

College of Agricultural Sciences

Oregon State University

August 2007

Introduction

This report to the provost from the College of Agricultural Sciences makes no attempt to provide *comprehensive* documentation of the many activities and accomplishments of our faculty, staff, and students. Instead, in each of the categories specified by the provost, it offers examples of the kinds of work going on and the consequences for students, stakeholders, Oregon residents, and others. Because so much of the College's work is long-term, any report like this is necessarily a snapshot at a point in time. Some programs we report here were part of last year's report and may well be a part of next year's as well.

2006-2007 highlights

Programmatic achievements

Three themes are apparent in the College's programs and accomplishments in 2006-2007. They are *relevance*, *application*, and *leadership*. As you read the following report and examples, the College's commitment to listening to its stakeholders—students, producers, processors, environmental and natural resource interest groups, government agencies, agri-businesses, and others—will be apparent, as will our responses to them that demonstrate our intent to remain highly *relevant*. Proof of relevance may be measured by the extent to which delivered knowledge is then applied. *Application* is a real manifestation of the Land Grant university's responsibility to provide real solutions to real people, right now. Numerous examples of that follow. Finally, *are we seen as leaders*, on-campus, nationally, and internationally? The 2006-2007 year has provided **powerful acknowledgment of the College's leadership role**, including designation as **number one in the nation** for cited research in agricultural sciences. For detail, please see the research section, page 4.

Initiatives in support of student engagement and success

The College embraces multiple approaches to student success inside and outside the classroom and laboratory, and to providing co-curricular activities that engage, inform, and educate its students. An informal survey of the College's undergraduate students identified three factors that enrich the student experience:

- **Distributed advising.** Students say they like having advisors who are based in academic departments (instead of in a single, centralized advising office). The advisors, students say, are more familiar with them as individuals and are well-acquainted with requirements and options in their particular majors.
- **Internship support.** The E.R. Jackman organization, a long-established group of loyal alumni and friends, assists in funding numerous internships that enable students to gain practical, hands-on experiences that otherwise might not be possible. Examples include Congressional internships in the nation's capitol; wildlife management at a game preserve for cheetahs in South Africa; and horticultural practice at botanical gardens in London.

• **Leadership development through student clubs.** Once again, funding from the Agricultural Research Foundation, E.R. Jackman, and other generous donors enable clubs and organizations to provide co-curricular leadership opportunities for students. More than 30 clubs, most focused on pre-professional areas of interest, enable students to hone leadership skills while also enhancing their understanding of and appreciation for the student's own particular areas of interest. As their skills develop, students often advance to membership in the student government component of the College, the Agricultural Executive Council. In yet another separate but related activity, students in the College publish their own magazine, called *New Fields*, that is distributed to enrolled students as well as prospective students, donors, and friends of the College.

Individual departments create their own opportunities for student success

The **Department of Rangeland Ecology and Management** annually invites undergraduate and graduate students to participate in the national meeting of its principal professional organization, the Range Society. Society meetings afford students the occasion to get acquainted with future professional colleagues, attend symposia, present their own research, compete for honors, and participate in interviews that lead to direct hiring, often by the U.S. Forest Service and the Bureau of Land Management.

An innovation by the department this year offered students a resume clinic and a mock job interview—ahead of the national meeting—to refine their job-hunting skills. The effort was a success. OSU students and those from 12 other universities participated in the direct hire process for 18 jobs. Range students from OSU landed 8 of the 18 jobs and reported they felt better prepared than their peers because of their having taken part in the resume clinic and mock interviews.

The **Department of Microbiology** is making a special effort to address a need often expressed by graduate students: that of being prepared for future roles as faculty members. The department—joint between Agricultural Sciences and the College of Science—offers a graduate course in teaching, MB699, called *Success in the College Classroom*. Taught by professor **Janine Trempty**, the course has become an increasingly popular for graduate students across campus. Now in its fourth year, MB699 enrolls graduate students from the colleges of Agricultural Sciences, Science, Engineering, Liberal Arts, Education, Forestry, and Oceanic and Atmospheric Sciences. The course covers syllabus design and articulating learning outcomes, understanding different pedagogy, crafting an engaging lecture, developing learner centered activities, teaching to different learning styles, teaching students to think and write in their disciplines, assessing students' learning in progress, test construction and preparing students for tests, and evaluating and documenting teaching effectiveness.

The turf program in the **Department of Horticulture** has developed into a fully integrated curriculum. It comprises a comprehensive suite of on-campus subject-matter classes, an intensive hands-on field laboratory, an active student club, and networking with industry leaders throughout the western United States. The field laboratory component introduces students to practical aspects of turfgrass culture, irrigation design and installation, and overall site management. The student-led Turfgrass Club participated in several volunteer service projects including irrigation installation at the 9-hole Children's Course in Gladstone, Oregon, and work at several local golf courses. A dozen club members attended the national golf industry conference in Anaheim, California, where they networked with many of the 25,000 attendees and competed in the Collegiate Turf Bowl Competition. The club also earned "outstanding club" honors in the College of Agricultural Sciences for the 2006-2007 school year. Students graduating from the turf program are sought after for internships and industry positions. Almost 300 graduates are employed in the turfgrass industry at all levels, including elite golf courses such as Bandon Dunes, Chambers Bay, and other top courses in the Pacific Northwest and throughout the West. OSU graduates are leaders in local and

regional associations and are known for environmentally sound golf course management. Several of our alumni have been recognized nationally for their efforts in providing wildlife habitat on their golf courses. Alumnus Tony Lasher has made Mt. Hood's The Resort at The Mountain an acknowledged leader in salmon habitat restoration.

Graduate students part of international collaborative studying biodiversity

Horticulture graduate students collaborated with students from eight other institutions to synthesize current ecological information on the role that biodiversity in agricultural landscapes plays in providing ecosystem services such as pest control and carbon sequestration. The collaborative seminar was sponsored by the **National Center for Ecological Analysis and Synthesis (NCEAS)** at the University of California, Santa Barbara, and included institutions from across the United States and from Latin America. OSU students interacted during the winter term with distant participants using an innovative Web interface. Students from all the participating institutions then met in person in the spring for a work session in Santa Barbara at NCEAS. Students are now preparing to publish the results of the seminar in several peer reviewed and extension publications. This will be the most **current and comprehensive assessment of the role that biodiversity plays in the functioning of agroecosystems.**

A dynamic curriculum for a changing world

The **Department of Biological and Ecological Engineering** has won approval for a new **undergraduate program in ecological engineering.**

"The program is the first of its kind. Anywhere!" says **John Bolte**, professor and department head. "The ecological engineering program will produce a new kind of engineer focused on designing sustainable systems that are in concert with ecological principles and that integrate human activities with the natural environment—to the benefit of both."

The new curriculum in ecological engineering is offered jointly through the College of Engineering and the College of Agricultural Sciences and will enroll its first students in fall 2007. The curriculum will:

- Emphasize systems analysis and design of sustainable systems to solve problems in a broad range of application areas;
- Incorporate ecological principles into the design of both natural and human-dominated systems;
- Use ecology as its fundamental design paradigm, emphasizing resiliency, adaptation and systems approaches to develop engineered solutions that are sustainable;
- Intrinsically incorporate a broad range of biological systems as components; and
- Emphasize mutual improvement of both human and natural environments.

It is this **incorporation of ecological principles in engineering design** to promote development of robust, sustainable systems that sets the new program apart from other engineering disciplines.

Exploring alternative educational models

The **Department of Crop and Soil Science** is drawing on the experience of assistant professor **Markus Kleber** and other faculty members who are well-acquainted with European-system education to explore alternative educational models that may add additional educational value for undergraduates.

Scholarships lend a hand

Students in Agricultural Sciences are eligible for scholarships from the College and its departments. In 2006-2007, enrolled and prospective students received **almost a half million dollars in scholarship assistance**. Several categories of scholarships are offered through the College of Agricultural Sciences, including the Beginning Venture Agricultural Honors Scholarships for incoming students, Continuing Venture Agricultural Honors Scholarships for continuing students, College of Agricultural Sciences Scholarship Awards for incoming or continuing students, and departmental scholarships for incoming or continuing students.

The E. R. Jackman board and the Agricultural Research Foundation partner with the College in an effort to continue to attract talented students. Together, they support Agricultural Honors scholarships that enable students to concentrate on their studies with less worry about personal finances. Through the Agricultural Honors scholarship program alone, the College awards about \$72,000 to incoming students and \$10,000 to continuing students each year.

