

Provost's Council
ACADEMIC REPORT for 2010–2011
College of Forestry/Oregon Forest Research Laboratory
September 1, 2011

The College of Forestry (CoF), Oregon Forest Research Laboratory (OFRL), and Forestry and Natural Resources (FNR) Extension Program together provide the knowledge upon which society depends to meet its needs from sustainable forests. Faculty, staff, and students completed another terrific year of serving through teaching, research, and outreach education programs. Enrollment in undergraduate (UG) and graduate (G) programs continued to grow in response to updated core programs and new on-campus and distance opportunities. Employment of graduates improved as the forest-sector economy began to recover. Faculty engaged colleagues within OSU, OUS, and other western universities and agencies to compete for several large grants that will enhance the visibility of OSU and Oregon. Faculty and administrators were active in fostering Earth Systems Science Division (ESS) and broader university initiatives.

CoF, OFRL, and FNR Extension remain broadly recognized among national and international peers for the quality of faculty, students, and programs. In this United Nations designated "International Year of Forests," faculty demonstrated leadership at local to international scales, and several received awards in recognition of their efforts. Faculty and staff once again demonstrated extraordinary resiliency in the face of considerable uncertainty during the Oregon legislative session. The legislative session outcomes are better than they could have been, but financial challenges erode the foundation for the future of the CoF, OFRL, and FNR Extension if not resolved. The following is a sample of our achievements over the past year.

2010-11 PROGRAMMATIC ACHIEVEMENTS

1. Brief list of key initiatives undertaken and noteworthy outcomes achieved in the following areas:

a. Student engagement and success (see Appendix A for additional information)

The Student Services Office (SSO) did a terrific job of supporting student success and building community in the CoF. In addition to crucial roles in student recruiting, advising, and retention, the team hosted events to foster student engagement, including new student orientation, student awards banquet, commencement breakfast, student clubs and volunteer service days to promote participation and leadership development, student job fair, and Fernhopper e-Newsletter and blog.

- During the past year, 153 UG students and 43 G students received degrees. Thirty-one percent of UGs graduated with Honors! In all, 814 UG and 139 G students were enrolled in the CoF in fall term, AY11. UG enrollment continued the upward trend that has doubled enrollment over the past five years. The greatest growth continues to be in online degrees.
- The CoF awarded \$400,000 to 89 UG students and \$108,000 to 34 G students for AY12. Departments awarded \$242,000 of additional support to students from departmental gift funds.
- The CoF Board of Visitors expanded support for student-faculty mentoring to 12 UG pairs. Projects included research, teaching, Extension, and other creative projects. Mentors included "regular," emeritus, FRA, Extension, and adjunct faculty. Students represented most CoF academic programs.
- With leadership from Forestry Media Center staff, the Strengthening Education and Employment for Diverse Students (SEEDS) Program gained momentum with an infusion of federal stimulus funds. Twelve diversity students participated this year, engaging with 17 different faculty and sponsoring agency mentors. SEEDS created experiences that led to three diversity students beginning graduate studies in 2011. The program aspires to assist students in finding a comfortable academic home in the CoF and a professional home in the related natural resources fields.
- The Wood Science and Engineering Department (WSE) launched the new Renewable Materials BS degree.
- The Peace Corps Masters International Program continues to gain popularity; the first two students are in Peace Corps service in Ethiopia and Peru and four new students have been accepted for fall 2011.
- As part of the National Science Foundation (NSF) Long Term Ecological Research (LTER) Program, the H.J. Andrews Experimental Forest (HJA) provided incredible opportunities for engaging students in research.

During 2010-11, 50 UG students were supported through NSF Research Experiences for Undergraduates and summer work experiences, 3 post-doctoral trainees and 35 graduate students were engaged in research, and 13 theses were completed.

- The Forest Engineering, Resources, and Management Department (FERM) established the new Sustainable Forest Management graduate program. The Forest Ecosystems and Society Department (FES) established the new Forest Ecosystems and Society graduate program.
- The Recreation Resources Management (RRM) faculty completed a process to transition the current RRM degree into an option in the Natural Resources degree program.
- New options were approved for the Natural Resources degree in Wildland Fire Ecology, Urban Forest Landscapes, Ecological Restoration, and Recreation and Tourism Management.
- The Masters in Natural Resources (MNR) program was approved and enrollment quickly grew to 20 students. The first student graduated at the end of spring term.
- Ron Reuter hosted the National Collegiate Soil Judging contest at the OSU-Cascades Campus in April, with 21 universities participating. Great exposure for OSU and Oregon!
- Ed Jensen released the 12th edition of *Trees to Know in Oregon*, which won a Gold Award from the Association for Communication Excellence. First published in 1950, it has educated six generations students, visitors, and tree enthusiasts.
- The WSE student chapter of the Forest Products Society (FPS) won the annual Wood Science Bowl and the Outstanding Student Chapter award at the 2011 international convention in Portland!
- WSE organized a study abroad to Scandinavia on housing in conjunction with UO Architecture. FERM initiated a new study abroad to Spain, with a focus on sustainable forest management.

b. Research and its impact (see Appendix B for additional information)

The CoF, through the OFRL, conducted a mixture of basic and applied research at microscopic to local to global scales that ranged in focus from discovery to decision support. The CoF/OFRL is known nationally for its research cooperatives that bring stakeholders to OSU with pooled resources. Our scientists collaborated with a large group of courtesy faculty from the USDA Forest Service, USGS, EPA, and other partners.

- CoF faculty obtained \$13,416,664 in extramural funding in FY 2011: \$11,570,817 from 125 grants and agreements and \$1,845,847 from research cooperative dues (represents 84 cooperators).
- University Distinguished Professors John Sessions and Steve Strauss provided CoF leadership on the development of two successful mega USDA-NIFA-AFRI grant proposals. Glenn Howe provided leadership for another multi-university and agency team in anticipation of a large AFRI proposal focused on climate change and western conifers. That RFA has been delayed after substantial preparation.
- Forestry Communications (FCG) staff collaborated with OSU Libraries to expand CoF presence in and use of ScholarsArchive (SA). CoF publications in SA were viewed 80,676 times by users in 100 different countries.
- CoF retained distinction as one of twelve national Wood Utilization Research Centers with continued Congressional support in 2010. However, after 26 years of continuous funding, Congress did not appropriate new funds for 2011 or 2012 (earmarks eliminated), so the future depends on securing alternative funding.
- The CoF, Institute for Natural Resources (INR), and the Forest Service Pacific Northwest (PNW) Research Station are midway through a \$5.5 million stimulus-funded effort aimed at watershed-level prioritization of land-management actions based on fuel conditions, wildlife and aquatic habitats, economic values, and projected climate change across all lands in Arizona, New Mexico, Oregon, and Washington. The project was acknowledged as one of eight “exemplary case studies” by the Farm Foundation.
- Joe Karchesy was awarded a patent in FY11 for natural pest-control chemistry. One patent disclosure and two patent applications were also filed by WSE faculty.
- The HJA LTER program is midway through its sixth cycle of continuous grants since 1980. While the science conducted through LTER is already widely known, recognition of the program’s pioneering relationships between science and humanities and its outreach programs focused on K-12 teachers has increased.
- University Distinguished Professor Jeff McDonnell served as Director of the Institute for Water and Watersheds (IWW), an interdisciplinary team that secured a \$4.3 million NSF grant to study how climate

change, population growth, and economic growth will alter the availability and use of water in the Willamette River. The project involves 21 faculty from OSU, UO, Portland State, and Oregon Sea Grant.

- The CoF-hosted IWW “Collaboratory” provided access to low-cost water-quality and stable-isotope analysis facilities for 25 students and researchers from 11 departments in CoF, College of Science, College of Agricultural Sciences (CAS), and College of Engineering, running over 10,000 samples during the year.
- Darius Adams received continuing Forest Service support for his Forest and Agriculture Sector Optimization Model that is evaluating national greenhouse gas emissions from agriculture and forestry.
- John Bailey initiated an NSF-funded study in central Oregon on coupling natural ecosystem responses to fire exclusion and future restoration efforts with social system responses.
- Temesgen Hailemariam developed methods to improve the accuracy of forest inventory and monitoring that is pivotal to examining potential impacts of climate change on forests of the Pacific Northwest.
- Claire Montgomery collaborated with landscape ecologists and social scientists from the Forest Service PNW Research Station to explore the potential for large-scale forest-fire fuel treatments on federal land in Oregon and Washington to benefit rural communities that have been impacted by federal forest policy changes in the last few decades. This work complemented work with scientists at the Institute for Computational Sustainability at Cornell University and at the Forest Service Rocky Mountain Research Station to address optimal management of wildfire on forested landscapes.
- Eric White provided a first-ever estimate of the nationwide health benefits associated with recreation activity on National Forest System lands.
- Michael Wing’s collaboration with the OSU Extension Service resulted in a web-enabled spatial decision support system for watersheds along the entire Oregon Coast, the Umpqua sub-basin, and Rogue Valley sub-basin that enable county development officials to estimate stormwater runoff.
- Mark Harmon published a major review article that indicated that changes in carbon balances following major disturbances are likely to be much more complex than generally appreciated. He and colleagues from the Forest Service PNW Research Station developed a carbon-calculator software program for use by land managers to estimate the impacts of harvesting and disturbances on carbon stores.
- Mark Needham completed the first study of recreationists’ psychological values toward coral reefs and examined the effect of a local science center on community comprehension of natural resource issues.
- Anita Morzillo is a co-editor on a new book published by Cambridge: *Sources, Sinks and Sustainability*.
- Bryan Black applied techniques from dendrochronology to long-lived marine and freshwater organisms, and identified their relationships to other biological indicators, including seabird reproductive success and salmon growth. With this innovative work, he found that some biological processes are particularly sensitive to wintertime climate patterns, while others are sensitive to summertime patterns.
- Steve Strauss and his research team have made major advances in the study of epigenetics and, for the first time, have mapped the methylation of DNA in the entire genome of native black cottonwood.
- Bev Law and Mark Harmon provided an invited paper to *Carbon Management* focused on forest sector carbon management, measurement, and verification. It included discussion of policy options related to mitigation and adaptation of forests to climate change.
- Bill Ripple co-authored a review article “Trophic Downgrading of Planet Earth” in *Science* magazine.
- Robert Kennedy and collaborators from the University of Washington (UW) and Montana State are using an AFRI grant to develop maps of forest condition and carbon for the three-state region for the period 1985 to 2010 that assess change in carbon storage and release at the regional scale.
- Matt Betts is demonstrating thresholds in broadleaf tree cover that influence avian abundance, providing initial evidence about the importance of landscape pattern for vertebrates in managed forests.
- Dave Turner used remote sensing and modeling to map net ecosystem carbon exchange over the Northwest Forest Plan area and evaluate how carbon flux has changed since implementation.
- Bruce Shindler is leading several projects focused on human interactions and adaptation in fire-prone landscapes across in the western United States, Australia, and Canada.
- The WSE Green Building Materials Laboratory obtained commercialization grants from Oregon BEST (Built Environment and Sustainable Technologies Center) and the OSU Venture Fund to develop engineering design plans for three commercial-scale Viscoelastic Thermal Compression production systems.

