincoln County
Waldport OR

Bob Montgomery
State representative
Cascade Locks OR

Willa Nehlsen
U.S. Fish and Wildlife Service
Portland OR

Merritt Tuttle
Retired, formerly of the National Marine Fisheries Service
Newberg OR

Staff Index

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