OREGON STATE UNIVERSITY

2013 Federal Priorities
Oregon State University has an unwavering commitment to excellence, service, innovation and leadership. Our world-class faculty inspire students to expand their horizons and develop the knowledge to achieve their goals. Our cutting-edge research and community outreach and engagement promote a healthy planet, wellness and economic progress.

OSU generates more than $2 billion in annual economic impact through our teaching, research, outreach and engagement. Our unique presence in each of Oregon’s 36 counties, establishes the university as a vital partner in workforce and economic development, locally focused research and public health.

We are proud and deeply committed to serve as Oregon’s land grant university – a charge we have carried out with determination for nearly 150 years. While OSU serves the people of the State of Oregon, we are also a national and international leader in a variety of fields, including childhood obesity, agriculture, forestry, oceanography, nanotechnology, metals manufacturing, clean technology, natural resources, and high tech health care.

We value our partnerships with the federal government particularly in the areas of student access, community outreach and scientific research.

OSU researchers successfully leverage support from key federal agencies – including NSF, USDA, DOD, DOE and NIH – to create solutions to global challenges. In 2011-12, OSU scientists earned more than $176 million in federal research grants and contracts, meriting more federal research funding than any other university in the Oregon University System.

OSU is committed to provide a world-class, affordable education for Oregonians. Each year, more than 4,000 of our students receive donor-funded scholarships and fellowships worth more than $7.5 million.

I look forward to building upon our strong partnership during the coming year to create a more vibrant future in this state, the nation and the world.

Sincerely,

Edward J. Ray
President
Oregon State University
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Oregon State University’s more than 26,000 students come from every county in Oregon, all 50 states and nearly 100 countries. This includes nearly 22,000 undergraduates and more than 4,500 graduate and professional students. OSU consistently enrolls more high achievers — including 170 valedictorians in 2012 — than any other Oregon public university. OSU also leads in the number of full-time resident students. In Fall 2012, Oregon State University enrolled 14,304 of these students, as compared to 13,265 at Portland State University and 11,633 at the University of Oregon. OSU-Cascades enrolls an additional 215 full-time resident students.

Oregon State Student Enrollment by Oregon County* – Fall 2012
Total students from Oregon*: 17,487

*Best estimation of assignment by county; does not reflect all Oregon resident students.
Source: Enrollment Summary Fall Term 2012, Office of Academic Planning and Assessment, Oregon State University, November 2012.
Oregon State University Fall Term 2012 Enrollment by Academic College* and Student Level

<table>
<thead>
<tr>
<th>Academic Unit</th>
<th>College of Agricultural Sciences</th>
<th>College of Business</th>
<th>College of Earth, Ocean, and Atmospheric Sciences</th>
<th>College of Education</th>
<th>College of Engineering</th>
<th>College of Forestry</th>
<th>College of Liberal Arts</th>
<th>College of Pharmacy</th>
<th>College of Public Health and Human Sciences</th>
<th>College of Science</th>
<th>College of Veterinary Medicine</th>
<th>Graduate School</th>
<th>University Exploratory Studies Program</th>
<th>Total</th>
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<tbody>
<tr>
<td>Undergraduate</td>
<td>1,946</td>
<td>3,034</td>
<td>535</td>
<td>13</td>
<td>4,949</td>
<td>811</td>
<td>3,475</td>
<td>3,007</td>
<td>3,053</td>
<td></td>
<td></td>
<td>989</td>
<td>21,812</td>
<td></td>
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<tr>
<td>Graduate</td>
<td>338</td>
<td>268</td>
<td>207</td>
<td>334</td>
<td>958</td>
<td>175</td>
<td>205</td>
<td>26</td>
<td>260</td>
<td>15</td>
<td>854</td>
<td></td>
<td>3,993</td>
<td></td>
</tr>
<tr>
<td>First Professional</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>223</td>
<td>588</td>
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<tr>
<td>Total</td>
<td>2,284</td>
<td>3,302</td>
<td>742</td>
<td>347</td>
<td>5,907</td>
<td>986</td>
<td>3,680</td>
<td>391</td>
<td>3,267</td>
<td>238</td>
<td>854</td>
<td>989</td>
<td>26,393</td>
<td></td>
</tr>
</tbody>
</table>

Top 10 States — Fall 2012
Total out-of-state enrollment: 6,520**

17,487 OREGON
2,024 CALIFORNIA
1,204 WASHINGTON
377 HAWAII
191 IDAHO
188 COLORADO
176 TEXAS
158 NEVADA
139 ARIZONA
121 ILLINOIS
120 NEW YORK

Top 10 Foreign Countries — Fall 2012
Total international student enrollment: 2,362***

933 CHINA
286 SAUDI ARABIA
120 SOUTH KOREA
102 INDIA
67 IRAN
60 TAIWAN, REPUBLIC OF CHINA
59 THAILAND
56 KUWAIT
55 INDONESIA
46 CANADA

Thanks to an innovative collaboration with INTO University Partnerships, OSU’s international student population has nearly doubled since 2007. In 2012, international enrollment grew to 2,362 students, a 27.5 percent increase over 2011 and nearly nine percent of the overall student population.

*Unduplicated headcount based upon student’s primary college.
**Residency based on student fee status.
***Foreign countries are based upon countries of citizenship.
Source: Enrollment Summary Fall Term 2012, Office of Academic Planning and Assessment, Oregon State University, November 2012.
of Oregon State University undergraduate and graduate students received need-based federal financial aid in the 2011-12 school year.

