

Advancement of human knowledge and provision of technical and technological services to the commonwealth are recognized functions of institutions of higher education. Research to advance human knowledge is encouraged and assisted at Oregon State University by general and directed research funds and is conducted within departments, colleges, centers, and institutes as a part of normal academic activity.

Research is supported by appropriations to experiment stations, institutes, and centers, as well as by grants from private and public agencies for institutional and individual projects. The General Research Fund (seed funding) is administered with the advice of the Research Council.

Separately organized research units include the following:

Research Statewide Programs

- Agricultural Experiment Station
- Engineering Experiment Station
- Environmental Remote Sensing Applications Laboratory
- Forest Research Laboratory
- Pond Dynamics/Aquaculture Collaborative Research Support Program
- Oregon Sea Grant
- Oregon Space Grant

Research Centers

- Center for Fish Disease Research
- Center for Gene Research and Biotechnology
- Center for the Humanities
- Center for Water and Environmental Sustainability
- Environmental Health Sciences Center
- Integrated Plant Protection Center
- Institute for Natural Resources
- Laboratory Animal Resources
- Marine/Freshwater Biomedical Sciences Center
- Hatfield Marine Science Center
- Radiation Center
- Survey Research Center

Research Institutes

- Cooperative Institute for Marine Resources Studies
- Linus Pauling Institute
- Transportation Research Institute

Research Consortia

- Inter-University Consortium for Political and Social Research
- University Corporation for Atmospheric Research (UCAR)
- Consortium for Plant Biotechnology Research, Inc.
- University Alliance for Research, Education and Technology (UA)

The vice provost for research coordinates efforts of the various research organizations of the university. The vice provost encourages and assists faculty members in the development of research programs and in handling grant and contract applications; advises the president of the university regarding general progress of the institution's research programs; works to ensure maximum opportunity for the integration of graduate instruction and research; and

maintains a technology transfer program for researchers who identify new devices and/or processes useful to the public. Special evaluations are made of patent ownership provisions to assure that the interests of the inventor, the university, and the state are best served. The vice provost also coordinates administration of grant and contract operations with the directors of business affairs and business services to aid the work of faculty and to ensure compliance with university, state, and federal regulations.

Grants from Research Office

The General Research Fund (GRF) is primarily intended to provide "seed money" for developing new concepts and to support faculty research that is not supported by organized or directed programs of other research organizations on or off campus. Funds are allocated by the vice provost for research with the advice of the Research Council. Faculty members with the rank of instructor and above are eligible to serve as principal investigators. Application forms are available from the Research Office (RO) or the RO Web site. Awards are made to enable faculty to carry out scholarly, creative work that should lead to the pursuit of other funding sources. Funds may be used for wages, travel, equipment, supplies, and services. Faculty salaries including summer and sabbatical leaves, faculty release time, graduate assistantships and tuition, travel to meetings/conferences, laboratory animal care, as well as expenses related to curriculum development, administration, instruction or training are not supported. Other funds include the Research Equipment Reserve Fund, Faculty Release Time, Major Research Initiative and the Kelly Family Fund.

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AGRICULTURAL EXPERIMENT STATION

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The Oregon Agricultural Experiment Station was organized July 1, 1888, in accordance with the Hatch Act of 1887. It now includes a central station at Corvallis and eleven branch stations in the major crop, climate, and marketing areas of Oregon, assuring that its research program is close to the people and the needs of Oregon agricultural and natural resources.

The station is the principal agricultural research agency in the state. Its mission is

to conduct research and demonstrations in the agricultural, biological, social, and environmental sciences that contribute to the economic, environmental, and social welfare of Oregon. The products of its research help to:

1. Ensure a stable and productive agriculture through wise management and use of the soil, water, wildlife, and other natural resources of the state.
2. Protect crops and animals from insects, diseases, and other hazards.
3. Improve the efficiency of agricultural production by developing integrated system approaches to management.
4. Develop new agricultural products and processes and enhance quality of the state's food products.
5. Improve the marketing of Oregon's agricultural products.
6. Promote community development.
7. Improve the nutritional value and quality of food and protect the consumers of Oregon's food products.
8. Protect and improve the environment and quality of living for residents of the state.
9. Assist developing countries in agriculture to promote trade with the United States and alleviate world hunger.

The station conducts research in the following departments and colleges: Agricultural and Resource Economics, Animal Sciences, Bioengineering, Botany and Plant Pathology, Chemistry, Crop and Soil Science, Environmental and Molecular Toxicology, Fisheries and Wildlife, Food Science and Technology, Health and Human Sciences, Horticulture, Microbiology, Rangeland Resources, Statistics, and Veterinary Medicine. Research is supported in other units such as the Center for Gene Research and Biotechnology, Linus Pauling Institute, and the Environmental Health Sciences Center. Branch stations provide opportunity for basic and applied field research programs at the following locations: Central Oregon Agricultural Research Center (Madras and Powell Butte), Eastern Oregon Agricultural Research Center (Burns and Union), Food Innovation Center Experiment Station (Portland); Klamath Experiment Station (Klamath Falls), Malheur Experiment Station (Ontario), Hermiston Agricultural Research and Extension Center (Hermiston), Mid-Columbia Agricultural Research and Extension Center (Hood River), North Willamette Research and Extension Center (Aurora), Columbia Basin Agricultural Research Center (Pendleton and Moro), Southern Oregon Research and Extension Center (Medford), and the Coastal Oregon Marine Experiment Station (Newport and Astoria).