Students considered for College of Agricultural Sciences scholarships are incoming or continuing students enrolling or enrolled in the College not only at the Corvallis campus, but also those in the College's programs at the Eastern Oregon University campus in La Grande, OSU's distance-education program, or OSU's dual-admission programs with select Oregon community colleges. Students with an agricultural science-related interest enrolling or enrolled in the general agriculture, environmental science, or natural resources program at OSU's Cascades campus also are considered.

Major research and scholarship initiatives

“What Harvard is to medicine and Yale is to law, Oregon State University is to agricultural sciences.”

That's what editor **Peg Herring** wrote in her introduction to the summer 2007 issue of *Oregon's Agricultural Progress*. She was referring to a ranking from *Science Watch*¹ in which **the College of Agricultural Sciences is ranked number one in the nation** among the top 100 federally funded U.S. universities in agricultural sciences for “citation impact of published research” in the field. *Science Watch* described the listing as showing the universities whose research papers attracted citations at a rate notably above the world average over the past five years.

The OSU College of Agricultural Sciences' number one ranking was reported in the November-December 2006 edition. Based on a set of Thomson-indexed journals, *Science Watch* calculated the citations-per-paper (impact) score for each university, for papers published and cited between 2001 and 2005.

Along with Oregon State as number one in agricultural sciences citations impact nationally, other institutions were:

2. University of Wisconsin, Madison
3. Cornell University
4. Rutgers University
5. University of California, Davis
6. University of Minnesota
7. Pennsylvania State University

¹ *Science Watch* is the subscription newsletter of Thomson Scientific that quantitatively analyzes the scientific journal literature and provides science policymakers, research administrators, science journalists, and others with concise overviews of key developments in today's scientific research.

8. Washington State University
9. University of Nebraska
10. University of Illinois, Urbana.

This latest national leadership comes on the heels of an earlier global Thomson study that showed Oregon State University's College of Agricultural Sciences as 9th **worldwide** in citations impact in agricultural sciences. That was for the 10-year period from January 1996 to February 2006. Others with OSU in that Top-10 list were:

- University of Helsinki
- Cornell University
- University of Wisconsin
- University College Cork, Ireland
- University of California, Davis
- Commonwealth Scientific and Industrial Research Organisation (Australia)
- University of Massachusetts
- National Institute for Agricultural Research (France)
- Wageningen University, Netherlands

Examples of research *relevance* and *application*

Two microscopic roundworms have demonstrated once again that **human food production is never free of attack by pests**. In the past six years, scientists have discovered that about half the dryland wheat fields in eastern Oregon, eastern Washington, southern Idaho, and eastern Montana are infested with a roundworm called the *root-lesion nematode* that can reduce yields of the most sensitive wheat varieties by as much as 68 percent. OSU scientist **Richard Smiley** and others determined that winter wheat yields could be increased by 5 to 20 percent if growers in Oregon and Washington planted only those varieties of wheat that were most tolerant to the nematode. By publishing nematode-tolerance information about each variety of wheat, scientists are helping growers keep infested fields in production, and are helping wheat breeders to eliminate breeding lines that are sensitive to this widespread pest. A second such pest, the *cereal cyst nematode*, can interfere with small grain production in Oregon. Smiley's research identified the specific strain of nematode present here, then identified and introduced a targeted resistance gene into the best-producing Oregon wheat varieties.

In combating a continuing onslaught of insects and diseases and also to sustain or increase yields, **growers look to OSU for new wheat varieties** that have desirable traits. Department of Crop and Soil Science plant breeder **Jim Peterson** has developed and licensed two innovative varieties of wheat. Wheat producers have now planted the new varieties on more than 300,000 acres in the Pacific Northwest.

Hood River fruit growers and shippers have committed to take steps necessary to reduce the impact of their industry on the environment, especially on the water resources of the area. The Hood River Grower-Shipper Association has enlisted **research from the Department of Environmental and Molecular Toxicology to help minimize pollutants** in plant effluents. Faculty members **Kim Anderson** and **Jeff Jenkins** are investigating facility effluent, seasonal effects, and facility effects.

Graduate students in plant breeder **Jim Myers'** vegetable breeding and genetics program in the **Department of Horticulture are developing tomato germplasm with high levels of flavonoids**. These compounds are associated with significant health benefits in the prevention of certain cancers and the mitigation of chronic cardiovascular health problems. By combining two genes that individually have a weak effect, the students were able to increase the purple pigmented class of flavonoids called anthocyanins in the fruit. Antioxidant potential of fruit containing the anthocyanins is significantly higher than that produced by the aryteneoids in the fruit. The tomato

fruit resembles purple eggplant in color. This research has been the subject of intense media and public interest. Myers expects to release the first high-anthocyanin tomato in 2008.

Commercial onion production is a vital industry in the Treasure Valley of eastern Oregon but, beginning in 2000, a plant disease called Iris Yellow Spot Virus (IYSV) emerged as a major threat that began reducing onion yields. Working with growers and seed companies, scientist **Clinton Shock** at the **Malheur Experiment Station** soon undertook research to address this challenge to the industry. A major strategy is to learn to **manage the onion crop to reduce the expression of the virus**. Another is yield trials with different varieties of onions, seeking those that not only maintained characteristics consumers expect but that also were resistant to the IYSV. Varieties meeting these standards are now being identified and introduced into commercial production.

Two College of Agricultural Sciences scientists win nanotechnology grants

Regional officials of the U.S. Environmental Protection Agency (EPA) as well as staff representatives of Oregon's Congressional delegation, and University leaders announced in June the award of "STAR" grants in nanotechnology to two College of Agricultural Sciences scientists, **Alan Bakalinsky** and **Robert Tanguay**.

The EPA's STAR (Science to Achieve Results) program awarded 21 major grants in nanosciences nationally, with two of them going to these College of Agricultural Sciences researchers. Both grants focus on **biological implications and safety of nanomaterials** and build on the growing body of research related to the Oregon Nanoscience and Microtechnologies Institute (ONAMI) collaborative. Bakalinsky is associate professor in the **Department of Food Science and Technology**; Tanguay is associate professor in the **Department of Environmental and Molecular Toxicology**.

These grants—\$600,000 over three years—will determine if manufactured nanoparticles with commercially useful properties produce adverse responses in animals or humans, and what specific structures in manufactured nanoparticles might cause damage to cells.

Sun Grant program earns support, gains momentum

Oregon State, as **one of five regional Land Grant university Sun Grant centers**², is playing an important role both regionally and nationally to ensure viability and relevance of the program. Sun Grant's mission emphasizes national energy security and independence through the development, distribution and implementation of bio-based energy technologies. Sun Grant promotes bio-based diversification and environmental sustainability of the region's agriculture, and promotes opportunities for bio-based economic diversification in rural communities.

Dean **Thayne Dutson** is an active participant in national leadership of the program. Together with counterparts from other universities, he has enlisted support of Congressional delegations and worked with top leadership of the federal departments of Agriculture, Transportation, and Energy. As a consequence, **top levels of the federal government are embracing the Sun Grant mission** as relevant to those of their own agencies. The resulting partnerships are enhancing and helping to secure the national Sun Grant budget.

At the regional level, Oregon State has sponsored **meetings, symposia, and other events** that engage private sector entities, foundations, other educational institutions, local, state and federal governments, and other organizations to address myriad questions and apparent opportunities

² Regional Sun Grant centers are: South Dakota State University, Oregon State University, Oklahoma State University, the University of Tennessee - Knoxville, and Cornell University.

growing out of the nation's intent to be less reliant on external sources of energy and to embrace new biobased products. As the regional center, OSU Sun Grant has conducted a **competitive grants program** to allocate about \$900,000 this year for collaborative research, education, and outreach projects in three strategic program areas:

- Biofuels feedstocks development,
- Biofuels conversion processes, and
- Bioproducts development to reduce or replace petroleum use.

The Western Center also invited **single-institution grant proposals** with similar aims.

Because there is so much still to be learned about the economic and environmental viability of various bioproducts and processes, the Sun Grant center has encouraged research to help inform choices, especially those in the private sector and in public policy arenas.

One such study was an economic analysis of biofuels potentials, carried out by economists **William Jaeger, Robin Cross, and Thorsten Egelkraut** in the **Department of Agricultural and Resource Economics**. The study set a cautionary tone for the large-scale production of biofuels in Oregon. Results suggested that the "net energy" of biofuels is expensive when all costs of its production and delivery are taken into account.

By subtracting the energy spent to produce raw materials and to process and transport the biofuel, the researchers found that the cost of the net gain in energy for these biofuels may be more than seven times higher in some cases when compared to gasoline.

"There is a commercial market for biofuels in Oregon given current subsidies," Jaeger said. "But success in the marketplace doesn't mean cost-effectiveness in achieving the state's goals of energy independence and reducing greenhouse emissions."

