

College of Agricultural Sciences

Oregon State University

September 2016

Introduction

The College of Agricultural Sciences (AgSci) connects people and the environment, helping communities and industries thrive by finding real-world solutions that are both economically and ecologically sustainable. With 2500 students, 250 professorial faculty, \$500,000 in scholarships, and \$52.3 million in sponsored research funding, AgSci is integral to OSU's standing as a top-tier land-grant university and its ranking in the top 10 worldwide for agriculture and forestry.

The Student Experience

AgSci provides a transformational educational experience for all learners by:

Enhancing the learning environment to raise and equalize student success:

- [The Hermiston Agricultural Research and Extension Center](#) added the Don Horneck Memorial Building, a \$300K research facility, and the new \$3.3M Precision Irrigated Agriculture Facility, in collaboration with Blue Mt. Comm. College.
- [The AquaFish Innovation Lab](#) supported and mentored over 120 undergraduate and graduate students in nine countries, including at OSU.
- [AquaFish created the Yang Yi Young Scientist Fellowship](#) through the Asian Fisheries Society, and the Best Student Paper for Aquaculture Economics in Developing Countries Award through OSU's Int. Institute of Fisheries Economics & Trade.
- [The Eastern Oregon Agricultural Research Center](#) helped undergraduates find internships with industry partners, and employed ten undergrads and two high school students as summer technicians last year.

Making high-impact learning a hallmark of undergraduate education:

- [The Experiential Learning and Leadership Program](#) continues to expand its opportunities for undergrads to engage in research across campus and the state.
- [The Leadership Academy](#) connected students with faculty mentors for leadership training, and established two endowed scholarship funds totaling over \$225,000. Over 20 industry professionals participated as guest speakers and mentors.
- [A record 51 students earned B.S. degrees in Food Science & Technology](#), reflecting record enrollments (about 205 students) in the major.
- [Seven OSU Fermentation Science](#) students received Jack Joyce Scholarships totaling \$85,000—tripling last year's funds. The scholarships were created by Columbia Distributing and Rogue Brewing as a tribute to Rogue founder Jack Joyce.
- [Horticulture students, led by John Lambrinos](#), travelled to New Orleans on an intensive service learning trip to actively explore resource management of the U.S. Gulf Coast.
- [Biological and Ecological Engineering](#) students engaged in a design challenge to develop grid-independent aquaculture pond aerators for developing countries, mentored by BEE faculty and AquaFish Innovation Lab director Hillary Egna.
- [The Student-Engaged Business Assessment](#) program provided Applied Economics students the opportunity to work with agricultural businesses in the Pacific Northwest, conducting economic and financial analyses for agribusiness owners.
- [The Fisheries & Wildlife Undergraduate Mentorship Program](#) was created by F&W graduate students to pair undergraduates (on campus and online) with graduate mentors to cultivate a community of scientific excellence.
- [A new field course in Ecology and Conservation of Hawaiian Coral Reefs](#), developed by Susie Dunham (Fisheries & Wildlife advisor/instructor), took eight students—five from the online degree program—to Hawaii in 2016.

Advancing learning through course design, assessment, and faculty development:

- [BioResource Research and BioEnergy Education Initiative](#), an interdisciplinary biosciences major, has grown from 30 to 70 students, conducting research in faculty labs affiliated with 7 colleges and state and federal agencies.
- [BioEnergy Minor](#), a new interdisciplinary minor housed in BioResource Research, now has over 100 students from across campus preparing for energy careers of the future.
- [A new experiential learning course](#), offered by BioResource Research, taught techniques for science education in Bioenergy and delivered lessons to local middle school students.
- [Botany & Plant Pathology](#) implemented a new Exit Interview and Annual Student Review system for graduating seniors to assess student satisfaction and gather data.
- [Ari Friedlaender](#) (Fisheries & Wildlife) created a new field course in Antarctica, and deployed 2 graduate students to conduct ecological research at Palmer Station in 2016.
- [A new Fisheries & Wildlife Professional Development course](#) was designed by advisors to prepare students for internships and job experience.

Growing online education and exploring new pedagogical models:

- [Genevieve Weber \(Botany & Plant Pathology\)](#) and [Andrew Bouwma \(Integrative Biology\)](#) developed a series of online biology courses (BI204, 205, 206) that, along with a 3-D animation tool, can put a virtual microscope in the hands of distance education students.
- [Scott Baker](#) (Marine Mammal Institute) developed several new online courses (FW302, FW419/519 and FW 407H) focused on marine resource management.
- [Bioenergy Minor](#)'s introductory Bioenergy course online has made lectures available as a YouTube channel and has received over 5,000 views from 37 different countries.
- [Fisheries & Wildlife](#) created an online forum for Ecampus students to connect with each other and an Online Advising site to provide distance students with updates about course offerings, registration deadlines, and tutoring opportunities.

Enhancing our comprehensive Healthy Campus Initiative:

- [DPD values now integrated into non-DPD courses](#): AgSci integrated elements of Difference, Power, and Discrimination into standard, non-DPD-specified courses, to increase cultural fluency in all our graduates.

Expanding strategies to recruit diverse and high-achieving students:

- [The GEMM Lab](#) (Geospatial Ecology of Marine Megafauna) hosted two diversity undergrad students as summer interns on a National Oceanic and Atmospheric Administration-funded project.
- [Botany & Plant Pathology](#) advanced diversity through: 1) their Diversity Committee, 2) a seminar on Inclusiveness in Higher Education, and 3) scholarships that help target applicants.
- [Applied Economics](#) hosted a 2-day recruitment event for all students accepted into the AEC graduate program, co-hosted by faculty and graduate students, which highlighted student-led research and career opportunities.
- [Fisheries & Wildlife](#), with support from emeritus faculty, alumni, and other donors, expanded its scholarship opportunities to enhance diversity, and support students in need as well as high-achieving students.
- [Jessica Miller](#) (Fisheries & Wildlife) led the OSU component of an award funded by the Education Partnership Program of NOAA called the Living Marine Resources Cooperative Science Center to support 3-4 diversity graduate students.
- [Botany & Plant Pathology](#), which has won seven Provost's Award Fellowships/ Scholarships in the past five years, facilitated awards from NSF, the Mexican government, and NASA for students from underrepresented groups.