### 2011-12 Federal Financial Aid at Oregon State

<table>
<thead>
<tr>
<th>Type of Financial Aid</th>
<th>Number of students</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Pell Grants</td>
<td>8,014</td>
<td>$30,159,493</td>
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<tr>
<td>Federal Work-Study Program</td>
<td>666</td>
<td>$989,595</td>
</tr>
<tr>
<td>Federal Supplemental Education Opportunity Grants</td>
<td>1,045</td>
<td>$989,561</td>
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<tr>
<td>Perkins Loans</td>
<td>1,377</td>
<td>$3,129,463</td>
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<tr>
<td>Federal Ford Direct Loans</td>
<td>13,653</td>
<td>$145,535,454</td>
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</table>

#### Pell Grants

<table>
<thead>
<tr>
<th>Year</th>
<th>Pell Grant Recipients</th>
<th>Total Pell Grant Payments</th>
<th>% of Tuition Fees Covered by Maximum Pell Grant</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005-06</td>
<td>4,449</td>
<td>$11,487,130</td>
<td>75%</td>
</tr>
<tr>
<td>2010-11</td>
<td>7,224</td>
<td>$29,397,456</td>
<td>77%</td>
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</table>

OSU’s 3-year default rate is **4.2%** compared to the national average of 13.4 percent.
The 2013 edition of the Fiske Guide to Colleges named Oregon State University a Best Buy School, one of only 41 colleges and universities nationwide and one of only two in the Pacific Northwest.

Financial Aid dollars – 2011-12
Total: $229,673,214

- Work Study: $989,595 (<1%)
- Loans: $156,451,495 (68%)
- Grants: $36,446,699 (16%)
- Scholarships: $35,785,425 (16%)
- Work Study: $989,595 (<1%)

Tuition and Fees Per Student

<table>
<thead>
<tr>
<th></th>
<th>Undergraduate*</th>
<th>Graduate**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Resident</td>
<td>Non-Resident</td>
</tr>
<tr>
<td>FY 2008</td>
<td>$5,911</td>
<td>$18,187</td>
</tr>
<tr>
<td>FY 2013</td>
<td>$8,138</td>
<td>$22,322</td>
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</table>

*Oregon University System Academic Year Fee Book 2011-12. Assume 15 credit hours. All majors except business, engineering and some forestry and public health and human sciences majors, which have higher differential tuition.

**Oregon University System Academic Year Fee Book 2011-12. Assume 12 credit hours. All majors except business, engineering, master of public health and professional science masters, which have higher differential tuition.

Source: Oregon State University Office of Financial Aid and Scholarships, January 2012.
Oregon State Payroll by County 2011
Total payroll from Oregon: $349,409,366

Source: OSU Office of Human Resources
Includes all paid Oregon State University faculty and staff, student employees and graduate assistants. Does not include OSU Foundation or OSU Alumni Association employees.

Oregon State Alumni Count by County 2012
Total Alumni from Oregon: 92,141

Source: Active Alumni
Demographic Data report, OSU Foundation, December 2011.
Financial Profile

Source of Funds – FY 2012
Total: $819,597,000

- Other Revenue: $63,723,000 (8%)
- Auxiliary Enterprises: $109,245,000 (13%)
- Sales and Services: $31,770,000 (4%)
- Gifts, Grants and Contracts: $240,494,000 (29%)
- Student Tuition and Fees: $202,573,000 (25%)
- Federal Appropriations: $8,009,000 (1%)
- County Appropriations: $7,047,000 (1%)
- State Appropriations: $127,971,000 (16%)
- Capital and Debt Service Appropriations: $13,811,000 (2%)
- Capital Grants and Gifts: $14,954,000 (2%)

Source of Funds – FY 2007
Total: $611,150,000

- Other Revenue: $51,499,000 (8%)
- Auxiliary Enterprises: $72,714,000 (12%)
- Sales and Services: $28,492,000 (5%)
- Gifts, Grants and Contracts: $165,248,000 (27%)
- Student Tuition and Fees: $119,764,000 (20%)
- Federal Appropriations: $7,677,000 (1%)
- County Appropriations: $5,521,000 (1%)
- State Appropriations: $145,508,000 (24%)
- Capital and Debt Service Appropriations: $6,076,000 (1%)
- Capital Grants and Gifts: $8,651,000 (1%)

Source: Oregon University System Audited Financial Statements. Using FY07 numbers restated for comparison to FY12 presentation.
Oregon State’s Research Enterprise

Oregon State University is ranked in the Carnegie Foundation’s top tier for “very high research activity” and is one of only two research universities in America to hold the federal land, sea, space and sun grant designations simultaneously. OSU is the leading public research institution in the Oregon University System, receiving approximately half of the total federal research funding in OUS (see graph on page 11).

In 2011–12, Oregon State scientists earned nearly $281 million in research contracts and grants. In addition:

DEVELOPMENT

Three new start-up companies were created — Applied Exergy, CLJV, and MicroFlow CVO
47 new patent applications were submitted
74 new invention disclosures were submitted

REVENUE

$4,220,000 in licensing income was generated from commercialization activities

AGREEMENTS

127 material transfer agreements
126 confidentiality agreements
Three option agreements
108 exclusive and nonexclusive license agreements

Source: Proposal and Award Statistics, OSU Research Office; OSU Office for Commercialization and Corporate Development.
Competitively Awarded OSU Grants and Contracts by Federal Agency
FY 2007-08 to FY 2011-12

Oregon University System Federal Research Dollars Awarded
5-year trends by institution*

OSU’s contribution in federal research dollars awarded is consistently around 50% of the OUS total.