The current research emphases in the station will develop value-added Oregon products and markets for them; aid in understanding nature as a system-providing information about natural resources for crucial management choices and policy making; and expand Oregon agriculture in ways that are both economically sustainable and environmentally sound.

The station collaborates with the OSU Extension Service, the College of Agricultural Sciences' instructional programs, the U.S. Department of Agriculture, the U.S. Department of Interior, the U.S. Department of Commerce, and other federal and state agencies on research programs of interest to the state, the Pacific Northwest, the nation, and other countries.

ENGINEERING EXPERIMENT STATION

Chris Bell, *Director*

By act of the Board of Regents of Oregon State College on May 4, 1927, the Engineering Experiment Station was established at Corvallis to serve the state in a manner broadly outlined by the following policy:

- a. To serve the industries, utilities, professional engineers, public departments, and engineering teachers by making investigations of significance and interest to them.
- b. To stimulate and elevate engineering education by developing the research spirit in faculty and students.
- c. To publish and distribute through bulletins, circulars, and technical articles in periodicals the results of such studies, surveys, tests, investigations, and research as will be of greatest benefit to the people of Oregon, and particularly to the state's industries, utilities, and professional engineers.

The Engineering Experiment Station is an integral part of the College of Engineering. All staff members and laboratory facilities are available for the investigative work of the station. The associate dean of engineering is the director of the Engineering Experiment Station.

Research is conducted by faculty and students from eight departments: Bioresource Engineering, Chemical Engineering, Civil Construction and Environmental Engineering, Computer Science, Electrical and Computer Engineering, Industrial and Manufacturing Engineering, Mechanical Engineering, and Nuclear Engineering. Collaborative research is conducted in four principal areas, each with numerous subdisciplines:

Integrated microsystems design and manufacture

- Electronic materials
- Microelectronics processing and testing
- Microscale energy, chemical, and biological systems
- Thermal issues
- Wireless/IC design

Information technology

- Database mining and decision support
- Data security
- Networking
- Software reliability

Sustainable infrastructure technology

- Zero waste manufacturing
- Waste remediation
- Materials and design technology for infrastructure
- Energy systems

Biomedical technology

- Biomaterials
- Biomedical systems and processes

ENVIRONMENTAL REMOTE SENSING APPLICATIONS LABORATORY

William J. Ripple, *Director*

Coincident with the launch of the first Landsat satellite in 1972, the National Aeronautics and Space Administration provided funding to Oregon State University for the establishment of the Environmental Remote Sensing Applications Laboratory. NASA and OSU jointly agreed that this campus would be one of a select group of universities to conduct research in the rapidly developing field of remote sensing. Since that beginning, ERSAL scientists, graduate students, colleagues at Oregon State University, and colleagues in state and federal agencies have conducted a variety of programs that integrate remote sensing and related technologies in geographic information systems (GIS). ERSAL is located in the Department of Forest Resources within the College of Forestry at Oregon State University.

"Remote sensing" refers to the acquisition, processing, analysis, and interpretation of reflected and emitted radiation from targets of interest, usually features on the surface of the earth: plants, soil, minerals, water, etc. At ERSAL, data acquired from detectors mounted in satellites, aircraft, and field instruments are used to study the spectral properties of vegetation-soil systems. Information regarding these properties is then used to develop techniques for detecting, classifying, mapping, and quantifying vegetation cover and the condition of vegetation. Examples of research topics include

landscape ecology, spotted owls, forest fires, forest structure, forest landscape patterns, wildlife habitat, aspen ecology, wolves as keystone species, and ecosystem analysis.

With combined funding from federal, state agencies and private sources, the ERSAL research program develops and applies remote sensing and GIS technology for the study of forest lands and related natural resource problems.

FOREST RESEARCH LABORATORY

Hal J. Salwasser, *Director*
Web site: <http://www.cof.orst.edu/fri>

The Forest Research Laboratory is Oregon's forestry and forest products research agency; its director is the dean of Oregon State University's College of Forestry. Established by the Oregon Legislature in 1941, the program is supported by state and federal appropriations and by research grants from public and private sources. In addition to research in campus laboratories and university forests, studies are conducted cooperatively in public and private forests and in wood products plants throughout Oregon.

Activities are organized within five program areas that draw upon faculty expertise in the College of Forestry's Departments of Forest Engineering, Forest Resources, Forest Science, and Wood Science and Engineering; and, with jointly appointed faculty in the Departments of Botany and Plant Pathology, Entomology, Fisheries and Wildlife, and Soil Science. Research program areas are forest regeneration; forest ecology, culture, and productivity; protecting forests and watersheds; evaluating forest uses and practices; and wood processing and products performance. Interdisciplinary teamwork is characteristic of many of the research projects. The program supports research of graduate students in forest genetics, economics, physiology, biometrics, hydrology, entomology, pathology, forest soils, forest engineering, recreation, forest policy, silviculture, ecology, and wood science.

This laboratory's program is designed to provide information enabling wiser public and private decisions concerning the management and use of Oregon's forest resources and the operation of the state's wood-using industries. As a result of this research, Oregon's forests produce more forest products, water, forage, fish, wildlife, and recreation; wood is harvested and used more efficiently; forests are used more intensively and effectively; employment, production, and profitability in dependent industries

are strengthened; and assistance is provided in maintaining a quality environment for Oregonians.

The Forest Research Laboratory, the Corvallis Forestry Sciences Laboratory of the U.S. Forest Service, and related research conducted elsewhere on campus combine to form the largest concentration of forest sciences research in North America.

