OREGON STATE UNIVERSITY

2014 Federal Priorities
Oregon State University is Oregon’s statewide university — defined and distinguished by its authenticity, commitment to inclusive excellence, collaboration and innovation. The university is an internationally recognized research institution and a leader in promoting a healthy planet, wellness and economic progress.

Last year marked my 10th year as president of OSU. As I reflect on the past decade and Oregon State’s mission as a 21st century land grant and international research university, I am pleased to share with you our accomplishments and meaningful contributions to those we serve.

Over the past decade:

• OSU’s enrollment has soared by 53 percent to nearly 29,000 students, making OSU Oregon’s largest university on the basis of credit hours delivered.

• Our online enrollment has increased by nearly 400 percent to nearly 3,800 students. Ecampus has expanded to 33 degree programs and is ranked among the top online programs nationwide.

• The number of degrees awarded by Oregon State each year has grown steadily, with 5,256 graduates in 2013 — a new record.

• Research funding has increased by 69 percent to $263 million in 2013.

• Record-breaking philanthropy has put Oregon State among the top echelon of universities nationwide. The Campaign for OSU will conclude this year having raised well more than $1 billion.

I value OSU’s partnerships with the federal government, particularly in the areas of student access, community outreach and scientific research.

OSU takes very seriously its land grant mission to bring economic prosperity and higher education to Oregonians. This fall, OSU enrolled 17,657 Oregon resident students, making Oregonians 63.2 percent of our total student population. Oregonians represent nearly 75 percent of our undergraduate students attending OSU on the Corvallis and OSU-Cascades campuses.

OSU’s globally recognized research enterprise is a leader in climate science, wave energy, conservation biology, open source software, forestry, agriculture, nutrition and other fields. OSU researchers are renowned leaders in their fields, and successfully leverage support from key federal agencies — including the National Science Foundation, the U.S. Departments of Agriculture, Defense, Energy, Education and Interior, the National Oceanic and Atmospheric Administration and the National Institutes of Health. Numerous OSU administrators, faculty and researchers advise state and federal agencies in areas of national and global importance.

To better guide the university’s mission and to accelerate our momentum over the next 10 years, OSU has established an independent governing board of trustees. The trustees, who officially take office in July 2014, will be responsible for establishing policies for university operations, establishing tuition and fees, guiding academic programs, approving the university’s budget proposal to the state and appointing and employing the university’s president.

On behalf of the Oregon State University community and our many diverse stakeholders, I look forward to working with you during the coming year to advance the health, prosperity and success of Oregon and the nation. Thank you for your ongoing service and support.

Sincerely,

Edward J. Ray
President
Oregon State University’s nearly 29,000 students come from every county in Oregon, all 50 states and U.S. territories and 58 foreign countries. This includes more than 23,000 undergraduates and more than 4,700 graduate and professional students. OSU continues to attract high-achieving students. Thirty-nine percent of incoming freshmen from Oregon high schools had a GPA of 3.75 or higher, and 149 of these students were the valedictorians of their high schools. Among public universities in Oregon, OSU leads in the number of full-time resident students. In fall 2013, OSU enrolled 14,318 full-time resident students, as compared to 13,145 at Portland State University and 11,280 at the University of Oregon. OSU-Cascades enrolls an additional 271 full-time resident students.

### Oregon State Student Enrollment by Oregon County* – Fall 2013

<table>
<thead>
<tr>
<th>Total students from Oregon*</th>
<th>17,657</th>
</tr>
</thead>
</table>

*Best estimation of assignment by county; does not reflect all Oregon resident students.**

### Oregon State Student Enrollment by Oregon County* – Fall 2013 (continued)

<p>| Oregon State University Fall Term 2013 Enrollment by Academic College* and Student Level |
|----------------------------------|------------------|</p>
<table>
<thead>
<tr>
<th>Academic College</th>
<th>Undergraduate</th>
<th>Graduate</th>
<th>First Professional</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>College of Agricultural Sciences</td>
<td>2,161</td>
<td>346</td>
<td>362</td>
<td>2,507</td>
</tr>
<tr>
<td>College of Business</td>
<td>3,156</td>
<td>309</td>
<td>362</td>
<td>3,465</td>
</tr>
<tr>
<td>College of Earth, Ocean, and Atmospheric Sciences</td>
<td>511</td>
<td>219</td>
<td>221</td>
<td>730</td>
</tr>
<tr>
<td>College of Education</td>
<td>5,682</td>
<td>1,076</td>
<td>28</td>
<td>7,358</td>
</tr>
<tr>
<td>College of Engineering</td>
<td>820</td>
<td>191</td>
<td>28</td>
<td>1,039</td>
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<tr>
<td>College of Forestry</td>
<td>3,083</td>
<td>274</td>
<td>274</td>
<td>3,357</td>
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<tr>
<td>College of Liberal Arts</td>
<td>3,143</td>
<td>394</td>
<td>394</td>
<td>3,537</td>
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<tr>
<td>College of Public Health and Human Sciences</td>
<td>19</td>
<td>39</td>
<td>39</td>
<td>58</td>
</tr>
<tr>
<td>College of Pharmacy</td>
<td>783</td>
<td>19</td>
<td>19</td>
<td>987</td>
</tr>
<tr>
<td>College of Science</td>
<td>987</td>
<td>145</td>
<td>145</td>
<td>27,925</td>
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<tr>
<td>Graduate School</td>
<td>4,179</td>
<td>223</td>
<td>223</td>
<td>545</td>
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<tr>
<td>University Exploratory Studies Program</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
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<tr>
<td>Total</td>
<td>23,161</td>
<td>783</td>
<td>783</td>
<td>27,925</td>
</tr>
</tbody>
</table>