Marine Mammal Institute established in College of Agricultural Sciences

Building on widely recognized success in marine mammal research and outreach, the University this year created a new Marine Mammal Institute as a unit of the College of Agricultural Sciences.

OSU's research in the **study of threatened and endangered whale species has been internationally recognized over the past three decades**, primarily through the pioneering studies of **Bruce Mate**, who directs the Institute. Mate was the first scientist to use satellites to track whales, and specialized tags developed by his team at Oregon State have led to new discoveries and a wealth of data on blue, gray, humpback, bowhead, right, fin, sperm, and other whale species.

During the past year, the OSU program achieved significant growth with the **hiring of Scott Baker**, a cetacean geneticist and scientific delegate to the International Whaling Commission, who will serve as the Institute's associate director, and **Markus Horning**, a pinniped ecologist from Texas A&M University. Their addition widens the focus of the Institute beyond satellite tagging of large whales to encompass new technology for the study of all marine mammals, including seals, sea lions, and dolphins.

Strong participation in the University's initiatives

Among the six strategic initiatives approved by the University, faculty in the College of Agricultural Sciences are active participants in five of them. The College has committed significant support to four of these initiatives. For example, in addition to recurring faculty support as the initiatives progress, the College provided more than \$200,000 in non-recurring funds to help initiatives get started and gain momentum. Separate reports to the provost from leaders of each of

the initiatives provide additional detail, including contributions from College of Agricultural Sciences faculty. Please see Appendix B for further information.

University strategic initiative: Computational and Genome Biology

The College has employed three faculty members who are providing key contributions to the Computational and Genome Biology initiative. They are **Erica Bakker**, assistant professor of horticulture; **Jeff Chang**, assistant professor of botany and plant pathology; and **Todd Mockler**, assistant professor of botany and plant pathology. They are among the 95 University-wide now affiliated with the Center for Genome Research and Biocomputing. Of those 95, more than 50 are a part of the College of Agricultural Sciences.

University strategic initiative: Subsurface Biosphere Education and Research

The **Department of Crop and Soil Science** has recruited and appointed a **soil biologist-chemist to a new 12-month, tenure-track position** intended to contribute significantly to this initiative. The new faculty member is **Markus Kleber**, formerly a geological scientist in the earth science division at Lawrence Berkeley National Laboratory. In addition to teaching, Kleber will develop a research program in soil organic biogeochemistry or rhizosphere biology, and will collaborate with soil scientists, microbiologists, and plant scientists within the department and the larger OSU community.

University strategic initiative: Sustainable Rural Communities

The College of Agricultural Sciences is **contributing to three positions** associated with this initiative. The **Extension Agriculture Program** and the **Department of Agricultural and Resource Economics** are jointly funding a 0.75 FTE, 12-month, fixed-term **Extension community economist** position for three years (two years funded by Extension Agriculture Program and one year funded by the department). A decision regarding a recurring commitment beyond the three years of initial funding will be considered in a future round of the College's Priority Staffing process. In addition, beginning in year 6 of the initiative, the College of Agricultural Sciences will assume funding responsibility on a recurring basis for a 0.75 FTE, 12-month, tenure-track, assistant professor position in **economics of rural areas**. The College has provided non-recurring funds that assisted with **start-up costs**. **In-kind match** is provided from the College and the Extension Agriculture Program with 0.5 FTE for the **initiative coordinator, Bruce Weber**. See a related report on assisting rural communities elsewhere in the section on outreach and engagement.

University strategic initiative: Water and Watersheds

For a report on certain of the College's contributions to this initiative, see the several water-related narratives elsewhere in this report (page 10).

University strategic initiative: Mathematics, Computer Science and Ecology

Agricultural Sciences faculty contribute to this initiative but, unlike those noted above, the College has made no major financial contribution to it.

Major outreach and engagement initiatives

Outreach and engagement are integral to the fabric of the College of Agricultural Sciences, linked as they are to the identification of needs and the creation of new knowledge. Outreach may be informal, as in a conversation between a faculty member and a stakeholder, or more structured, through the Extension Agriculture Program educational activities, Agricultural Experiment Station field days, and other activities.

About half of all OSU Extension Service educational programming is carried out through the Extension Agriculture Program based in the College of Agricultural Sciences. In addition, significant outreach occurs through scientists and Extension educators who, among their many other activities, design and conduct field days to extend knowledge developed at the several branch experiment stations. More than 3000 people attend about **18 different field days offered annually** by units of the College. Recent examples include:

- **Hyslop field day**, Corvallis. Emphasis: barley and wheat research, biofuels feedstocks. About 65 attendees.
- Two **Malheur Experiment Station** field days, Ontario. Emphases: (1) irrigation, onion research, poplar, other crops; (2) variety trials of onions. 300-400 attendees.
- **Columbia Basin Agricultural Research Center**, Pendleton and Moro. Emphases: wheat, camelina, cutter bees, nematodes, wheat rust trials. 300-500 attendees.
- **Central Oregon Agricultural Research Center**, Madras. Emphasis: bioproducts. 20-30 attendees.
- **OSU Lewis-Brown Farm**, Corvallis. Emphasis: Turf grass, golf course applications. 50 attendees.
- Two **Hermiston Agricultural Research and Extension Center** field days, Hermiston. Emphases: (1) potatoes, (2) sweet corn. 100-plus attendees.
- **Mid-Columbia Agricultural Research and Extension Center**, Hood River. Emphases: cherries and pears. 200-plus attendees.
- **Southern Oregon Research and Extension Center**, Medford. Emphases: Pears, grapes. 100-plus attendees.
- Three **North Willamette Research and Extension Center** field days, Aurora. Emphases: (1) strawberries, (2) caneberries, (3) blueberries. 300-plus attendees including many from other countries including Canada, China, and Korea.
- **Rangeland Ecology and Management** field days, Prineville, Burns, and La Grande (rotating). Emphases: natural resource issues, juniper management, watersheds. About 100 attendees.
- **Coastal Oregon Marine Experiment Station**, Newport. Field days are part of SeaFest. Emphasis: marine resource management. About 1,000 attendees.

Outreach and engagement through the Extension Agriculture Program

More than 30 Extension programs were highlighted in this year's report of the OSU Extension Agricultural Program. The following section abstracts from that report a few examples of the innovative Extension programs that contribute to Oregon's economic, social, and environmental well-being.

Cost-effective, environmentally sound production of carrot seed. Central Oregon growers are important producers of hybrid carrot seed for the nation, generating more than \$8 million in Oregon farm income annually. Producers turned to OSU research and Extension faculty members **John Hart** and **Marvin Butler** when they sought information about managing the use of fertilizer for the seed crop—seeking to optimize their fertilizer use while also keeping environmental impacts to a minimum. Since carrying out necessary research and later surveying growers and field representatives, the OSU faculty have determined that their recommendations are now being followed by almost 90 percent of the growers over about three-fourths of the acreage devoted to producing carrot seed. This practical research in response to grower requests, and the resulting Extension program, is estimated to be **saving growers as much as \$2 million annually** in production costs.

Productivity, cost savings, and the environment: Tweaking pasture management. Extension educators and research faculty asked whether nitrogen might be applied to Oregon pastures to **stimulate early season forage growth, but without losing the added nitrogen** to streams and ground water. Their tests confirmed that pastures so treated delivered more forage with higher early season protein *and* without significant loss of nitrogen. They also determined that livestock producers could put their animals in pastures about three weeks earlier than they would otherwise—saving about \$16 in feed costs per cow during the period. Many producers have adopted this practice, and are pasturing animals earlier and saving money. As more land managers adopt the recommended management changes, benefits should increase and should do so without environmental cost.

OSU helps rural people and rural communities face new challenges. Rural Oregonians are increasingly concerned about their economic futures and the viability of their communities. Many social and economic indicators (unemployment, personal incomes) show the relative disadvantage in rural places. In collaboration with the Rural Studies Program and the Sustainable Rural Communities initiative, the Extension Agriculture Program—through community-specific research—has helped local communities make **informed decisions about economic well-being and community vitality**.

This Extension education program has informed state policymakers seeking to understand implications of policy choices, supplied local leaders with information about policy impacts, and gathered information from city officials about their needs and concerns. The program is also involved in OSU efforts to educate local official and community leaders to give them the tools to understand both the constraints faced by rural communities and the impacts of policy choices on rural sustainability.