POND DYNAMICS/AQUACULTURE COLLABORATIVE RESEARCH SUPPORT PROGRAM

Hillary S. Egna, *Director*
Web site: <http://pdacrsp.oregonstate.edu/>

The Pond Dynamics/Aquaculture CRSP is one of nine international agricultural research programs that are headquartered at U.S. land grant universities. CRSPs were initiated under Title XII legislation enacted by the U.S. Congress. They are partially supported by the U.S. Agency for International Development and by participating U.S. and host country institutions. Research conducted by these programs helps farmers improve their incomes and alleviate hunger without depleting the natural resource base on which they depend for food, fuel, fiber, and shelter. CRSPs work with international agricultural research centers, universities and colleges, private industry, and non-governmental organizations in the US and abroad.

Oregon State University is the lead institution for the Pond Dynamics/Aquaculture CRSP, providing oversight for research and development activities for 20 host country institutions and 11 U.S. universities. Present research locations include Bangladesh, Brazil, Cambodia, El Salvador, Honduras, Kenya, Malawi, Mexico, Nepal, Nicaragua, Peru, the Philippines, South Africa, Thailand, the United States, and Vietnam; former sites included Egypt, Guatemala, Indonesia, Panama, and Rwanda. Since 1982, the Pond Dynamics/Aquaculture CRSP has focused on improving the efficiency of aquaculture systems through a unique collaborative process that brings together researchers from the U.S. and host countries to solve constraints in the generation and adoption of aquaculture technologies.

The main research areas currently pursued by Oregon State University are fish reproduction control and minimization of environmental impacts of aquaculture conducted in the Department of Fisheries and Wildlife and information management and networking in the College of Agricultural Sciences. Other research has been

conducted to promote women in development, optimize pond fertilization, and characterize pond soils.

SEA GRANT COLLEGE PROGRAM

Robert E. Malouf, *Director*
Web site: <http://seagrant.oregonstate.edu/>

Oregon Sea Grant takes an integrated approach to addressing the problems and opportunities of Oregon's marine resources. Oregon Sea Grant's three related primary activities—research, education, and outreach—respond to the needs of ocean users and act to stimulate the Oregon economy. Funding for Sea Grant comes from federal and state appropriations, as well as contributions from local governments and industry. The major support is a grant from the National Oceanic and Atmospheric Administration.

Program activities are conducted in several interdependent topical areas. They include biotechnology, commercial fisheries, seafood technology, coastal economic development, and coastal ecosystems.

Oregon Sea Grant has been an innovator in promoting cooperative Pacific regional research and development. The program also provides professional, technical, and public education, as well as Extension services through the Extension Sea Grant program. In addition, Sea Grant administration provides support for OSU graduate students to study important marine and coastal problems and to participate in research administration.

Oregon Sea Grant Communications offers publication and other media support for program participants. The communications specialists operate from within Sea Grant administration and cooperate with other information offices at Oregon State University. Sea Grant Communications also prepares news releases and video programming as part of a broader effort to inform the public about marine resource issues.

Multidisciplinary and interdisciplinary in operation, the Oregon Sea Grant program involves faculty and students in several OSU colleges. Participants in the program also include the University of Oregon, Oregon Health Sciences University, Portland State University, and Eastern Oregon University.

Oregon Sea Grant also maintains close relationships with several research facilities on the Oregon coast, among them the OSU Mark O. Hatfield Marine Science Center in Newport and the Seafood Laboratory in Astoria. Sea

Grant administers the Visitor Center of the Hatfield Marine Science Center.

The users of Oregon's marine resources are key contributors to the program. An advisory council of marine industry and coastal community leaders provides external review of program emphasis and progress.

OREGON SPACE GRANT PROGRAM

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The National Aeronautics and Space Administration (NASA) established Oregon Space Grant in 1991 as a part of the National Space Grant College and Fellowship Program. The objectives of the program are to establish a national network of universities with interest and capabilities in aeronautics, space and related fields; encourage cooperative programs among universities, aerospace industry, and federal, state, and local governments; encourage interdisciplinary training, research, and public service programs related to aeronautics, space science and technology; recruit and train professionals, especially women, under-represented minorities, and persons with disabilities, for careers in aerospace-related science and engineering; and develop a strong science, mathematics, and technology education base from elementary through university levels.

Oregon Space Grant supports an array of programs to benefit Oregon's students and faculty from middle school through graduate school. SMILE's Challenge Weekend, and Saturday Academy's Apprenticeships in Science and Engineering program, provide aerospace-related opportunities for K-12 students and teachers to explore areas beyond their in-school activities. Native American undergraduate students at OSU work on aerospace-related projects in order to gain valuable experience in scientific research through the Native Americans in Space Science program. Oregon Space Grant undergraduate scholarships are available for students at affiliate campuses across the state, and graduate fellowships attract excellent graduate students to aerospace related research programs.

CENTER FOR FISH DISEASE RESEARCH

Michael L. Kent, *Director*
Web site: <http://oregonstate.edu/dept/salmon>

The faculty of Oregon State University have been in the forefront of fish disease research for over 30 years, beginning with the pioneering efforts of Dr. John L. Fryer, OSU Distinguished Professor of the Department of Microbiology. During this time, faculty members engaged in salmonid disease research has increased and currently numbers twelve in four colleges. Investigators have trained many of the nation's professional fish pathologists and fish health researchers, have developed vaccines and diagnostic tests that are routinely used for cultured and wild stocks of fish, and have provided a wealth of knowledge on the pathogenic mechanisms and epidemiology of most of the serious salmonid diseases of the U.S. and the world. The Center for Fish Disease Research (CFDR) was established in 1994 as a multidisciplinary unit to recognize this group as a Research and Educational Center within Oregon State University and the Oregon State System of Higher Education. Center investigators consist of faculty selected primarily from the College of Agricultural Sciences and the College of Science, with the involvement of several faculty from the College of Pharmacy, the College of Veterinary Medicine, and other units or institutions as appropriate.

