This report summarizes major accomplishments in the Forest Ecosystems and Society (FES) Department related primarily to teaching, research/scholarship, and service/outreach for the 2016-2017 fiscal/academic year. The report follows the outline provided by the College of Forestry Dean’s office.

The department had several personnel changes in 2016-17. We added two new tenure-track faculty: Ashley D’Antonio and Reem Hajjar. These two positions shore up our ability to offer our recreation and natural resources undergraduate degree programs and provide guidance to social science graduate students. Two Associate Professors (Needham and Betts) were recommended for promotion to Professor and were granted this promotion effective July, 2017; Keith Olsen was also promoted (to Senior Faculty Research Associate). Mark Harmon, Norm Johnson, and Jo Tynon retired, and Assistant Professor, Senior Research, Andres Schmidt left OSU.

Part A: Major Accomplishments Related to the College’s Five Strategic Areas and the OSU Strategic Plan

1. Strengthen the College’s commitment to academic excellence

   a. Transformative educational experiences: Teaching summary and commentary

   Oregon State University seeks to provide transformational educational experiences by raising and equalizing student success, incorporating high-impact activities, growing on-line education, using new pedagogical models, and expanding efforts to recruit diverse and high-achieving students. FES contributed to this goal in several ways:

   - Curriculum improvements. New faculty (re)developed and offered several undergraduate courses. In some cases this included adding field trips (FES 354), computer labs (NR 325) and working with clients (FES 354). The NR capstone course was revised to use a case-study model, which was well received by students. Broader improvements to curricula/programs are described in (b) below.

   - Peer review of teaching. In 2016, FES voted to adopt a formal policy on peer-review of teaching in which teams of faculty review all course materials and observe in class (or on line) instruction. We have begun implementing this policy, which is providing very thorough careful critique of all aspects of teaching.

   - High quality advising. New advisors were hired for the undergraduate RRM and NR programs. To improve communication, the NR program director (Hall) generally met weekly with advisors to discuss issues and review petitions. We created a new advising guide format for the NR program that is interactive and aids students in creating long term plans for the completion of their degree, and we refined the process for students to develop written justifications for Individualized Specialty Options. We also strengthened our work with OSU-Cascades and OSU-LaGrande to provide consistent, appropriate advising and policies for NR students at those locations.
campuses. For graduate programs, the FES graduate program coordinator co-led several brown-bag lunch workshops and information sessions with graduate students.

- Increased attention to assessing student accomplishment of program learning outcomes. FES graduate programs continued to refine policies and procedures, including more rigorous and thorough annual reviews of academic progress for all students. The NR program began a complete overhaul of the approach used to assess student achievement of learning outcomes, and the new TRAL program developed a detailed “map” of delivery and assessment points for learning outcomes.

b. New/revised curriculum/programs

FES continued the work begun in prior years to merge the Recreation Resource Management (RRM) program at Corvallis and the Tourism & Outdoor Leadership (TOL) program at OSU-Cascades into a new Tourism, Recreation, and Adventure Leadership (TRAL) degree. The abbreviated Cat I proposal was approved by the Faculty Senate in May, 2017, and marketing/communications work has begun. As of summer, 2017, four students have declared the TRAL major.

The NR program responded to the 10-year curriculum review (whose report was received in summer, 2016) in a written Action Plan presented to APAA in October, 2016. After discussion with the University Curriculum Council, this plan was accepted in Spring, 2017. Implementation of various actions began in Fall 2016 and are on-going. Notably, these include a complete review of all courses listed in the NR Core, NR Breadth, and each Specialty Option; submission of the Cat II proposal to create the new Integrated Conservation Analysis option led by FES faculty; new approaches to assessment of student learning outcomes; and a new governance model consisting of a faculty curriculum committee in addition to the existing Program Committee. The full proposal (“NR-3”) will be presented to the Program Committee for vote in fall, 2017.

c. Credit hours and scheduled courses

FES faculty and instructors based out of Corvallis/Ecampus delivered a total of 9,676 student credit hours (SCH) in scheduled courses across the four quarters of the academic year. (This does not include credits associated with thesis, research, capstone projects, or reading and conference courses). For cross-listed courses taught by FES employees, all SCH are included in this total. Overall, SCH production showed a steady increase from previous years (Figure 1), even though the number of teaching faculty has not increased. Just over half of the SCH generated in FES were through Ecampus courses. Appendix A lists courses and enrollments by faculty.