One example is a report for the National Renewable Energy Laboratory titled *Umatilla County's Economic Structure and the Economic Impacts of Wind Energy Development: An Input-Output Analysis*. This report examines impacts of wind farm investment to Umatilla County's existing economic structure and how rural communities can use economic modeling to maximize wind energy investment. The developer of a local ethanol plant used some of the data developed in this report to attract interest from local investors. Some local farmers expressed interest in wind energy and the study may have helped them gain better access to electrical transmission systems, always a barrier in alternative energy systems.

A seven-month “**County College**” program has been developed for newly-elected county commissioners and is designed to help county officials with local governance, issues, and programs. The curriculum includes topics such as public education, public works, and human services. Sessions often involve as many as 20 commissioners from around the state, both rural and urban. This educational outreach has proven valuable to new and seasoned county commissioners.

The Rural Studies Program has created a Web site with an inventory and characterization of existing sources of information about rural social, economic, and environmental community indicators, and links to various resources for all 36 counties in Oregon. This project led to a **partnership with OSU Libraries** to create a prototype of a portal for rural communities.

***Oregon's Agricultural Progress* issue delivers on water**

Faculty throughout the College of Agricultural Sciences have expertise on water, watersheds, and related matters and, therefore, are major continuing contributors to the University initiative in this area. Many of those same faculty were sources for stories in a special edition of *Oregon's Agricultural Progress* magazine this year, focused on “**Water in Oregon.**”

It included a water map of Oregon and articles on the Willamette Basin, groundwater statewide, issues in the Klamath Basin, consequences of population growth for water resources, water in the Cascades, the Umatilla Basin, the Blue Mountains, the Malheur Basin, and other areas. Among other articles there was focus on stewardship, water re-use, and invasive species.

Five copies of the “Water in Oregon” issue were sent to each Oregon high school for consideration and use in science classes. **Six school districts are now expanding their use of the magazine in their curricula.** A pre-school is using it to show women in science. Middle schools and high schools in Portland, Eugene, Corvallis, and Merlin have adopted the magazine to augment textbook information in science and natural resource-based classes.

In addition, the special edition earned national accolades for its quality. In awarding the “Water in Oregon” issue the association’s highest recognition, a Gold Award, judges for the **Association for Communication Excellence** said it earned a rare perfect score and described it as “an excellent publication” and a “**stellar effort.**”

Integrated Plant Protection Center serves broad, worldwide audience

The Integrated Plant Protection Center (IPPC) that is part of the College of Agricultural Sciences carries out strong outreach programs for an international constituency. A new edition of *IPMnet News*, an international newsletter about integrated plant protection, is published every six weeks. It now reaches more than **5,000 subscribers in about 150 countries.** In addition, a new IPPC Web site has attracted about **36,000 visits per month** to its new content during its first few months of operation.

National and international impact of programs and initiatives

The College’s faculty are involved in numerous programs and activities with national and international dimensions. These are but four examples of programs with strong involvement and consequence.

“AquaFish” project wins major grant, addresses poverty, local economies worldwide

The U.S. Agency for International Development selected Oregon State’s proposal from among those of several universities competing vigorously to lead an **\$8.9 million, five-year Aquaculture and Fisheries Collaborative Research Support Program (CRSP).** The new research program, now officially renamed “**AquaFish,**” is designed to reduce poverty in developing countries by improving access to fish and water resources. OSU will lead the CRSP, partnering with other universities and institutions around the world.

Hillary Egna, international aquaculture specialist and director of the new program, oversaw preparation of the successful proposal. She points out that poverty remains the single biggest threat to children’s health today, and **giving the poor better access to well-managed water resources—**as AquaFish is designed to do—can help toward the eradication of poverty. Most of the grant money will be meted out to research teams from institutions around the world that will apply to AquaFish for funding.

The new CRSP follows on the heels of another in **pond dynamics and aquaculture** that OSU has led for years, based in the College of Agricultural Sciences. The new program will focus more on increasing access to water, and reducing the number of constraints to using aquaculture and fisheries to promote local economies.

OSU survey researcher helps shape U.S. Census of Agriculture

The Census of Agriculture is the gold standard for information about agriculture and natural resources in the United States. Conducted every five years, the Census is used daily across the country and around the world for planning and decision-making in business and government at the county, state, and national levels. When it came time for the federal government to prepare for the 2012 Census, it commissioned an Expert Review Panel to conduct a comprehensive review of the Census including how data would be collected, and how it would be made available to users.

Virginia Lesser, director of the **Survey Research Center**, was **one of only 14 scientists nationwide** invited to membership on the expert panel; she directed one of four sub-panels. Their work, completed in April 2007, identified changes needed to make the 2012 Census more useful.

Lesser also served as a reviewer for a report for the **National Academies** on the Agricultural Resource Management Survey, a key source of data for national policy makers on financial condition, agricultural production, and resource use on farms. She was invited to this review by the USDA Economic Research Service and the National Agricultural Statistics Service.

Economist's research informs national biotechnology policy

Steven Buccola, professor of agricultural and resource economics, spoke in July to the national University-Industry Demonstration Partnership on the influences that finance source and size have on university biotechnologists' research programs. The Partnership is a component of the **National Academies** that includes university vice presidents for research, directors of university-sponsored research offices, intellectual property licensing officers, and research managers in industry. These policy makers at state and federal levels, along with university officers and biotechnology firms, are seeking to understand the **determinants and productivity of university biotechnology programs**, and the returns to federal life-science investments.

Buccola told the group that industry support for academic research can enhance the pace of technology commercialization but also inhibit basic and publicly accessible science. He said there is new evidence suggesting industry funding leads to less basic research effort and more excludable—for example, more patentable—research findings in university agricultural biotechnology. However, the norms which academic scientists maintain regarding the importance of basic research and publicly appropriable benefits exert even stronger influences on research orientation. University culture, the bioscientist's experience, and availability of in-kind laboratory support also play a part. These findings point to the **importance of nurturing an open-science culture**, particularly in view of recently stagnating public funding for science.

Helping put new fisheries management tools into practice

Susan Hanna, professor of agricultural and resource economics based at the Coastal Oregon Marine Experiment Station in Newport, has led a public education program on **economic instruments for marine fisheries management**. The use of market-based tools in fishery management is now explicitly **authorized by federal statute**. However, these tools are different enough from traditional management approaches that the level of literacy concerning their design, operation, and consequences is generally low, even among policy makers, fishery managers, community leaders, and fishers. Hanna has directed this educational program about economic instruments for management to participants from the National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Joint Ocean Commission Initiative, regional Fishery Management Councils, the Oregon Department of Fish and Wildlife, Oregon Coastal Zone Management Association, the commercial fishing industry, and others.

Faculty recognition and awards

College of Agricultural Sciences faculty and staff have earned **recognition from many sources**: departmental, College, University, professional associations, government agencies, and others. External leadership and fellow awards this past year include:

- **George Boehlert**, president-elect, Western Association of Marine Laboratories;
- **Stella Coakley**, fellow, American Phytopathological Society;
- **Selina Heppell**, leadership fellow, Aldo Leopold Leadership Program;
- **Robert Hughes**, president, Western Division, American Fisheries Society;
- **Jim Males**, fellow, American Society of Animal Science, and distinguished alumnus, The Ohio State University;
- **Greg Thompson**, president, Western Region Association for Agricultural Educators; and
- **James Thompson**, president, Western Section, American Society of Animal Science.

A complete list of awards is published in *A Celebration of Talent and Accomplishment*, the printed program for the College's annual Faculty and Staff Day. Copies are available from the Office of the Dean.

OSU entomologist is author of new book on butterflies

Oregon State University entomologist **Jeff Miller** is one of three authors of a large-format book of photographs of butterflies published by the Harvard University Press. The book, *100 Butterflies and Moths: Portraits from the Tropical Forests of Costa Rica*, was prepared by Miller, Daniel H. Janzen and Winifred Hallwachs. It features 100 of Miller's large-format photographs documenting the variety of shapes, colors, and cryptic markings of flamboyant Costa Rican butterflies and moths.

Miller is a professor in the Department of Rangeland Ecology and Management; Janzen and Hallwachs are tropical ecologists from the University of Pennsylvania. Their studies have brought advances to the fields of restoration ecology, biodiversity prospecting, biotechnology, and ecotourism, and serve as a model for ecologists around the world. The three previously collaborated on a book called *100 Caterpillars: Portraits from the Tropical Forests of Costa Rica*, which Harvard published in 2006. It went on to win the **National Outdoor Book Award** for Design and Artistic Merit.

Other books by the College's faculty

Tony Chen, Department of Horticulture:

Chen, T. H. H., M. Uemura, et al. (2006). *Cold hardiness in plants: molecular genetics, cell biology and physiology*. Wallingford, UK ; Cambridge, MA, CABI Pub.