*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 2013, Office of Institutional Research, Oregon State University, November 2013.

### Top 10 States — Fall 2013

<table>
<thead>
<tr>
<th>State</th>
<th>Total out-of-state enrollment: 7,285**</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Oregon</td>
<td>17,657</td>
</tr>
<tr>
<td>2. California</td>
<td>2,382</td>
</tr>
<tr>
<td>3. Washington</td>
<td>1,308</td>
</tr>
<tr>
<td>4. Hawaii</td>
<td>377</td>
</tr>
<tr>
<td>5. Texas</td>
<td>212</td>
</tr>
<tr>
<td>6. Colorado</td>
<td>196</td>
</tr>
<tr>
<td>7. Idaho</td>
<td>192</td>
</tr>
<tr>
<td>8. Nevada</td>
<td>163</td>
</tr>
<tr>
<td>9. Arizona</td>
<td>152</td>
</tr>
<tr>
<td>10. Florida</td>
<td>145</td>
</tr>
</tbody>
</table>

Top 10 Foreign Countries — Fall 2013

<table>
<thead>
<tr>
<th>Country</th>
<th>Total international student enrollment: 2,859***</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. China</td>
<td>1,255</td>
</tr>
<tr>
<td>2. Saudi Arabia</td>
<td>297</td>
</tr>
<tr>
<td>3. South Korea</td>
<td>120</td>
</tr>
<tr>
<td>4. India</td>
<td>116</td>
</tr>
<tr>
<td>5. Iran</td>
<td>84</td>
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<tr>
<td>6. Oman</td>
<td>75</td>
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<tr>
<td>7. Indonesia</td>
<td>73</td>
</tr>
<tr>
<td>8. Taiwan, Republic of China</td>
<td>64</td>
</tr>
<tr>
<td>9. Canada</td>
<td>54</td>
</tr>
<tr>
<td>10. Japan</td>
<td>52</td>
</tr>
</tbody>
</table>

Thanks to an innovative collaboration with INTO University Partnerships, OSU’s international student population has almost tripled since 2008. In 2013, international enrollment grew to 2,859 students, a 21 percent increase over 2012 and more than 10 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 2013, Office of Institutional Research, Oregon State University, November 2013.
FINANCIAL AID BY THE NUMBERS

2012–13 Federal Financial Aid at Oregon State

<table>
<thead>
<tr>
<th>Type of Financial Aid</th>
<th>Number of Students</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pell Grants</td>
<td>8,410</td>
<td>$31,961,065</td>
</tr>
<tr>
<td>Federal Work-Study Program</td>
<td>991</td>
<td>$929,910</td>
</tr>
<tr>
<td>Federal Supplemental Education Opportunity Grants</td>
<td>2,067</td>
<td>$1,040,453</td>
</tr>
<tr>
<td>Perkins Loans</td>
<td>2,443</td>
<td>$3,618,279</td>
</tr>
<tr>
<td>Federal Ford Direct Loans</td>
<td>13,987</td>
<td>$10,818,151</td>
</tr>
</tbody>
</table>

Pell Grants

- **2007-08**: 4,287 recipients, $12,007,204 total payments, 74% of tuition fees covered by maximum Pell Grant
- **2012-13**: 8,410 recipients, $31,961,065, 69% of tuition fees covered by maximum Pell Grant

OSU’s 3-year default rate is **6.1%**, compared to the national average of 14.7 percent.

Financial Aid dollars – 2012–13

Total: $247,840,660

- Scholarships: $81,007,526 (33%)
- Work Study Grants: $52,145,038 (21%)
- Loans: $163,758,186 (66%)

Tuition and Fees Per Student

<table>
<thead>
<tr>
<th>Year</th>
<th>Undergraduate</th>
<th>Graduate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Resident</td>
<td>Non-Resident</td>
</tr>
<tr>
<td>FY 2009</td>
<td>$6,187</td>
<td>$16,823</td>
</tr>
<tr>
<td>FY 2014</td>
<td>$8,322</td>
<td>$23,354</td>
</tr>
</tbody>
</table>

* Oregon University System Academic Year Fee Book 2013–14. 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 2013–14. Assume 12 credit hours. All majors except business, engineering, master of public health and professional science masters, which have higher differential tuition.