In addition to scheduled courses, the MNR 560 and SNR 506 capstone project courses generated 139 SCH of graduate courses. Separate from the Corvallis-based courses, the two tenured faculty with appointments in FES located at OSU-Cascades generated 220 SCH in the NR and TOL programs.
d. Number of graduates and enrolled students

FES directly oversees two undergraduate BS programs: Recreation Resource Management and Natural Resources. The Tourism and Outdoor Leadership program at Cascades is also considered a program in FES. On average across the three quarters of the academic year, 35 students were enrolled in RRM, 27 were enrolled in TOL, and 567 were enrolled in NR (194 Corvallis, 272 Ecampus, 14 La Grande, and 87 Cascades). Together, these numbers account for 68.5% of the students enrolled in BS degrees administered out of the College of Forestry. If one excludes the NR-Cascades, NR-LaGrande, and TOL students, RRM and NR accounted for 54.6% of the BS students in the College of Forestry. RRM (4 students), TOL (13 students), and NR (102 students) accounted for 68.4% of the 174 BS degrees conferred by the College across the academic year.

At the graduate level, FES offers MS, PhD, and MNR degrees. Collectively, these programs averaged 116 students enrolled during the academic year, 50.9% of all CoF enrolled graduate students. The three on-line graduate certificate programs (SNR, Urban Forestry, and Forests & Climate Change) averaged 47 students enrolled (with many of the certificate-seeking students jointly enrolled in the MNR program). The FCC certificate was new, and it grew from one student in fall to 8 students in spring. Of the 65 graduate degrees conferred by the College during the year, 41 (63%) were in degree programs in FES. Notably, the MNR program conferred 51% of all MS degrees in the college.

Finally, many FES faculty and staff mentored students from underrepresented groups in coursework, research experiences, or employment.

e. Other data (e.g., exit interviews)

No additional data were collected in 2016-17 regarding undergraduate programs, given the on-going creation of TRAL and the Action Plan for NR. For graduate programs, the Department Head conducted an hour-long exit interview with every graduating MS and PhD student. The results of
these interviews demonstrated that students were largely quite positive about their experiences, with especially high levels of praise for the FES office staff (particularly the graduate coordinator), the IT/Help Desk, availability and quality of facilities and equipment, and overall quality of the graduate program. However, they revealed some areas in need of attention, such as inconsistent expectations across major professors regarding work duties and research, superficial attention to some requirements (such as competencies), and some aspects of courses that could be improved.

2. Stabilize the financial health of the college

a. Donor activities or outreach

Several FES faculty participated in information sessions with the OSU Foundation. Apart from one meeting with a potential major donor, there was no concerted effort to engage in donor activities or outreach by FES.

b. New industry or community partnerships

None.

c. Using technology as a strategic asset

The Provost has requested information on how we “use technology as a strategic asset,” meaning how we share information to make effective decisions, invest in information technology to enable educational innovation, and enhance the quality of service in administrative processes.

In FES, the department head served as the primary link to share information upward and downward in relation to decision-making; at monthly departmental meetings, she reported on news and activities from the College and university administrations.

In terms of information technologies for educational innovation, the FES department supported license fees for specialized software needed for classes and encouraged faculty to participate in trainings related to teaching.

With regard to administrative services, the FES Office Manager served as a member of the university task force developing improved procedures for hiring student workers.

d. other

FES was diligent in implementing the Ecampus policy for course enrollments, so that – as a whole -- Ecampus tuition covered the costs of instruction. One issue that came to light was that the department must cover expenses associated with administering the MNR program, and we were in deficit. This was because the Dean’s “tax” on ecampus tuition was being taken before all program administration costs were paid. After discussion, it was agreed that the tuition should cover all administrative costs before the tax, and we expect the MNR program to be financially self-sufficient henceforth.

3. Strengthen the College’s commitment to research excellence

a. Research summary and commentary (Provost’s Goal 2)
OSU’s Strategic Plan 3.0 identifies three signature areas of scholarship: Advancing the Science of Sustainable Earth Ecosystems, Improving Human Health and Wellness, and Promoting Economic Growth and Social Progress. FES research contributes directly to each of these. For example, FES faculty, staff, and students have world-renowned research programs related to the functioning and productivity of forested ecosystems, basic science related to climate change and carbon sequestration, and genetics/genomics of various tree species. The recreation and social science faculty focus on providing high quality outdoor recreation experiences -- which contributes to individual health – as well as the resilience and health of resource-dependent communities.