- Rakesh Gupta and several students were members of NSF and American Society of Civil Engineers (ASCE) damage-assessment teams that examined the performance of wood-framed buildings in Alabama and Missouri impacted by 2011 tornados. Their report has been published on NSF and ASCE websites.
- *Strategic Marketing in the Global Forest Products Industry, 2nd Edition* by Eric Hansen and Heikki Juslin was published in winter 2011.
- Research by Rakesh Gupta and student Scott Goodall demonstrated that earthquake or hurricane damage to wood-frame buildings can be significantly reduced by applying additional low-cost sheathing to frame walls, an improvement that represents only a modest cost increase beyond current code minimums.
- The CoF/OFRL added one new research cooperative, for a total of eleven; the newest is CoF's second NSF Industry/University Cooperative Research Center and is focused on wood-based composites.
- The Environmental Performance of Treated Wood (EPTW) Research Cooperative, led by University Distinguished Professor Jeff Morrell, has compiled a new book on the state of science about *Managing Treated Wood in Aquatic Environments*.
- The Utility Pole Research Cooperative identified a potential problem with a preservative used to treat utility poles, resulting in an immediate change in treating practice by a major pole supplier and a request for assistance in managing "in use" poles treated with the suspect chemical.
- The Watersheds Research Cooperative (WRC) concluded field measurements at the Hinkle Creek Paired Watershed study site. Activities now concentrate on publishing results. Workshops are planned to communicate findings and policy implications. Alsea and Trask watershed studies continue.
- The Center for Intensive Planted-forest Silviculture (CIPS) developed a CIPS/VMRC variant of CONIFERS, a young stand model that predicts growth and mortality of young Douglas-fir trees and dynamics of herbaceous and shrub vegetation under different management regimes.
- The Hardwood Silviculture Cooperative completed RAP-ORGANON, the red alder plantation version of the growth and yield modeling system ORGANON. The emergence of red alder as a high value commercial species can be attributable, at least in part, to the information generated via this research cooperative.
- The Pacific Northwest Tree Improvement Research Cooperative (1) demonstrated that new acoustic tools can be used to reliably estimate wood stiffness on standing trees or logs in older genetic tests; (2) used next-generation DNA sequencing to sequence the Douglas-fir "transcriptome," the total set of active genes in the species; and (3) published a review article entitled "Forest responses to climate change in the northwestern United States: Ecophysiological foundations for adaptive management."
- The Tree Biosafety and Genomics Research Cooperative identified eucalyptus genes expressed during flowering and provided a first-ever catalog of genes with containment traits such as sterility. Containment may be a key to public and regulatory acceptance of genetically engineered eucalyptus.
- The Swiss Needle Cast Cooperative (SNCC) determined through dendrochronological analysis that the disease was rare prior to 1960 and has become increasingly severe over the last two decades, with climatic factors appearing to drive increases. The SNCC developed an integrated pest-management plan to assist landowners in mitigating effects of the disease.

c. Outreach and engagement, including international level activities (see Appendix C for additional information)

CoF and FNR Extension faculty and staff offered a rich suite of outreach programs that communicated research, experiential, and decision-support information to a wide assortment of stakeholders that included professionals, woodland owners, the public, policy makers, and K-12 teachers and students.

- Marquee, long-running FNR Extension programs continued to prosper, often in cooperation with the Oregon Forest Resources Institute, Oregon Department of Forestry (ODF), Oregon Department of Fisheries and Wildlife, the Forest Service, and watershed councils.
 - Three Tree Schools, held in Oregon City, Grants Pass, and Roseburg, attracted 815 participants.
 - Oregon Master Woodland Manager Program's 75 volunteers reached 13,000 people in 17 counties through educational events, site visits, tours, and leadership in local associations.
 - The three-year-old Pest Scene Investigator (PSI) Program trained 71 PSIs, with a focus on Swiss Needle Cast disease, mountain pine beetle, and defoliating insects.

- The Ties to the Land Initiative, FNR Extension's innovative partnership with the Austin Family Business Program, reached more than 500 landowners in seven states. A new grant will support expanded activities in Oregon, Washington, Idaho, and California.
- In its second full year, the Oregon Master Naturalist Program focused on Oregon Coast classes, reaching 385 attendees. This was a pilot year in partnership with the Centers for Ocean Science Education Excellence Pacific Partnership and funded by an NSF grant.
- Oregon Natural Resources Education Program (ONREP) workshops reached 1,163 K-12 educators who will reach 46,520 students in 2011-12. The Teachers as Watershed Researchers Project, part of the NSF LTER program at the Andrews Forest, in collaboration with the Oregon Hatchery Research Center, finished its final year with 15 middle and high school teachers working with scientists to bring science methods into their teaching. In 2011-2012, ONREP will provide leadership for the development of a strategy to implement Oregon's K-12 environmental literacy plan.
- Olga Krankina and Kari O'Connell received a grant from NASA's Global Climate Change Education Initiative titled: "Researcher-teacher partnerships: making global climate change relevant in the classroom."
- The Oregon Wood Magic Program delivered educational programs about wood and related resource issues to 2,600 3rd and 4th graders through events on campus and at the World Forestry Center in Portland.
- Loren Kellogg chaired the Western Region Council on Forest Engineering Conference in Eugene. Co-sponsored by the CoF and the Association of Oregon Loggers, this 7th annual event attracted 230 forest engineers, logging contractors, and agency employees to discuss updates in technology, engineering, and business practices related to sustainable, reduced-impact timber harvesting and transportation.
- Paul Adams, working with FCG staff, led a major revision to the *Oregon Forest Protection Laws Illustrated Manual*, a popular and valuable resource for forest landowners and operators. First released in 2002, this update incorporated significant changes in operational considerations and legal requirements.
- Amy Grotta helped plan the Vernonia Center for Rural Sustainability, a community initiative to provide educational opportunities for K-16 students, workforce training, and an economic development catalyst.
- University Distinguished Professor Norm Johnson, working with Jerry Franklin from UW, initiated a series of pilot projects applying principles of forest restoration to BLM O&C lands at the request of Secretary of Interior Ken Salazar and members of the Oregon Congressional Delegation.
- In its sixth year, Oregon Wood Innovation Center, a collaborative OFRL/FNR Extension initiative, fostered the competitiveness of Oregon's wood-products industry through outreach, R&D, and distance education:
 - Represented CoF on the Forest Cluster Strategy Project that developed an economic development plan for the forest sector leading to a strong presence for the sector in the Oregon Business Plan.
 - Expanded the web-based *Forest Industry Directory* that connects small- to medium-sized business buyers with suppliers. Impact assessments illustrate up to a 15% increase in business with its use.
- At least 33 faculty studied, conducted research, or delivered papers abroad, visiting 37 countries, and two received Fulbright or other international awards.
- The CoF/OFRL hosted at least 45 international scholars, visiting scientists, and trainees, and was home to 29 international G students and 1 UG student. These visitors hailed from 25 different countries.
- Badege Bishaw initiated a collaborative research partnership between OSU and the World Agroforestry Center in Nairobi, Kenya.
- USDA National Needs Fellows and WSE MS students Ashlee Tibbets and Natalie Macias conducted research about designer/builder views of structural building materials in Australia and were the first students from North America to participate in the International Forestry Student Symposium (IFSS) held last year in Seoul, Korea, where they won an award for best oral presentation.
- WSE MS student Mike Karas was hosted by three German universities for his research about the acoustic properties of wood plastics from low-grade woody biomass. He also received the Best Student Presentation Award at the ECOWOOD conference in Oporto, Portugal.
- CoF faculty played many key leadership roles in support of the 2010 23rd IUFRO World Congress in Seoul, Korea. This is the primary international forest science event held every five years.

d. Community and diversity enhancement initiatives (see Appendix D for additional information)

- The annual OSU Food Drive to benefit Linn-Benton Food Share continued as a key community-building event, with the CoF leading all campus units in contributions for the 11th year in a row.
- The successful SEEDS initiative was noted earlier in the report.

e. Other appropriate initiatives (see Appendix E for additional information)

- The SSO staff collaborated within the ESS Division, especially with CAS. CoF is a partner in the new CAS-led Student Leadership Academy, CAS-related employers were invited to participate in the 2011 CoF Student Job Fair, staff plans to include CAS in our “success” seminars for undergrads in AY2012, and they are working with CAS and the College of Oceanic and Atmospheric Sciences to create a “decision tree” to assist prospective students in understanding NR-related degree options.
- CoF partnered with OSU Horticulture and ODF to deliver Urban Forest Landscapes courses and create an OSU Extended Campus (Ecampus) version of this NR degree option.
- Several CoF faculty were active in the development of the vision and planning for the new College of Earth, Oceanic and Atmospheric Sciences.
- FERM is working with Biological and Ecological Engineering on a proposal to create a virtual School of Natural Resources Engineering.
- CoF/OFRL, part of the Statewide Public Service Units (Statewides), collaborated with conservation-group and industry stakeholders to support the appropriation process of the recent Oregon legislative session.
- The CoF initiated development of a new strategic/business plan that will be completed in FY2012.
- The ESS deans collaborated on a proposal for new faculty positions funded by the Provost’s Faculty Investment Initiative.

2. Brief assessment of unit’s efforts: what worked; areas that need improvement; major barriers

a. Student engagement and success

- Terrific progress was made in reconfiguring existing UG and G degree programs and in launching new degree programs, including both on-campus and distance-delivered degrees. New graduate programs were approved in both FERM and FES. Investments in focus group and market research on student interests and perceptions informed curriculum discussions, especially the new Renewable Materials degree. Information will be applied to revisions of FERM UG degrees and to potential new options in the Natural Resources program in 2012.
- Enrollment growth continued across the CoF, but is most rapid for Ecampus degree programs, including the UG Natural Resources program and the new distance Master of Natural Resources. The CoF recognizes the importance of continued enrollment growth and is evaluating alternatives and incentives for aggressive marketing of distinctive programs to new audiences, especially non-residents.
- Enrollment growth has pushed increasing numbers of courses to a tipping point that requires more lecture and/or lab sections. Managing this enrollment growth with static or declining teaching funds is an increasing challenge. The current university funding model for teaching presents no incentives for offering more or more effective courses. Unfilled faculty vacancies as a result of insufficient funding are eroding capacity to deliver courses.
- We continue to work through challenges associated with bi-departmental management and “faculty ownership” of the UG Forest Management degree resulting from our reorganization in 2008. Communication among faculty has improved through the creation of the Faculty of Forest Management.
- Our SSO staff is increasingly burdened with “push down” from central campus to bear the responsibility for OSU initiatives and special programs that continually require more CoF staff time (e.g., assessment, INTO, first-year engagement, and divisional relationships).
- Departments continue to struggle with understanding and meeting university reporting expectations for student assessment.

b. Research and its impact

- This was a successful year for connecting UG students with faculty in many different kinds of research experiences through long-standing programs such as the HJA LTER and our more recent Board of Visitor

and SEEDS-supported mentor-protégé programs.

- The expertise of CoF faculty was sought by national, state, and local leaders, agencies, and businesses to inform a variety of management and policy discussions. Some examples include testimony before Congressional committees, engagement with the Secretary of the Interior, and providing support for the Oregon Business Plan.
- Departments have attracted some outstanding grant-funded faculty and post docs. Membership dues for research cooperatives increased as the economy recovered and our two newest cooperatives became more established.
- Several CoF faculty led or were active in preparing proposals in response to mega RFAs from federal agencies. We have learned crucial lessons about the commitment and collaboration necessary to prepare successful proposals. In testament to the quality of our faculty, we have been successful on several very large NSF or AFRI grants (soon to be announced). Clearly, both OSU and CoF must recognize and value the enormous personal commitment and opportunity cost required for faculty to engage in these efforts.
- Balancing the assignment of faculty talent to student success, grantsmanship, and service is an increasing challenge. We are learning that assigning successful research faculty to more UG teaching carries a substantial opportunity cost in reduced research productivity. We also need to support a reasonable work-personal life balance to reduce potential for burnout.
- Revenue from grants, contracts, and research cooperative dues is down about 17%, however. Several causal factors interact: unfilled faculty vacancies reduce capacity; federal opportunity has declined, including loss of ARRA stimulus money and Congressional earmarks; and, in some cases, faculty successful in previous grant competitions were ineligible to apply this year.

c. Outreach and engagement, including international-level activities

- CoF/OFRL faculty and staff, with integral linkage to the FNR Extension Program, had an outstanding year in outreach and engagement, with positive impacts on constituents that range from K-12 students and teachers to forest land owners. The FNR team continues to be recognized with awards.
- The CoF and FNR completed a strategic analysis of outreach and engagement opportunities, including alternative administrative structures and potential linkages with University Outreach and Engagement. Business plan evaluation is continuing and implementation is resource dependent.
- CoF faculty international engagement and leadership is remarkable, especially given the relatively small investment in this area by both the college and the university.
- CoF proposed that INTO expand its program and recruiting in natural resources, with little enthusiasm from INTO. CoF will continue to explore approaches for expanding international UG and G enrollment.
- The FNR Extension Program has faced financial challenges as Statewides funding has declined. Implementation of the Extension reorganization in FY2012 will add additional stress in the near term.

d. Community and diversity enhancement initiatives

- The SEEDS program was successful in building community with underrepresented groups at an unprecedented level over the past year. The internship program was successful in its first year and made some connections with employers for the future. Joint efforts between the CoF Diversity and Social Justice Committee and SEEDS are seeking to strengthen linkages with campus cultural centers. We will be challenged to secure longer-term funding for SEEDS after the federal stimulus funds expire.
- The CoF encouraged faculty and staff to attend outreach programs focused on power and privilege and diversity, and supported registration fees for selected events. The best responses from faculty and staff were for departmentally sponsored events, such as the FES Safe Space training.
- We have been able to recruit several women through soft money faculty appointments. Progress in diversifying the T/TT faculty has been slow in the absence of new faculty hires.

e. Other appropriate initiatives

- The CoF used Provost's Faculty Investment Initiative funds to recruit one WSE faculty member focused on green building materials and one FES faculty member who will focus on climate change modeling when he

arrives in 2012. Both add valuable capacity in these timely areas. We look forward to additional support for positions in FY 2012 that will enhance capacity in teaching as well as research.