Creating programs that support lifelong learning:

- [The Oregon Master Beekeeper \(OMB\) Program](#), in collaboration with the Oregon State Beekeepers Association, has delivered accredited education to more than 850 beekeepers to date. There is already a long wait list for 2017.

- [Master Gardener Program extends outreach statewide](#): 3,323 active Master Gardener volunteers donated a total of 215,599 hours via Plant Clinics, classes, and other activities supported by AgSci faculty on campus and across the state. The monetary value of this volunteer service is nearly \$5 million dollars.
- [The Summer Agriculture Institute](#) provided hands-on pedagogical experience in agriculture and natural resources to 20 Oregon teachers, who in turn engage hundreds of school children with new ideas for science learning.
- [Two 2015 STEM Summer Camps](#) conducted by Botany & Plant Pathology focused on 'DNA Biology and Bioinformatics' for grades 8-12.
- [The College hosted the 2016 Oregon FFA Convention](#). More than 2,000 high school students, agriculture teachers, parents, and industry leaders attended leadership workshops and career development events.

Leaders in Research and Innovation

AgSci integrates scholarship, creativity, and collaboration throughout learning and discovery by:

Attracting and retaining high-quality faculty:

- [This year, OSU's statewide public service programs](#) received a boost from the Oregon Legislature with \$14 million of additional funds to support up to 40 new positions and stimulate new research and extension projects across the state.
- [Kim Anderson's \(Environmental & Molecular Toxicology\) research was highlighted on the cover of C&EN](#), summarizing her development of the passive sampling wristband with a 4-year, multimillion dollar NIEHS R33 award.
- [John Antle \(Applied Economics\) received the USDA](#) Abraham Lincoln Honor Award for Increasing Global Food Security, one of the most prestigious awards given by the US Secretary of Agriculture.
- [Jae Park](#) (Food Science & Technology) received the Bor S. Luh International Award from the Institute of Food Technologists in recognition of his accomplishments in surimi seafood products, processing, and byproducts utilization.
- [AgSci welcomed Paul Hughes](#) to the Fermentation Sciences program. Hughes will develop a teaching, outreach, and research program in distillation science.
- [AgSci welcomed Guojie Wang](#), a research agronomist who will focus on optimizing forage production systems with climate change impacts and water conservation needs for the semi-arid regions of the western US.
- [Fisheries & Wildlife hired 2 new tenure-track faculty](#): Kelly Biedenweg (Human Dimensions) and Jonny Armstrong (Freshwater Ecology).
- [The John L. Fryer Salmon Disease Lab](#) (Microbiology) celebrated its 25th anniversary of helping manage fish diseases in the region and worldwide. The lab changed its name to the Aquatic Animal Health Lab, which recognizes the opportunity for scientists to study the factors affecting the health of salmon and other aquatic animals.

Increasing the quality, capacity and impact of graduate programs:

- [AgSci conducted a thorough review of graduate programs](#), and identified action to improve visibility, establish leadership structure, and enhance support for graduate programs.
- [Bernadine Strik](#) (Horticulture) won the American Society for Horticultural Science (ASHS) Outstanding Graduate Educator Award, 2015.
- [Environmental & Molecular Toxicology \(EMT\) developed a new 4+1 AGP graduate program](#) in Toxicology and Risk Analysis, in collaboration with Applied Economics, and modified its Toxicology MS program to have a non-thesis option.
- [EMT received a new 3 year cooperative training grant from the EPA](#): This novel \$1.8M training program will provide both pre- and postdoctoral training opportunities at OSU and for up to 1 year working in a collaborating EPA laboratory.
- [The Toxicology graduate program](#) created mandatory Individualized Training Plans (IDP) for all Environmental & Molecular Toxicology graduate students in order to foster a personalized program for each student. EMT also initiated a new competitive small grant, which enables students to travel and collaborate with other laboratories.
- [Brian Atkinson](#), a doctoral student in Botany & Plant Pathology, was featured in a news release from the National Science Foundation, highlighting his work in paleobotany and fossil-hunting.

- [Aymeric Goyer and Ken Frost](#) (Botany & Plant Pathology) have received a grant from the USDA NIFA National Needs Graduate Fellowship Grant Program to train six Master's students in biosciences at the Hermiston Agricultural and Research Extension Center.
- [Applied Economics now offers an Accelerated Master's Platform](#), where students can earn an undergraduate degree and master's degree in Applied Economics in five years.
- [Graduate student groups are active in collaborative outreach and research](#), for example:
 - [Team-Tox](#) provides professional development beyond the EMT curriculum.
 - [Fisheries and Wildlife Graduate Students](#) engage online F&W students with campus-based colleagues.
 - [BUDS \(Bolstering Undergraduate Development and Success\)](#): Botany & Plant Pathology graduate students mentor undergraduates to strengthen academic excellence.
 - [Applied Economics graduate students](#) created an Environmental and Resource Economics working group that meets regularly for seminars and presentations. Faculty and grad students connect as peers and collaborators.

Expanding high-profile programs in the arts and humanities:

- [Art About Agriculture has connected urban and rural culture for 40 years](#). Space within the remodeled Strand Ag Hall now serves as a rotating gallery for this 250-piece art collection, which was recently appraised at more than \$300,000.