*Based on OUS count.
**Does not include statewide Public Service Programs.
***Includes EOU, SOU, WOU and OIT.
Source: Oregon State University Research Office; Oregon University System 2012 Fact Book.
By the Numbers

Based on fall 2012 enrollment, unless otherwise noted.

1,039 enrolled students, including 801 upper division and graduate students and 238 attending classes at COCC.

50% of graduates are first in their family to attend college (2010).

76% of students are from Central Oregon. 18% are from other Oregon communities. 6% are from out of state.

42% of students transfer from COCC.

50% of students plan to live and work in Central Oregon after graduating (2010).

16 academic majors offered.

1,939 degrees awarded since founding in 2001.

$1.8 million in scholarships awarded since 2001 through the OSU Foundation.

16 students on average in upper-division courses.

274 students engaged in internships, practicums and study abroad programs with businesses, organizations and agencies in Central Oregon and around the world in 2012.

1,200 community members attended lectures in Central Oregon presented by OSU faculty researchers from Bend and Corvallis.

Powered by the resources of Oregon State University

Oregon State University - Cascades is OSU’s branch campus in Bend and the first and only branch campus in Oregon. It is the only undergraduate and graduate degree-granting institution in Central Oregon.

Central Oregon’s university

OSU-Cascades was established more than a decade ago based on a grassroots effort by Central Oregonians to bring a university to the region. In 2000, the Oregon University System selected OSU to administer a campus that would offer upper-division and graduate coursework toward bachelor’s and master’s degrees in a 2+2 partnership with Central Oregon Community College. The new university opened its doors in September 2001.
Creating a four-year undergraduate experience

After record enrollment growth and demonstrated financial support from the surrounding community, in August 2012 the Oregon University System endorsed OSU-Cascades’ expansion to a four-year campus. The branch campus plans to add freshman and sophomore courses beginning in fall 2015 and establish a physical campus near downtown Bend. To learn more, visit OSUCascades.edu/4.

Degree programs that matter locally and globally

OSU-Cascades offers degree programs that meet both local and global demand for sustainable enterprises in energy, natural resources public health and recreation and tourism. The spectacular living-learning laboratory of Central Oregon provides an incubator for experiential learning shaped by OSU’s strengths in engineering, science, business and the humanities. The vibrant campus continues to develop a uniquely Central Oregon orientation to OSU’s strategic emphases.

Student Profile

- Most students are from Central Oregon.
- 32 percent attended local high schools.
- Students are slightly older than traditional university students.
- More than 75 percent are enrolled full-time.
- Women comprise 56 percent of undergraduate students.
- About 9 percent of students self-identify as representing a minority.

Facility excellence

OSU-Cascades’ 34 full-time faculty include a Distinguished Professor of Art History, a Fulbright Fellow and Max Planck Institute for Economics research fellow, a finalist for the Oregon Non-Fiction Book of the Year award, a Fellow of the International Canadian Studies Institute and several published authors.
100+ years of service to Oregonians and the Oregon economy

Oregon State University’s three Statewide Public Service Programs — the OSU Extension Service, Agricultural Experiment Station and Forest Research Laboratory — have been improving quality of life and bolstering the state’s economy for more than a century.

Serving Oregon’s 36 counties

Since 1911, the OSU Extension Service has been providing research-based educational programs across the state. A total of 194 Extension faculty are located on the Corvallis campus and in each of Oregon’s 36 counties. Programs focused on agriculture, family and community health, forestry, 4-H youth development and marine resources help Oregonians of all ages and in both rural and urban settings solve problems, develop skills and manage resources wisely. A statewide network of 14,048 volunteers works with OSU Extension Service faculty to lead programs such as 4-H, Master Gardeners, nutrition and health assistance and others. OSU Extension Service programs reach an estimated 2.1 million Oregonians every year — nearly two thirds of the state’s population.

Extending our Land Grant Mission

Written by U.S. Rep. Justin Smith Morrill of Vermont and signed into law by President Abraham Lincoln, the Morrill Act provided grants of federal lands to fund the establishment of public universities in each state, extending higher education from the privileged few to the many. The land grant colleges inspired learning, promoted innovation and helped to grow vibrant local economies.

In 1868, the Oregon Legislative Assembly designated Corvallis College as the state’s land grant college, providing access to education, practical, problem-solving research and outreach programs in communities statewide. It is a charge we have carried out with determination for nearly 150 years and one we continue to apply to the needs of the 21st century.

194 faculty

+14,048 volunteers

2.1 million Oregonians served every year
Oregon is our campus

OREGON STATE UNIVERSITY is the only college or university in Oregon that can claim a presence in each of Oregon’s 36 counties. The 64 physical locations are supplemented by the virtual presence of OSU Extended Campus and Oregon Open Campus programs, making the university a vital partner in workforce and economic development, locally focused research, public health assistance and other issues.