The CFDR seeks to resolve disease problems which present a threat to the salmonid species and other fishes of the Pacific Northwest, the nation, and the world. A central function of the center is to promote and assist the salmonid disease research of center investigators.

CENTER FOR GENE RESEARCH AND BIOTECHNOLOGY

James C. Carrington, *Director*
Web site: <http://www.cgrb.orst.edu>

We are experiencing a revolution in the biological sciences. Spectacular progress in understanding genome structure, complex cellular processes, development of all types of organisms, and evolution is occurring on a daily basis. These advances are fueled by innovation, new technologies, and multidisciplinary collaborations that combine biochemistry, genetics, computer sciences, molecular and cellular imaging, and engineering. The Center for Gene Research and Biotechnology at Oregon State Univer-

sity facilitates the development of molecular biological and genetic research with the ultimate goal of improving health, natural and agricultural resources, and environmental quality. The center offers leadership and services to faculty, staff and students through core facilities, seminars, and retreats. It also provides a focal point for researchers to establish contacts, initiate collaborations, and establish new technologies in their own laboratories.

Established in 1983, the Center for Gene Research and Biotechnology consists of 86 scientists, all holding primary appointments in academic departments of the Colleges of Agricultural Sciences, Engineering, Forestry, Pharmacy, Science, and Veterinary Medicine. The center was established to meet several objectives: (1) to acknowledge explicitly the interdisciplinary character of today's biology by creating a structure that spans departmental and college boundaries; (2) to increase communication among researchers with shared interests; (3) to foster the development of research collaborations, particularly those that focus new technologies on problems of practical importance; (4) to facilitate development of new technologies; (5) to provide a vehicle for seeking new kinds of support for research and graduate training; and (6) to enhance the biological research and educational environment on campus by seeking opportunities to recruit outstanding new faculty members.

The center's main focus is on the structure, expression, and manipulation of genetic information. The success of this effort played a key role in the chartering of the Center for Gene Research and Biotechnology. However, the center's responsibilities in both genetics and biotechnology led to the realization that biotechnology encompasses many more disciplines and technologies than those based simply upon molecular genetics. Accordingly, the focus has broadened, with the center's current membership being drawn from 17 departments in six colleges.

A key part of the center is the Central Services Laboratory (CSL), a core facility that is available to all researchers on the OSU campus. The CSL is a fully staffed facility that serves as a focal point for acquisition and development of new instrumentation and technologies. The CSL focuses its efforts in four areas: genomic services, functional genomics, bioinformatics, and imaging. The CSL provides DNA sequencing, DNA synthesis and fragment analysis (genotyping) services; high-throughput microarray services for analysis of global gene expression patterns in all types of

organisms; advanced computational resources for data mining, data analysis and database development; and a confocal laser scanning microscope facility for high-resolution analysis of a wide variety of specimens. In addition, the center maintains a set of common-use instruments and computers for research and data presentation.

The center coordinates a seminar program in which faculty, staff and students can interact with outstanding scientists from other institutions and organizations. The center also sponsors a yearly retreat for scientific exchange, building collaborations, strengthening ties across departmental and college boundaries, and social interaction.

The director of the center reports to the vice provost for research. He is served by a scientific advisory board committee and an administrative advisory board.

THE CENTER FOR THE HUMANITIES

David Robinson, *Interim Director*
Wendy Madar, *Assistant Director*
Web site: <http://oregonstate.edu/dept/humanities/>

The Center for the Humanities, established in 1984, is primarily concerned with the advancement of interdisciplinary humanities research. The center consists of visiting scholars and OSU resident fellows engaged in individual research. Fellowship applications are screened by an advisory board made up of former fellows and OSU faculty from the College of Liberal Arts. The center also hosts or co-sponsors research conferences, seminars, film and lecture series, and numerous public programs. In addition, it maintains an undergraduate certificate program in Twentieth Century Studies, which was developed during the early years of activity. The center's fundamental concern is the improvement of the quality of humanities research and teaching at OSU. It is located in Autzen House, 811 SW Jefferson Avenue. Contact: David Robinson, (541) 737-3530.

CENTER FOR WATER AND ENVIRONMENTAL SUSTAINABILITY

Kenneth J. Williamson, *Co-Director*
Denise Lach, *Co-Director*
Web site: <http://cwest.orst.edu>

The Center for Water and Environmental Sustainability (CWESt) coordinates interdisciplinary research, education, and information transfer on issues related to water, the environment, and

sustainability. CWESt serves as the administrative unit coordinating several natural resource research and education programs including: The Water Resources Program, the Sustainable University Program, the Technical Outreach Services to Communities (TOSC), and the Technical Assistance for Brownfields Communities Program (TAB).

Originally established in 1960 as the Oregon Water Resources Research Institute, CWESt is administered under the vice provost for research with technical and administrative advisory committees comprised of college deans, faculty, and government and agency representatives. CWESt is also supported by the U.S. Geological Survey and the U.S. Environmental Protection Agency. The Water Resources Program faculty includes all faculty members in higher education in Oregon who are engaged in water and environmental sustainability research and teaching.