Cultivating transdisciplinary research to advance the science of sustainable earth ecosystems:

- [Michael Banks \(Fisheries & Wildlife\)](#) is part of a transdisciplinary group that has received a 5-year, \$3M National Research traineeship award from NSF, to help graduate students hone transdisciplinary collaborative skills.
- [Robert Tanguay \(Environmental & Molecular Toxicology\) was awarded](#) a new, 3-year, \$300k grant from NSF to research the effects of new nanomaterials on human health.
- [Dave Stone](#) (Environmental & Molecular Toxicology) was awarded a 5-year subcontract from UC Davis for a multimillion dollar EPA grant to develop training manuals for all certified pesticide applicators in the US.
- [The Whale Telemetry Group, led by Bruce Mate](#), developed a new high-resolution tag to track whales for up to 7 weeks.
- [Thomas Sharpton](#) (Microbiology) represented OSU at the Office of Science and Technology Policy's Announcement of the National Microbiome Initiative in Washington, DC. He leads the OSU Microbiome Initiative.
- [Andy Jones](#) (Botany & Plant Pathology) and his lab received an NSF RAPID award to study the effects of the 2016 El Nino on tropical forest regeneration in Panama.
- [An Applied Economics team](#) (Steve Dundas, David Kling, and Dave Lewis) lead the Transdisciplinary Approach to Valuing Ecosystem Services from Natural Infrastructure project. This research is supported by funding from NOAA's National Centers for Coastal Ocean Science/Center for Sponsored Coastal Ocean.

Strengthening Impact Throughout Oregon and Beyond

Positioning OSU's outreach and engagement programs as learning laboratories that:

Promote high-impact learning and effectively utilize university research:

- [Kim Anderson's \(Environmental and Molecular Toxicology\) research was cited by Senator Jeff Merkely](#) to promote modernizing the Toxic Substances Control Act. Signing the new legislation, President Obama referred to research advancements at OSU utilizing the zebrafish model (Robert Tanguay, EMT) in support of the modernization legislation.
- [The College of Agricultural Sciences](#) was awarded a \$1.2 million grant to establish the Western Regional Food Safety Training Center. PIs Robert McGorrin, Christina DeWitt, and Michael Morrissey are working with 13 other western land-grant universities and 2 Pacific island nations to coordinate food safety training.
- [Staci Simonich](#) (Environmental & Molecular Toxicology) was awarded a major supplement to her current 3-year NSF grant to study the formation and toxicity of a new class of environmental contaminants to which all humans are exposed, discovered by Stacy Simonich through previously published research.

- [The National Pesticide Information Center](#) (NPIC) staff won honorable mention in the Visualization Contest sponsored by the National Science Foundation for their new “Herbicide Properties Tool.”
- [The OSU Superfund Research Program](#) (EMT) continues their 5-year project examining the effects of ubiquitous environmental pollutants on human and environmental health.
- [Neil Shay \(Food Science & Technology\)](#) is conducting research funded by the California Walnut Commission to investigate the health benefits of walnuts and polyphenol-rich foods to a typical high-fat Western diet.
- [The Geospatial Ecology of Marine Megafauna \(GEMM\) Lab](#), which has pioneered the use of Unmanned Aerial Vehicles to study whale behavior, documented nursing behavior via UAV footage featured in *National Geographic*. The GEMM Lab, with NOAA, has begun long-term research on the physiological impacts of ambient ocean noise on baleen whales.
- [The Bio-Telemetry and Behavioral Ecology Laboratory](#) made advances in tag designs and analytical techniques currently used by more than 15 international partners, and highlighted in several major documentary films, including: Big Blue Live (BBC), Ocean Mysteries, World’s Biggest Beasts (Smithsonian Channel), and Sonic Seas (Discovery Channel).
- [Scott Baker \(Fisheries & Wildlife\)](#), with funds from the Office of Naval Research, is adopting technology to identify species of whales and dolphins using environmental (e)DNA collected from seawater.
- [Michael Behrenfeld’s](#) (Botany & Plant Pathology) research team completed the first of four field campaigns to study plankton ecosystems and atmospheric aerosols in the North Atlantic. Blog: <http://www.journalistatsea.com/>
- [Inga Zasada](#), (Botany & Plant Pathology and USDA ARS), is part of the international team studying the nematodes in potatoes—a major world food staple.
- [Spotted Wing Drosophila](#) (SWD) attacks many kinds of fruits, including blueberries. OSU is part of a national network of researchers who have been able to develop strategies for control that reduce the number of sprays required.
- [AquaFish researchers found ways to successfully grow a species of freshwater catfish](#) in hyposaline waters in Bangladesh, thereby expanding the potential for aquaculture amid climate change impacts.

Grow rural and urban regional centers to advance social progress:

- [AquaFish established demonstration fish ponds at four rural elementary schools in](#) Nepal to improve overall health and nutrition and to integrate STEM knowledge with lessons in fish farming for schoolchildren.
- [Hermiston Agricultural Research and Extension Center](#) constructed an addition to the main office building to house 4 additional faculty, and also built a successful partnership with Extension to house 2 new county based faculty at HAREC.

Drive economic development:

- [Food Science students](#) have developed new varieties of Beaver Classic™ Cheese for production, including cheddar cheese soaked in wine, artisan beer, and cider, using OSU Creamery milk and student-made wine, beer, and cider.
- [Hazelnut industry funds](#) are supporting Food Science & Technology researchers Yanyun Zhao, Jooyeoun Jung, and Robert McGorin to develop new protocols for drying to improve hazelnut flavor, quality, and freshness over storage.
- [Joy Waite-Cusic \(Food Science & Technology\)](#) is working with onion and hazelnut growers to ensure the highest food safety and quality during growing and harvesting.
- [Ryan Contreras \(Horticulture\) is supporting economic growth](#) and ecological sustainability of nursery production through the development of low input cultivars of nursery crops.
- [Janine Trempey](#) (Microbiology) helped to patent and commercialize a new type of thickener derived from a natural bacterium isolated in Oregon, which may add probiotic characteristics to food products.
- [The 12th annual Cattleman’s Workshop](#), a beef-industry sponsored conference that brings international beef experts to Oregon, attracted approximately 400 participants, an opportunity for both OSU students and Oregon cattle producers.
- [OSU Blueberry School](#) was a two day training event for new and experienced growers, managers, and consultants that drew over 300 registrants from OR, WA, and B.C., Canada, and featured simultaneous interpretation in Spanish.
- [Horticulture completed](#) a 3-year study, in collaboration with Washington State University and Michigan State University, that provided rates of degradation for 13 insecticides and 5 fungicides commonly used in blueberry production, to help growers and shippers keep below Maximum Residue Limits for export markets.
- [OSU’s hazelnut breeding program](#) continued its rapid expansion with new resistant varieties, including “Burgundy Lace,” an ornamental hazelnut, and “McDonald.”