Hatch Act: The Hatch Act of 1887 established a sustainable federal funding stream for state agricultural experiment stations. The Hatch Act authorized direct payment of federal grant funds to each state to establish agricultural experiment stations under the direction of each state’s land grant college. These funds provide each state with basic infrastructure, scientific expertise and facilities for conducting research. Hatch Act FY12 funding was $2,479,560 for Oregon State and $236,300,000 nationwide.

Smith-Lever Act: The Smith-Lever Act of 1914 established a stable federal funding stream for cooperative extension programs. Current extension education programs are creating social, economic and environmental benefits. Extension programs contribute to economic growth; sustainable agricultural, forestry and marine production methods; improved health and wellness of limited-income populations; positive rural development; and disaster management, responding to the diverse needs of Oregonians. Smith-Lever Act FY12 funding was $4,533,989 for Oregon State and $294,000,000 nationwide.

McIntire-Stennis Act: The McIntire-Stennis Act of 1962 provides ongoing federal funds in a federal-state partnership to support university-level forestry research. Research efforts of faculty and graduate students have focused on sustainable, healthy forests that provide economic, social and ecosystem benefits to the state, region and nation. The scientific results and management technologies developed from a variety of research activities are delivered to policy makers, forest managers, forest land owners and other scientists. McIntire-Stennis Act FY12 funding was $1,061,001 for Oregon State and $32,900,000 nationwide.
Farming for the Future

The Amstad family grows potatoes, research and community

In Umatilla County, food is not just part of life three times a day — it is life. There are nearly two million acres of irrigated land in this part of the Columbia Basin, and from it comes potatoes, wheat, watermelons, alfalfa and many other crops. Trucks loaded with produce leave the farms in a constant stream, headed to Portland, California and beyond.

For more than 50 years, the Amstad family has farmed with an eye towards improvement — not just for their business, but also for their community. Tony Amstad started Amstad Produce in Sherwood in 1959, and when demand for his potatoes outstripped supply, he moved most of the growing operations to Eastern Oregon.

Collaborating with OSU researchers from the Hermiston Agricultural Research and Extension Center (HAREC), the Amstads have opened their fields for research trials and supplied potatoes for field tests. The family tracks research through the center and has served on its advisory board.

Recently, Hermiston growers struggled with silver scurf, a fungal disease that attacks potatoes. Researchers were flummoxed by the biology of the fungus. Was it coming from the seeds or the soil? Through tests conducted on local fields, including the Amstads’, researchers discovered that the pathogen spreads through daughter tubers planted as seed, and they soon discovered ways to control the fungus and limit the impact of silver scurf.

That kind of research is essential, and it takes patience from the landowner, says Phil Hamm, superintendent of HAREC and a plant pathologist. Test plots require adherence to strict protocols, which means farmers have to conduct all of their normal operations — watering, fertilizing and harvesting — without disturbing the test area.

The Amstads aren’t the only growers in the region who value OSU research. HAREC has served as a community resource in the Columbia Basin for more than 100 years. In that role, modest state and federal investments have been leveraged by donations of money and equipment over the years to meet the community’s needs. From a new pesticide facility to lab equipment, area growers and food producers have graciously, and continuously, supported the station.

“Whenever I need something from the Amstads, or any of the potato growers here, they’re very willing to collaborate,” Hamm says. “The growers have made this station what they consider their station, and they have put up the dollars to say that.”
Faculty, staff and administrators in the College of Public Health and Human Sciences are working collaboratively to ensure the college is accredited by the Council on Education for Public Health (CEPH). Accreditation will bring national reputation, peer recognition and new resources to OSU, and the college will serve as an economic engine as part of federal and state investments in health reform. More specifically, accreditation will allow OSU to apply for more than $100 million per year in federal grants and service contracts awarded only to accredited colleges of public health. In addition, accreditation will help the college recruit and retain talent in Oregon to solve emerging, local public health problems.

The formal application to become the state's first accredited college of public health was approved June 18, 2011. During 2010-11, PHHS made strategic investments and completed key activities necessary to gain accreditation, including hiring the required number of core public health faculty members, developing curricula and competencies for new academic programs and recruiting students for those programs. The college is now conducting a self-study, to be completed in June, with the ultimate objective of formal accreditation by the end of 2013.

Throughout the accreditation process, faculty members have made great strides in interdisciplinary understanding and partnerships that support collaborative research, inspirational learning and outstanding scholarship. The college's strengths in public health, human development and family sciences, nutrition and exercise science are essential to achieving the university's strategic goal of improving human health and wellness. With an increasing ecological focus on social, behavioral and environmental determinants of health, these disciplines complement traditional public health programs in promoting and protecting public health. Within the OSU Division of Health Sciences, PHHS is allied with the colleges of Veterinary Medicine and Pharmacy, where the Master of Public Health (MPH) is offered as a double degree with a Doctor of Veterinary Medicine (DVM) or Doctor of Pharmacy (Pharm.D.).

College faculty members conduct research and scholarship that has significant, day-to-day impact locally, nationally and globally. This impact is represented in projects that attract significant federal funding, as well as community-focused projects with long-term meaningful and translational outcomes for individuals, families, communities and populations.
Closing in on $1 billion goal
With gifts totaling nearly $888 million at the end of 2012, The Campaign for OSU is rapidly approaching its goal of $1 billion by the end of 2014. Priorities for the final phase of the campaign focus on attracting top faculty and high-achieving students and supporting commercialization of research innovations.