FES faculty, staff, and students are strong leaders in research and scholarship. Exit interviews with graduate students affirm that it is the strong reputation of FES faculty that is the major consideration in attracting students. In addition to their own scholarship, faculty serve as Associate Editors or Editors-in-Chief for several scientific journals, and they review for journals and grant proposals (e.g., for NSF). Most FES PhD and MS students presented their work at national or international conferences, and several were organizers of the successful WFGRS conference in 2017.

A sampling of leadership roles includes the following:

- Barb Lachenbruch was Vice-Chair of the 2016 Gordon Research Conference, Multiscale Plant Vascular Transport, June 26-July 3, 2016, Sunday River, Maine and is the conference co-Chair for the 2018 Gordon Research Conference.
- Badege Bishaw was the Chairman for the PNW AgroForestry Working Group and President of the Association for Temperate Agroforestry.
- Paul Ries was President-Elect of the Board of Directors of the International Society of Arboriculture.
- Matt Betts served as Associate Editor for *Current Landscape Ecology Reports* and *Landscape Ecology*. He was also a member of the Advisory Board for the Las Cruces Biological Station.
- Janean Creighton served as Associate Editor for the *Journal of Forestry*.
- Reem Hajjar was guest co-editor of a special issue on forest governance impacts for *Land Use Policy* and guest co-editor of a special issue on forests as a pathway to prosperity for *World Development*. She also served on the coordinating committee for the FLARE conference.
- Glenn Howe served as Associate Editor for *New Forests*. He also served on the steering committee for the Tree Genes Initiative on Accelerating Stress-Adapted Trees, a project co-sponsored by the U.S. Forest Service and the Institute of Forest Biosciences, as well as the Expert Advisory Panel for the Specialty Wood Products Partnership, Rotorua, NZ.
- Bev Law was an invited expert on forest carbon accounting, Intergovernmental Panel on Climate Change (IPCC), Wollongong, for the Expert Panel on “Technical Assessment of IPCC Inventory Guidelines for Agriculture, Forestry, and Other Land Use (AFOLU) sectors.” She was also a member of the World Meteorological Organization Planning Team for an Integrated, Global Greenhouse Gas Information System (Ig3IS); on the Board of Advisors for the Integrated Carbon Observation System ICOS, a European system of land, ocean and atmospheric observations and modeling to quantify greenhouse gas emissions and the effects of climate on land, oceans and the atmosphere; on the Board of Advisors, ICOS Sweden; a member of AmeriFlux research network Science Steering Committee, which identifies gaps in knowledge and observations needed to better understand ecosystem responses to climate and disturbance. We advise
Lawrence Berkeley National Lab on improvements needed, technical advances, etc. to make sure it is leading cutting edge science; and a member of the Oregon Global Warming Commission Forest Carbon Subcommittee, which advises the use of scientifically rigorous methods for quantifying the forest carbon sector's role in meeting Oregon's greenhouse gas emissions target.

- Dan Luoma was chair of the Liaison for Amateur Societies Committee for the Mycological Society of America and vice president of the Native Plant Society of Oregon.
- Mark Needham was Editor-in-Chief for *Human Dimensions of Wildlife* and Associate Editor for the *Journal of Outdoor Recreation and Tourism*, *Leisure Sciences*, and the *Journal of Leisure Research*. He was also a steering Committee Member for the International Coastal and Marine Tourism Society.
- Michael Nelson was an Editorial Review Board Member for *BioScience* and a member of the Board of Advisors for the journal PAN: Philosophy, Activism, Nature, as well as a member of the Scientific Advisory Board for Project Coyote.
- Christine Olsen was a committee member for the 2nd International Smoke Symposium, Long Beach, CA.
- Bill Ripple was an Editorial Review Board Member for *Biological Conservation*.
- Jim Rivers was an Associate Editor for *Auk: Ornithological Advances*, a member of the American Ornithological Society Scientific Program Committee, a member of the North American Ornithological Conference Workshops and Training Opportunities Committee, and a Council Member for the American Ornithologists' Union.
- Darrell Ross served as subject editor (community ecology) for *Environmental Entomology*.
- Brad Withrow-Robinson served as Committee Member, Willamette Mainstem Cooperative Steering Committee.
- Glenn Ahrens served as the Program Organizer, Society of American Foresters - Portland Chapter Program, and is serving on the OSAF 2017 program planning committee.
- Nicole Strong was a committee member on the Association of Natural Resources Professionals, Professional Development Committee.
- Paul Oester was Chairman, Union County Forestland Classification Committee, Oregon Department of Forestry.
- John Campbell organized the Forest Carbon Workshop for Oregon Stakeholders in Salem.
- Emily Jane Davis served as a member of Oregon's State Wood Energy Team. She also represented OSU at the Federal Forest Working Group, which federal forest health issues and collaboration.
- Troy Hall served on the US Forest Service's national Wilderness Information Management Steering Team and as subject matter specialist for the national Wilderness Character Monitoring protocol development.