- [Applied Economics developed AgBiz Logic](#), a suite of farm-scale economic, financial, and environmental decision tools for businesses that grow, harvest, package, add value, and sell agricultural products.

Increase study abroad and strategic international research partnerships:

- [Agricultural Education and Agricultural Sciences](#) led students on the first annual Puerto Rico Emersion Experience. 12 students were immersed in the cultural traditions of the island while learning about agricultural policies and initiatives.
- [AquaFish was awarded \\$4.4 million](#) by the US Agency for International Development (USAID) for FY16 to address global issues in food security and aquaculture by cultivating international multidisciplinary partnerships, and was awarded the prestigious Asian Fisheries Society Gold Medal Award.
- [AquaFish conducted 33 short-term trainings in eight countries](#), on topics including climate change impacts on aquaculture, nutrition and income generation for women's fish farming groups, and mobile phone use for women fish processors and marketers. AquaFish faculty hosted two days of technical sessions at the Asian-Pacific Aquaculture conference, which was attended by 6,000 people from 51 countries.
- [The Eastern Oregon Agricultural Research Center](#) has developed an on-going Brazilian internship program that provides valuable research experience for undergraduate students from Brazil while assisting with EOARC research projects.
- [Scott Baker](#) (Fisheries & Wildlife) has initiated a photo-identification study of the critically endangered Maui dolphins of New Zealand and a study of inshore dolphins of the Falkland Islands.
- [AgSci sponsored the Agricultural and Natural Resources study abroad program](#) in Chile during winter quarter.
- [John Antle](#) (Applied Economics) is Co-PI of AgMIP, a multi-million dollar global community aiming to improve agricultural system science and its use in climate impact assessment and analysis of pathways to sustainable development.

Engage alumni and other external partners to advance our goals:

- [Horticulture](#) hosted the Organic Seed Alliance's 8th Organic Seed Growers Conference, with more than 500 participants and 330 people joining via live webinar. The conference is the largest event in North America focused on organic seed.

Enhancing Diversity

Increasing diversity of faculty, staff, and students:

- [Leah Chibwe](#), international pre-doctoral trainee from Zambia, completed her doctoral studies and was awarded a highly competitive Oregon Lottery Graduate Scholarship for the 2015-16 academic year.
- [Omar Miranda Garcia](#), an MS graduate student with Neil Shay (Food Science & Technology), won the National 3rd Place Award, Oral Graduate Division I, at the Minorities in Agriculture and Natural Resource Related Sciences (MANRRS) 2016 Conference in Jacksonville, FL.
- [OSU's MANRRS Chapter](#) attended the 2016 National Career Fair and Training Conference in Jacksonville, FL: 4 graduate students, 14 undergraduate students and 4 Jr. MANRRS helped staff the AgSci and Graduate School recruitment booth, and took home several national awards and certificates of excellence.
- [OSU SACNAS Chapter](#) (Society for Advancing Chicanos/Hispanics and Native Americans in Science) sent 28 students—4 grad and 24 undergrad representing 7 colleges—to the SACNAS 2015 National Conference in Washington, D.C. Three students received national travel awards and 7 student advisees had abstracts selected and presented. OSU SACNAS Chapter received the National Chapter Role Model Award for Outstanding Development and Outreach activities.
- [BioResource Research received its fourth USDA NIFA Multicultural Scholars Program](#) grant: \$200,000 awarded for student scholarships beginning 2016/17 academic year. Student scholars receive up to \$6500/year for up to 4 years.
- [Raven Waldron](#), a BRR student and USDA MSP Scholar, was awarded a DeLoach Work Scholarship for the 2016 summer and fall terms, and the Udall scholarship for Native Americans in Tribal Health Sciences 2016.
- [Environmental and Molecular Toxicology has expanded its undergraduate](#) summer internship program, jointly funded by the Society of Toxicology, to bring minority student candidates to OSU for summer internships as a recruiting tool for its

graduate program. EMT hosted two interns from underrepresented minorities in the summer internship program for the summer of 2015 and again for 2016.

- [Marc Elie](#), an African-American post-doctoral scientist in Robert Tanguay's Research Group, was awarded the Division of Environmental Chemistry (ENVR) Symposium Presentation Award for his presentation at the 249th ACS National Meeting & Exposition Meeting in Denver, CO.
- [The Conservation Careers Program](#) was a collaboration between the US Fish & Wildlife Service and OSU MANRRS Chapter that included a \$35,000 grant, which provided scholarships to 12 AgSci students. OSU hosted USFWS professionals on campus, and AgSci students attended the Science of the Service Symposium held in Portland.

Stewardship of Resources

Enhancing resources through private philanthropy by:

Developing an integrated infrastructure recapitalization plan:

- [The restoration of Strand Agriculture Hall](#) celebrated new facilities for conferences, student learning, and public interaction.
- [AgSci maintained research and teaching facilities throughout the state](#), and shared many buildings on campus. Efforts continue to address deferred maintenance on these facilities and to develop housing on branch stations for graduate students, interns, faculty, or visiting experts.
- [AgSci developed a new set of safety, risk, and compliance resources](#) for on- and off-campus facilities.