BEST BUY SCHOOL

The 2014 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 three in the Pacific Northwest. This is the third time in four years OSU has made the list.

FISKE • BEST BUY SCHOOL •

GUIDE TO COLLEGES

Oregon University System Academic Year Fee Book 2013–14. 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 2013–14. Assume 12 credit hours. All majors except business, engineering, master of public health and professional science masters, which have higher differential tuition.
**Source of Funds – FY 2008**

**Total:** $689,618,000

- **State Appropriations:** $131,950,000 (19%)
- **Capital and Debt Service Appropriations:** $4,776,000 (1%)
- **Federal Appropriations:** $4,972,000 (1%)
- **County Appropriations:** $37,124,000 (5%)
- **Capital Grants and Gifts:** $17,671,000 (3%)
- **Gifts, Grants and Contracts:** $170,809,000 (25%)
- **Student Tuition and Fees:** $125,710,000 (18%)
- **Other Revenue:** $72,160,000 (10%)
- **Auxiliary Enterprises:** $79,219,000 (11%)
- **Sales and Services:** $31,613,000 (5%)
- **Capital and Debt Service Appropriations:** $4,776,000 (1%)
- **Federal Appropriations:** $4,972,000 (1%)
- **County Appropriations:** $37,124,000 (5%)
- **Capital Grants and Gifts:** $17,671,000 (3%)
- **Gifts, Grants and Contracts:** $170,809,000 (25%)
- **Student Tuition and Fees:** $125,710,000 (18%)
- **Other Revenue:** $72,160,000 (10%)
- **Auxiliary Enterprises:** $79,219,000 (11%)
- **Sales and Services:** $31,613,000 (5%)

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**Source of Funds – FY 2013**

**Total:** $876,371,000

- **State Appropriations:** $134,191,000 (15%)
- **Capital and Debt Service Appropriations:** $19,250,000 (2%)
- **Federal Appropriations:** $9,139,000 (1%)
- **County Appropriations:** $31,344,000 (12%)
- **Capital Grants and Gifts:** $31,105,000 (3%)
- **Gifts, Grants and Contracts:** $234,659,000 (27%)
- **Student Tuition and Fees:** $228,436,000 (26%)
- **Other Revenue:** $86,611,000 (10%)
- **Auxiliary Enterprises:** $124,422,000 (14%)
- **Sales and Services:** $35,401,000 (4%)
- **Capital and Debt Service Appropriations:** $19,250,000 (2%)
- **Federal Appropriations:** $9,139,000 (1%)
- **County Appropriations:** $31,344,000 (12%)
- **Capital Grants and Gifts:** $31,105,000 (3%)
- **Gifts, Grants and Contracts:** $234,659,000 (27%)
- **Student Tuition and Fees:** $228,436,000 (26%)
- **Other Revenue:** $86,611,000 (10%)
- **Auxiliary Enterprises:** $124,422,000 (14%)
- **Sales and Services:** $35,401,000 (4%)

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**Oregon State Payroll by County 2013**

Total payroll from Oregon: $369,914,068

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 2013**

Total Alumni from Oregon: 96,505

Source: Active Alumni Demographic Data report, OSU Foundation, December 2013.

**FINANCIAL PROFILE**

**Source of Funds – FY 2013**

Total: $876,371,000

**Source of Funds – FY 2008**

Total: $689,618,000

Source: Oregon University System Audited Financial Statements, using FY08Auditory increase for comparison to FY13 presentation.
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 the OUS (see graph on page 11).

In 2012-13, Oregon State faculty earned more than $263 million in research contracts and grants. In addition:

DEVELOPMENT
Five new start-up companies were created: Northwest Medical Isotopes, LLC; CSd Nano LLC; Online Labs, LLC; OilEx Tech, LLC; Amorphyx Inc.

62 new patent applications were submitted
80 new invention disclosures were submitted

REVENUE
$7,765,984 in licensing income was generated from commercialization activities

AGREEMENTS
117 material transfer agreements
344 confidentiality agreements
88 option agreements
88 exclusive and nonexclusive license agreements

Source: OSU Office for Commercialization and Corporate Development.

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

*Based on OUS count.
**Does not include statewide Public Service Programs.
***Includes EOU, PSU, WOU and OIT.

OSU’s Federal Agency Awards – FY 2012-13
Total Federal Agency Awards: $153,777,287

OSU Externally Funded Awards – FY 2012-13
Total: $263,431,625

Competitively Awarded OSU Grants and Contracts by Federal Agency
FY 2008-09 to FY 2012-13

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

PERCENT
Launched in early 2013, the Oregon State University Advantage connects businesses with faculty expertise, student talent and world-class facilities to provide research solutions, help bring ideas to market and launch companies. Already, the OSU Advantage is making an impact through its three programs:

**Advantage Partnerships** develops collaborations with industry, matching faculty expertise and student talent with companies across Oregon. This includes three jointly funded projects with Hewlett-Packard, as well as ongoing relationships with Intel, Portland General Electric, Daimler Trucks and Blount International.