Research projects are conducted in the areas of water supply and quality, hazardous waste site remediation, environmental planning and management, systems analysis, sustainability issues, legal and institutional complexities, and water and land uses and use impacts. Research assistantships and fellowships are available through many of the member departments and CWESt coordinates graduate research assistantships for both the USGS and the EPA.

TOSC and TAB hold frequent community meetings and workshops to facilitate local involvement in hazardous cleanup decision-making. The Water Resources Program sponsors an interdisciplinary graduate minor in Water Resources with a specialization in Hydrology, Water Quality, or Water Resources Planning and Management. The Sustainable University Program annually hosts and guides an undergraduate research team on a topic of interest to sustainability. Both programs organize workshops on topics of current interest.

A seminar series is offered each fall term by CWESt to provide a forum for discussion of current controversial water resource issues. CWESt also produces *OSU Sustainability News*, an electronic newsletter that highlights activities and events related to sustainability at OSU.

ENVIRONMENTAL HEALTH SCIENCES CENTER

Joseph Beckman, *Director*
Web site: <http://www.ehsc.orst.edu>

The Environmental Health Sciences Center was established in 1967 with funding by the National Institute of Environmental Health Sciences (NIEHS).

As an organizational unit under the vice provost for research, it provides resources for coordination and stimulation of interdisciplinary basic research and training related to the effects of environmental factors on human health.

Environmental quality problems and their resultant effects continue to challenge people's health and their ability to understand and manage the evolving impact of environmental agents. Solutions to environmental problems require the interdisciplinary scientific efforts of professionals in many fields, both to generate new knowledge and to develop a qualified cadre of scientists who can provide an improved basis for risk assessment.

The EHS Center currently brings together and uses a variety of professional capabilities of research and teaching faculty, staff, and students from numerous OSU departments, schools, and colleges within OSU. Academic areas include chemistry, biochemistry and biophysics, environmental and molecular toxicology, microbiology, molecular and cell biology, food science and technology, fisheries and wildlife, veterinary medicine, pharmacology, zoology, and statistics. The center's visiting scientists program complements research expertise in these areas.

The broad mission of the EHS Center encompasses coordinated ongoing research of its faculty and encourages research by the training and support of qualified graduate students, predoctoral candidates, and postdoctoral research associates. As one of 26 national research centers designated by NIEHS, the EHS Center at OSU enhances the collaborative scientific research of its investigators with specialized core facilities. The center serves as an interdisciplinary resource on human health as related to the environment; it periodically awards funding for pilot projects submitted by OSU faculty to encourage new approaches in environmental health research. Selected proposals receive funding for preliminary studies, many of which have led to agency funding as major projects. It sponsors conferences, symposia, seminars, and meetings for student training, faculty consultations, and public communication. The EHS Center, through the OSU Cooperative Extension Service and other existing mechanisms, has developed a Community Outreach and Education Program to communicate and heighten public awareness about environmental issues and the related recognition of risk to human health.

Examples of specific research areas include toxicology of environmental chemicals, cellular and biochemical toxicology, immunotoxicology, natu-

rally occurring toxins, carcinogenesis of environmental chemicals, genetic toxicology, mass spectrometric ionization processes and methodologies, heteronuclear NMR studies, the chemical basis for solid waste and chemical waste disposal, and statistical studies, e.g., temporal aspects of cancer risks.

Federal environmental health legislation, particularly the Toxic Substances Control Act, has created a greater need for qualified toxicologists. To help meet this need, many EHS Center investigators serve as faculty within the OSU MS/PhD interdisciplinary graduate Toxicology Program, as well as being faculty for the ongoing predoctoral and postdoctoral training program supported by the NIEHS and administered by the center. The focus of the training and research in environmental toxicology emphasizes determination of the mode of action of environmental chemicals; the curricula encourage use of biochemical, pathological, and pharmacological approaches to acquire a mastery in aquatic, biochemical, comparative, environmental, food, as well as general toxicology.

The administrative office of the EHS Center is in the Agricultural and Life Sciences (ALS) building; the research and teaching facilities are in the cooperating departments on campus. The EHS Center office has information available upon request.

INTEGRATED PLANT PROTECTION CENTER

Paul Jepson, Director
Web site: <http://ippc.orst.edu/>

The Integrated Plant Protection Center (IPPC) was established in 1991, to expand upon the range of activities of the International Plant Protection Center, that was chartered by Oregon State University in 1969 (see <http://ippc.orst.edu/>). The IPPC is partially supported by the Agricultural Experiment Station, and the Cooperative Extension Service. The IPPC focuses upon research, education and outreach activities associated with the adoption of sustainable integrated pest management (IPM) practices in agriculture. It is the home for a number United States Department of Agriculture (USDA)-funded programs associated with pest control and pesticide management, including the state IPM program, the Regional Pest Management Center program, the Pesticide and Environmental Stewardship program, and the Farm Safety program.