- The Statewides were collectively successful in rallying constituent support during the recent legislative session, resulting in smaller reductions than initially proposed. Harvest tax (HT) supporters matched the State appropriation to the OFRL 1:1, but the resulting net reduction in OFRL base funding over the coming biennium is \$1,520,775, based on continuing service level and reduction in the HT rate. There is little optimism that current funding will enable us to begin refilling faculty vacancies and restore lost capacity.
- CoF completed an analysis of long-term subsidization of our educational mission by OFRL, HT, endowments, and federal formula funds, and estimated a \$2 million subsidy, an amount about equal to the current OSU E&G allocation. Eliminating the subsidy with tuition revenues would help sustain the CoF/OFRL top-tier status and enable us to fill faculty vacancies and respond to emerging opportunities. CoF has engaged a consultant to help develop a refined business plan in FY2012.

3. Brief summary of major faculty and student awards

Faculty or Student	Award
Jeff McDonnell	Birdsall Dreiss Distinguished Lecture Award, Geological Soc. of America
Mike Bondi	Extension Forester of the Year, Forest Landowners Association
Mike Bondi	Excellence in Extension Award for the Western Region, APLU
Glenn Ahrens	Forester of the Year, Oregon Society of American Foresters (SAF)
Arne Skaugset	Forest Researcher of the Year, Oregon SAF
Eric White	Certificate of Merit (Chief, USDA Forest Service)
John Sessions	High Climber Award, Douglas Timber Operators, Roseburg, OR
Barte Starker / Bond Starker	E.B. Lemon Distinguished Alumni Award, OSU Alumni Association
OSU College of Forestry	2011 OSU Food Drive's "Top Banana" Award
Nicole Strong	OSU Women of Achievement Award, OSU Women's Center
Parker, Ahrens, Fitzgerald, Oester	ANREP Gold Award for Best Web-based Course
Kirsten Tilleman	National Phi Kappa Phi Graduate Fellowship
Kate Pfretzschner	Top honors, Student Poster Competition, FPS Intl. Convention
OSU FPS Student Chapter	Outstanding FPS Student Chapter Award 2011, FPS Intl. Convention
Gupta, Seaders, Miller	FPS 2011 Markwardt Wood Engineering Award for top paper

4. Key initiatives to leverage E&G and other base resources and to improve administrative efficiencies

The CoF booked over \$6.5 million in pledges toward our Capital Campaign goal, putting us within \$2 million of our revised goal of \$40.5 million. Two new faculty endowments were created and leveraged another \$675,000 from the Provost's Faculty Match Program over five years. Three new members joined the CoF Board of Visitors, bringing its membership to 15. This group donates \$150,000 annually to the Dean's Fund for Excellence and Innovation and provides strategic advice to the Dean regarding the Campaign. The CoF Student Logging Training Program benefitted from another \$200,000 of in-kind support from our partnership with Triad Machinery and Papé Group. A new relationship with the Achievement Rewards for College Scientists (ARCS) Foundation led to the selection of our initial ARCS PhD scholar in the CoF.

The CoF/OFRL faculty success in competing for external research support maintained a nearly 6:1 leverage against the state General Fund OFRL appropriation. With the addition of the NSF-supported Center for Wood-Based Composites research cooperative and a generally improving financial environment for other research cooperative members, our 11 research cooperatives—the primary focus of our industry partnerships—generated more than \$1.87 million in dues and accounted for 9.3% of our total research funding.

2010-11 RESULTS AND OUTCOMES

1. Performance on college-level metrics (see attached tables)

Increasing UG enrollment and graduates, SCHs, and student:faculty ratio has already been discussed, along with declining faculty FTE, grant and contract awards, and overall graduate enrollment. Tables do not accurately reflect successes in fundraising and strong progress towards meeting revised CoF goals for the OSU Capital Campaign.

Oregon State University
Annual Academic Program Review 2010-11
College of Forestry

PART 1A

	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	% Change '09 - '11
Faculty FTE												
Professorial	83.1	86.8	79.5	78.1	80.1	78.0	63.9	58.5	62.7	63.2	65.0	3.7%
Non-Professorial	107.1	119.3	109.8	112.3	114.7	122.1	134.4	133.2	123.6	123.8	121.1	-2.0%
Total Faculty FTE	190.2	206.1	189.3	190.4	194.8	200.1	198.3	191.7	186.3	187.0	186.1	-0.1%
E&G Tenured/Tenure Track	-	-	-	-	-	-	-	7.8	10.0	5.9	3.0	-70.0%
Faculty Headcount												
Professorial	88	94	86	84	86	81	69	65	67	68	69	3.0%
Non-Professorial	113	116	117	120	122	130	144	140	130	131	128	-1.5%
Total Faculty Headcount	201	210	203	204	208	211	213	205	197	199	197	0.0%
E&G Tenured/Tenure Track	-	-	-	-	-	-	-	8	10	6	3	-70.0%

SCH (Academic Year)												
Undergraduate	8438	8187	8090	7406	7673	8379	7977	8550	9180	9605	9525	3.8%
Lower Division	2213	2278	2086	2134	2294	2440	2054	2270	2284	2252	2420	6.0%
Upper Division	6225	5909	6004	5272	5379	5939	5923	6280	6896	7353	7105	3.0%
Graduate	4970	4959	4894	4981	4866	5282	4911	5336	4551	4097	4316	-5.2%
First Professional	0	0	0	0	0	0	0	0	0	0	0	-
Other	0	0	0	0	0	0	0	0	0	0	0	-
TOTAL SCH	13408	13146	12984	12387	12539	13661	12888	13886	13731	13702	13841	0.8%

Fall Enrollment by Major												
Undergraduate	382	353	350	362	387	453	458	586	652	732	779	19.5%
Graduate	154	140	136	146	157	167	149	153	150	134	148	-1.3%
First Professional	0	0	0	0	0	0	0	0	0	0	0	-
TOTAL Enrollment	536	493	486	508	544	620	607	739	802	866	927	15.6%

* In 2007, seventy-seven (77) from the Natural Resources degree in the College of Agricultural Sciences were reallocated to the College of Forestry.

Oregon State University
STRATEGIC PLANNING METRICS 2010-11
College of Forestry

PART 1B

	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	College Targets 2012-13
Goal 1. Provide Outstanding Academic Programs 2004-05 Themes: Increase research and outreach. Increase diversity.										
1.2 Invention Disclosures	2	5	2	2	4	3	0	3	4	
1.3 % of Faculty, Staff, Students Comfortable with Climate for Diversity.	-	68.3%	-	-	-	-	-	-	-	
1.4 % of US Minority Students of Total Enrollment	7.1%	5.7%	5.5%	7.3%	7.2%	7.3%	7.5%	7.0%	7.7%	

Goal 2. Improve the Teaching and Learning Environment 2004-05 Themes: Improve student success and retention. Increase diversity.										
2.1 First Year Retention Rate (College/University)	75.0/ 80.0	69.4/ 86.1	70.5/ 81.8	63.3/ 73.5	66.7/ 82.2	61.8/ 83.6	67.3/ 86.5	65.2/ 73.9		
2.2 6-Year Graduation Rate (College/University)	37.7/ 59.0	41.2/ 56.9	46.8/ 68.1	52.5/ 62.5	55.2/ 69.0	62.5/ 72.5	44.4/ 72.2	56.8/ 70.5		
2.5 Seniors Participating in Student Engagement Activities (% /Respondents)	-	75.0/ 8	93.3/ 15	-	80.7/ 62	-	-	69.0/ 65		
2.6 Student to Faculty FTE Ratio (Primary Majors/ Course)	14.1/ 10.2	13.0/ 9.0	14.3/ 9.3	21.1/ 12.9	20.5/ 11.7	27.7/ 15.7	22.0/ 13.0	24.0/ 13.1	38.1/ 20.5	

Oregon State University
College of Forestry
 Annual Academic Program Review 2010-11

PART 2

	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	% Change '09 - '11
Resources (Fiscal Year)												
E&G - Initial Budget (\$)	2,182,101	2,204,568	2,351,353	2,263,151	2,575,008	2,764,595	2,834,320	3,209,935	3,251,980	3,443,308	3,427,316	5.4%
Total R&D Expenditures (\$)			18,270,617					20,577,088	23,892,923	22,784,030		10.7%
1.1												
Awards from Grants and Contracts* (#) 3.1	153	140	149	168	161	157	138	125	118	160	110	-6.8%
Awards from Grants and Contracts (\$) 3.1	11,751,300	10,136,827	8,101,750	14,074,018	11,566,572	12,814,264	9,488,854	10,830,135	12,170,824	14,568,574	11,570,817	-4.9%
Private Giving (\$) 3.2									4,163,291	1,725,537	1,893,782	-54.5%

Strategic Planning Metrics 2010-11

	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	College Targets 2012-13
Goal 1. Provide Outstanding Academic Programs										
2004-05 Themes: Increase research and outreach. Increase diversity.										
1.1 Total R&D Expenditures	see APR data above									
1.x.1 External Funds Generated per State Dollar Invested in Statewide Public Services (FRL)	6.25	6.80	6.81	6.63	6.02	5.31	5.59	5.98	6.47	

Goal 3. Increase Revenues										
3.1 Awards from Grants and Contracts (# / %)	see APR data above									
3.2 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.

Oregon State University
College of Forestry
 Annual Academic Program Review 2010-11

PART 3

	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	% Change '09 - '11
Degrees (academic year)												
Bachelor	85	77	86	82	61	79	106	124	132	138	169	28.0%
Master	28	34	36	29	33	33	28	30	29	25	15	-48.3%
Doctorate	14	14	15	17	14	10	15	11	22	13	15	-31.8%
First Professional	0	0	0	0	0	0	0	0	0	0	0	n/a
Total Degrees	127	125	137	128	108	122	149	165	183	176	199	8.7%

Strategic Planning Metrics 2010-11

	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	College Targets 2012-13
Goal 2. Improve the Teaching and Learning Environment										
2004-05 Themes: Improve student success and retention. Increase diversity.										
2.3 Undergraduate Degrees Awarded	86	82	61	79	106	124	132	138	169	
2.4 Graduate Degrees Awarded	51	46	47	43	43	41	51	38	30	

Provost's Council
ACADEMIC REPORT for 2010–2011
College of Forestry/Oregon Forest Research Laboratory
September 1, 2011

APPENDICES

These are important accomplishments that were not included in the main body of the report because of space limitations.

Appendix A. Student engagement and success

i. Facilities and support units

Academic Affairs and Student Services Office (SSO)

- The SSO provided leadership for the COF student Ambassador Program that includes co-teaching three leadership classes. CoF was able to fund five this year.
- The CoF recruiter conducted/attended 73 events and spoke to 8018 students throughout Oregon high schools and at special events.
- Nearly all incoming students were enrolled in degree partnership programs with community colleges. The number of post-bacs is increasing rapidly, especially in the Natural Resources-Distance program, thus requiring more time of the SSO staff in support of student application, review, and advising.