The **Advantage Impact** program negotiated agreements licensing Oregon State research innovations to four Corvallis-based startup companies: CSD Nano, NW Medical Isotopes, Online Labs and Amorphyx. The University Venture Development Fund has provided additional financial support.

The **Advantage Accelerator** offers a variety of business consulting resources, entrepreneurial expertise and networking with investors and strategic partners to help launch successful startups. The program chose its first 13 companies in July 2013, a mix of Oregon State faculty and student research concepts in clean energy, health care, e-commerce and other fields.

2014 is a signature year for Oregon State’s College of Public Health and Human Sciences (PHHS). Pending accreditation, it will become Oregon’s first accredited college of public health, bolstering its visibility and reputation, as well as its ability to attract committed students and faculty.

Accreditation ensures the college has the resources to educate the next generation of globally minded public health and human sciences professionals, research new ways to ensure health across the lifespan and continue its community partnerships through OSU Extension programs.

The field of public health focuses on the 90 percent of factors that make us healthy — our biology, environment, lifestyle and behavior — rather than health care delivery, which influences 10 percent of human health. As a result, the college is well-positioned to improve health, lower health care costs, affect health system change and work to prevent the leading causes of death, disease and injury.

The college is also launching a center on global health — which joins three existing PHHS research centers — and is at the forefront of a national movement to integrate its curriculum across all academic disciplines. These include public health, nutrition, exercise and sport science, and human development and family sciences.
Expanding to a four-year university

OSU-Cascades fulfills a 30-year grassroots effort to bring a university to Central Oregon. Since opening in 2001, OSU-Cascades has steadily expanded academic programs and awarded more than 2,000 degrees. Based on record enrollment growth – 44 percent since 2009 – and community financial support, the Oregon University System endorsed OSU-Cascades’ expansion to a four-year university, with freshman and sophomore classes scheduled to begin in fall 2015. Enrollment is expected to reach 3,000 to 5,000 students by 2025.

Building a new campus

OSU-Cascades has purchased properties totaling 56 acres on Bend’s west side to build the new campus. Preliminary designs for the first phase of development feature a dining hall, academic buildings and two residence halls in a pedestrian-focused layout that takes advantage of mountain views. OSU-Cascades is collaborating with the City of Bend, Deschutes County and community and business leaders on its expansion plans.

Academic excellence, world-class faculty, community partnerships

OSU-Cascades has developed degree programs to meet the education, economic and community needs of Bend and Central Oregon, as well as global demand for qualified graduates in energy, natural resources, health, recreation and tourism and other fields. OSU-Cascades has more than 40 full-time faculty, including distinguished professors, recipients of prestigious fellowships and awards, published authors and leading researchers in energy systems, public health, business and the humanities. OSU-Cascades is a vibrant part of the community, partnering with more than 150 businesses, government agencies and nonprofits in Central Oregon for student internships, research and economic development.
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 FY13 funding was $2,244,615 for Oregon State and $218,300,000 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 FY13 funding was $4,112,436 for Oregon State and $271,600,000 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 FY13 funding was $94,793 for Oregon State and $30,400,000 nationwide.

Identifying potential invasive species
When a 66-foot dock from Japan washed up on the beach near Newport, Ore., in 2012, it highlighted the potential threat of invasive species — one of the long-lasting effects of natural disasters like the 2011 Japanese tsunami.

Sam Chan is Oregon Sea Grant Extension’s expert on aquatic invasive species. He says much of debris from the tsunami — with all sorts of aquatic plant and animal life clinging on — is currently swirling around the ocean in what’s known as the Great Pacific Garbage Patch. But some potentially invasive species, such as the Asian shore crab, the Northern Pacific starfish and wakame seaweed, have been found near Vancouver, British Columbia. Chan has been working with his Canadian counterparts to identify these invaders and prevent them from crowding out native species and causing other ecological and economic damage.

Oregon is our campus
OREGON STATE UNIVERSITY has 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.
Long recognized internationally for excellence in marine sciences, Oregon State University is leading new research and education initiatives on the Oregon coast. Growth is coming to the university’s Hatfield Marine Science Center (HMSC) in Newport. President Ed Ray met with coastal leaders in summer 2013 about developing undergraduate programs and curriculum that would bring some 500 students to a residential campus.

In addition, plans are underway to expand research capacity and infrastructure at HMSC, where the National Oceanic and Atmospheric Administration (NOAA), U.S. Environmental Protection Agency, U.S. Department of Agriculture, U.S. Fish and Wildlife Service, U.S. Geological Survey and the Oregon Department of Fish and Wildlife collaborate with the university on marine science research.