Promoting sustainable built and natural environments:

- [Ramesh Sagili \(Horticulture\) and his research team](#) have helped formulate best management practices for both beekeepers and growers to promote honey bee health in Oregon, resulting in an estimated annual savings of approximately \$8 million to Oregon beekeepers. Honey bee pollination is estimated to be worth \$500M in Oregon.
- [Robert Tanguay](#) (Environmental & Molecular Toxicology) received a new \$800k award from the EPA to conduct the first comprehensive in vivo, structure-activity based toxicity studies of the ubiquitous flame retardant chemical pollutants to which everyone in the US is exposed.
- [Jennifer Field](#) received funding from the Navy (NESDI) for an additional new two-year project aimed to create a decision tool that will allow the Navy to develop better plans for remediation of PFCs at contaminated sites.
- [The Eastern Oregon Agricultural Research Center](#) is beginning a 10-year project on the USDA Forest Service Starkey Experimental Forest evaluating managed cattle grazing on stream function, vegetation, and wildlife diversity. This collaborative effort includes USDA Forest Service, Oregon Department of Fish & Wildlife, US Fish & Wildlife Services, National Marine Fisheries Service, and multiple faculty from Oregon State University.
- [Food Science researcher Yanyun Zhao](#) is conducting field trials on cherries and other fruits to test the efficacy of a proprietary coating that prevents skin cracking caused by pre-harvest precipitation. Such biodegradable packaging and food fiber applications are being explored as a way to add natural nutritional components to foods.
- [Bruce Mate \(Fisheries & Wildlife\)](#) is conducting studies in multiple US Navy training areas with new innovative tag technologies that will help determine if endangered whale species are displaced due to sonar use or are associated more closely to environmental issues affecting prey (food) distribution.
- [Jerri Bartholomew](#) (Microbiology) and her research team have developed molecular tools and models for determining disease risk in Klamath River salmon, allowing managers to target actions to reduce salmon loss.

Balancing economic and environmental improvements in the region:

- [Leigh Torres \(Fisheries & Wildlife\)](#) conducted stakeholder workshops to develop Oregon's first guidelines for vessel operation around whales, so that whale watching can continue sustainably.
- [The Food Safety and Environmental Stewardship Program](#) (FSES), directed by Kim Anderson (EMT), provided lab research support for Oregon food safety, environmental stewardship, and agricultural quality. A few examples:

- A new portable “Colorimetric Sweet Onion Test Kit” that provides 30-minute field-test showing the sweetness/pungency of onions, is now in limited production at OSU and available for purchase. This test kit helps growers determine optimum time of harvest for max crop price.
- A new grant award from the Department of Defense to develop personal wearable monitors of environmental chemicals that can be analyzed for the presence of 1,400 different chemical compounds.
- A pilot study published in the journal *Environmental International* demonstrates how silicone breast implants could help identify environmental contaminants that women are exposed to.
- [Vaughn Walton and Nik Wiman](#) (Horticulture) conducted research on filbert worm behavior, seasonal phenology and emergence, in order to refine IPM programs. The economic impact on hazelnut was measured in commercial production systems and culminated in decreased pesticide use by 60-75%.
- [Horticulture researchers](#) determined the insect vector responsible for spreading a new viral disease that causes red blotch in wine grapes, which can seriously reduce sugar content in grapes.

Technology as a Strategic Asset

Sharing relevant information to make effective decisions:

- [Bridges to Prosperity](#) webpage was expanded to include more than 80 success stories geared for use with legislators and decision-makers from around the state.

Enhancing the quality of service in administrative processes:

- [AgSci invested in creating a college-wide web team](#) to develop new, consistent designs, navigation, and a content management system that is fully integrated, mobile, and aligned with OSU’s branding.

Equity, Inclusion, and Civil Discourse

- [AgSci’s Principles and Practices](#) embraced methods to increase diversity and inclusivity in faculty, staff and students. These Principles and Practices are actively shared across the university and are a standard part of the culture of AgSci.
- [Kim Anderson \(Environmental & Molecular Toxicology\)](#) has received a new grant award that aims to reduce pesticide exposure to Latina Youth, funded by the California Breast Cancer Research Foundation.
- [Hillary Egna at AquaFish](#) helped organize the 6th Global Symposium on Gender in Aquaculture and Fisheries. The symposium focuses on diversifying educational and professional opportunities.
- [Fisheries and Wildlife’s](#) Diversity Committee received an ADVANCE faculty award to evaluate data from a climate survey of students, staff, and faculty, and recommend steps to enhance inclusiveness throughout the department.
- [The Eastern Oregon Agricultural Research Center \(EOARC\) organized](#) a regional Search Advocate Training Program for the Baker, Union, and Wallowa county region. Approximately 20 faculty members from EOARC, the OSU Agriculture & Natural Resource Program, and OSU Extension took part in the training program.

Appendix

Several AgSci faculty received grants of \$1,000,000 or more:

- [Brett Tyler](#) (Botany & Plant Pathology) received \$1.6M in funding from the National Science Foundation to explore dynamic interactions between plant and oomycete biodiversity in a temperate forest.
- [Hong Liu](#) (Biological & Ecological Engineering) received \$1.6M in funding from the Department of Energy to develop a novel hybrid microbial electrochemical system for efficient hydrogen generation from biomass.
- [David Noakes](#) (Fisheries & Wildlife) received \$1.2M in funding from the Oregon Department of Fish and Wildlife to further enhance collaborative research, education and outreach at the Oregon Hatchery Research Center.
- [Vaughn Walton](#) (Horticulture) received \$1.15M in funding from the USDA NIFA Specialty Crop Research Initiative as a sub-award to develop sustainable management of spotted wing drosophila for US fruit crops.
- [Stephen Giovannoni](#) (Microbiology) received \$1M in funding from the Bermuda Institute for Ocean Sciences to study the microbial oceanography in the North Atlantic subtropical gyre.
- [Katie Dugger](#) (Fisheries & Wildlife) received \$1M in funding from the USDA Forest Service to study the demography of northern spotted owls in Oregon and Washington.
- [Robert J. McGorrrin](#) (Food Science & Technology) received \$1.15M in funding from USDA NIFA for Western Training, Education, Extension, Outreach, and Technical Assistance Center to enhance food safety.
- [Chris Mundt](#) (Botany & Plant Pathology) received \$2M in funding from the USDA National Institute of Food and Agriculture for research to predict and mediate future global epidemics.
- [Steven Dundas](#) (Applied Economics) received \$1.35M from NOAA's National Centers for Coastal Ocean Science to develop a transdisciplinary approach to valuing ecosystem services from natural infrastructure.
- [Kim Anderson](#) (Environmental & Molecular Toxicology) received a \$1.6M dollar 4-year grant from the National Institute of Environmental Health Sciences to assess environmental exposure to PAHs (polycyclic aromatic hydrocarbons) with new analytical chemistry techniques to identify the constituents of those exposures.
- [Jennifer Field](#) (Environmental & Molecular Toxicology) received over \$1M in funding from the Environmental Security Technology Certification Program (ESTCP) to help assess the risks posed by perfluorinated chemicals in the environment.
- [Jennifer Field](#) also received over \$1M in funding from the Strategic Environmental Research and Development Program (SERDP) as a Subcontract from Towson University to help assess the risks posed by perfluorinated chemicals in the environment.