Faculty endowments
Campaign donors have funded 64 of Oregon State’s 111 endowed positions, helping attract faculty from some of the world’s leading institutions. The Provost’s Faculty Match Program, which has established or expanded 22 endowments, has entered a second phase with the potential of leveraging an additional $10 million in private support.

Scholarships
More than 40 percent of Oregon State’s incoming students had a GPA of 3.75 or higher in 2012. The Campaign for OSU has raised $150 million for both merit- and need-based scholarships. The Presidential Scholarship Initiative provides matching funds to help raise an additional $10 million in endowed scholarships.

Investing in world-class facilities
The Campaign for OSU has funded 23 major construction projects across campus, including these recent milestones:

Completed
» Student Success Center
» Whyte Track and Field Center
» James E. Oldfield Animal Teaching Facility
» Joyce Collin Furman Hall renovation (formerly Education Hall)
» Native American Cultural Center

In Progress
» Centro Cultural César Chávez
» Basketball Practice Facility

Groundbreaking in 2013
» Austin Hall (College of Business)
### Federal Scientific Research Priorities

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<thead>
<tr>
<th><strong>Agriculture Bill</strong></th>
<th><strong>$ In millions</strong></th>
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<tbody>
<tr>
<td>Agriculture and Food Research Initiative (AFRI)</td>
<td>264.5</td>
</tr>
<tr>
<td>Hatch Act Funds</td>
<td>236.3</td>
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<tr>
<td>Smith-Lever Funds 3(b) and 3(c)</td>
<td>293.9</td>
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<tr>
<td>McIntire-Stennis Cooperative Forestry</td>
<td>32.9</td>
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<thead>
<tr>
<th><strong>Commerce, Justice, Science Bill</strong></th>
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<tr>
<td>National Science Foundation (NSF)</td>
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<tr>
<td>NSF, Major Research Equipment and Facilities (MREFC)</td>
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<tr>
<td>National Aeronautics and Space Administration (NASA), Science Mission Directorate</td>
<td>4,945.0</td>
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<tr>
<td>NASA, Space Grant</td>
<td>46.0</td>
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<tr>
<td>National Oceanographic and Atmospheric Administration (NOAA)</td>
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<td>NOAA, Sea Grant</td>
<td>61.3</td>
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<tr>
<td>NOAA, Oceanic and Atmospheric Research (OAR)</td>
<td>427.0</td>
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<th><strong>Defense Bill</strong></th>
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<td>Department of Defense Basic Research (6.1)</td>
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<td>Department of Energy (DOE), Office of Science</td>
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<td>DOE, Advanced Research Projects Agency for Energy (ARPA-E)</td>
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<td>DOE, Office of Science, Energy Frontier Research Centers (EFRC)</td>
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<tr>
<td>DOE, Energy Efficiency and Renewable Energy (EERE), Water Power R&amp;D Account</td>
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<th><strong>Interior, Environment Bill</strong></th>
<th><strong>$ In millions</strong></th>
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<tr>
<td>United States Geological Survey (USGS), Water Resources Research Institute (WRRI)</td>
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</tr>
<tr>
<td>USGS, Climate Science Centers</td>
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</tr>
<tr>
<td>USGS, Cooperative Fish and Wildlife Research Units</td>
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<tr>
<td>Environmental Protection Agency (EPA), Office of Science and Technology</td>
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four research cores in the university’s Center for Healthy Aging Research: diet and genetic factors, musculoskeletal factors, psychosocial factors and gerontechnology. They earn an interdisciplinary minor in aging sciences in addition to a Ph.D.

**United States Department of Agriculture (USDA)**

Oregon State researchers are successfully using support from the U.S. Department of Agriculture to promote agricultural sustainability, aid rural development, improve food security and preserve natural resources. USDA support for OSU research during fiscal years 2008-2012 totaled more than $160 million, with more than $35 million in FY12 alone.

**Climate Impacts on Cereal Crops**

For 80 years, OSU researchers have studied wheat from every angle, including disease resistance, yield potential, milling and baking qualities, soil erosion and pesticide use. Growers are now key participants in a $20 million USDA-funded study of climate impacts on cereal crops in the Pacific Northwest. Along with Washington State University and the University of Idaho, OSU is looking at how grain crops will fare under future climate conditions. The research will increase understanding for adapting cropping practices to fit changing climate dynamics.

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**National Impacts of Federal Research**

As a partner with government agencies and a steward of federal dollars, Oregon State conducts high-quality research with national and international implications. Our research emphasizes:

- Relevance: We create high-impact solutions to the pressing needs of local and global communities in order to ensure a healthy and sustainable world.
- Integration: Our transdisciplinary research addresses needs with transformative approaches, both basic and applied, both short-term and long-term.
- Collaboration: We collaborate locally, nationally and internationally with communities, industries, academia and the public and private sector.
- Leadership: We lead the research community and educate and mentor the next generation of leaders.
- Accessibility: We openly exchange ideas, approaches, data and results while protecting intellectual property.
With support from NIFA’s Organic Research and Extension Initiative, OSU vegetable breeder Jim Myers leads the Northern Organic Vegetable Improvement Collaborative, providing to growers services aimed at sustainable production, including education on seed production and processing, farmer-led plant breeding and on-farm variety trials.