Forestry Computing Resources computer labs and helpdesk

- The Forestry Computing Resources (FCR) computing staff (8.5 FTE) includes five people with advanced degrees (MS and PhD) in a variety of scientific fields. This expertise allows FCR members to operate as research partners and collaborators, rather than simply service providers, a recognized and respected distinction within the forestry community. FCR provides a unique computing support environment for CoF students, faculty, and staff, as well as State and Federal research partners (USFS, USGS, ODFW). CoF and other students benefit from this environment in a variety of ways:
 - The knowledge and expertise gained in supporting specialized research computing allows that support to be cost effectively extended to the CoF student computing labs, where more than 50 specialized software packages are provided as course requirements. Thirty-seven of these applications are only available in the CoF student computing labs. They are available with 24-hour access.
 - The CoF student computing labs provide critical access to computing resources for the west end of campus. INTO classes and sessions make extensive use of computing labs supported by CoF Forestry Computing Resources.
 - In the annual student survey, students are clear in expressing what these computing resources mean to them, writing, “The Forestry labs have become some of the best venues for quiet and easy computer usage on the entire campus.”

FCR brings this spirit of collaboration to on-campus interactions as well. In the past year, FCR engaged with the College of Agriculture to explore ways that the two colleges might collaborate to provide computing services to a diverse community of users. FCR staff are actively involved in a variety of campus IT efforts. Kathy Howell co-chairs the campus IT Coordinating Committee (ITCC) and serves on two of the four IT cross-cutting governance committees. Mike Altimus chairs one campus IT working group and serves on another. FCR staff is working with Central Web Services staff to share expertise and contribute a CoF perspective to University Web planning. Paul Foshay serves as technical advisor to the Buy Orange purchasing committee. FCR staff has served as “insourcing” expertise for hire on a

variety of campus projects. These are just a few examples of FCR's commitment to campus collaborations. But tight budgets and thin staffing will make these contributions harder to sustain without a new funding model for campus IT.

College Forests

- The 11,500-acre McDonald-Dunn Forest, one of OSU's crown jewels, is located 20 minutes from campus and provides outstanding opportunities for teaching, research, demonstration, and participation in forestland management activities. The College Forests staff supported a variety of courses from the CoF and other campus departments; mentored several students; and facilitated operations for the Student Logging Training Program, a unique and comprehensive educational program. The College Forests staff has been downsized in recent years, but those remaining have excelled in fostering support and volunteerism from the Corvallis community to maintain a vibrant public education and recreation program. Using voluntary and fiscal contributions, a new trail was constructed through a series of research plantings studying the effects of tree seedling spacing on tree growth and wood properties. The trail links these young plantations with the existing Old Growth Trail to show the contrast in forest management objectives and allow interpretation opportunities for forest visitors and university students. Recreation volunteers continued to provide significant support for the College Forests recreation program. Volunteers from Oregon Equestrian Trails, various trail runner groups, the Team Dirt Bike Mountain Bike Team, the Community Services Consortium, OSU Community Services Center, fraternities and various College of Forestry student clubs contributed sufficient work to maintain and enhance the Forest's 22 miles of trails. An Oregon Recreational Trail Program grant allowed reconstruction and strengthening of a popular trail linking Chip Ross Park with Dimple Hill. After a 2-year hiatus due to poor timber markets, the College Forests staff was able to market a sale of timber that returned the financial picture of the College Forests to the "black."

H.J. Andrews Experimental Forest (HJA)

- The H.J. Andrews Experimental Forest was featured in several media pieces (TV, newspaper) related to the use of LiDAR to understand patterns of vegetation structure and carbon storage at a landscape scale, as well as how structural variability influences bird distributions, breeding behavior, and movements within a mountainous landscape. The LiDAR data analysis is funded, in part, through the NSF grant, "Long-Term Ecological Research at the H.J. Andrews Experimental Forest (LTER6)."
- Funded by an NSF dissertation improvement award, PhD student Eric Sproles, who works with the HJA LTER program, used HJA climate data as input to a snow model to simulate present-day and projected future climate impacts on snowpack in HJA and the greater McKenzie River Basin. He found that by the 2040s, significant losses in snowpack would occur throughout HJA, resulting in less water storage and earlier seasonal disappearance of snow.
- OSU was awarded \$4.3M from NSF to study water scarcity in the Willamette River Basin. HJA data on climate, hydrology, and forest ecosystems are helping investigators evaluate how climate change and land cover/land use changes affect water availability and water quality. Additional snow monitoring capabilities from this project will complement continuing efforts to quantify temperature-sensitive snowpacks. The project is also funding Kelly Gleason and Elizabeth Garcia, two graduate students associated with the HJA LTER program who are modeling HJA ecohydrologic processes and patterns.
- HJA Day was held on June 23, 2011, with 150 attendees from OSU, other universities, the USDA Forest Service (FS) Pacific Northwest (PNW) Research Station, Willamette National Forest, private industry, and the public. The H.J. Andrews Experimental Forest continues to be a leader at OSU and across the United States in developing programs that encourage interactions among the humanities, arts, and sciences to understand ecosystems and our place within them. Representatives from a dozen LTER sites and two arts/education/outreach centers gathered at the HJA May 6-8, 2011, to advance this work. This event was sponsored by the LTER Network Office and hosted by the HJA LTER program and the Spring Creek Project for Ideas, Nature, and the Written Word.

- In early May 2011, 15 Oregon middle- and high-school teachers convened at the HJA for a workshop co-sponsored by the HJA LTER program and the Oregon Natural Resources Education Program. Teachers worked with HJA researchers to collect data for a long-term phenology project. Despite the lingering snowpack, the teachers examined spring emergence of insects using a technique called leaf turning. The success of the teacher-researcher interactions is apparent from the feedback from the teachers: “Taking the time to do real data collection led to many questions and insights about field science” and “the field research practice and ideas allowed me to figure out how to break it down for my students when we do it in the classroom.” Three additional workshops are planned.

CoF Seminars / Graduate Student Symposia

- CoF departments conducted or sponsored series of seminars and graduate student symposia to help engage OSU students in the scientific community. CoF graduate students participated both in presenting research and as organizers of events.

ii. Enrollment and graduation data

FERM Department

- UG enrollment in FERM was 267, up 53% since 2006. The total number of grad students supervised by FERM faculty increased significantly from 38 to 53, up 38%. In a slight increase over last year, 14 graduate students (4 PhD, 10 MS) completed their degrees this year.
- During 2010, FERM faculty organized themselves into six major disciplinary groups, each with a mix of basic/theoretical and applied/practical activities. These groups are tied to the areas of specialization in the new Sustainable Forest Management graduate program:
 - *Watershed Management*: McDonnell, Skaugset, P. Adams, Pyles, Bailey
 - *Silviculture, Fire and Forest Health*: Fletcher, Johnson, Bailey, Shaw, Rose, Maguire and active emeriti Newton, Walstad, and Tappener
 - *Forest Economics and Policy Analysis*: Montgomery, D. Adams, T. Maness
 - *Operations Planning and Management*: Sessions, Boston, Pyles, Kellogg, Murphy, Maness
 - *Biometrics and Geomatics*: Temesgen, Hann, Wing, Maguire, Kiser
 - *Forest Engineering*: Pyles, Kellogg, Wing, Boston
- Several faculty have been active in the development of eCampus versions of existing classes or of classes uniquely taught through eCampus (e.g., Bailey—FOR436, Kellogg—SNR 534, Bailey and Fletcher—SNR 531).
- FERM held its 3rd Annual Graduate Student Symposium in June 2011, advised by David Shaw.

FES Department

- FES was responsible for 507 UG majors during the past year. The number of grad students in the department is a combination of FS, FR, MNR, and SNR students, and now stands at 94; there are additional students in other graduate programs advised by FES faculty (e.g., Environmental Sciences, Fisheries and Wildlife, Applied Economics).
- The RRM faculty completed a process to create an option in Natural Resources that would reflect our Recreation Resources strengths. Due to low numbers of headcount majors and graduates, the BS program will be retired once the final new student enrolled in the program during 2011-12 has graduated.
- FES continued to work with representatives from CSS, Horticulture, and BPP to develop a plan for a new undergraduate degree program in Plant Science.
- FES and related NR faculty created new options in Wildland Fire Ecology, Urban Forest Landscapes, Ecological Restoration, and Recreation and Tourism Management in the NR degree. Paul Ries from the Oregon Department of Forestry (ODF) has entered into an agreement with CoF and ODF to continue to offer courses in Urban Forest Landscapes and to move this option to distance delivery.
- A sampling of highlights in teaching contributions from FES faculty includes the following:
 - Anita Morzillo, Assistant Professor, Senior Research, organized and taught a new eCampus course,

Human Dimensions of Fisheries and Wildlife Management, FW/FS 439, during fall 2010.

- Bruce Shindler, Professor, re-designed and taught a new capstone course for natural resource majors: NR 455 Natural Resource Decision-making.
- Bryan Black, Associate Professor, taught FS 115, Ecology of Oregon Coastal Forests, in spring 2011.

WSE Department

- Fall UG 2010 enrollment in WS&T and RM increased slightly to 26, as WSE implemented the new BS in Renewable Materials curriculum.
 - Marketing the Renewable Materials Program was a major undertaking in AY11. With support from the Board of Visitors, WSE launched the new degree using various activities. In addition to print and electronic media stories, new web pages were constructed and unveiled to provide a foundation for a social media marketing campaign organized and run by students. The RM Facebook page was launched with routine postings by students. A new series of videos was created to help students understand career opportunities in RM and what being a student or an alum is all about. Several recent alumni are featured.
 - New Curriculum Implementation. A major activity for the department this year has been developing and delivering an entirely new suite of courses as part of the new RM degree program. The instructional faculty developed five new courses and significantly revised seven others. WSE has now delivered all courses at least once, except for WSE465 (2), Renewable Materials Manufacturing Experience, which will be taught the week prior to Fall Term 2011.
- Four MS students and six PhD students completed this year. Based on current offers and acceptances WSE expects the fall 2011 census to be slightly smaller. About 50% of our MS students are women. About 50% of our current graduate students are foreign, from eight different countries.

Appendix B. Research and its impacts

i. Highlights of research contributions:

- CoF faculty published 175 refereed journal articles and 113 other non-Extension publications. They gave 225 research presentations and 126 outreach/extended education presentations.
- The Forestry Communications staff worked closely with OSU Libraries to promote and expand the use of ScholarsArchive (SA). Research articles and reports by CoF authors were viewed 80,676 times in 2011, nearly double 2010, and downloaded 52,921 times by researchers from 100 different countries around the world.
- The CoF and the Institute for Natural Resources (INR) are collaborating with the FS PNW Research Station on a \$5.5 million grant funded by the American Recovery and Reinvestment Act.
 - More than 50 GIS datasets were compiled and standardized across Oregon, Washington, Arizona and New Mexico for input into ILAP models. Data includes potential natural vegetation, existing vegetation and structure, ownership/management-allocation, wildfire, and soils.
 - All of the forest, range, shrub and grassland state and transition models (VDDT models) were completed for 12 Northwest modeling regions (encompassing all of Oregon and Washington).
 - The first round of overview webinars for all ILAP project modules was completed. The webinars can be accessed from the ILAP website: <http://oregonstate.edu/inr/ilap-webinars>.
 - Climate Change and Watershed module work was completed by Gordie Reeves and Lee Benda. The data can be downloaded at <http://www.netmaptools.org/coverage>.
 - ILAP was acknowledged as one of eight “exemplary case studies” by Farm Foundation and selected for presentation at the [R&D round table](#) on March 15, 2011, in Washington, DC.
- As director of the IWW, Jeff McDonnell led an interdisciplinary team that developed a successful \$4.3 million dollar National Science Foundation proposal. The 5-year project began in October 2010 and is evaluating how climate change, population growth, and economic growth will alter the availability and use of water in the Willamette River Basin on a decadal to centennial timescale. The project involves 21

faculty from OSU, the University of Oregon (UO), Portland State University, and Oregon Sea Grant. FMI: <http://water.oregonstate.edu/ww2100>.