The National Science Foundation (NSF) last year chose Oregon State to lead the design and construction of as many as three new coastal research vessels. Oregon State will receive nearly $3 million for the design phase, and if all three vessels are built, the total grant is projected to reach $290 million over 10 years.

These developments build on other major initiatives in Newport, including the relocation of NOAA’s Pacific marine fleet to Newport and the Ocean Observatories Initiative, a $386 million NSF-funded project jointly led by Oregon State’s College of Earth, Ocean, and Atmospheric Sciences.
Federal Scientific Research Priorities

<table>
<thead>
<tr>
<th>Program</th>
<th>FY 2013 Estimated (pre-seq)*</th>
<th>Omnibus FY 2014</th>
<th>President’s FY 2015 Request</th>
<th>USDA’s FY 2015 Request</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture Bill</td>
<td>$ in millions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agriculture and Food Research Initiative (AFRI)</td>
<td>277</td>
<td>316.4</td>
<td>325</td>
<td>360</td>
</tr>
<tr>
<td>Hatch Act Funds</td>
<td>218.3</td>
<td>243.7</td>
<td>244</td>
<td>244</td>
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<tr>
<td>Smith-Lever Funds 3(b) and 3(c)</td>
<td>271.6</td>
<td>300</td>
<td>300</td>
<td>300</td>
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<tr>
<td>McIntire-Stennis Cooperative Forestry</td>
<td>30.4</td>
<td>33.9</td>
<td>34</td>
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<tr>
<td>Commerce-Justice-Science Bill</td>
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<tr>
<td>National Science Foundation (NSF)</td>
<td>6,901</td>
<td>7,172</td>
<td>7,255</td>
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<td>National Aeronautics and Space Administration (NASA), Science Mission Directorate</td>
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<td>5,151</td>
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<td>NASA, Space Grant Program</td>
<td>(40)</td>
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<td>24</td>
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<tr>
<td>National Oceanographic and Atmospheric Administration (NOAA), Oceanic and Atmospheric Research (OAR)</td>
<td>369</td>
<td>416</td>
<td>462</td>
<td>462</td>
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<tr>
<td>NOAA, OAR, Sea Grant</td>
<td>62</td>
<td>62.8</td>
<td>63.4</td>
<td>80</td>
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<tr>
<td>Defense Bill</td>
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<td></td>
</tr>
<tr>
<td>Department of Defense (DOD), Science and Technology (6-1-6.3)</td>
<td>12,147</td>
<td>12,185</td>
<td>11,515</td>
<td>12,389</td>
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<tr>
<td>DOD, Science and Technology, Basic Research (6.1)</td>
<td>2,150</td>
<td>2,167</td>
<td>2,017</td>
<td>2,230</td>
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<tr>
<td>DOD, Defense Advanced Research Projects Agency (DARPA)</td>
<td>2,817</td>
<td>2,778</td>
<td>2,914</td>
<td>2,914</td>
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<tr>
<td>Energy and Water Development Bill</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Department of Energy (DOE), Office of Science</td>
<td>(4,875)</td>
<td>5,066</td>
<td>5,111</td>
<td>5,223</td>
</tr>
<tr>
<td>DOE, Advanced Research Projects Agency for Energy (ARPA-E)</td>
<td>(265)</td>
<td>280</td>
<td>325</td>
<td>325</td>
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<td>DOE, Energy Efficiency and Renewable Energy (EERE), Water Power R&amp;D Account</td>
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<td>Interior-Environment Bill</td>
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<td>United States Geological Survey (USGS), Water Resources Research Institute (WRRI)</td>
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<td>6.5</td>
<td>3.5</td>
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<td>Environmental Protection Agency (EPA), Office of Science and Technology</td>
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<td>Labor-Health and Human Services—Education Bill</td>
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<td>Health and Human Services (HHS), National Institutes of Health (NIH)</td>
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<td>29,900</td>
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<tr>
<td>USAID, Feed the Future Innovation Labs (Partially Collaborative Research Innovation Labs)</td>
<td>(31.5)</td>
<td>32</td>
<td>Not Referenced</td>
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FEDERAL SCIENTIFIC RESEARCH PRIORITIES

The figures in parentheses represent the FY13 appropriated amounts, before across-the-board cuts to adjust for the FY13 budget caps per the American Taxpayer Relief Act of 2012 and before the cuts from the sequestration.

National Impacts of Federal Research

Oregon State University’s globally recognized research enterprise has more than doubled in the past decade. The university is a pacesetter in research on climate science, wave energy, conservation biology, open-source software, forestry, agriculture, nutrition and other fields. Oregon State researchers are renowned leaders who are designing the next generation of ocean-going research vessels, developing new green materials, creating a national ocean-observing program, exploring multiple sources for renewable energy, and determining ways to enhance wellness as people age. Oregon State researchers advise state and federal agencies and international research organizations in areas of national and global importance.