Several AgSci faculty received grants of \$500,000 or more:

- [Bruce Mate](#) (Marine Mammal Institute) received \$637,762 for Baleen (Blue & Fin) whale tagging in Southern California in support of marine mammal monitoring across multiple Navy training areas.
- [Peter McEvoy](#) (Botany & Plant Pathology) received \$500,000 for rapid evolution in biological control: implications for safety and effectiveness.
- [Peter Bottomley](#) (Microbiology) received \$648,688 to study the impact of archaeal and bacterial nitrifiers on the fate of digester N applied to fodder crops.
- [Jeff Anderson](#) (Botany & Plant Pathology) received \$646,724 to research regulation of *Pseudomonas syringae* virulence by plant-derived chemical signals.
- [Thomas Wolpert](#) (Botany & Plant Pathology) received \$498,780 from the USDA National Institute of Food and Agriculture to study the molecular biology of host-parasite interactions.

Faculty Awards:

- [John Antle](#) (Applied Economics) was honored with the F.E. Price/Agricultural Research Foundation Award for Excellence in Research. The award recognizes outstanding contributions to agriculture.
- [Gil Sylvia](#) (Applied Economics) was honored with the Briskey Award for Faculty Excellence. The award recognizes faculty achievement within the College of Agricultural Sciences.
- [Steve Dundas](#) (Applied Economics) was honored with the Distinguished New Professor of the Year for the College of Agricultural Sciences. Steve was also awarded the 2016 Gerald A. Carlson Outstanding Ph.D. Dissertation Award at NC State University in Raleigh, NC in April 2016.
- [Steve Buccola](#) (Applied Economics) was honored by AAEA (Agriculture and Applied Economics Association) for co-authoring the year's outstanding *Choices* article.
- [JunJie Wu](#) (Applied Economics) was named an AAEA Fellow. This is AAEA's most prestigious honor.
- [Richard Johnston](#) (Applied Economics) was named to the Diamond Pioneer Registry, which honors individuals for lifetime contributions to agriculture, natural resources, and the people of Oregon.
- [Susan Tilton \(Environmental & Molecular Toxicology\) et al were recognized by NIH](#) for developing a faster assessment of carcinogenic potential for PAH mixtures.
- [Reinaldo Cooke](#) (Animal & Rangeland Sciences) was recognized as the Outstanding Young Scientist of the Western Section of the American Society of Animal Sciences.
- [Jerri Bartholomew](#) (Microbiology) received the S.F. Snieszko Distinguished Service Award from the American Fisheries Society.
- [Nik Grunwald](#) (Botany & Plant Pathology), was named a Fellow of the American Phytopathological Society.
- [Maryna Serdani](#) (Botany & Plant Pathology), received an Outstanding Achievement award by the Director of the Western Plant Diagnostic Network at the National Plant Diagnostics Network national meeting in Washington, DC.
- [Phil Hamm](#) (Botany & Plant Pathology) was named "Hermiston Man of the Year" at the Hermiston Chamber of Commerce.
- [Luisa Santamaria](#) (Botany & Plant Pathology) received an "Achievement Award" from the National Association of County Agricultural Agents (NACAA) and the Early Career award from Epsilon Sigma Phi (ESP) National Conference.
- [Jeremiah Dung](#) (Botany & Plant Pathology) based at the Central Oregon Agricultural Research Center in Madras, OR, received the APS Pacific Division Early Career Award.
- [Staci Simonich](#) (Environmental & Molecular Toxicology) was awarded both the University Mentoring and Professional Development Award and the Excellence in Graduate Mentoring Award at University Day 2015.
- [Dave Williams](#) (Environmental & Molecular Toxicology) and his coinvestigators' publications were recognized as one of the "favorite papers published in 'Chemical Research in Toxicology'" in the past two years.
- [Collaborative research from the Simonich and Tanguay laboratories](#) was recognized in the July issue of the NIH newsletter "Environmental Factor" as a Paper of the Month.
- [Wanda Crannell](#) (BioResource Research Advisor/Instructor) received the 2015 Dar Reese Excellence in Advising University Day Award, Faculty Senate.
- [Peter Bottomley](#) (Microbiology and Crop & Soil Science) was awarded the Agricultural Research Foundation Distinguished Faculty Award.

Graduate Student Awards:

- [Predoctoral trainees Holly Dixon and Matthew Slattery](#) in EMT were selected as OSU 2015 ARCS Scholars.
- [First year EMT predoctoral Trainees Laura Holden, Matt Kaiser and Matt Slattery](#) have all been accepted into the 2016 OMSI Summer Fellowship Program, and were awarded a scholarship to help cover the tuition for this program.
- [Predoctoral trainee Krista Barzen-Hanson](#) in EMT, mentored by Dr. Jennifer Field, received a 2015 National Science Foundation Graduate Research Fellowship Program. Krista was published in Environmental Science & Technology Letters in 2015, and received one of the Journal's 2015 Best Papers Awards.
- [Gloria Garcia](#), pre-doctoral trainee in Robert Tanguay's research group, was awarded an NIH F31 NRSA individual fellowship award.
- [Predoctoral trainee Erin Madeen](#) in EMT was awarded a Young Investigator Award for her presentation at the recent LPI Diet and Optimum Health Conference.