- FERM has seen major growth in research activity and funding. New grants and contracts during FY 2010-11 for FERM totaled \$2.06 million, with an additional \$1 million in research co-op dues, for a total of \$3.1 million.
- Darius Adams was awarded \$141,000 by the U.S. Forest Service to continue to develop the Forest and Agriculture Sector Optimization Model for its use in studying changes in national greenhouse gas emissions due to the agriculture and forestry sector.
- John Bailey launched a major new effort in central Oregon on coupling natural system responses to fire exclusion and future restoration efforts with social system responses. He was awarded \$204,400 from NSF.
- Temesgen Hailemariam is continuing his work to develop (or extend) imputation and sampling methods to improve the accuracy of forest inventory and monitoring. The methods have been pivotal in multi-temporal mapping of potential forest productivity and in examining potential impacts of climate change on forests of the Pacific Northwest. He has begun a new project using ancillary information and forest inventory data to improve small area and regional estimates.
- Loren Kellogg coordinated a comprehensive international literature review on steep terrain biomass harvesting equipment and techniques and launched a field study of alternative steep slope small wood harvesting techniques in collaboration with Starker Forests and Miller Timber Services.
- Doug Maguire's research focused on compilation and analysis of data on young stand establishment and growth, in collaboration with Robin Rose and Eric Dinger of the VMRC and Tim Harrington of the FS PNW Research Station. Growth of trees on various field trials was simulated with the SMC variant of CONIFERS (growth model for simulating young Douglas-fir plantations under different vegetation management regimes). Validation of SMC-CONIFERS helped to identify strengths and weaknesses of the growth model for intensively managed stands of Douglas-fir. Components of a VMRC/CIPS version of CONIFERS were developed, including top height growth, individual-tree diameter and height growth, individual-tree mortality, dbh assignment, and competing vegetation dynamics.
- Jeff McDonnell published in *Nature-Geosciences* on "Two water worlds" (2010). This work has sparked a number of new studies around the world on the findings that trees at HJA use water that we never see in the stream and vice versa. Several 2010 papers have appeared on the "most downloaded" list at *Water Resources Research* (McGuire and McDonnell 2010) and *Hydrological Processes* (Fenecia et al. 2010). Another paper led by McDonnell (with 20+ co-authors), was the culmination of a UN-sponsored workshop exploring the future of water isotope studies focused on stream water residence time.
- Claire Montgomery's research efforts centered on wildfire in forests. She collaborated with computer scientists and applied mathematicians at the Institute for Computational Sustainability at Cornell University and fire ecologists and economists at the FS Rocky Mountain Research Station in Missoula, MT to address complex problems relating to optimal management of wildfire on forested landscapes. They applied cutting-edge optimization techniques to develop an optimal policy rule to guide the suppress/let burn decision based on information available at the time a wildfire ignites. This involves combining spatial models of fire spread and intensity, models of vegetation development, and economic models of fire suppression cost, timber management, and wildlife benefits in a Monte Carlo framework to simulate a range of potential futures in a study area of 70,000 ha in the Deschutes National Forest of central Oregon. They are concurrently working on graph theory approaches to the problem of the optimal placement of forest fire fuel treatment on the landscape. This is a far more complex problem than the suppress/let burn problem because it involves a spatial decision vector. Claire also collaborates with forest landscape ecologists and social scientists at the USDA Forest Service PNW Research Station to explore the potential for large-scale forest fire fuel treatment on federal land in Oregon and Washington to benefit rural communities that have been impacted by federal forest policy changes in the last few decades. The goal is to help inform policy makers setting priorities for the

placement of forest fire fuel treatment on the landscape. They are building a model of community-level investment in biomass processing capital, particularly in emerging technologies associated with bioenergy.

- Glen Murphy's research continued on extracting maximum value from the forest estate. Research on assessing stand value and log product yields in standing trees through the use of terrestrial laser scanning and optimal bucking technologies was completed in pine plantations and initiated in poplar plantations. Work was initiated to rank error sources associated with stand value and log product yields estimation. Research on the use of acoustics and other sensor technologies for capturing additional value through in-field sorting of high stiffness Douglas-fir logs was completed. Woody biomass expands the opportunities for improving value recovery for Oregon's forests.
- John Sessions provided OSU leadership on the development of a multi-university AFRI grant proposal to develop a liquid biofuel industry. John completed an assessment for the City of Forest Grove Feasibility Study for developing a 25 MW cogeneration plant. He participated on an assessment of effects of thinning on carbon stores in the Pacific Northwest. He supervised graduate students assessing the economics of short rotation energy crops, opportunities to implement log truck scheduling, and methods for harvest scheduling under uncertainty. John also completed the development of engineering guidelines for assessment of biomass transportation on steep forest roads.
- Dave Shaw is focusing research on approaches to delay or avoid mortality of coast live oak due to Sudden Oak Death (SOD) by interrupting the second stage attack by ambrosia beetles. He is also exploring cedar extractives as a way to protect rhododendrons from infection by SOD pathogen.
- Eric White examined the interactions between markets, people, and natural resources in managed landscapes. His work provided a first estimate of the nationwide health benefits of recreation activity on national forest system lands. He has been funded by the USDA to study landowner behavior due to forest carbon payments for afforestation.
- Jeff Wimer collaborated with John Sessions on evaluating roads and landings for biomass operations in steep terrain.
- Michael Wing's collaboration with the OSU Extension Service has resulted in the creation of a web-enabled spatial decision-support system for watersheds along the entire Oregon Coast, the Umpqua sub-basin, and Rogue Valley sub-basin. The decision-support system enables county development offices and other interested parties to select an area of interest and estimate stormwater runoff, given a storm event (6-month to 50-year return intervals). Data layers representing land cover, soil properties, urban growth boundaries, and other features are made available to decision-support system users. Mike is also involved in developing decision-support tools as part of the Integrated Landscape Assessment Project involving four western states. The decision support tools will allow users to consider wildlife, biomass supply, and community economic considerations in transporting forest materials to processing centers.
- Mark Harmon continued investigations into factors controlling carbon dynamics of forests. A major review of carbon losses indicated that changes in carbon balances following major disturbances are likely to be much more complex than generally appreciated, with multiple periods of carbon uptake and release over successional time. He and colleagues from the FS PNW Research Station have developed a carbon calculator software program for use by land managers to estimate the impacts of alternative harvesting and natural disturbances on carbon stores at the stand and landscapes levels.
- Mark Needham completed the first ever study of recreationists' psychological values toward coral reefs, examining the effect of a science center on community learning and comprehension of natural resource issues, and recreationists' tradeoffs in support of management strategies in response to changing social, resource, and facility conditions.
- Steve Strauss and his research team have made major advances in the study of epigenetics—changes to DNA that modify the expression of genes. This is increasingly recognized as important to all biological processes, ranging from cancer in humans to adaptation of plants to environment. With a \$1.2 million

grant from the DOE, Strauss' laboratory, together with strong collaboration from the laboratories of Drs. Mocker (Botany) and Frietag (Biochemistry) at OSU, has for the first time mapped the methylation of DNA in the entire genome of our native black cottonwood.

- Klaus Puettmann is leading research designed to improve understanding of stand development after partial disturbances, such as thinning. After the initial increase right after thinning, the cover and richness of exotic species declined within a decade. Also, findings highlighted the special importance of gaps in increasing structural and species diversity in forests.
- "Bear" Pitts has been refining the MAPSS team Dynamic General Vegetation Model, MC1, to serve as a tool to assist with the prediction of possible future timing and depth of the snowpack for the Greater Yellowstone Ecosystem region.
- Matt Betts is demonstrating that there are thresholds in broadleaf tree cover below which avian abundance is dramatically reduced. Fortunately, these thresholds are quite low, 6%-10% cover. Additional research studied the importance of connectivity of mature forest in managed landscapes for northern flying squirrels. This is some of the first evidence that landscape pattern is important for movement of vertebrates in managed forest landscapes.
- Jo Tynon completed a 2-year study of the direct impacts of FS fire policy on recreation opportunities across the United States. Current research focuses on linking people and landscapes by using public perceptions of urban forestry services to create new management strategies.
- Dave Turner published an article based on the use of remote sensing and modeling to map net ecosystem carbon exchange over the Northwest Forest Plan area and evaluate how carbon flux has changed since the plan was implemented. Results showed a near neutral carbon balance on private forestland in recent years, but a large increase in carbon sequestration on public forestland associated with a plan-mandated reduction in forest harvest.
- Bruce Shindler was active in several regional and international projects, including human interactions and adaptation in fire-prone landscapes across 13 states; a longitudinal (5-year) analysis of homeowner adoption and support of fuel treatments in Oregon, Idaho, and Utah; and as team leader of an international group of scientists studying fire management strategies in Australia, Canada, and the United States.
- Darrell Ross identified two species of predatory flies that are important sources of hemlock woolly adelgid (HWA) mortality in the West, providing a potential source of biological control of HWA in the East.
- In addition to all of the contributions to research made by the professorial faculty and emeritus faculty, we have a large group of courtesy and adjunct faculty who add significantly to the research enterprise of the department. With them we share important grant resources from NSF, USDA Competitive Grants, NASA, and the Joint Fire Science Program, as well as USDA Forest Service Co-Op Grants, USDA JVAs and others. For many years it has been possible to achieve and share in many excellent accomplishments due to the interactions and collaborative efforts by our faculty together with our more extended faculty in the U.S. Forest Service, the USGS, and the EPA.
- *Strategic Marketing in the Global Forest Products Industry, 2nd Edition*, by Eric Hansen and Heikki Juslin, was published in winter 2011. This update to the 2002 edition is described as taking a unique planning and modeling approach to marketing, allowing the reader to easily move from theoretical to practical marketing processes.
- Recently completed research by Rakesh Gupta and student Scott Goodall showed that earthquake or hurricane damage to wood-frame buildings can be significantly reduced by additional low-cost sheathing applied to frame walls. This finding offers dramatic improvement in performance for building walls a little better than current code-specified minimum construction. This complements the observations from disaster assessment teams that conclude that poor construction practices and weak building code enforcement resulted in the most significant damage to wood-frame houses caused by high winds.

- Steve Voelker, Barb Lachenbruch, and colleagues have published on the effects of low lignin in hybrid poplar on tree function. They found that reducing lignin by 20%-40% results in much weaker and less stiff wood. To compensate, the wood develops a higher incidence of tension wood and the trees were half as tall for the same basal diameter. This work suggests limits on bioengineering trees for plantations.

ii. Research cooperative highlights and impacts:

The CoF/OFRL launched one new research cooperative in 2010-2011, ending the year with 11 active cooperatives. A second NSF Industry/University Cooperative Research Center (I/UCRC) was established—this one in wood-based composites—led by Jeld-Wen Chair Fred Kamke and supported by five other WSE faculty and faculty at Virginia Tech. The focus is on emissions, “green building,” long-term durability, sustainability, process characterization, and wood-adhesive interaction. The financial status of co-ops recovered, in general, as member organizations began to recover from the recession and were able to pay full dues once again. The 11 research cooperatives of the CoF seek to advance science, resolve management, business, and environmental issues in Oregon and beyond, and provide a continuous program of outreach to a broad spectrum of forestland owners, agencies, and lay public groups.

- The Center for Intensive Planted-forest Silviculture (CIPS) was initiated in 2009 to facilitate collaboration among existing research cooperatives. In 2010-2011, the co-op
 - Refined mathematical models for predicting growth and mortality of young Douglas-fir trees and dynamics of herbaceous and shrub vegetation under different management regimes.
 - Produced a CIPS/VMRC variant of CONIFERS, a young stand model developed by the FS Pacific Southwest Research Station.
 - Organized a conference on “Intensive Silviculture of Planted Douglas-fir Forests: Opportunities for Increased Productivity.”
 - Developed a database on soil water-holding capacity for various sites containing long-term field trials in the Pacific Northwest.
 - Developed a database with climatic variables (ClimateWNA) at a monthly resolution for various sites containing long-term field trials in the Pacific Northwest.
- The Environmental Performance of Treated Wood (EPTW) Research Cooperative, led by Jeff Morrell, completed its second year with eight members. The co-op compiled and published a new book, *Managing Treated Wood in Aquatic Environments* (2011). The book is being distributed by the Forest Products Society. A new water and preservative analysis lab is being constructed in the west bay of the Oak Creek Building and a new analytical chemist/lab manager began work in July 2011.
- The Hardwood Silviculture Cooperative (HSC), led by David Hibbs, Emeritus Professor, has been providing information for foresters interested in hardwood management for over 20 years. The cooperative has continued to maintain and measure 36 installations in Oregon, Washington, and British Columbia, with some plantations now over 22 years old. With the collaboration of emeritus professor David Hann, HSC completed RAP-ORGANON, the alder plantation version of the growth and yield modeling system, ORGANON. The emergence of red alder as a high value commercial species can be attributed, at least in part, to the information generated via this research cooperative.
- The Northwest Tree Improvement Cooperative members have decided to proceed to a third cycle of breeding and testing coastal Douglas-fir and western hemlock, and five third-cycle breeding orchards have been grafted. In 2011:
 - 125 elite selections were made within second-cycle Douglas-fir progeny tests and grafted in breeding orchards for third-cycle breeding and testing.
 - Data from 32 second-cycle Douglas-fir progeny tests were analyzed and genetic gain predictions obtained.
 - Seed from 330 second-cycle Douglas-fir crosses were sown and 65,000 seedlings obtained for tests to be planted in Douglas and Lane counties in 2012.