Developing algorithms to model bird migration

Thomas Dietterich and an Oregon State computer science team have developed machine learning algorithms to model bird migration. As part of the BirdCast project led by the Cornell Lab of Ornithology, these algorithms extract information on biomass, migration direction and speed from Doppler radar scans. When combined with weather forecasts and volunteer observations, this information helps scientists infer migration patterns and factors that affect where and how far birds fly. Dan Sheldon, Dietterich’s former post-doc, now at the University of Massachusetts, Amherst, led the radar work. Knowledge of migratory behavior can help inform decisions for placement of wind turbines and nighttime lighting of tall buildings. The project has received funding from the NSF Division of Information and Intelligent Systems. The algorithmic models that link with weather parameters, topography and bird identification will advance the utility of radar data for the scientific community.

Oregon State’s priorities are national and global importance and to advise state and federal agencies and international research organizations in areas of national and global importance.

More precise data informs U.S. crop insurance program

Oregon State’s Chris Daly has developed one of the nation’s most sophisticated weather and climate analysis systems, and with support from the USDA’s Risk Management Agency, Daly’s PRISM system is helping to improve the efficiency and integrity of the federal crop insurance program. Refined over 20 years, the PRISM system factors topography into climate parameters such as precipitation and temperature, and can provide precise daily estimates of weather and climate conditions across the nation. The program is helping farmers, producers and insurance companies to improve the underwriting process and saving taxpayer dollars in the $120 billion crop insurance program.

Managing the threat of stink bugs for orchards and specialty crops

The brown marmorated stink bug is an extremely invasive and damaging pest, first identified in Portland in 2004 and spreading throughout the Willamette Valley and Columbia Gorge by 2012. The first significant damage to Oregon orchard crops, small fruit, vegetables and ornamentals was seen in 2013. Peter Shearer, an entomologist at Oregon State’s Mid-Columbia Agricultural Research and Extension Center in Hood River, Ore., is leading research funded by the USDA’s Agricultural Research Service to characterize the stink bug’s biology.

U.S. Department of Agriculture (USDA)

USDA support for Oregon State research during the past five years has totaled almost $169 million, including more than $33 million in FY13.
**Department of Health and Human Services (HHS)

HHS support for Oregon State research during the past five years has totaled more than $118 million, including $13.6 million in FY13.

**Exploring antioxidant therapies to resist chronic disease and aging

Oregon State's Linus Pauling Institute (LPI) is an international leader in research and education about micronutrients and antioxidants, focusing closely on health promotion and disease prevention. Current research funding from renewal of the Center of Excellence for Research on Complementary and Alternative Medicine Antioxidant Therapies (CERCAT) is led by LPI director Bari Frey and LPI faculty members Tony Hagin and Joe Beckman, in collaboration with faculty at Oregon Health & Science University (OHSU). Their work has led to a new understanding of how antioxidants function in the body, supporting development of new treatments that reverse cell tissue dysfunctions. Research is ongoing to better understand the mechanisms of action and to test the efficacy of protocols with the potential to substantially improve the body’s resistance to chronic disease and aging — allowing people to enjoy good health longer.

**Microtechnology makes portable dialysis possible

More than 400,000 Americans with end-stage kidney disease depend on regular dialysis treatments to keep them alive. Most spend hours every week in centers hooked to a machine the size of a refrigerator. Microchannel technology, developed by Oregon State nuclear engineer Andrew Klein and his colleagues, has created a prototype of the compressor that is the size of a refrigerator. Microchannel kidney disease depend on regular dialysis to enjoy good health longer.

**An affordable home filling station for natural gas vehicles

The scarcity of natural gas refueling stations in the U.S. has been a big obstacle to the growth of natural gas as a primary vehicle fuel. Chris Hagen, an assistant professor of Environmental Health Sciences (NIEHS), through a training grant, has provided support for dozens of Oregon State graduate students and postdoctoral scientists in the area of technological and health science. Fast pumps train prominent positions in the academic, private and government sectors. Robocare is a new company that teamed up with NIEHS Toxicology Training Grant, has also received substantial NIEHS support to advance the use of zebrafish as a model organism to study anti-infectives. Tanguay pioneered the use of zebrafish for environmental health sciences. Zebras offer many advantages because like humans, they are vertebrates and share many of the same genes, but they are transparent and develop in a matter of days instead of months. The main goal is to determine what chemicals in the environment pose a risk to humans.

**Department of Energy (DOE)

DOE support for Oregon State research during the past five years has totaled more than $68 million, including $15.6 million in FY13.