**Agriculture Policy Research Centers**

Oregon State and the University of California, Davis have been awarded a multi-year grant from the National Institute of Food and Agriculture (NIFA) to conduct agricultural policy research to inform the USDA and Capitol Hill decision makers. The project will inform the debate over policies, including those included in the Farm Bill, that affect agriculture, food, rural communities and ecosystem services. It will also serve as an authority on issues relevant to the Western U.S., providing high-quality, objective economic analysis of agricultural, rural community, food system, natural resource and environmental policy issues, as well as complementing traditional agricultural policy analysis of federally subsidized commodities by focusing on regional topics such as specialty crops, food concerns, rural well-being and conservation.

**Collaboration for Land Management**

Lisa Gains and Steve Tesch are Oregon State leads on the Forest Service Integrated Landscape Assessment Project (ILAP), a partnership of federal and state agencies, universities and other organizations devoted to developing methods, data and models for integrated, collaborative large landscape assessments across all wildland ownerships in Oregon, Washington, Arizona and New Mexico. The project involves 57 people and will inform land management planning to restore watersheds, promote wildlife habitats and support the economic well-being of communities.

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**National Institutes of Health (NIH)**

Oregon State researchers are successfully using support from the National Institutes of Health to better understand human aging and improve health throughout the lifespan. NIH support for OSU research during fiscal years 2008–2012 totaled more than $120 million, with more than $23 million in FY12 alone.

**Supplementing Health**

OSU’s Linus Pauling Institute (LPI) is one of the nation’s first two NIH/National Center for Complementary and Alternative Medicine (NCCAM) Centers of Excellence. An international leader in research and education about micronutrients and antioxidants, the LPI is one of a few centers in the U.S. to focus entirely on health promotion and disease prevention. The NIH provides ongoing support to LPI researchers.

Recent NCCAM-funded projects include a grant for the competitive renewal of the Center of Excellence Research on CAM Antioxidant Therapies (CAM–CERCAT). This brings together the expertise of Balz Frei and numerous other faculty from LPI and from Oregon Health and Science University. The work has already led to a paradigm shift in understanding how antioxidants function in the body, aiding the development of new modalities that reverse cell and tissue dysfunctions. CERCAT is working to better understand the mechanisms of action and to test the efficacy of modalities that have the potential to substantially improve the body’s resistance to chronic disease and aging.

**Public Health**

Peggy Dolcini contributes to prevention of HIV and STDs. With funding from the National Institute of Mental Health and the National Institute of Child Health & Human Development, her research is leading to the development and evaluation of intervention programs for high-risk adolescents, plus translation to public health practice.

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**Diet in Cancer Prevention**

Epigenetics is a major new NIH research priority. Dietary factors have been shown to de-repress epigenetically-silenced genes in cancer cells. Oregon State’s Roderick Dashwood leads National Cancer Institute-fund research aimed to better understand how beneficial epigenetic changes can be brought about by dietary agents, to identify and characterize biomarkers that can be applied in the clinical setting, and to evaluate those biomarkers. Research utilizes an epigenetic/translational biomarkers core, while addressing the application of dietary indoles and isothiocyanates for cancer intervention.

**Infectious Diseases**

The National Institute of Allergy and Infectious Diseases (NIAID) has funded Luiz Bermudez’s research on the mechanisms of pathogenesis of intracellular bacteria, with focus on mycobacteria. Mycobacteria are a common cause of infections in humans and animals. Mycobacterium avium, an environmental bacterium, commonly causes disseminated disease in patients with AIDS and pulmonary infection in patients with chronic lung disease, cystic fibrosis, and in elderly women. Mycobacterium tuberculosis infects a third of the world population and is responsible for 3 million deaths annually. Mycobacterium avium subsp paratuberculosis is an important agriculture pathogen causing Johne’s disease, a wasting disease in cattle. Mycobacteria also infect fish, and a number of species causing disease have been isolated.
**Department of Defense (DOD)**

Oregon State researchers are successfully using DOD support to help enhance national security through scientific and engineering contributions to critical systems, platforms and programs. DOD support for OSU research during fiscal years 2008–2012 totaled almost $78 million, with approximately $13 million in FY 2012 alone.

**Ocean Dynamics**

With Office of Naval Research (ONR) funding, work by OSU researchers in the National Ocean Partnership Program (NOPP) led to development of the ocean observing system off the Oregon coast that tracks the complexities of subsurface circulation. The program sets the stage for ongoing advances that will help to predict ocean climate changes, forecast weather, develop pollution controls, aid in rescues and help commercial operations. The NOPP project also furthered understanding of wind-driven ocean circulation and how physics structures the ecosystem and can lead to low-oxygen dead zones in the ocean.

**Wave Energy**

The Northwest National Marine Renewable Energy Center (NNMREC), a partnership between Oregon State and the University of Washington, is one of three DOE National Marine Renewable Energy Centers. Led by OSU’s Belinda Batten, NNMREC’s mission is to advance wave and tidal energy technology through research, education, outreach and engagement. In January, NNMREC selected Newport for the first utility-scale, grid-connected wave energy test site in the U.S.

**Carbon Cycle Science**

DOE’s Office of Science has supported the work of College of Forestry researcher Beverly Law, who advises national and international policymakers about carbon cycle science and the role of forests in global climate change. Law’s research contributes to understanding how forest ecosystems respond to disturbances and to climate variation. As the science lead for the AmeriFlux network, Law has helped develop a high-quality database to synthesize observations.