- During the past year, the Pacific Northwest Tree Improvement Research Cooperative (PNWTIRC) led or collaborated on research into the genetics of wood stiffness, adaptation of forests to climate change, and Douglas-fir genomics.
 - Although wood stiffness is becoming increasingly important to the forest products industry, it has been difficult to measure and improve wood stiffness in tree-breeding programs. In two recent publications, PNWTIRC showed that new acoustic tools can be used by breeders to rapidly and reliably estimate wood stiffness on standing trees or logs in older genetic tests. To speed tree improvement, these methods are now being adopted on much younger trees (6- to 12-years old).
 - As a member of the Taskforce on Adapting Forests to Climate Change, PNWTIRC published a review article entitled “Forest responses to climate change in the northwestern United States: Ecophysiological foundations for adaptive management.” This paper is aimed at the co-op’s goal of developing strategies that forest managers can use to maintain healthy and productive forests in the face of climate change.
 - As a member of the Conifer Translational Genomics Network (CTGN), PNWTIRC used next-generation DNA sequencing to sequence the Douglas-fir “transcriptome” – the total set of active genes in Douglas-fir. The co-op identified 25,000 potential genes that are now being used to develop genetic markers to improve the efficiency of Douglas-fir breeding.
- The Swiss Needle Cast Cooperative (SNCC) was established in January 1997 to conduct research on Douglas-fir productivity and forest health in the presence of Swiss needle cast (a native fungus) and other diseases in coastal forests of Oregon and Washington.
 - 2010 had the highest number of acres detected in 16 years of aerial survey, with almost 400,000 acres of Douglas-fir plantations impacted. Studies have determined through dendrochronological analysis that SNC damage was rare prior to 1960, picked up in the 1980s, and has become increasingly severe over the last two decades. The disease is not abating, is likely new to the coast, and climatic factors appear to be the major driver of disease.

SNCC is assisting landowners in implementing an integrated pest management plan to help mitigate effects of the disease. The SNCC website is the portal for landowners to access this IPM information: <http://sncc.forestry.oregonstate.edu/>. Recently completed work has shown that operational fertilization with a number of different fertilizers has no effect on SNC, positive or negative.

- The Tree Biosafety and Genomics Research Cooperative, directed by Steve Strauss, continued its new focus in eucalyptus, working on developing gene transfer methods and analyzing gene expression. In a study of gene expression during flowering, Steve’s team identified nearly all of the genes expressed during flowering, providing a first ever catalog of genes for possible use in genetic engineering of containment traits such as reproductive sterility. Containment may be essential for public and regulatory acceptance of most types of genetically-engineered eucalyptus in the U.S. and worldwide.
- The Utility Pole Research Cooperative (UPRC) remained strong with 21 members from electrical utilities and suppliers from across the U.S. The work of this co-op is very important to Oregon consumers, who depend on electricity, and to Oregon landowners, who benefit from the high market potential of pole timber. The price for pole timber is over four times that of saw logs.
 - This year UPRC developed data on the use of “through boring” for Douglas-fir utility poles. This process improves treatment at the ground line, extending wood pole service life. This saves utilities money, reduces the need to harvest, and helps maintain the competitiveness of wood poles.
 - UPRC identified an important potential problem with a preservative used for utility poles. Based upon that data, the major supplier of poles treated with this chemical switched products and the co-op is working with them to determine how to manage the poles already treated with this chemical.
 - UPRC served as a resource to regional pole suppliers visiting with congressional staffers from Washington, Illinois, and South Carolina to inform them about the merits of wood over alternative, non-renewable materials.

- The Vegetation Management Research Cooperative was founded in 1993 for the purpose of developing management systems that increase seedling success while enhancing and/or maintaining forest resources. Currently, it is intensely studying the subject of combining weed control and seedling stock size in order to maximize Douglas-fir productivity and economic return. In simple terms, this cooperative of forest industry members is trying to determine how to use larger, more expensive seedlings in order to use less herbicide. The idea is to reduce environmental impacts, reduce costs, increase yields, and promote sustainable forestry.
- The Watersheds Research Cooperative (WRC) recently completed its tenth year. The WRC is the administrative home for three paired watershed studies: the Hinkle Creek Paired Watershed Study, the Alsea Watershed Study Revisited, and the Trask Paired Watershed Study. The overarching goal of all three of these studies is to investigate the environmental impacts of contemporary forest practices. The treatments involve contemporary forest practices and logging equipment on harvest-regenerated stands of young Douglas-fir in western Oregon. The research parameters of interest are aquatic habitat, fish and other aquatic biota, watershed hydrology, sediment yield, and water quality.
 - Alsea Watershed Study Revisited. Last fall, the principle partners for the study, NCASI and Plum Creek, undertook a study to determine the impacts of the aerial application of herbicides for site preparation on water quality. Over 1,200 water samples were collected during the aerial application of the herbicide and in the fall, during the onset of winter storms. These samples were analyzed at a cost of roughly \$500,000 (in kind contribution from NCASI) to determine the impact of the herbicide application on water quality.
 - Trask Paired Watershed Study. The last full year of data collection for the calibration period was carried out at Trask during the last year. New roads will be constructed or existing roads will be reconstructed and upgraded during the summer of 2011 in anticipation of the timber harvest that will occur during the summer of 2012. In addition, a roads project was initiated to quantify the impact of the construction, maintenance, and use of logging roads on the sediment content in the receiving streams.
 - The Hinkle Creek Paired Watershed Study. The last full year of data collection is complete and the paired watershed study will terminate on September 30, 2011. Activities now concentrate on analysis, synthesis, and integration across the disparate studies, with a primary goal of publishing results in journals.
 - Two conferences are planned for 2013 to update cooperators on the results and progress of the WRC paired watershed studies. The first has a working title, “The Environmental Impact of Contemporary Forest Practices: Key Findings from the WRC.” The second, “Interpreting the Findings of Watershed Research on Contemporary Forest Practices,” will focus on the integration and synthesis of the projects and their policy implications.
- The Wood-based Composites (WBC) Center was established as a National Science Foundation (NSF) Industry/University Cooperative Research Center in July 2010, with eight industry members and two university sites. In addition to NSF and member companies, the WBC also receives financial support from the Oregon Built Environment and Sustainable Technologies center (Oregon BEST). Industry-selected research projects are addressing improved Douglas-fir veneer recovery, adhesive application efficiency in composite manufacture, fundamental physical and mechanical interactions between adhesives and wood, and gas phase emissions from wood composites. These projects provide financial support to seven graduate students (three at OSU) and two OSU undergraduate students. Total financial support to OSU in the first year was \$230,000.

iii. Commercialization and licensure

- Joe Karchesy was awarded a patent for natural pest control chemistry.
- John Simonsen and colleagues filed a patent disclosure on hydrogel technology.
- Kaichang Li filed two patent applications for new adhesive technologies—both of those are in the process of commercialization.

- John Nairn created new open source analysis software that is being distributed as freeware through Google.

Appendix C. Outreach and engagement, including international-level activities

The College of Forestry (COF) has an active Outreach & Engagement (O&E) Program, with O&E activities appearing prominently in seven of the eight goals in the College's Strategic Plan. Here in the COF, O&E is very much a part of the academic culture, with the following primary divisions recognized:

- Forestry & Natural Resources Extension Program
- Youth & Teacher Education Programs
- Continuing & Professional Education Programs

The bulk of the College's O&E programs can be placed under one or more of these three umbrellas. In many instances the lines between traditional program areas like research and teaching and O&E become blurred. Technology transfer activities within research cooperatives and service learning courses for undergraduates are good examples. Selected highlights from O&E for 2010-2011 are provided here.

i. Forestry & Natural Resources Extension Program

The Forestry & Natural Resources (FNR) Extension Program is the largest and arguably the strongest program of its type in the United States. With 35 total employees, the program has 13 agents covering 24 counties, and 8 statewide specialists covering a wide variety of subjects. Additionally, the FNR Extension Program is home to special projects such as the Oregon Natural Resources Education Program, the Oregon Master Naturalist Program, and the Oregon Wood Innovation Center. Additionally, the FNR Extension Program is a partner with the College of Business Austin Family Business Program and the Ties to the Land Initiative. Each year, the FNR Extension Program conducts hundreds of educational events across Oregon, the West, nationally, and internationally. Thousands of forest land owners, professional natural resource managers, forest workers such as loggers and tree planters, forest industry workers and managers, homeowners, youth, and others attend these programs. A few highlights from 2010-2011 are as follows:

- Annual Tree Schools have been a feature of the FNR Extension Program for many years. Originally started in Clackamas County in 1992, Tree Schools are one-day events with a wide variety of individual classes appealing to a diverse audience of homeowners, forest owners, farmers, forest workers, natural resource managers, and others. Each year several Tree Schools are held around the state. In 2010-2011, three Tree Schools were held in Oregon City, Grants Pass, and Roseburg. A total of 121 classes attracted 815 participants, generating gross revenues of \$55,470. A variety of partners help to make these programs successful, including the Oregon Forest Resources Institute (OFRI), Oregon Small Woodlands Association, Jackson/Josephine Small Woodlands Association, Clackamas County Farm Forestry Association, Forests Forever, Inc., Clackamas Community College, Umpqua Community College, and Southern Oregon University (SOU).
- The Oregon Master Woodland Manager Program has provided high-caliber training to woodland owners and has provided a platform for community service for over 25 years. Funded by OFRI, with an annual grant of around \$60,000, in 2010, 75 Master Woodland Manager volunteers reported 3,600 hours of service, reaching 13,000 people in 17 counties through educational events, site visits with other landowners, tours, and leadership in local associations. In addition to OFRI, other partners include FS, ODF, the Oregon Department of Fish and Wildlife (ODFW), the Oregon Small Woodlands Association, and local watershed councils.
- The FNR Forest Health Extension Program has been building on a venture that began in 2008 entitled Pest Scene Investigator (PSI). PSI is a program designed for Master Woodland Manager volunteers who have a special interest in forest and tree health. PSI volunteers are available in their communities to respond to inquiries, figure out what is wrong, and dispense information on how to deal with the problem. With continuing funds from OFRI and FNR Extension, Extension Specialists and Foresters designed the programs and conducted trainings throughout all regions of the state, training a total of 71 PSIs. Training has been conducted on special problems such as Swiss Needle Cast in Douglas-fir and mountain pine beetle in pine; in 2011, we added a two-day workshop on defoliating insects of eastern

Oregon. In addition to OFRI, other partners included ODF, FS, and the Swiss Needle Cast Cooperative.

- The Ties to the Land Initiative, a result of FNR Extension Program's innovative partnership with the Austin Family Business Program, continues to increase forest landowners' ability to handle the complex issue of planning for the transfer of their land to the next generation. This year, more than 500 landowners in seven states attended a Ties to the Land workshop or seminar, increasing the likelihood that the 28,000 acres owned by these families will remain working forests. A follow-up survey found that 71% of participants in workshops had made progress on their succession plan a year later. The program received a 2010 grant from the USDA State & Private Forestry Western Competitive Grant. Oregon, Washington, Idaho, and California were awarded \$276,579 to address the critical challenge of helping families plan for the future of their land. These funds supported the training of facilitators to present *Ties to the Land* succession planning workshops and the development of new curriculum to help families complete their plans, as well as logistical support for providing the workshops to landowners in all four states.
- The second full year of the Oregon Master Naturalist Program saw significant progress in the initial development of the program. The first year of Oregon Coast classes was completed, with attendance at all classes reaching 385 attendees (many repeat participants). This was a pilot year in partnership with the Centers for Ocean Science Education Excellence (COSEE) Pacific Partnership, and was funded by an NSF grant. All but one of ten classes was offered in 2010 and 2011. These included the following: Introduction to Coastal Habitats; The Oregon Ocean; Coastal Forests and Streams; Estuaries; Sandy Beaches and Dunes; Offshore Islands; Open Ocean; Geology of Oregon Coast; and Human History and Impact on the Coast. A Rocky Shores class is planned for this winter. Several notable aspects of these classes are as follows: First, the Coastal Forests and Streams class was a joint Master Naturalist and Master Watershed Stewardship "water school." This very successful two-day class (71 attended) shows that we can continue to combine OSU Extension outreach classes between programs. Second, a new partnership was forged with Shoreline Education for Awareness (SEA), a volunteer coastal docent program. Six of the classes were jointly offered with SEA, and were offered for both Master Naturalist and SEA training. This partnership will continue in subsequent years. A new season of Oregon coast classes is being scheduled now, and there will be a charge for future classes.