Robert Lackey, Department of Fisheries and Wildlife:

Lackey, R. T., D. Lach, et al. (2006). *Salmon 2100: the future of wild Pacific salmon*. Bethesda, Md., American Fisheries Society.

Jeff Miller, Department of Rangeland Ecology and Management

Miller, J. C., D. H. Janzen, et al. (2006). *100 caterpillars: portraits from the tropical forests of Costa Rica*. Cambridge, Mass., Belknap Press of Harvard University Press.

David Noakes, Department of Fisheries and Wildlife:

Noakes, D. L. G. (2006). *Bill Ricker: an appreciation*. Dordrecht, Springer.

Benno Warkentin, Department of Crop and Soil Science

Frossard, E., W. E. H. Blum, Benno Warkentin, et al. (2006). *Function of soils for human societies and the environment*. London, Geological Society.

Warkentin, B. P., International Union of Soil Sciences., et al. (2006). *Footprints in the soil: people and ideas in soil history*. Amsterdam; Boston, Elsevier.

Journal editors and editorial board members

Thirteen College of Agricultural Sciences faculty members are **editors or associate editors** of major scientific periodicals. They are:

- **Michael Banks**, Fisheries and Wildlife, editor of the *Reviews in Fish Biology and Fisheries*;
- **Jerri Bartholomew**, Microbiology, associate editor of the *Journal of Aquatic Animal Health*;
- **Gita Cherian**, Animal Sciences, associate editor of the *Poultry Science Journal*;
- **Lynda Ciuffetti**, Botany and Plant Pathology, associate editor for *Molecular Plant-Microbe Interactions*;
- **Jennifer Field**, Environmental and Molecular Toxicology, associate editor of *Environmental Science and Technology*;
- **Stephen Giovannoni**, Microbiology, associate editor of *Environmental Microbiology*;
- **Kate Lajtha**, Botany and Plant Pathology, editor-in-chief for *Biogeochemistry*;
- **Michael Morrissey**, Food Science and Technology, co-editor of the *Journal of Aquatic Food Product Technology*;
- **Patricia Muir**, Botany and Plant Pathology, associate editor of the *Canadian Journal of Forest Research*;
- **David Noakes**, Fisheries and Wildlife, editor-in-chief of *Environmental Biology of Fishes*; and editor of the *Fish and Fisheries Monographs*;
- **George Rohrmann**, Microbiology, editor of *Virology*, and associate editor of the *Journal of Virology*, and of *Biomed Central Microbiology*, and of *Virus Genes*;
- **Greg Thompson**, Agricultural Education and General Agriculture, regional editor of the *Journal of Agricultural Education*, and associate editor of *Journal of Natural Resources and Life Sciences Education*;
- **Janine Trempy**, Microbiology, editor of the *Journal of the American Society for Microbiology*;
- **David Williams**, Environmental and Molecular Toxicology, associate editor of *Toxicology and Applied Pharmacology*.

Many other faculty members serve on **editorial boards** for significant scientific publications. They include:

- **Alan Bakalinsky**, Food Science and Technology, for *Applied and Environmental Microbiology*;
- **Candace Cronney**, Animal Sciences, for *Journal of Animal Science*;
- **Lawrence Curtis**, Office of the Dean, for *Toxicology and Applied Pharmacology*;
- **Theo Dreher**, Microbiology, for *Virology*, and for *Journal of Virology*;
- **W. Dan Edge**, Fisheries and Wildlife, for *The Wildlife Society Bulletin*;
- **Michael Kent**, Microbiology, for *Journal of Fish Diseases*; and for *Diseases of Aquatic Organisms*;

- **Robert Lackey**, Fisheries and Wildlife, for the *Journal of the American Fisheries Society*, and for *Renewable Resources Journal*;
- **Howard Meyer**, Animal Sciences, for the *Journal of Animal Science*, and for *Sheep Research Journal*, and for *Journal of Small Ruminant Research*;
- **Dave Pyke**, Rangeland Ecology and Management, for *Restoration Ecology*;
- **Carl Schreck**, Fisheries and Wildlife, for *Diseases of Aquatic Organisms*, and for *Comparative Biochemistry and Physiology*, and for *Aquaculture*;
- **Bernadine Strik**, Horticulture, for the *International Society for Horticultural Sciences*;
- **JunJie Wu**, Agricultural and Resource Economics, for the *American Journal of Agricultural Economics*, and the *Journal of Environmental Economics and Management*.

Patent issued for unique thickener

Janine Trempy, professor of microbiology, has for some time carried on research aimed at developing natural and safe food thickeners for dairy and other food industries. After an eight-year patent-application process in the United States and Australia, a **biopolymer thickener** that is a product of her work has received patent approval in both countries.

The thickener is a previously unknown *polysaccharide*³, a carbohydrate made up of many simple sugars, that has a novel chemical structure. When added to milk, it imparts desirable sensory characteristics to the milk, including making the milk thick with a smooth “mouth-feel” and slightly sweet with what is described as an obvious “chewable-bite.” The polysaccharide may be added to any milk-based or non-milk-based food products to produce these sensory characteristics. It may also be added to liquids to cause thickening that is desirable in beauty care products and pharmaceuticals.

Student recognition and awards

Ryan Scholz, 2007 graduate in Animal Sciences and Bioresource Research, was one of four students nationally to receive a **National FFA Star Agriscience award, the organization’s top student recognition**. The last time an Oregon student was so recognized was more than two decades ago.

A national organization for minority students—for the second consecutive year—elected the same College of Agricultural Sciences student to national office. **Jee Lee**, a senior in Bioresource Research from Beaverton, was voted Region VI national undergraduate vice president for **Minorities in Agriculture, Natural Resources, and Related Sciences (MANNRS)**.

Recognized with the University’s **Clara H. Waldo and E.A. Cummings Outstanding Student Award** was **Amanda Wetherell**, a sophomore in Animal Sciences from Brookings. Seven more College of Agricultural Sciences students received **honorable mention** for this award. They are: **Collin Kayser, Sara Livesay, Colleen Paquette, Erin Pugh, Maria Quiroz, Lauren Salgo, and Karyn Zittel**.

Kendall Rae Dutcher, a senior from Florence, Oregon, with majors in Bioresource Research and Chemistry, was the recipient of the University’s **Grace Wu Award** for outstanding contributions to the campus and community while showing unbiased leadership.

Six students in the College received the University-level **Drucilla Shepard Smith Scholastic Award**:

³ Specifically, the polysaccharide is *Lactococcus lactis* subspecies *cremoris* Ropy 352.

- **Jami Cate**, a sophomore in Crop and Soil Science from Lebanon, Oregon;
- **Javier Fernandez-Salvador**, a senior in Horticulture from Corvallis;
- **Kevin Julian**, a senior in Animal Sciences from Bridgeport, California;
- **Rachel Rich**, a sophomore in Animal Sciences from Powell Butte, Oregon;
- **Sri Kumar Senthirajah**, a sophomore in Animal Sciences from Oregon City; and
- **Brian Toncray**, a freshman in Animal Sciences from Lowell, Oregon.

Strategic Plan implementation

University focus areas for 2006-2007

Enhancing student success

Many College of Agricultural Sciences faculty go to extra lengths to enrich their students' educational experience inside and outside the classroom. They offer such things as unusual experiential learning by embracing partnerships in research with undergraduate students, and by ensuring that the latest in new knowledge from OSU research makes its way quickly into the classroom. Examples are cited earlier in this report (pages 1-4).

Increasing research and outreach

Oregon Sustainable Agriculture Resource Center has a home and is established

The Oregon Sustainable Agriculture Resource Center, a consortium of state and federal agencies, non-governmental organizations, and private businesses, now has a home at OSU and a project coordinator, **Sally Duncan**, as part of the **Institute for Natural Resources**. By serving as a centralized repository and information source, the Center is intended to advance sustainable agricultural and natural resource practices that have positive environmental, economic, and social consequences for Oregon.

Governor Ted Kulongoski originally directed Oregon State University to provide leadership for this consortium first by developing the idea, then by organizing and operating it. In addition to the OSU Institute for Natural Resources, other early partners were food processor NORPAC, Oregon Department of Agriculture, Oregon Department of Energy, Defenders of Wildlife, U.S. Natural Resources Conservation Service, The Food Alliance, Water Resources Department, Oregon OSHA, Oregon Watershed Enhancement Board, Oregon Department of Fish and Wildlife, Eugene Water and Electric Board, SalmonSafe, Oregon Department of Environmental Quality, Tillamook County Creamery Association, Agricultural Cooperative Council of Oregon, Celilo Group Media, and others.