- [Predoctoral trainee Anna Chlebowski](#) was awarded an F31 NRSA individual pre-doctoral training grant from NIEHS.
- [Sean Bugel, an EMT post doc student](#), has been awarded a highly prestigious NIH K99/ROO award.
- [Predoctoral trainee Derik Haggard](#) was awarded the 2016 Eric A. Andreasen Memorial Graduate Student Award for Excellence in Research and Scholarship.
- [Predoctoral trainee Ivan Titaley](#) in EMT was selected to receive one of the 2016 ACS Graduate Student Paper Awards by the Division of Environmental Chemistry. This is the highest award given to students by this Division.
- [Predoctoral trainee Leah Chibwe](#) was selected as a winner of one of the 2015 Graduate Student Paper Awards by the Division of Environmental Chemistry of the American Chemical Society. This is the highest award given to students by the Division of Environmental Chemistry.
- [PhD candidate Sheanna Steingass](#) at the Marine Mammal Institute received the HMSC student teaching and experiential education award, the HMSC Holt Marine Education Fund scholarship, an ARCS fellowship, and the HMSC Markham graduate research award.
- [Graduate Awards in Botany & Plant Pathology](#) included Matthew Brown (Behrenfeld lab), who was awarded a NASA Graduate Fellowship, and Dusty Gannon (Jones lab), who was awarded an NSF Graduate Research Fellowship.
- [Lauri Lutes](#) was awarded the 2016 Savery Outstanding Master's Student sponsored by the Agricultural Research Foundation. She focuses on viral diseases that threaten cherry production with major professor Jay Pscheidt.
- [Yukiko Hashida](#) in Applied Economics was awarded a pre-doctoral Fellowship from USDA for her study of adaptation to climate change in forestry - an empirical analysis of harvest and replanting decisions under climate change in the western US.
- [Roshan Adhikari](#) in Applied Economics was awarded an Oregon Sylff Fellowship for International Research, as well as D. Barton DeLoach Distinguished Graduate Awards; and Dede Long the Robert Johnson Fellowship along with fellow student Matt Sloggy.
- [Cassie Finer, Christopher Mihiar, Jian Shi, and Grant Zimmerman](#) in Applied Economics were all awarded the Emery Castle Scholarship in Economics.

Undergraduate Awards:

- [Undergraduate Research, Innovation, Scholarship & Creativity](#) (URISC) scholarships were awarded to EMT students Ji Yun Hwang, Zia Klocke, and Amy Bortvedt to support their research under the mentorship of Stacey Harper.
- [David Sampson](#), an undergraduate working in Dave Williams' laboratory, was selected as the College of Ag Undergraduate Research Award winner through the Office of Undergraduate Research.
- [BPP Undergraduate Awards](#): Michael Belcher, Miranda Ariel, and Duncan Ocel received TCM Scholarships for 2016; Shelby Porter and Quinn Rasmussen received Charles and Helen Fulton Memorial Scholarships for 2016; Cierra Walker received a Jean Siddall Memorial Scholarship for 2016; Jeannie Klein and Shelby Porter received Bill and La Rea Outstanding Senior Awards for 2016.
- [Dakota Jacobs](#), a senior in BioResource Research (Toxicology option), received the OSU Libraries 8th annual Library Undergraduate Research Award for outstanding research, scholarship, and originality in writing.
- [Three undergraduate students in BioResource Research](#)—Cesar Juarez, Samantha Roof, and Simon Fraher—received Oregon Seed Association Scholarships.
- [Applied Economics Undergraduate Awards](#) included: Christine Mapes, Applied Economics Outstanding Senior Award; Andrew Miles, Western Agricultural Economics Association Outstanding Senior Award; Brecklin Milton, E.L. Potter Scholarship Award; Ben Lawrence, Fred Obermiller Memorial Scholarship.

Oregon State University
College of Agricultural Sciences
 Annual Academic Program Review 2015-16

PART 1

	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	% Change '14 - '16
Faculty FTE															
Professorial	229.4	200.9	195.8	206.8	211.6	204.1	222.1	204.6	201.7	224.3	225.6	236.8	241.1	242.2	2.3%
Non-Professorial	301.5	321.0	301.3	305.1	296.7	306.4	298.4	301.8	319.6	333.1	344.8	345.1	346.7	342	-0.9%
Total Faculty FTE	530.9	521.9	497.1	511.9	508.3	510.5	520.5	506.4	521.3	557.4	570.4	581.9	587.8	584.2	0.4%
E&G Tenured/Tenure Track	41.5	36.0	31.1	40.4	36.8	39.5	31.6	36.2	36.5	45.8	47.2	49.3	48.2	50.7	2.8%
Faculty Headcount															
Professorial	242	218	214	224	233	222	251	225	222	249	253	274	271	273	-0.4%
Non-Professorial	335	365	336	338	331	339	329	347	366	379	386	382	379	378	-1.0%
Total Faculty Headcount	577	583	550	562	564	561	580	572	588	628	639	656	650	651	-0.8%
E&G Tenured/Tenure Track															
0% E&G Funded	57	54	55	52	63	61	64	61	50	47	33	34	34	39	14.7%
1%-33% E&G Funded	86	70	63	60	66	62	63	62	64	67	81	79	76	75	-5.1%
34%-66% E&G Funded	29	28	21	30	24	25	23	27	29	30	33	31	30	35	12.9%
67%-99% E&G Funded	13	12	13	14	12	15	9	11	9	13	12	15	17	16	6.7%
100% E&G Funded	4	2	3	7	7	8	4	6	6	13	12	10	9	8	-20.0%
Total Tenured/Tenure Track	189	166	155	163	172	171	163	167	158	170	171	169	166	173	2.4%
SCH (Academic Year)															
Undergraduate	24607	25340	25246	25342	24529	23833	24741	27220	28479	33983	34677	37275	36943	35859	-3.8%
Lower Division	6362	6870	7735	7634	7731	7327	8659	8912	8596	11277	11460	12348	12534	11780	-4.6%
Upper Division	18245	18470	17511	17708	16798	16506	16082	18308	19883	22706	23217	24927	24409	24079	-3.4%
Graduate	10274	10277	10571	9907	9213	8685	9809	9599	10267	11404	12295	12359	11493	11511	-6.9%
First Professional	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Other	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
TOTAL SCH	34881	35617	35817	35249	33742	32518	34550	36819	38746	45387	46972	49634	48436	47370	-4.6%
Fall Enrollment by Major															
Undergraduate	1158	1123	1140	1129	1141	1061	1104	1209	1496	1793	2019	2226	2266	2337	5.0%
Graduate	331	328	339	320	289	280	266	251	253	328	352	366	415	417	13.9%
First Professional	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
TOTAL Enrollment	1489	1451	1479	1449	1430	1341	1370	1460	1749	2121	2371	2592	2681	2754	6.3%