**Fuel for High-Performance Research Reactors**

OSU nuclear engineer Brian Woods has received funding from the DOE and Idaho National Laboratory to study the behavior of nuclear reactor–specific fuel elements under prototypical thermal hydraulic conditions. Objectives of study are to collect a database of hydraulic information needed to qualify the proposed fuel for the high-performance research reactors. Topics to be explored include experimental and computational fluid dynamics, nuclear reactor thermal-hydraulics and reactor safety.

**Pipeline Repair**

Collaboration among OSU chemical engineer Skip Rochefort’s Polymer Research Team, Timberline Tool and the National Energy Technology Laboratory has created an external repair technology for damaged or defective polyethylene gas pipelines in situ, eliminating the need for large-scale isolation, excavation and replacement of pipe sections. This safe, rapid, cost-effective technology is in the final phases of commercialization.

**Department of Energy (DOE)**

Oregon State researchers are successfully using DOE support to advance the science behind innovative energy technologies. DOE support for OSU research during fiscal years 2008–2012 totaled more than $64 million, with more than $12 million in FY 2012 alone.

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**Miniature and Microscale**

The U.S. Air Force Office of Scientific Research (AFOSR) has funded research by OSU chemist Vincent Remcho on analysis and materials for macro- and nanotechnology. Current work on microsystems development for investigating gold nanoparticle synthesis aims to develop methods for manufacturing uniformly sized inorganic nanoparticles in a microsystem. The work focuses on gold nanoparticles because of the possibility of...
manufacturing them with exacting size and shape specificity. Results of the highly interdisciplinary and collaborative work will have applications in biofuels and alternative energy, clinical chemistry, synthetic biology, as well as in furthering nanotechnology.

DOD AFOSR has also funded research by Robert Tanguay to study safer nanomaterials and nanomanufacturing. Project tasks include developing a rapid in vivo system for determining the biological activity and toxic potential of manufactured nanoparticles, rapid screening for in vivo effects from nanomaterial exposure, identifying cellular targets and modes of action for engineered nanomaterials, developing a nanomaterials effects database and probing the biological impacts of functionalized nanoparticles. Tanguay’s studies, often using the advantages of the zebrafish model, are helping to improve human and environmental health.

**Tsunami Research and Outreach**

Dan Cox, Patrick Corcoran, and other OSU experts address the needs of communities at risk for tsunamis. Their research helps to understand the effects tsunamis have on structures and evaluate potential evacuation routes. In one NOAA–funded project, scientists crashed miniature waves into a scale physical model of a town. Outreach efforts included education for public officials, emergency response teams and residents, with strategies for preparedness and survival.

**Research and Response**

Oregon State is home to a NOAA National Sea Grant College Program that focuses on ocean and coastal use and conservation. Oregon Sea Grant supports research driven by state and regional priorities and extends engagement and education to industry, government agencies and the public. Among Sea Grant’s strengths is quick and effective response to pressing issues, including tsunami preparedness and coastal resilience to climate change.

**Department of Commerce (DOC)**

Oregon State researchers are successfully using Department of Commerce support to promote economic development, environmental stewardship and technological advancement. DOC support for OSU research during fiscal years 2008–2012 totaled almost $62 million, with more than $14 million in FY12 alone.

**NOAA Cooperative Institutes**

The OSU/NOAA Cooperative Institute for Marine Resources Studies (CIMRS) represents a strong, long-term partnership dedicated to research, graduate and public education and cooperation with regional industries and communities. An integral part of Oregon State’s Hatfield Marine Science Center (HMSC) and colocated with three regional NOAA laboratories representing two line offices, CIMRS brings together research partners from a variety of disciplines, addressing complex issues relating to the living and non-living components of the marine environment.
National Aeronautics and Space Administration (NASA)

Oregon State researchers are successfully using support from the National Aeronautics and Space Administration to enhance knowledge, education, innovation, economic vitality and stewardship of the Earth. NASA support for OSU research from fiscal years 2008–2012 totaled more than $28 million, with almost $7 million in FY12 alone.

Wildlife Recovery and Response

Barred owls are expanding into the Pacific Northwest and are likely competing with northern spotted owls for habitat — an issue with broad implications for the recovery of this threatened species. The U.S. Geological Survey (USGS) has been a major sponsor of research investigating the species’ relationship to each other; funding has also come from the Bureau of Land Management (BLM) and the U.S. Fish and Wildlife Service. David Wiens, an OSU Ph.D. student and USGS scientist, was lead author of the study.

Dan Roby’s Fisheries and Wildlife Lab at Oregon State uses energetics and nutritional approaches to wildlife management issues. His USGS projects include an analysis of long-term changes in marine bird populations due to the 1989 Exxon Valdez oil spill in Alaska. Roby has also conducted a U.S. Fish and Wildlife Service-sponsored satellite telemetry study of endangered short-tailed albatrosses, which has increased understanding of response to spatial and temporal variability in the pelagic environment.

Forest Restoration

John Bailey leads a Bureau of Land Management-sponsored study of fire regimes, forest change and restoration of forested plant associations in Oregon’s Middle Applegate Watershed. Outcomes will help to identify and determine applicability of restoration activities, as well as balance potential short-term compromises with long-term forest health and resilience.