With its integration into the Institute for Natural Resources, the Center has begun providing **access to informational, financial, and technical resources related to sustainable agriculture**, such as financial incentive programs in Oregon; technical assistance for planning, permits, and on-the-ground work; certification programs, standards, and self-assessment tools; and other related information.

Enhancing diversity and community

Detailed survey informs action for 2007-2008

The College of Agricultural Sciences engaged the OSU **Survey Research Center to help design, create, and conduct a survey of its faculty and staff regarding diversity-related matters.** The survey invited responses to a detailed questionnaire from about 700 individuals, asking for their perceptions of the University's overall direction with respect to diversity, their own observations of circumstances in the respondent's workplace, and feelings about adequacy of training and development opportunities related to diversity.

About half of those eligible to respond did so, providing a sufficient sample size from which to draw conclusions about where the College might focus its resources for diversity and community. For example, one such focus may be in encouraging and supporting women faculty and staff for professional development and networking. Although the preponderance of respondents expressed a great deal of workplace satisfaction, women were more likely than men to say they had experienced or observed workplace discrimination or racial tensions and, similarly, women were more likely than men to assert that opportunities were lacking for professional development related to diversity and community. In this context, professional development included such things as being involved in conversations about gender-related and racial-ethnic issues, and learning more about various cultures. Results of the survey will be the basis for decisions by the College's Committee on Diversity and Inclusiveness about where to place program emphasis in 2007-2008.

This may be the first survey of its kind in the University, comprising as it did professional review of the complex questionnaire and sophisticated statistical analysis of the results by the Survey Research Center. Faculty and a graduate student in the **Department of Agricultural Education and General Agriculture** oversaw the survey and intend to use it as the basis for professional journal articles about survey design and data analysis. What we have learned also likely would benefit other OSU colleges or departments considering similar surveys.

Of course, enhancement of diversity and community occurs not only College-wide but also at the unit level and with individual initiative. Some examples follow.

Recruiting minority students to graduate study

The **Department of Environmental and Molecular Toxicology** is the recipient of a training grant, **Environmental Health for Minority Undergraduates**, that the department has used to recruit minority students to graduate school. The grant enabled **David Jesus Castro** to enroll as a graduate student at OSU after graduating from the University of Arizona. In his graduate studies, he has gone on to earn significant national awards:

- Carl Storm Under-represented Minority Fellowship to the Gordon Conference on Mechanisms of Toxicity;
- Third place for best abstract from the Society of Toxicity; and
- American Association for Cancer Research Minority Scholar in Cancer Research Award.

Also in the Department of Environmental and Molecular Toxicology, faculty nominated post-doctoral student **Abby Benninghoff** who was ultimately selected as recipient of the highly competitive **Ruth L. Kirschstein National Research Service Award** from the National Institute of Environmental Health Sciences. The Kirschstein Award is intended to increase the number of scientists from diverse population groups who are prepared to pursue careers in biomedical and other health-related fields.

Klamath: Helping build “community” at the community level

A recent name change for what formerly were the Klamath Experiment Station and the Klamath County office of the OSU Extension Service also signals a change in the vision for what OSU’s presence means in that region. The new name is **Klamath Basin Research and Extension Center**. The Center’s two locations bear the same name but with “Vandenburg site” added for one office, and “Washburn site” for the other. **Willie Riggs**, an economist recently named as director of the Center, stresses that the name change represents a closer working relationship between the OSU research and Extension faculty there as well as the Center’s role as a broadly based community resource for the Klamath Basin.

“Water, wildfire and urban interface, community growth, youth and adults at risk, energy prices, changes in public policy, heritage and tradition; these are issues that impact the citizens of Klamath County and communities across the West,” Riggs says. “These issues present challenges...we, as researchers and educators, can help our neighbors and our communities address.”

An example of how the Center is integrated into the community is its participation in the Rotary Club’s First Harvest project that provides food bank services to the needy. A garden at the Center’s Vandenburg site is managed by the Center, Master Gardeners, Rotary, and Klamath County government. The garden has received a good deal of local recognition and appreciation for OSU’s contribution to the community partnership.

International programs touch *many* regions of the globe

The College of Agricultural Sciences does not have a centralized international program. Instead, individual units and programs are encouraged to include international aspects as an integrated part of their activities. As a result, many faculty, staff, and students are productively engaged in activities with strong international dimensions to them. Some examples follow.

- **Dave King**, head of the **Department of Extension and Experiment Station Communications**, was commissioned by the U.S. Department of Agriculture Foreign Agriculture Service and the American Distance Education Consortium to lead a national scientific exchange team to China. The team explored opportunities for **collaboration in agricultural distance learning between United States and Chinese universities and colleges**. A likely outcome is a joint publication and a conference in Beijing to bring together developers of learning modules from the United States and China.
- **King** also has been a key architect of a new **Latin American Center for Distance Learning** that will open next year in Honduras at Zamorano University.
- **Paul Jepson**, director of the **Integrated Plant Protection Center**, is leading a Global Environment Facility-sponsored program **investigating pesticide contamination and risks** in the Niger and Senegal river basins in West Africa. Faculty in the departments of Environmental and Molecular Toxicology, and Biological and Ecological Engineering are co-principal investigators for the program. International collaborators include the United Nations Food and Agriculture Organization (FAO), the FAO’s LOCUSTOX project with the government of Senegal that is studying environmental effects of locust control, and the West African non-profit organization, Environment and Development Action in the Third World (ENDA-TM).
- **Jepson** also was a consultant to the FAO in Vietnam on the **development and use of environmental impact indicators for pesticides** and other integrated pest management (IPM) practices. New guidelines are being prepared to help developing countries quantify environmental and human health risks associated with broad-spectrum pesticides.
- **Steve Sharrow**, professor of rangeland ecology and management, and **Iraj Motazedian**, Extension seed certification specialist in Crop and Soil Science, are agricultural consultants to

the Armenia Fund USA. They have conceived and put into place a novel free market-based **economic development strategy in the Nagorno Karabakh Republic**, in the southern Caucasus Mountains bordering Iran. Wheat and livestock are principal food sources there and agriculture is the basis for the local economy. Already, the locally based project has helped more than 100 families have an adequate income and food supply; in the next year the project leaders expect to increase that number ten-fold.

Summary: Promoting the thematic areas

Programs in the College of Agricultural Sciences are relevant to the University’s thematic areas, strategic initiatives, and federal initiatives. For a graphic portrayal of how these activities relate to one another, please see Appendix B.

Focus on the Natural Resources initiative

Although the College contributes significantly to four of the five theme areas, for the purpose of this report we provide examples of the variety of research projects and education programs being carried out by faculty and staff in Agricultural Sciences that advance the Natural Resources initiative. Detailed information about each of these is available in our accountability database, *Oregon Invests!*, on the Web at: <http://oregoninvests.oregonstate.edu/> Taken together, even these relatively few sample programs provide insight into the multiple avenues faculty in the College are pursuing that advance the Natural Resources initiative, which is about **managing natural resources and growing and sustaining natural resources-based industries in the 21st century**.

Every Oregonian has a stake in the state’s natural resources, their wise management, their sustainability, and the viability of the economic engine that derives from them. These examples **illustrate the breadth of faculty expertise that forwards the interests of Oregon’s natural resources**, through policy choices, improved management, exploration of new potentials, control of insects, weeds, and diseases that challenge desirable plant materials, understanding and controlling pollution, and developing and applying new tools to understand and provide wise stewardship for this complex natural resources system.

It is striking to explore any of these or other programs or projects in *Oregon Invests!* to note that almost every one is collaborative: across departments, across colleges, across agency boundaries, and, often, across state lines. **Our faculty are practiced at coordination and collaboration**. Indeed, these and many, many other educational programs and research projects in the College significantly advance the University’s natural resources initiative.

Agricultural and Resource	
Economics	
Andrew Plantinga	Measuring compensation under Measure 37
JunJie Wu	How do location decisions of firms and households affect economic development in rural America?