The IPPC provides leadership, coordination and support for scientists at OSU, in the Pacific Northwest region,

and internationally, in the field of IPM. Its activities encompass pest, disease and weed management, and the rational management and use of pesticides. It also provides news and facilitates communications between university, state, and federal agencies through a number of media, including an electronic news alert system, and a newsletter (see <http://oregonipm.ippc.orst.edu>)

IPPC activities include the provision of electronic tools that assist growers and their advisors in making pest management decisions within their crops. This includes online weather data and degree-day models, that forecast the developmental stages and epidemiology of a number of important crops pests and diseases (see <http://oregonstate.edu/Dept/IPPC/wea/>). In addition, the IPPC works collaboratively with scientists throughout the state, to manage online pest alerts to growers. These can be accessed via the IPPC home page (see <http://ippc.orst.edu/>)

The IPPC maintains a large and important collection of documents, monographs and books on IPM, much of which is searchable via the OSU Valley library online database. It also supports a unique service in international outreach, IPMnet, which includes, among a number of other resources, IPMnet NEWS, a monthly electronic newsletter that is distributed to scientists in 127 countries (see http://www.ipmnet.org/IPMnet_NEWS/archives.html). IPMnet NEWS is supported by the Consortium for International Crop Protection (CICP) and a grant from the USDA.

The IPPC is expanding its activities in four areas at present, (1) biological control/biologically-based pest management, (2) enhanced diagnostic and forecasting tools, (3) pesticide management, rational use, risk mitigation and (4) information delivery, decision support and outreach. For further details please contact the director.

THE INSTITUTE FOR NATURAL RESOURCES

Hal Salwasser, Interim Director
Web site: <http://oregonstate.edu/ornhic/info-office>

The Institute for Natural Resources provides integrated research, information, and policy services to agencies and groups in the broad area of natural resources. It draws on expertise from across OSU as well as allied universities and research institutions, and also administers the Oregon Natural Heritage Information Center.

LABORATORY ANIMAL RESOURCES

Alexander D. Ojerio, DVM, MS, Dipl. ACLAM, Director and Attending Veterinarian
Web site: <http://oregonstate.edu/dept/larc/>

The Laboratory Animal Resources Center (LARC) is a university-wide support-services facility and organization. Its staff works with all members of the campus community to foster the appropriate and humane use and care of animals in education, research and biological enterprises. By working with the Institutional Animal Care and Use Committee (IACUC), and encouraging ethical choices and critical decisions by all who interact with animals, the LARC strives to meet or exceed professional standards and ensure regulatory compliance at OSU.

MARINE/FRESHWATER BIOMEDICAL SCIENCES CENTER

David E. Williams, Director
Web site: <http://oregonstate.edu/dept/mfbccenter/>

The Marine and Freshwater Biomedical Sciences Center has as its mission the development and use of aquatic models to investigate environmental problems of human health concern. The center was established initially in 1985 through core support from the National Institute of Environmental Health Sciences, and was formally established as a research Center of Excellence through the State Board of Higher Education in 1989.

As recognized by the National Institutes of Health, fish are sensitive, low-cost, comparative vertebrate models that reduce dependence on mammalian species for health-related research. Center research has historically used rainbow trout to study cancer and its modulation by dietary environmental factors. Attention has been given to the basic mechanisms and causes of cancer, and to naturally occurring dietary factors capable of preventing or inhibiting the cancer process. Center investigators have also used fish models for the study of aging, immune function, environmental pollution, and stress response. A more recent focus of the center involves research on the chemistry of marine toxins and nerve gases and their neurotoxicology in fish models. A multidisciplinary team of senior investigators and students from three colleges at OSU, and investigators from Washington State University and the

University of Georgia provide expertise in pharmacology, biochemistry, molecular genetics, chemistry, and pathology in a collaborative environment. The center's work on the interactions between environmental agents, and health supports the research, teaching, and extension mission of OSU as a land and sea grant university.

To support these functions, the center provides research funds for pilot studies leading to research grant applications, supports a schedule of seminars and visiting consultants, provides guidance in program development through annual external program review by invited experts, and supports a trout hatchery/histopathology research core facility that is unique worldwide.

HATFIELD MARINE SCIENCE CENTER

Newport, Oregon
George Boehlert, *Director*
 Web site: <http://hmsc.oregonstate.edu>

The Marine Science Center is located on a 49-acre site in Newport adjacent to Yaquina Bay and one mile from the Pacific Ocean. The facility is operated by the university to serve the general public, the staff of OSU, sister institutions, and cooperating state and federal agencies. The university encourages all workers in the marine sciences whose research, instruction, or extension activities require a coastal site to use the center facilities.

Main buildings provide 200,000 square feet of office, library, classroom, and fresh and salt water laboratory space and include a public auditorium and aquarium. Buildings include the Marine Science Center, Oregon Department of Fish and Wildlife Marine Region Headquarters, the Newport Aquaculture Laboratory and Research Support Facility of the National Marine Fisheries Service, Environmental Protection Agency, U.S. Fish and Wildlife Service, Guin Library, and ship support facilities of the College of Oceanography. Dock areas serve the OSU ship *Wecoma*. There are housing and self-service kitchen facilities for up to 82 students and visiting staff members.

Research projects currently involve more than 250 staff members from the Colleges of Agricultural Sciences, Oceanography, Pharmacy, and Science; Sea Grant; the Extension Service; the U.S. Environmental Protection Agency; the National Marine Fisheries Service; the Ocean Environment Research Division of NOAA; the Cooperative Institute for Marine Resources Studies; and the Oregon Department of Fish and

Wildlife. The instruction program focuses on fisheries, aquaculture and marine biological aspects of tidal, estuarine, and nearshore marine environments, subjects for which the center's location provides a natural laboratory. Extension work concentrates on programs of interest to the general public and to the coastal fishing industry. Much of the research and extension work of the OSU Sea Grant College Program is conducted at the center.