**Robots replicate how people walk

Jonathan Hurst, head of Oregon State’s Dynamic Robotics Lab, is leading a multi-institute project that has produced prosthetic legs and robots that can navigate rough terrain to aid in disaster response or on dangerous missions. The innovations, achieved through a multi-institute project that has produced robots named ATRIAS, one sent to Carnegie Mellon University, one to the University of Michigan and that remains at Oregon State. ATRIAS is the first machine to demonstrate a smart, maz-walk, which reproduces the fundamental physics of animal and human walking. This approach has the potential for agile, efficient walking and running over unpredictable, rough terrain, meeting or exceeding the performance of animals and humans. The innovations, supported by the Defense Advanced Research Projects Agency (DARPA) support, will enable exoskeletons, prosthetic legs and robots that can navigate rough terrain to aid in disaster response or on dangerous missions.

**Improving accuracy for detecting data anomalies

The South China Sea is one of the world’s most important commercial shipping routes — for fishing, trade and energy resources — and it is also one of the world’s most dangerous, according to a new study by Oregon State researchers. Monsoons bring wind and rain, very strong tides, and the fast, warm currents of the Kuroshio create a natural laboratory for the study of mixing in the ocean and the impacts on marine ecology and productivity. In a long-range, basic and applied research effort for the Office of Naval Research, Oregon State oceanographers Hitig Shepman and Emily Shroyer are leading a coordinated effort to assess the processes that drive mixing in the South China Sea using novel scientific instruments. In a long-range, basic and applied research effort for the Office of Naval Research, Oregon State oceanographers Hitig Shepman and Emily Shroyer are leading a coordinated effort to assess the processes that drive mixing in the South China Sea using novel scientific instruments. In a long-range, basic and applied research effort for the Office of Naval Research, Oregon State oceanographers Hitig Shepman and Emily Shroyer are leading a coordinated effort to assess the processes that drive mixing in the South China Sea using novel scientific instruments.

**Department of Defense (DOD)

DOD support for Oregon State research during the past five years has totaled more than $118 million, including $15.6 million in FY13.

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**Improving management of marine resources

Oregon State’s Cooperative Institute for Marine Resources Studies (CIMRS) is a long-term, strategic collaboration between NOAA and university researchers in areas where critical research
The Research Consortium (CIRC), which was Oregon State leads the Climate Impacts. Making informed decisions about delivery, presentation and aggregation, along with accurate tracking of acidification, hypoxia rescue missions. The data also provides fast navigation and has better informed search and respond immediately to input concerning at-sea monitoring devices, eight labs monitor underwater gliders and stationary and floating oceans and estuaries of the Pacific Northwest. Ocean Observing Systems (NANOOS), which to the Northwest Association of Networked habitats Protecting people, property and essential habitat for Pacific coast groundfish. and updated Oregon Coastal maps to identify essential habitat for Pacific coast groundfish. Planning for the Future and Resilience Oregon and Washington, and existing and developing social and built environments. Approaches for fine-grained and updated time scales for climate change and has also created tribes in the Pacific Northwest to study impacts of the 52 federally recognized Native American

Managing cultural and natural resources in the context of climate change Oregon State serves as the central location and administrative center of the Northwest Climate Science Center, established by the DOI in 2010 to address the challenges climate change brings to the Pacific Northwest. A joint effort of Oregon State, the University of Washington, and the University of Oregon, the center also taps into the scientific expertise of the U.S. Geological Survey. The center has worked with the 12 federally recognized National Native American tribes in the Pacific Northwest to study impacts of climate change and has also developed an annual Climate Boot Camp — a unique, weeklong interdisciplinary training program that prepares graduate students and early-career professionals to work in climate science, science communications and science policy.

Helping keep Oregon waterways clean Oregon Sea Grant is partnering with the Oregon State Marine Board to improve boaters’ awareness of access to and use of sewage pump-outs, dump stations and floating restrooms. Founded by the U.S. Fish and Wildlife Service and led by Dave Hansen, program leader for Oregon Sea Grant Extension, the program received a 2012 NOAA Coastal and Technical Assistance Initiative has taken a stakeholder-based approach by first surveying boaters and interviewers on their experiences and concerns, then developing appropriate signage, local events and videos to promote clean boating practices. The initiative is working. Last year, Oregonians kept 750,000 gallons of untreated sewage out of the state’s waterways.

Regional Aeronautics and Space Administration (NASA)

NASA support for Oregon State research during the past five years has totaled more than $5 million, with more than $5 million in FY13.

Observing ocean and wind dynamics from space NASA-funded research led by Oregon State oceanographer Dudley Cheesman has been catalyzed by ongoing research of four different variables — sea surface elevation, sea surface temperature, surface winds and oceanic chlorophyll — to investigate the interaction between the physics and the biology inside ocean eddies. Synergistic analysis of these four satellite data sets has shown that eddies generate vertical velocities within their interiors from the combined effects of surface winds, the velocity field of the eddies and the influence of eddies on sea surface temperature within the eddies’ interiors. The swirling motion of an eddy interacts with the overlying wind field to cause nutrients that are otherwise locked in colder, deeper waters to rise to the nutrient-rich upper ocean, or vice versa, depending on whether the eddies rotate clockwise or counterclockwise. Concurrent satellite measurements of near-surface chlorophyll reveal that the associated upwelling or downwelling of the eddies strongly influence ecosystems trapped within the eddies.