Animal Sciences	
Mike Gamroth (and others)	Business management for Oregon dairies

Biological and Ecological	
Engineering	
Gail Andrews	OSU Extension well water program

Roger Ely	Systems for biological production of hydrogen gas
Derek Godwin (and many others)	Understanding watershed ecosystems and how to maintain their health
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Botany and Plant Pathology	
Lynda Ciuffetti	An investigation into the fungus that causes tan spot of wheat
Phil Hamm (and others)	Diversification into value-added agriculture in the Columbia Basin
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Crop and Soil Science	
Marvin Butler	Seed production of native rangeland plants
Neil Christensen	Managing nitrogen to protect groundwater quality
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Environmental and Molecular Toxicology	
Staci Simonich	Atmospheric transport of organic pollutants from Asia to the U.S. Northwest coast
Tim Stock	Protecting farm workers from pesticides
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Fisheries and Wildlife	
Samuel Chan	Aquatic invasive species educational program
Stan Gregory	Landscape processes and restoration ecology of streams and rivers
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Food Science and Technology	
Mike Penner	Value-added processing of plant biomass
James Kennedy	Improving quality of Oregon wines
<hr/>	
Horticulture	
James Altland	Solving problems in perennial container nursery stock
Rebecca McCluskey	Hazelnut advanced selection, cultivar, and rootstock evaluation
Xinhua Yin	Alternative nutrient, water, and ground management strategies for pears and sweet cherries
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Microbiology	
Janine Trempy	Developing natural and safe food thickeners for dairy and other food industries
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Rangeland Ecology and Management	
Jeff Miller (and others)	Biological control of exotic rangeland weeds using herbivorous insects
Doug Johnson	Electronic technologies for inventorying and monitoring rangelands and pastures
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Summary: Accomplishments in support of the OSU Capital Campaign

The College opened the 2006-2007 fiscal year with a fund-raising goal of \$3.5 million and concluded it having achieved **a total of about \$8.6 million, or more than 234 percent of the goal**. This is the product of work on the College's and the University's behalf by a number of individuals and groups. With **Todd Bastian**, OSU Foundation director of development, and **Jack Holpuch**, associate director of development, for the College of Agricultural Sciences, the dean, associate deans, and department heads made **more than 300 personal, face-to-face donor visits** during the period.

Other noteworthy steps include:

- **Two fully funded professorships.** The Oregon Hazelnut Professorship at \$1 million in cash, pledges, and bequests, in the Department of Horticulture; and the Withycombe Endowed Chair in Reproductive Physiology at \$1.75 million through a bequest, in the Department of Animal Sciences.
- **Significant progress on OSU Wine Institute.** About \$1 million towards the \$2 million goal for the OSU Wine Institute directorship.
- **Pavilion progress.** More than \$1.2 million in cash, pledges, and bequests for an Animal Sciences Education and Research Pavilion and, also for the Pavilion, have opened \$2.4 million in proposals with prospective donors.
- **Scholarships and fellowships.** Established a number of new endowed scholarships and fellowships within our various units. Many of those are in the Department of Fisheries and Wildlife.
- **Nursery chair.** Working with industry leaders to establish a \$2.5 million endowed chair in Nursery Production and Plant Materials. The nursery industry is Oregon's number one "farm gate" product at more than \$1 billion annual contribution to Oregon's economy.

Other initiatives

Two departments celebrate 100 years of education and research

The departments of **Animal Sciences** and **Crop and Soil Science** this year jointly celebrated the centennial of their establishment. Events included a seminar series of invited speakers and culminated in June with social activities and a major address by New Mexico State University President **Mike Martin**, who spoke on the role of the Land Grant university in the 21st century. Martin is a former faculty member in the College of Agricultural Sciences.

Crop and Soil Science alumnus receives OSU Distinguished Service Award

Rollie Sears, considered to be a patriarch of wheat and plant breeding in the United States, was selected by the University as recipient of its **2007 OSU Distinguished Service Award**. Sears earned his doctorate at Oregon State in 1979. He has delivered outstanding performance in both the private and public sectors and served for seven years as the peer-elect chair of the National Wheat Improvement Committee. His sound counsel is often sought, and he has served on numerous U.S. Department of Agriculture review panels as well as a major review in 2004 of the International Center for the Improvement of Maize and Wheat in Mexico. Sears' work is widely published. In selecting him as 2007 recipient of this high award, the University recognized his leadership and vision that have **made a lasting difference in the global food system**.

Safety continues as an emphasis

Given its operations throughout the state, often involving heavy equipment, physical labor, animals, chemicals, and a sometimes almost-industrial environment, the College places strong emphasis on **safety training and safe work practices**. One recent acknowledgement of this was a review of the **East Greenhouse** and **West Greenhouse** by the State of Oregon Occupational Safety and Health Administration (OSHA) inspectors. Hard work and attention to safety by Greenhouse Manager **Jim Ervin** and staff paid off when the OSHA inspectors declared “**no violations**” and “**nothing in need of correction**” for the OSU Greenhouse facilities.

College Web site designed anew

The College will enter into the 2007-2008 school year with a new “face to the world.” After more than a year of behind-the-scenes work, the College of Agricultural Sciences has unveiled its new, visually attractive Web site that emphasizes ease of access to a wealth of information, especially for prospective and enrolled students. Under leadership of **Liz Webb**, the College’s research accountability program manager, the redesign project involved collaboration among Web designers and content managers in **University Publications**, **Central Web Services**, **Web Communications**, and **Extension and Experiment Station Communications**. The Web project was closely coordinated with **Betsy Hartley**, the College’s external relations and marketing director, to ensure a consistent “look-and-feel” between new student-related publications that Hartley was overseeing and the Web site. The Agricultural Sciences Web site is among the first in the University to embrace a new content management system introduced by Central Web Services that puts content control in the hands of subject-matter experts (but who are not necessarily “technology savvy” about creating Web pages).

Scorecard

Performance on metrics

Please see Appendix A for information provided by the Institutional Research office.

Departmental review

Academic departments in the College of Agricultural Sciences are reviewed regularly by the University and by external teams commissioned by the U.S. Department of Agriculture Cooperative State Research, Education, and Extension Service (CSREES). During the 2006-2007 period, a CSREES comprehensive review of the **Department of Fisheries and Wildlife** was combined with an OSU graduate and undergraduate review, with a highly positive outcome.

The review team noted that the faculty is highly qualified, diverse in expertise, strongly team-oriented and loyal to the department, program, and institution, and are regionally, nationally, and internationally recognized. The research productivity is high and relevant and the department has “outstanding rapport with state and federal agencies....” This relationship with agencies facilitates multidisciplinary, team-oriented research projects, conducted in Oregon and throughout the world. The department’s applied research program was seen as having critical importance to local, state, and regional issues. Undergraduate and graduate education programs were described as “sound, reflecting latest advances in natural resources science, management, and pedagogy. Graduate students are of high caliber, and are generally financially well-supported.” The team also noted ongoing initiatives by the department in promoting group problem-solving, internship experiences, outcomes assessment, diversity enhancement, and graduate student mentoring, among others.

Leveraging resources

Initiatives to leverage state resources

The single most important factor for this College in leveraging state resources comes down to clearly defining state needs, hiring highly competent faculty, and supporting their pursuit of outside research funding. Despite a serious loss of faculty FTE a few years ago, the College's success in securing grant funding continues. Recent data show that the ratio of external funds (in the Oregon Agricultural Experiment Station) to funds appropriated by the legislature is about 1.5 to 1; that is, for every state dollar Oregon invests, another \$1.50 in external funding is generated. Once again, the College of Agricultural Sciences secured **more new external research grants than any other college**. The College's research awards for 2006-2007 were more than **\$34 million**.⁴

Integrated Plant Protection Center attracts grants, distributes resources

In 2006, the College of Agricultural Sciences research metrics revealed that the Integrated Plant Protection Center (IPPC) returns **\$8.64 in external funding for every dollar of support it receives** from the Agricultural Experiment Station.

The IPPC seeks to obtain resources that can support programs: grants, contracts, and collaborative arrangements beyond IPPC between 2002 and 2007 were \$424,237, with \$393,146 already in hand for 2008-2009. IPPC is \$26,000 short of having distributed \$1,000,000 in funds to other programs since 1998.

Initiatives to improve administrative efficiencies

The College is continuing a gradual remodeling of administrative office space in contiguous space in Strand Agriculture Hall. Progress already made in the dean's office, associate deans' offices, the business office, the office of assistant director of the Oregon Agricultural Experiment Station and leader of the Extension Agriculture Program has generated significant improvements in operating efficiencies, coordination, and communication. **A new, state-of-the-art conference room** is the result of outstanding design by Experiment Station architect **Lowell Fausett** and technical counsel and services by **Rick Brand** and **Paul Phoenix** of OSU Media Services. The conference room accommodates up to 15 participants and can be linked simultaneously by videoconference to multiple distant locations. The facility will enhance administrative and management communications, make for easier committee participation by OSU faculty and staff at distant locations, and enable wider participation in seminars or presentations.

Assessment of 2006-2007 priorities

The College has continued to work on its previously identified goals, including those in the OSU Strategic Plan and those in the College's own plan. These include the goals of enhancing student success, increasing research, scholarship, and outreach, and enhancing diversity and community. All involve cultural change and persistence, arguing for "staying the course" as articulated in current plans, and adjusting our strategies as we continue to learn. This report is intended to characterize the progress made this year.