The Visitor Center has more than 150,000 visitors annually, including about 11,000 elementary and high school students. Interactive exhibits, computer simulations, videos and aquariums focus on marine research conducted at OSU. The theme, "Searching for Patterns in a Complex World," connects research topics from global perspectives down through the microscopic level. Educational programs for adults and guided tours and nature walks for students are offered year-round. Potential users of center facilities are invited to write to the director and outline their needs.

RADIATION CENTER

Andrew C. Klein, *Director*

The Radiation Center is a campus-wide instructional and research facility especially designed to accommodate programs involving the use of radiation and radioactive materials. Located in the center are major items of specialized equipment and unique teaching and research facilities, including a TRIGA Mark II nuclear research reactor (licensed to operate at 1,100 kilowatts when running at a steady power level and at 2,500 megawatts in the pulsing mode); a cobalt-60 gamma irradiator; a number of gamma radiation spectrometers and associated germanium detectors; and a variety of instruments for radiation measurements and monitoring. Facilities for radiation work include teaching and research laboratories with up-to-date instrumentation and related equipment for performing neutron activation analysis and radiotracer studies; laboratories for plant experiments involving radioactivity; an instrument calibration facility for radiation protection instrumentation; and facilities for packaging radioactive materials for shipment to national and international destinations.

The Radiation Center staff is available to provide a wide variety of services including instruction and/or consultation associated with the feasibility, design, and execution of experiments using radiation and radioactive materi-

als, and with safety evaluations relating to experiments or devices involving the use of radioisotopes or other radiation sources. In addition, the center provides direct support and assistance to teaching and research programs involving nuclear engineering, nuclear and radiation chemistry, radiation health physics, neutron activation analysis, neutron radiography, radiation effects on biological systems, radiation dosimetry, production of short-lived radioisotopes, radiation shielding, nuclear instrumentation, emergency response, transportation of radioactive materials, instrument calibration, and radioactive waste disposal.

The center's laboratories and instruments are available to all campus instructional and research programs requiring such support. The center also accommodates instructional and nuclear research and development programs requested by other universities, by federal and state agencies, and by industrial organizations. In addition, a special neutron activation analysis service for forensic studies is available to law enforcement agencies.

SURVEY RESEARCH CENTER

Virginia Lesser, *Director*
 Web site: <http://oregonstate.edu/dept/statistics/src/>

The Survey Research Center, established in 1973, operates as a center for research in survey methodology, and to provide research support with regard to survey design, sample selection, questionnaire construction, data collection and reduction, statistical analysis, and the reporting of results.

The center is available to departments of the Oregon State System of Higher Education and to other organizations serving the public interest. Charges are made for all work in the center except preliminary consulting. Estimates for project proposals can be obtained upon request. For proposals to be submitted to funding agencies, the center can either submit a joint proposal or act as a subcontractor.

The center's interests include surveys of human populations, and other populations such as plants, animals, land areas, and other populations for which surveys can provide useful information.

COOPERATIVE INSTITUTE FOR MARINE RESOURCES STUDIES

Clare Reimers, *Director*
Web site: <http://oregonstate.edu/groups.cimrs>

The Cooperative Institute for Marine Resources Studies was established in 1982 to foster collaborative research between the National Oceanic and Atmospheric Administration (NOAA) and Oregon State University in fisheries, aquaculture, oceanography, and related fields. It also encourages education and training of scientists in disciplines related to marine resources.

Administered through the vice provost for research, the institute is the academic home for a staff of 20 to 25 (total) assistant professors, research associates, and faculty research assistants. It also has other members from NOAA's Pacific Marine Environmental Laboratory, the National Marine Fisheries Service and a number of departments at OSU. Headquarters are at the Hatfield Marine Science Center in Newport.

The broad goal of the Cooperative Institute for Marine Resources Studies is to coordinate research focused on living and nonliving marine resources. The institute works with projects that emphasize basic science and environmental impacts. The geographic area of interest extends over the eastern Pacific Ocean from northern California to the Bering Sea.

The institute promotes cooperative projects between government and the university. Its cooperative agreements with NOAA laboratories provide a mechanism for OSU faculty, staff and students to work with federal scientists on research that leads to the understanding of global ocean processes and fisheries resource issues.

LINUS PAULING INSTITUTE

Balz Frei, *Director*
Web site: <http://lpi.orst.edu/>

The mission of the LPI is to determine the function and role of micronutrients, vitamins and phytochemicals in promoting optimum health and preventing and treating disease; to determine the role of oxidative and nitrate stress and antioxidants in human health and disease; and to advance knowledge in areas that were of interest to Linus Pauling through research and educational activities. The institute engages in interdisciplinary efforts to elucidate the molecular

mechanisms and physiological effects of micronutrients, vitamins and phytochemicals, and to determine the optimum concentrations and functions of these substances in the body, a scientific discipline founded by Linus Pauling called "orthomolecular medicine."

The institute is particularly interested in elucidating the role of antioxidant vitamins and antioxidant phytochemicals in the prevention and treatment of diseases that are, in part, caused by oxidative stress. Oxidative stress is a condition under which biological macromolecules are damaged by oxidation reactions, leading to loss or impairment of normal biological function. Antioxidants in fruits and vegetables, such as vitamin C, vitamin E, and various carotenoids, and flavonoids and polyphenolic substances present in wine, tea and other foods may lower the risk of heart disease, certain types of cancer and neurodegenerative diseases.

Areas of research interests in the LPI include heart disease, cancer, aging, neurodegenerative diseases, immune dysfunction and disease caused by exposure to toxins. E-mail: lpi@orst.edu.