Space Grant promotes STEM education With funding from NASA, the Oregon NASA Space Grant Consortium promotes science, technology, engineering and mathematics (STEM) education through fellowships, scholarships, internships, competitions and research projects for undergraduate and graduate students. Examples include helping Oregon State’s American Institute of Aeronautics and Astronautics Team compete at the Design/ Build/Fly competition, putting together a NASA Student Symposium featuring research conducted by OSU experts on Oregon State’s Mars Rover Team, which won first place in 2008 and 2010 and third place in 2011 at the annual University Rover Challenge at the Mars Desert Research Station in Hanksville, Utah; and making it possible for a team of Jackrabbits in northern Oregon to fly an experiment on space shuttle Endeavour’s final mission as part of the Student Spaceflight Experiment Program.

Transportation (DOT)

DOT support for Oregon State research during the past five years has totaled almost $2 million, including more than $2 million in FY13.

Developing ecological approaches to transportation planning Lisa Gaines, director of Oregon State’s Institute for Natural Resources, lead a project funded by the Transportation Research Board of the National Academy of Sciences and national partners to develop an Integrated Ecological Framework (IEF), a collaborative ecosystem scale approach to decision-making during planning, environmental review and permitting. The nine-step IEF addresses how transportation agencies experience, analyze and respond to ecological and physical environmental changes. The project includes 13 steps, and it provides guidance on how transportation agencies can develop and use ecosystem crediting systems and markets.

Specifications for cast-in-place concrete

With support from the Washington Department of Transportation and the Federal Highway Administration, Oregon State construction engineer David Trejo is helping to investigate the influence of time and drum revolutions on the performance of cast-in-place concrete, assessing whether specifications established in 1935 and 1955 are justified. Currently, concrete that exceeds a 90-minute time limit and 800 drum revolutions must be discarded. If extended time to placement or high drum revolutions are needed, the concrete, eliminating these limits could be catastrophic. However, keeping the limits in place when no detrimental performance results from the longer times or drum revolutions is a waste of resources. Preliminary results indicate that low drum revolutions limits may not be applicable for most concrete mixtures, can result in higher costs and may not be value-added to a construction project.

Assessing highway buffers for storing stormwater Roadside vegetated filter strips provide a buffer zone to store stormwater, but they can generate runoff when saturated. In research funded by the Oregon Department of Transportation and the Federal Highway Administration, Oregon State’s Chad Higgins developed a network of five monitoring sites in Oregon. Each was instrumented with a novel “bucket” design for in situ runoff measurement, along with monitoring of soil moisture and infiltration, that allowed him to quantify water quality, properties and soil water content. Initial tests over the winter of 2013 indicated that soil saturation levels were mitigated, when rainfall was intense and snowfall, reducing the ability of the filter strips to retain runoff for incoming storms. Further research will help to establish reliable and robust design equations for the width of roadside filters.
Vital is the word Paul Jepson uses to describe the Extension Service, not just in Oregon, but worldwide.

It has a double meaning, he says. Extension is a vital part of agricultural production and food security in the United States. At the same time, Extension is vital because it’s a vibrant, dynamic and agile system that is constantly adapting and also developing state-of-the-science decision-support tools to help farmers increase yields, manage resources and apply new techniques and technologies.

The director of Oregon State’s Integrated Plant Protection Center, Jepson has taken the integrated Extension and science model to West Africa — and has brought back insights that can inform Oregon agriculture.

The United Nations’ Food Agriculture Organization (FAO) first approached Jepson about bringing this model to West Africa in 2005. An OSU study published in February 2014 by the London-based Royal Society found extensive use of highly toxic pesticides poses widespread and significant threats to human health and terrestrial and aquatic wildlife throughout the region. At the same time, evidence shows when chemical use goes down by about 80 percent, crop yields on vegetables increase by about 25 percent, Jepson says.

“The idea is to have sustainable yields, healthy families and an ecosystem that can support agriculture with low risk to wildlife,” Jepson says. “It’s a win-win-win.”

Although West Africa has no equivalent to the Extension Service, Jepson says there is an “ecosystem of cooperation where everybody in the community gets involved.” Just as in the U.S., his team listens to and collaborates with the community to find solutions and apply the latest science. They’ve also worked within FAO’s farmer field schools, which train a member of the community to be a facilitator who then works with local farmers, explaining where there are pesticide risks and helping them implement alternative pest management strategies.

“It’s the farmers themselves who are the experts in their own fields, so we’re empowering them to make better decisions,” Jepson says.

It’s a strategy that can work anywhere. And it’s vital to feeding a hungry world.
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