Statewide Curriculum. Four chapters are nearing completion for the statewide curriculum, which we will offer via the Web. Content experts in several topic areas have authored the following chapters: Ecoregions of Oregon; Geology and Earth Processes of Oregon; Forest Ecology and Management; and Rangeland Ecology and Management. Extension and Experiment Station Communication and Lifelong Learning are helping to build the online framework for these chapters. An initial offering of these chapters is anticipated in October 2011.

A fully functional Master Naturalist participant database has been designed and continues to evolve. In the summer of 2011, the Master Naturalist Program is conducting stakeholder planning meetings to develop a Willamette Valley Master Naturalist course. In November, citizen science training was offered to Oregon Coast Master Naturalist participants. This training served as a model for future trainings. The Master Naturalist Program applied for a citizen science grant from ODFW, and are working with them on the feasibility of funding a project for 2012-13.

ii. Youth and Teacher Education Programs

The Oregon Natural Resources Education Program (ONREP) provides professional development to K-12 educators in Oregon, primarily on topics related to Oregon's forests, wildlife, and watersheds. ONREP's goal is to build educator understanding and knowledge about the diversity and complexity of ecosystems so they can prepare children to make informed decisions; exhibit responsible behavior; and take constructive action concerning the future of Oregon's natural resources. Through workshops, classes, and conferences, educators participate in hands-on environmental lessons and strategies for using the natural environment as a context for teaching both inside and outside the classroom.

- In 2010-11, K-12 educator workshops served 1163 educators who will reach 46,520 students each year. There were 64 professional development workshops and programs conducted in 17 counties across Oregon. Participants were from 26 counties across Oregon.
- Program Highlights. Four programs focused on development that builds capacity and confidence as a means of creating a lasting change in teacher practice by offering extended experiences for learning, practicing, reflecting, refining, and implementing together with colleagues.
 - University pre-service faculty consortium. This the fifth year 15 faculty from seven universities— OSU, SOU, PSU, Western Oregon University, Eastern Oregon University, Pacific University, and University of Portland (UP)—have come together twice a year to share techniques and practices for preparing students to be teachers who engage their students in relevant, authentic, and interactive learning, both in and out of the classroom.
 - Teachers as Watershed Researchers Project. This project, part of the NSF-funded Schoolyard LTER program at HJA, in collaboration with the Oregon Hatchery Research Center, finished its third and final year. Working with scientists, 15 middle school and high school classroom teachers participated in a series of workshops that engaged teachers in research and helped bring science strategies and methods into their teaching.
 - Researcher-Teacher Partnerships: Making Global Climate Change Relevant In the Classroom. In 2011-2012, ONREP will begin a three-year NASA-funded project called Researcher-Teacher Partnerships: Making Global Climate Change Relevant in the Classroom. This project is designed on the principle that engaging teachers as active participants in the practice of science has a profound impact on their teaching practice. The proposed project will use NASA’s unique contributions to climate and Earth system science to improve the teaching and learning about global climate change in secondary schools. The primary goal of the project is to engage Oregon 7th – 12th grade teachers in professional development to (a) advance their personal knowledge of the fundamentals of global climate change; and (b) partner with scientists to research a particular focus area of global climate change; in order to (c) integrate this knowledge and experience into their classroom teaching.
 - Stewardship Schools Program. This program focuses on working with teachers, administrators and staff within an entire school. It promotes systemic change in practices within an entire school through a comprehensive approach using the natural environment as a context for teaching. Schools participate in three years of professional development which focuses on developing a school-wide strategy for integrating the natural environment throughout grade-level subject areas and a connection and progression of conceptual learning between grade levels. ONREP provides curriculum and resources, and connects schools to local community projects and partners. Five schools participated in the Stewardship Schools Program during 2010-2011: Vernonia School District; Elkton Charter School District; Fossil Charter School District; Triangle Lake Charter School District; and Forest Grove Community School.
- Partnerships. ONREP works collaboratively with state, federal and non-profit programs representing natural resources and educational constituents to ensure program applicability, relevancy and sustainability.
 - Working group member for Governor’s task force on K-12 environmental Literacy. In 2011-2012 ONREP will provide leadership in the development of a professional development strategy for the implementation of the environmental literacy plan and assist in the correlation of the plan to Oregon Department of Education’s benchmarks and standards.
 - OFRI steering committee for the Oregon Forest Literacy Program.
 - ONREP Program advisory board members represent the follow organizations and agencies: Oregon Department of Energy, ODF, ODFW, FS, U.S. Fish and Wildlife Service, World Forestry Center, Oregon Department of Education, OFRI, UP, and OSU.
 - Partnership Bureau of Land Management on implementation of K-12 invasive weed education. Additional partners and collaborators include Harney and Marion County OSU extension specialists,

Harney and Grant Cooperative Weed Management Area members, Benton and Marion County Soil and Water Conservation Districts, and Marion County Public Works.

iii. Continuing and Professional Education Programs

- Jeff Wimer is a board member of Oregon Logging Conference and helped organize an array of educational events, including staffing a booth and an alumni luncheon with over 100 in attendance.
- FERM helped to organize the Western Forests Economists Meeting at Wemme, Oregon and organized technical sessions on climate change and bio-energy.
- John Bailey organized and co-taught (with several other FERM faculty) the Inventory/Monitoring and Decision Support section of the FS National Advanced Silviculture Program.
- Brad Withrow-Robinson, Extension Agent and Associate Professor, developed a new extension program in “NatureConnections” which holds promise for the development of a popular citizen science effort and that should involve local Audubon and other birder groups.
- Oregon Wood Innovation Center (OWIC), an initiative of the Oregon FRL and the Extension Service, served as the principal outreach program of the WSE department and sought to improve the competitiveness of Oregon’s wood-products industry by fostering innovation. A copy of the OWIC annual report of accomplishments is at <http://owic.oregonstate.edu/annual-report/2010/>.
 - OWIC faculty members represented CoF and OSU on a multi-state agency Forest Cluster Strategy Project that developed a state-wide economic development plan for the Forest Sector.
 - OWIC expanded the use of a web-based Forest Industry Directory that puts buyers in touch with suppliers in the state. Most of those are small- to medium-sized businesses. Hits to the directory expanded from 400,000 in 2006 to over 10 million in 2010. Testimonials and impact assessments show that users can achieve up to a 15% increase in business with the directory.
 - Short Courses. OWIC faculty offered five courses: Selling Forest Products; [How to Dry Lumber for Quality & Profit](#); [Lumber QC/Lumber Quality Leadership](#); the 9th [Wood Adhesion Short Course](#); and a customized 1½-day course on wood products manufacturing in the Klamath Basin for members of the Klamath Tribes.
 - OWIC and WSE faculty completed a number of testing, technical assistance and market assessment projects for small Oregon businesses—many are described in the OWIC Annual Report.
- The Forestry Media Center (FMC) is a unique facility in the College of Forestry, providing new ideas, tools, and technologies to communicate forestry and natural resource information and issues to a vast audience, including forest scientists, land managers, college and K-12 students, and the general public. FMC’s mission is twofold: to help improve teaching, instructional programs and College communications through the application of educational and communication technology; and to help the CoF and other agencies in the forestry community deliver forestry and natural resources messages through the development and distribution of primarily electronic and audio-visual educational materials.
 - The Forestry Self-learning Center (SLC), coordinated by FMC staff, is a large public space for studying and group work, a place outside of the classroom in which to support learning and student success. This media-rich environment provides access to reserve readings, audiovisual programs, and other self-paced learning materials.
 - This is the first year in FMC history that a staff reduced to one part-time faculty member has administered all FMC activities, with support from one graduate student (assisting with the under-represented student support program) and 11 student employees. Current staffing levels have allowed us the following successes during the 2010-2011 fiscal year:
 - Strengthening Education and Employment for Diverse Students (SEEDS): FMC personnel provide leadership for the new undergraduate student recruitment, retention and transition program SEEDS, including the coordination of SEEDS student activities such as the Paid Mentored Work Experience Program. Twelve diversity students affiliated with CoF participated this year,

working with 17 different faculty and sponsoring agency mentors. SEEDS support helped to create the opportunity for two diversity students to begin graduate programs in fall 2011 and one in winter 2011. The SEEDS program aspires to assist students in finding an academic home in the CoF and a professional home in the related natural resources fields. This important program has received major financial support from both the BLM and FS since its inception in late 2009.

- Board of Visitors Paid Mentor-Protégé Work Experiences (BOV): FMC personnel provided leadership for the work experience program that had 14 CoF faculty and staff mentors working with 15 undergraduate protégés during winter and spring terms.
- Peace Corps Master's International in Forestry and Applied Economics (PCMI): OSU PCMI continues to develop into a strong graduate-level program. OSU's first MI student, Ramona Arechiga (FERM, silviculture program, working with John Bailey), is nearly two years into her graduate program and one year into her Peace Corps service in Ethiopia. OSU's second MI student, Shannon Daniels, arrived in September 2010 with several years of field ecology and conservation experience working with David Hibbs (FES, forest biology). In summer 2011, she left for Peru. Four PCMI students have been accepted to OSU for fall 2011.
- DeLoach Work Scholarship—Peavy Hall Arboretum Virtual Field Tour: beginning spring 2011, FMC Coordinator David Zahler is co-mentoring two undergraduate students in survey and other work in the Peavy Hall native plants garden. Ultimately this work will lead to an iPod app-based, self-guided tour of the more than 100 trees and shrubs in the collection.
- FMC provided media support for significant CoF events and in support of college faculty. Such support allowed distance audience members to participate in the 2nd Annual Traditional Ecological Knowledge in Ecosystem Sustainability Conference held in spring 2011; the Forests, People, Fire Seminar Series; and the Starker Lectures Series. In most cases the audience is increased by 25% through live streaming.
- FMC staff continues to provide educational media production services to a broad clientele. This year the following projects have been initiated:
 - Forest Stories: FMC staff is working in collaboration with the Austin Family Business Center and OSU Media Services to capture audio archives of Oregonians reflecting on their relationship with forests and forestry.
 - Ecology Field Cards of the Willamette Valley, Oregon—Set Six, “Invasive Species”: FMC Staff is collaborating with OSU Benton County Extension to produce the final 50-organism card set (sixth of six) that will help land owners and managers, students and citizens better understand the composition of Willamette Valley habitats.
 - *Shrubs to Know in the Pacific Northwest*: Working with Ed Jensen (FES) and in collaboration with OSU Extension Communications, FMC staff is assisting with the production of a companion book to *Trees to Know in the Pacific Northwest*, with a focus on notable shrubs.
 - Video Production: “Inquiry in Hinkle Creek, Part 2—Telling the Story”: In collaboration with the administrators and researchers of the Hinkle Creek Paired Watershed Study and the OFRI (funders), FMC staff and contractors have begun production on two companion videos to the original “Hinkle Creek” video. One video will provide follow-up to the original, focusing on turning research into results and communicating results to diverse audiences. The second video will highlight paired watershed study successes for an audience of policymakers.
- FMC continues to redefine its support services in order to serve the forestry community in the face of reduced budgets and staffing. For the time being this means less full-quality video and multimedia production, and more services in direct support of our growing student body. Sustaining basic support services in media production will continue to be important, however, in order to support ongoing faculty work and to be in position to retool, once again, as budgets and staffing are developed to support it.