Ocean Productivity

Mark Abbott, Dean of the College of Earth, Ocean, and Atmospheric Sciences (CEOAS), pioneered the use of satellite ocean color observations in analysis of surface ocean physical/biological coupling. A member of NASA’s Earth Observing System team, Abbott was instrumental in the inclusion of spectral bands in the Moderate Resolution Imaging Spectroradiometer (MODIS) used to estimate light emission by algae in the surface ocean. Collaborating with fellow CEOAS researcher Ricardo Letelier, Abbott developed the original algorithms used to measure this chlorophyll fluorescence signal from space and to estimate the fraction of light absorbed by algae that is reemitted as fluorescence — a potential indicator of the phytoplankton physiological state. These studies formed the basis for current analysis of MODIS and Medium Resolution Imaging Spectrometer ocean color data. Abbott and Letelier have maintained the Direct Broadcast station at Oregon State, providing MODIS data off North America’s West Coast, a platform for NASA’s remote sensing research, direct readout software testing, education and outreach.
Protecting Endangered Whales
Bruce Mate, director of OSU’s Marine Mammal Institute, uses the Active Response Gravity Offload System (ARGOS) environmental receiver package on selected National Ocean and Atmospheric Administration (NOAA) weather satellites to provide near real-time locations of tagged endangered whales worldwide. He uses funds from NASA’s National Ocean Partnership Program to evaluate the satellite telemetry tracks and remote sensing environmental data to characterize habitat preferences for blue, fin, humpback and gray whales in the California Current System, which in turn provide a spatial decision support system to help reduce impacts from human activities. The same system is used to discover and protect breeding and calving areas to help the western North Pacific gray whale population recover, as well as to inform managers of risks from oil and gas developments.

Department of Transportation (DOT)
Oregon State researchers are successfully using support from the U.S. Department of Transportation to help ensure a fast, safe, efficient, accessible and convenient transportation system. Support to OSU from USDOT during fiscal years 2007–2012 totaled almost $23 million, with almost $4 million in FY 2012 alone.

Robust Bridges
Jason Ideker, co-director of the Green Building Materials Laboratory and assistant professor in the School of Civil and Construction Engineering, has led a team that’s developing shrinkage-threshold limits and robust testing protocols for high-performance concrete to be used in building better bridge decks. The DOT Federal Highway Administration is the major sponsor. Suppliers will be able to easily determine material compliance, and the significant reduction in cracking will increase deck life and reduce the cost of inspections and repair.

Stronger Bridge Connections
OSU structural engineer Christopher Higgins specializes in evaluation and strengthening methods for gusset plates in steel truss bridges. With support from the DOT/Research and Innovative Technology Administration (RITA) and the Oregon Department of Transportation (ODOT), researchers are taking advantage of previously developed apparatuses and methods in the university’s O.H. Hinsdale Research Laboratory. The multi-institutional team designed and constructed a near full-scale representation of the connection that caused the 2007 collapse of the I–35W bridge in Minneapolis. Outcomes included field inspection guidance and strengthening designs to retrofit deficient connections, plus engagement with K-college students and a technology pull by agencies and industry.

Biomass Fuels
Supported by the DOT’s Western Region Sun Grant Program, Russ Karow and colleagues in the Department of Crop and Soil Science have been making biomass shed maps of the Pacific Northwest to determine the potential quantity and quality of biomass sources and to estimate the harvest costs of crop residues as feedstocks. They are also exploring ways to optimize biomass production on existing acreages through relay cropping or dedicated production, as well as possibilities for residue harvest from dryland cereal and the Conservation Reserve Program.
Among infectious diseases in humans, 60 percent have animal origins. And the economic impact of these diseases can be enormous. For example, salmonella costs the U.S. economy $1 billion annually in medical costs and lost productivity.

Supporting the One Health Initiative

The Oregon State University College of Veterinary Medicine supports the global One Health initiative, encourages communication and collaboration between health care disciplines to combat the growing prevalence of animal diseases communicable to humans. The goals of the initiative are simple: accelerate biomedical research discoveries and increase the effectiveness of public health efforts.

Work at the College of Veterinary Medicine is focused on three One Health areas:

» Research on mycobacterial diseases such as tuberculosis.
» Research using animal models to investigate human health.
» Collaborative work with national agencies to test for cross-species disease transmission.

Scientists in the College of Veterinary Medicine are trained in comparative biology and frequently collaborate with colleagues in a wide variety of fields including physical science, public health, social science and engineering. They are also uniquely qualified to use animal models in the study of human disease, allowing them to maximize each research dollar.
Critical research currently underway includes:

» NIH-funded investigation of the use of micronutrients such as vitamin D to improve memory function in the elderly.

» NIH-funded research on the use of a common malaria drug to treat tuberculosis, a highly contagious disease which kills two to three million people worldwide every year.

A State Resource

The College of Veterinary Medicine serves an important public health function for the state by managing the Veterinary Diagnostic Laboratory (VDL), which is part of the U.S. Food and Drug Administration’s National Animal Health Laboratory Network. The VDL investigates and diagnoses contaminations and outbreaks, including tests for rabies, West Nile virus, Hanta virus and other animal-related diseases within the state’s borders.

Global travel, international trade and population growth provide increased opportunities for animal/human contact and for pathogens to flourish. This reality requires our public health agencies to overcome challenges never imagined fifty years ago. By incorporating both human and animal health fields, the College of Veterinary Medicine contributes to health and productivity in Oregon, across the U.S. and throughout the world.
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