TRANSPORTATION RESEARCH INSTITUTE

Web site: <http://ccee.oregonstate.edu/tri>
E-mail: kiewit.center@oregonstate.edu

The Transportation Research Institute (TRI) was established in 1962 to enhance research and interaction within the university and to serve as a link with other universities, industry, and government on transportation-related issues. The institute conducts a variety of research efforts, including traditional single-disciplinary and multidisciplinary research, and also serves as a clearing-house and central source of transportation-related information.

The institute encourages faculty interaction from the Colleges of Engineering, Forestry, Agricultural Sciences, Oceanography, Business, Science, and Liberal Arts. The major areas of activity include transportation system economics, policy, and regulation; geotechnical engineering and highway materials testing; transportation systems planning, traffic operations, and safety; low-volume road design, construction, and maintenance; transportation for resource development; rural transportation; sociopolitical and behavioral factors; transportation for persons with disabilities; and environmental and energy factors. An advisory committee of professionals familiar with the transportation issues and problems in the

Northwest provides guidance to the TRI faculty.

Extensive facilities are available to institute members and students. These include computerized literature search capabilities, an electronic computing center, and a complete soils and materials testing laboratory. The laboratory houses closed-loop servo-controlled test systems, as well as a walk-in cold room for testing frozen soils. Also available are complete hydrology and hydraulic labs for drainage and hydraulic studies and 14,000 acres of timberland reserved for teaching and research, available through the College of Forestry.

INTER-UNIVERSITY CONSORTIUM FOR POLITICAL AND SOCIAL RESEARCH (ICPSR)

Karyle Butcher, *Director, The Valley Library*

As the world's largest data archive, ICPSR acquires, processes, and distributes data. Holdings are housed at the University of Michigan and contain over 30,000 machine-readable files.

Oregon State University is among the 350 colleges and universities worldwide that are members of ICPSR. Membership entitles the OSU community to all data sets in the archive at no charge, access to variable searches through the World Wide Web, and reduced fees to attend the Summer Program in Quantitative Methods.

Funding for the ICPSR Data Project is provided by the library. The project supports the annual membership fee and the part-time services of the ICPSR Research Consultant who provides assistance in conducting variable searches, ordering data sets, and downloading data.

UNIVERSITY CORPORATION FOR ATMOSPHERIC RESEARCH (UCAR)

Jeffrey R. Barnes,
OSU Member Representatives

Through its membership in this national research consortium, Oregon State University has access to extensive facilities and services in support of its research in atmospheric, oceanic, and related sciences. Chief among these is the National Center for Atmospheric Research (NCAR) in Boulder, Colorado. Under the support of the National Science Foundation, this national laboratory conducts significant programs of atmospheric, oceanographic,

and solar research in cooperation with member universities, and operates a state-of-the-art super computer facility which is accessible to member institutions. UCAR also operates facilities for scientific ballooning, and through NCAR, maintains instrumented research aircraft and an extensive research and data library.

In addition to using these facilities, OSU faculty and graduate students participate in numerous seminars, workshops, and scientific meetings and conferences that are held at NCAR throughout the year. Through the corporation, Oregon State also cooperates in various national and international initiatives for research, service, and training in the atmospheric and related sciences.

CONSORTIUM FOR PLANT BIOTECHNOLOGY RESEARCH, INC.

Rich Holdren, *Vice Provost for Research*
Web site: <http://www.cpbr.org/>

Founded in 1985, the Consortium for Plant Biotechnology Research, Inc. (CPBR) supports biotechnology research and technology transfer, facilitating research interactions among academic, industrial and government scientists. CPBR speeds the transfer of new technologies from the research labora-

tory to the marketplace, using a rigorously competitive project selection process that includes an industry review for relevance and peer review for scientific merit. Members of CPBR include universities, companies, and trade associations. Industrial participation includes the seed, agrochemical, forestry, food, energy, electric power, and other non-food agriculture-based industries.

CPBR's research programs focus on plant biotechnologies that will improve the competitiveness of U.S. agriculture; assess the risks, if any, that genetically engineered plants pose to the environment; and develop technologies that will lessen the country's dependence on foreign energy supplies. CPBR research produces technological innovations for higher quality crops and cropping practices, improved biomass energy production, commercially valuable alternative co-products, objective information on the relationship between genetically engineered plants and the environment, prevention/remediation of hazardous wastes, and reduction of greenhouse gas emissions. Research projects are selected for funding using a process that includes a two-stage review: (1) industrial and sponsoring agency review of preproposals to assess commercial and sponsoring agency relevance, and (2) peer review of full proposals to assess scientific merit.

UNIVERSITY ALLIANCE FOR RESEARCH, EDUCATION AND TECHNOLOGY

Rich Holdren, *Vice Provost for Research*
Web site: <http://www.uaret.org/>

The University Alliance for Research, Education and Technology, UA (formerly Associated Western Universities), is a nonprofit corporation with 58 colleges and university members that reflect a broad diversity of roles in higher education. Established in 1959, the consortium's mission is to provide a collaborative mechanism for research and educational interactions between academia, government and industry. UA has served as a manager and broker of Research Participation and Collaborative Research programs since 1967. In partnership with federal laboratories, industry and other cooperating facilities, UA provides fellowships and internships primarily for science and engineering research participation. Opportunities are available for student, graduates, postgraduates and faculty.

For more information on current opportunities and to complete online applications, visit the UA Web site or call (801) 273-8900; Fax: (801) 277-5632, or write to: 4190 S. Highland Drive, Suite 211, Salt Lake City, UT 84124.