iv. International-level activities

- Kevin Boston. Invited speaker 2010. University of Montreal. Development of meta heuristics for solving forest transportation problems, Montreal, Canada.
- Loren Kellogg
 - Principal Research Fellow, University of Melbourne, Australia.
 - Research Advisor for Forest Harvesting and Operations Research, Cooperative, Research Center (CRC) for Forestry, Tasmania, Australia
- Doug Maguire. Volunteered speaker, October 18-20, 2010. Douglas-fir growth response to variation in soil water-holding capacity and local climatic patterns in the Siskiyou Mountains of southwestern Oregon. Opportunities and Risks for Douglas-fir in a Changing Climate. Freiburg, Germany.
- Jeff McDonnell
 - Invited Keynote speaker, 2010. First Annual Water Research Horizon Conference, Berlin, Germany.
 - Invited speaker at International Conference on Triggering of Mass Movements in Steep Terrain, Monte Verita, Switzerland.
 - Catchment Science Summer School (one week), University of Aberdeen, Scotland (30 students).
 - UN short course on Isotope Tracers in Catchment hydrology (three days), Cairo, Egypt (25 students).
 - Catchment Hydrology Monitoring, (one day) Federal University of Rio de Janeiro and Instituto de Radioproteção e Dosimetria, Rio de Janeiro, Brazil (35 students).
 - Scientific Advisory Committee, German Water Science Alliance, Helmholtz Inst.
- Glen Murphy
 - Invited speaker, January 18, 2010. Optimal Allocation of Wood Fiber to Conventional Bioenergy Markets. CIRRELT, University of Montreal, Canada.
 - Invited speaker, January 21, 2010. Optimal allocation of wood fiber to conventional bioenergy markets. University Laval, Quebec City, Canada.
 - Invited Keynote Address, March 1-3, 2010. New sensor technologies and analytical tools for precision forest management. Precision Forestry Symposium, Stellenbosch, South Africa.
 - Invited speaker, March 4, 2010. Mechanized harvesting in commercial plantation forests: challenges and opportunities. Forestry faculty and students at Stellenbosch University, South Africa.
 - Volunteer speaker with Mauricio Acuna (as co-author) March 1-3, 2010. Stand value and log product yield determination using terrestrial LiDAR and optimal bucking: Experiences from Ireland, Oregon and Australia. Precision Forestry Symposium, Stellenbosch, South Africa.
 - Directed and Instructed: Value Recovery Workshop, Rotorua, New Zealand, 26 forest industry participants. August 27, 2010.
 - Directed and Instructed: Value Recovery Workshop, Canberra, Australia, 24 forest industry participants. September 1, 2010.
 - Native and plantation forest management in New Zealand. Forestry faculty and students, University of Stellenbosch, South Africa. March 4, 2010.
 - New sensor technologies and analytical tools for precision forest management. Forestry faculty and students. Waterford Institute of Technology, Waterford, Ireland. March 2010.
- Robin Rose, Adviser, Shanghai Roots and Shoots, Jane Goodall Institute: Took four members of the Jane Goodall Institute – Shanghai on a tour of Starker Forest properties. December 2010.
- John Sessions
 - Associate Editor – *International Journal of Forestry Research*.
 - Associate Editor – *Silva Fennica* (Finland).
- Temesgen Hailemariam

- Organized two technical sessions and presented four papers at the 23rd IUFRO World Congress in Seoul, Korea, August 23-28, 2010.
- Temesgen, H., J. Strunk, and H.E. Andersen. 2010. Estimating biomass change in coastal Alaska forests: Statistical issues. Presented at the 21st Annual The International Environmetrics Society Conference, June 20-24, Margareta Island, Venezuela.
- LeMay, V., I. Moss, and H. Temesgen. 2010. Using inventory and forecast models for land use planning, including timber volume, climate changes, biomass, carbon, and habitat. Presented at the Science to Management Forum, Forest Science Chat Series, March 2, Vancouver, Canada.
- Michael Wing. Hosted an international researcher, Dr. Abdullah Akay of the Kahramanmaraş Sutcu Imam University, Forest Engineering Department in Turkey.
- Many of the FES faculty are engaged in international activities and support international students. However, data on the numbers and types of involvement are not available for 2010-2011.
- WS&E faculty visited at least 13 countries in 2010 and most are very engaged with a myriad of international activities. Kaichang Li is assisting South China Technology Laboratory with establishing a wood-based composites research program.
- Eric Hansen, Chris Knowles and UO faculty colleagues began teaching the pre-departure course for Sustainable Housing in Scandinavia. The course includes five UO Masters of Architecture students and five OSU students (one graduate student from nuclear engineering and three graduate students and one undergraduate student from WSE). The participants in the course will gain a North American perspective on forest management, forest products manufacturing, energy production, sustainable community development, and sustainable housing prior to departing for Finland and Sweden (August 26-Sept 10) to study these topics.
- USDA National Needs Fellows and Wood Science MS students Ashlee Tibbets and Natalie Macias spent summer 2010 in Australia conducting research about designer/builder views of structural building materials in Australia. This research built on a project completed on the same topic in Oregon. After completing their research in Australia, Ashlee and Natalie traveled to Seoul, Korea, where they participated in the International Forestry Student Symposium (IFSS), an annual event put on by the International Forestry Student Association. Ashlee and Natalie became the first students from North America to participate in this event. During IFSS, Ashlee and Natalie won the award for best oral presentation for their presentation of their research in Australia. Natalie Macias finished her MS degree and is now working for the Softwood Export Council and traveling the world.
- Fellow and MS student Mike Karas spent August and September in Germany hosted by the University of Hamburg Department for Wood Science. Mike also worked with faculties affiliated with Hamburg Technical University and Hamburg University of Applied Sciences on research about the acoustic properties of wood plastics from low grade woody biomass. In addition, Mike participated in the ECOWOOD conference in Oporto, Portugal and received Best Student Presentation Award.
- International Journal Editorships or Editorial Boards
Composites, Part A - John Nairn, North American Editor for Applied Science
International Journal of Adhesion and Adhesives - John Nairn, Editorial Board
International Association of Wood Anatomists Journal - Barbara Lachenbruch, Associate Editor
- SSO International Engagement
 - Helped develop a proposal for new Natural Resources “pathway” for INTO program.
 - Helped approximately eight CoF students apply for INTO exchange program to China; CoF currently has one INTO student enrolled.
 - Helped allocate funds to send two undergrads to IUFRO meeting in Seoul, South Korea.
 - Facilitated one undergrad student summer “exchange” for 3-week study tour of Taiwan.

Appendix D. Community and diversity enhancement initiatives

- SSO, departments, and CoF hosted numerous special events to build community, including welcome picnics for new students, a spring awards picnic, the annual recognition and retirement reception, and a variety of monthly potlucks and coffees.
- The CoF raised \$11,565.65, or 57,901.25 pounds of food for Linn-Benton Food Share through CoF community fundraising events during the OSU Food Drive.
- Female faculty members comprise 30% of the professorial faculty in FES and 50% of the instructors. Half of the graduate students are women and women make up 39% of the professional faculty. Overall, women represent 37% of the Department's combined faculty, staff, and graduate students. FES is crafting position descriptions for new positions as broadly as possible; identifying diversity candidates at other universities, industries, and NGOs to recruit; and working with members of the Diversity and Social Justice Committee to complete focus group sessions to understand how FES can better recruit minority students into the CoF student body.
- With regards to social justice, FES is proactively empowering staff, students, non-tenured faculty and others who have the potential to feel marginalized by individuals in a higher level of power. Two tenured individuals who were trusted to maintain confidentiality and equity served as the contacts and conduit for information about power and privilege. FES convened meetings with students, FRAs, and staff to ensure that they were united and empowered in their stance against any form of abuse of power by others.
- One third of Wood Science graduate students and 20% of Renewable Materials undergraduates are women. In Winter Term 2011, the student members of the WSE Graduate Affairs Committee conducted a confidential survey by e-mail to assess graduate student concerns about discrimination, abuse of power, cultural conflict and similar topics. The students then followed up with specific conversations with selected women and other students. They reported that they found no significant issues or concerns within the current student body, but that there is the potential for poor communication, exacerbated by cultural differences, to cause stress. The committee recommended that a student group be empowered to conduct a similar survey from time to time.
- About half of Wood Science graduate students come from one of eight foreign countries. WSE hosted 18 international scholars and trainees in AY11. Exit interviews with WST undergraduates revealed that many of them had never met someone from a foreign country before coming to OSU. They opined that a benefit of being in a relatively small community like WSE is that they had the opportunity to interact closely with students from other cultures and faith traditions in ways that are not likely elsewhere on campus.
- SSO continued working with the SEEDS program to recruit, support, and retain racially/ethnically underrepresented students in forestry and natural resources and accomplished the following:
 - Completed a \$30,000 contract from BLM, but hope to expand to others
 - Produced a dual language recruiting flier.
 - Produced a DVD (in progress).
 - Produced a website (in progress).
 - Fostered new relationship with EOP/CAMP and other diversity programs across campus.
 - Arranged a paid summer internship for several SEEDS students.
 - Implemented a \$191,000 2-year grant (ARRA) from the FS in support of this effort.
 - Primary focus on providing money to support internships and jobs for diversity students.
 - Supported Latino summer camps
 - Provided funds and staff support for Mario Magana's 4-H efforts.
 - Participated in initial launch of LSAMP, but nothing has developed from it yet (at least for CoF).
 - Worked to further goals and projects for COF Committee on Diversity and Social Justice.
 - Assisted in developing survey to administer to members of cultural centers on campus.

Appendix E. Other

Faculty or Student	Award
Justin Thomas (FE)	Kelly Axe Award
Chet Miller (FE)	Pack Essay Award
Danielle White (WST)	Pack Essay Award
Ryan Bronson (FOM)	Harold Bowerman Leadership Award
Brad Hamel (FM)	Harold Bowerman Leadership Award
Kirsten Tilleman (NR)	Paul & Neva Dunn Outstanding Senior Award
Jesse Narog (FE-FE/CE)	Outstanding Student in Forest Engineering or Forest/Civil Engineering
Mathew Hemshorn (FM)	Outstanding Student in Forest Management
Ryan Bronson (FOM)	Outstanding Student in Forest Operations Management
Kirsten Tilleman (NR)	Outstanding Student in Natural Resources
Meaghan Luchau (RRM)	Outstanding Student in Recreation Resource Management
Kelly Pence (TOL)	Outstanding Student in Tourism & Outdoor Leadership
Jeff Vaughn (WST)	Outstanding Student in Wood Science & Technology
Jesse Narog (FE)	Dean's Award for Outstanding Service
Robin Rose	Aufderheide Award
Kama Luukinen	Xi Sigma Pi Mentor Award
Ashley Flint (FE)	Photo of the Year: "Oregon Gardens"
Steve Kelley	CoF Outstanding Alumni of the Year — WSE
Lee Miller	CoF Outstanding Alumni of the Year — FERM
Paige Fischer	CoF Outstanding Alumni of the Year — FES
Pat Cordova	Dean's Award for Outstanding Achievement — Service
Christina Fierro	Dean's Award for Outstanding Achievement — Service
David Hibbs	Dean's Award for Outstanding Achievement — Fostering Student Success
Matt Betts	Dean's Award for Outstanding Achievement — Research/Scholarship
John Bailey	Dean's Award for Outstanding Achievement — Extended and Continuing Education (Individual)
Bob Parker, Glenn Ahrens, Stephen Fitzgerald, Paul Oester	Dean's Award for Outstanding Achievement — Extended and Continuing Education (Team): "How to Manage Your Forest"
Irene Schoppy	Dean's Award for Outstanding Achievement — Support Staff
Margie York	Dean's Award for Outstanding Achievement — Support Staff
Liz Cole	Dean's Award for Outstanding Achievement — FRA
Greg Latta	Dean's Award for Outstanding Achievement — FRA
Doug Maguire	Dean's Award for Outstanding Achievement — International
Eric White	2010 Certificate of Appreciation (signed by the Deputy Chief for State and Private Forestry of the USDA Forest Service)
Eric White	2010 National Science Foundation and International Network of Research on Coupled Human and Natural Systems (CHANS-Net) Fellowship
Michael Wing	L.L. Stewart Faculty Development Award (\$2200). Python Programming Training for Geographic Information System (GIS) Applications. 2010.
David Shaw	Awesome Force Award, Forestry and Natural Resources Extension
Norm Johnson	Outstanding Forest Ecosystems & Society Faculty (selected by graduate students)
Danielle White	OSU Sustainability Writing Competition: "Buffalo Road"
Bill Ripple	2011 OSU L.L. Stewart Faculty Scholar award