Oregon State University
College of Agricultural Sciences
 STRATEGIC PLANNING METRICS 2015-16

PART 1

	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Goal 1. Provide a Transformative Educational Experience for all Learners.														
1.3 First Year Retention Rate (College/University)	73.5/ 85.8	71.4/ 84.4	74.1/ 84.4	76.3/ 82.7	71.1/ 81.7	72.4/ 82.7	70.5/ 83.6	71.4/ 81.0	71.5/ 82.1	73.2/ 83.9	70.9/ 83.1	71.4/ 83.4	70.2/ 81.9	73.9/ 86.3
1.4 6-Year Graduation Rate (College/University)	43.1/ 61.8	51.3/ 70.7	58.2/ 67.7	46.2/ 62.6	50.9/ 64.8	53.1/ 73.5	53.7/ 70.7	57.0/ 68.9	53.2/ 69.2	43.7/ 59.2	44.2/ 57.7	51.4/ 67.8	49.0/ 65.3	53.0/ 66.2
1.5 Junior Transfer 4-Year Graduation Rate (College/University)	81.3/ 84.4	79.3/ 84.8	70.0/ 74.3	72.3/ 73.8	67.2/ 67.2	62.0/ 72.2	74.0/ 80.0	61.8/ 67.6	68.3/ 76.7	69.1/ 69.1	73.5/ 73.5	62.5/ 61.1	48.2/ 55.3	53.2/ 57.8
1.6 % US Minority Students	5.4%	5.8%	6.2%	6.5%	7.0%	7.2%	8.7%	9.4%	12.0%	14.2%	14.4%	14.3%	14.5%	16.4%
1.7 % International Students	9.0%	10.0%	8.0%	8.0%	7.0%	8.0%	7.0%	6.0%	5.0%	4.0%	4.0%	5.0%	5.0%	5.1%
1.8 % High Achieving Oregon High School Graduates	-	36.7%	35.5%	40.0%	37.1%	28.6%	33.1%	31.5%	38.1%	35.4%	44.5%	43.4%	44.0%	39.2%
Goal 3. Strengthen Oregon State's Impact and Reach throughout the state and beyond.														
3.2 Invention Disclosures	13	6	9	13	10	15	6	13	14	12	14	17	16	17

Oregon State University
College of Agricultural Sciences
 Annual Academic Program Review 2015-16

PART 2

	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	% Change '14 - '16
Resources (Fiscal Year)															
E&G - Ending Budget (\$)	7,087,597	7,759,353	9,636,296	10,263,244	10,676,052	11,911,205	12,846,972	13,196,406	17,322,152	20,122,981	23,842,697	26,887,872	27,311,988	28,101,168	4.5%
Total R&D Expenditures (\$)	62,647,329					70,084,034	81,050,466	81,687,349	89,526,889	92,423,017	89,955,398	88,675,532	87,712,386	FEB 2017	-
Awards from Grants and Contracts* (#)	555	668	614	669	608	475	427	560	517	492	417	404	539	531	31.4%
Awards from Grants and Contracts (\$)	29,368,256	35,834,483	35,891,976	37,982,268	34,185,285	37,600,692	44,463,817	55,039,078	59,751,760	53,872,819	53,138,070	45,446,585	50,416,935	52,865,167	16.3%
Private Giving (\$)	1,168,796	1,827,412	2,246,571	5,618,015	8,630,223	9,460,980	4,399,905	10,466,936	5,311,623	11,443,406	9,080,308	10,157,419	11,461,399	7,826,682	-22.9%

Strategic Planning Metrics 2015-16

	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Goal 2. Demonstrate Leadership in Research, Scholarship and Creativity while enhancing preeminence in the three signature areas of distinction														
2.1 Total R&D Expenditures	see APR data above													
Goal 3. Strengthen Oregon State's Impact and Reach throughout the state and beyond.														
3.4 Dollars Leveraged per Appropriated Dollar for SWPS Research (AES)	1.29	1.41	1.51	1.51	1.45	1.30	1.54	1.63	2.50	2.50	2.30	2.10	2.16	1.90
3.5 Annual Private Giving	see APR data above													

* From 2000-01 to 2007-08, the number of grant/contract awards is based on the accounting transactions from the College's award index, rather than the actual number of awards received by the college.

Before 2005-06, awards affiliated with both a campus department and OSU Extension Service were reported under the department's college.

Starting in 2005-06 these were considered part of Extension Service and are not reported in the department's college.

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

Oregon State University
College of Agricultural Sciences
 Annual Academic Program Review 2015-16

PART 3

	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	% Change '14 - '16
Degrees (academic year)															
Bachelor	289	294	292	269	288	239	258	281	258	316	389	476	455	496	4.2%
Master	73	63	87	61	61	59	54	51	58	63	64	72	89	73	1.4%
Doctorate	32	26	22	34	36	24	24	22	26	21	20	24	20	22	-8.3%
First Professional	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
Total Degrees	394	383	401	364	385	322	336	354	342	400	473	572	564	591	3.3%

Strategic Planning Metrics 2015-16

	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16
Goal 1. Provide a Transformative Educational Experience for all Learners.														
1.1 Degrees Awarded-Total	see APR data above													
Goal 2. Demonstrate Leadership in Research, Scholarship and Creativity while enhancing preeminence in the three signature areas of distinction														
2.3 PhD's Awarded	see APR data above													