⁴ According to the OSU Research Office Proposal and Award Statistics, <http://oregonstate.edu/research/stats/dept.html>.

Major diversity enhancement efforts have focused on the completion of the survey mentioned earlier and development of strategies to advance our commitment to diversity and inclusivity.

As noted elsewhere, the College has, for the second successive year, exceeded its development goals that are part of the University's Capital Campaign. This has resulted from a coordinated team effort between the OSU Foundation and the College. Key members of the team include **Todd Bastian, Jack Holpuch, and Kevin Heaney** at the Foundation, and **Bill Boggess, Stella Coakley, Larry Curtis, Thayne Dutson, and Betsy Hartley** in the dean's office of the College. Not only have we exceeded our dollar goals but, perhaps more important, we have put in place relationships that will serve the interests of College, its students, and other stakeholders for years to come.

There is another kind of "development" effort that, for the Oregon Agricultural Experiment Station, is certainly equal to the Capital Campaign. It, too, is a joint effort, but with the OSU Extension Service and the OSU Forest Research Laboratory. This, of course, acknowledges the continuing attention of these OSU **Statewide Public Services** to program performance and accountability that wins biennial support from the **Oregon Legislative Assembly**. The team effort on behalf of the Statewide Public Services involves a number of people including Chancellor **George Pernsteiner** and President **Ed Ray**, but on a day-to-day basis is built on sound collaboration among **Thayne Dutson, Scott Reed, and Hal Salwasser**, with sustained support from OSU government relations director **Jock Mills**. Although we had initially proposed a greater increase, we still are pleased to note that the legislature **added approximately \$5 million** for the biennium beyond the continuing service level.

Finally, it has been essential that **Thayne Dutson**, as director of the regional **Sun Grant Center**, allocate significant time to be an active participant in collaborative **national leadership** of the program, along with counterparts from other Sun Grant institutions. Together, they have enlisted support of Congressional delegations and worked with senior executives of the federal departments of Agriculture, Transportation, and Energy. As a consequence, many in the top levels of these federal agencies are embracing the Sun Grant mission as relevant to those of their own agencies. **The resulting partnerships are enhancing and helping to secure the national Sun Grant budget.** For the sustained development of Sun Grant nationally, it is essential that this work continue.

Proposed priorities for 2007-2008

The provost annually requests a statement of personal priorities for academic deans. These are the priorities that Dean Thayne Dutson has identified as his for the 2007-2008 period.

Advance the programmatic priorities of the College of Agricultural Sciences and Oregon State University.

Both through personal leadership and through active support of others, the dean will advance the College's strategic goals 1 through 4 in education, research and outreach:

1. To build strength in biobased products (a goal related to the OSU Sun Grant Center);
2. To build excellence in ecosystem services;
3. To build excellence in food, nutrition, and health;
4. To build excellence in water and watersheds.

In the course of advancing these priorities, the dean will sustain the College's support for the University's six initiatives, especially the four in which the College already is making significant investment:

- Computational and Genome Biology
- Subsurface Biosphere Education and Research
- Sustainable Rural Communities
- Water and Watersheds.

Sustain and further build active engagement in the University's capital campaign

The dean will continue to allocate approximately 20 percent of his schedule to personal involvement with the College's development officers and its numerous constituencies to identify and cultivate donors consistent with the College's development priorities.

**Partner with the OSU Extension Service and OSU Forest Research Laboratory
in relating to the 2009 Oregon Legislative Assembly**

Because of the importance of the Statewide Public Services to the state's economic, social, and environmental well-being, the dean will allocate a substantial proportion of his time in late 2007 and in 2008 to ensure the centrality of the College's strategic plans, meeting with stakeholders, refining an already drafted Policy Option Package for the Oregon Agricultural Experiment Station, building and sustaining relationships with Oregon legislators and their staffs, working in collaboration with the University's governmental relations director and directors of the other two Statewide Public Services. A continuing goal will be to achieve some level of additional funding to address high priority needs identified by Oregon residents who look to these OSU programs for research and outreach.

Appendix A

Scorecard information

This information is provided by the Institutional Research office.

Metric #	Actuals (AY/FY)				College Targets
	2002-03	2003-04	2004-05	2005-06	
College of Agricultural Sciences					
Goal 1: Provide Outstanding Academic Programs					
2004-05 Themes: Increase research and outreach					
Increase diversity					
1.1 Expenditures from Grants and Contracts, and Other Sources ¹	\$66,072,334	\$65,716,755	\$64,965,137	\$69,593,406	\$65,000,000
1.2 Invention Disclosures ²	13	6	9	13	10
1.3 % of Faculty, Staff, and Students Comfortable with Climate for Diversity	N/A	82.7	N/A	N/A	N/A
1.4 % of U.S. Minority Students of Total College Enrollment	5.4	5.8	6.2	6.5	6.8
1.x.1 External Funds Generated per State Dollar Invested in Statewide Public Services (AES)	1.29	1.41	1.51	1.51	1.5
Goal 2: Improve the Teaching and Learning Environment					
2004-05 Themes: Improve student success and retention					
Increase diversity					
2.1 First Year Retention Rate (% Within College / % Within University)	73.0 / 85.3	71.4 / 84.4	74.1 / 84.4	76.3 / 82.7	75.0 / 84.0
2.2 6-Year Graduation Rate (% Within College / % Within University)	43.1 / 61.8	51.3 / 70.7	58.2 / 69.7	46.2 / 62.6	50.9 / 64.8
2.3 Undergraduate Degrees Awarded	284	293	290	266	280
2.4 Graduate Degrees Awarded	105	89	110	94	100
2.5 % of Seniors Participating in Student Engagement Activities / Number of Respondents	N/A	93.3 / 15	84.8 / 46	N/A	80.0
2.6 Student Primary Major to Faculty FTE Ratio / Student Course to Faculty FTE Ratio	23.5 / 15.7	24.9 / 17.9	24.7 / 17.5	21.7 / 16.0	25.0 / 18.0
Goal 3: Increase Revenues					
3.1 Awards from Grants and Contracts (# / \$) ¹	555 / \$29,368,256	668 / \$35,834,483	614 / \$35,891,976	669 / \$37,982,268	650 / \$36,000,000
3.2 Private Giving Revenue	\$1,168,796	\$1,827,412	\$1,495,628	\$2,993,339	\$3,250,000

¹ Invention Disclosure data for FY 2005 and 2006 is reported based on fiscal year, while data for 2002-03 and 2003-04 are based on calendar years. This change was made for '05 and '06 so that the numbers correspond to the data period requested by the annual Association of University Technology Managers (AUTM) survey, completed by the OSU Office of Technology Transfer.

² College of Agricultural Sciences award metrics include Agriculture Experiment Station (AES).

Note: For FY 2003, 2004, and 2005, all awards affiliated with both a campus department and the OSU Extension Service were reported under the affiliated campus department. Beginning FY 2006, these awards will be reported under the OSU Extension Service and not the campus department or college.

N/A - Not Applicable

Appendix B

The College's relevance to institutional priorities

Oregon State University
College of Agricultural Sciences

Strategic priorities and initiatives

OSU Strategic Plan Themes >>>	Enterprise, Technological Change, Innovation			Life Science, Public Health Services in Healthy Environment	Sustainability of the Earth and its Resources	Managing Natural Resources; Growing & Sustaining Industries	
	Sustainable Rural Communities	Biobased Products	NW Visioning, Innovation, and Productivity Center (VIP-SC); Community Seafood Initiative	Food, Nutrition, and Health	Ecosystem Services	Water and Watersheds	
CAS Strategic Plan Emphasis Areas + Two Other Focus Areas							Sustainable Agricultural Systems
OSU Strategic Initiatives & Oregon Inc. Signature Research Centers	Sustainable Rural Communities	Oregon Bio-Economy and Sustainable Technologies Center (BEST)		Computational Genome Biology ONAMI	Subsurface Biosphere	Water and Watersheds	Oregon Sustainable Agriculture Resource Center (OSARC)
Federal Initiatives	Sun Grant		Environmental Health Sciences Center (EHSC)		Superfund Center Proposal	Aquaculture and Fisheries CRSP	
The College's Policy Option Packages	Extension Community Sustainability Initiative	Bio-based Energy Systems	Food Innovation	Bio-based Health-promoting Products	Ecological or Ecosystem Services	Water, Watersheds, and Aquatic Resources	Viticulture and Enology; Sustainable Production and Marketing Systems