b. Number of proposals submitted and total funding awarded

In FY17, FES employees submitted 57 proposals for $16,741,293 through Cayuse for external funding (these do not include internal sources of funding, such as the IWFL professorships or the Fish & Wildlife in Managed Forests program). FES secured just over $7 million in external funding (in new
awards or incremental additions to prior awards; Table 1). This includes the full annual amount for the NSF LTER (~$1 million), as well as the first installment (~$1.2 million) for new research funded by the NSF and led by Steve Strauss. Other notable grants include approximately $470,000 (USFS) to Lisa Ganio for study of multidecadal forest vegetation change, approximately $460,000 (NPS) to Ashley D’Antonio for visitor use studies at Grand Teton National Park, approximately $380,000 to Janean Creighton (USFS) for the Northwest Fire Science Consortium, $320,000 (BLM) to Jim Rivers for work on pollinator responses to disturbance in mixed conifer forests, approximately $310,000 (USFS) to Chris Still to evaluate down-scaled climate data and vegetation models at regional scales, nearly $300,000 (USFS) to Meg Krawchuk for study of exotic species invasion dynamics in eastern Oregon, and $270,000 (Lawrence Berkeley National Lab) to Bev Law for management of the Ameriflux Network that supplies critical data for global climate models.

Table 1. FY 17 Booked Awards by Unit, College of Forestry

<table>
<thead>
<tr>
<th>Unit</th>
<th>Award Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extension Forestry &amp; Natural Resources</td>
<td>$242,307</td>
</tr>
<tr>
<td>Forest Engineering, Resources, &amp; Management</td>
<td>$2,919,021</td>
</tr>
<tr>
<td>Forest Ecosystems &amp; Society</td>
<td>$7,030,161</td>
</tr>
<tr>
<td>Wood Science &amp; Engineering</td>
<td>$936,281</td>
</tr>
</tbody>
</table>

c. Number of refereed publications and publications

In 2016, FES faculty published 88 papers in refereed journals and 8 book chapters (Appendix B), as well as numerous technical reports and other non-refereed articles. Outlets included top-tier journal such as the Proceedings of the Royal Society B, Ecology, PNAS, Biogeosciences, and Global Change Biology. FES faculty authored or co-authored dozens of presentations or posters at professional society meetings (Appendix C).

d. Selected highlights of major accomplishments, awards and achievements by faculty

FES faculty, staff, and students received several awards and honors in FY2017:

- Puettmann: Bullard Fellowship from Harvard Forest
- Betts: American Ornithological Union Elective Member
- Withrow-Robinson: OSUEA Search for Excellence, OSUEA
- Ahrens: Ask an Expert Question of the Year, OSU Extension Association
- Needham: Excellence in Teaching Award, The Academy of Leisure Sciences
- Strauss: 20 Year Mentorship, Apprenticeships in Science and Engineering, Saturday Academy, Portland, OR
- Strong: Awesome Force Award, Oregon State University Forestry and Natural Resources Extension, Experienced Faculty Award, Oregon State University Extension Association, State Recognized Program, Western Extension and Research Directors
- Law, Beverly E. Web of Science Most Cited Article in 2016 in Global Change Biology Bioenergy and ResearchGate’s Most Cited Researcher from OSU
• College of Forestry Dean’s Awards
  o Fostering Student Success: Dave Stemper
  o Research / Scholarship: Dick Waring
  o FRA: Becky Fasth
  o FRA: Keith Olsen
  o Extended and Continuing Education (team): Janean Creighton, Carrie Berger

• FES Awards
  o Zarrate Charry: James H Dukes Jr Graduate Fellowship
  o Wolf: FES PhD Student Achievement Award
  o Heaston: FES MS Student Achievement Award
  o Stokely: Robert F Tarrant Graduate Fellowship
  o Elorriaga: Henry & Mildred Fowells Graduate Fellowship
  o Lu: Henry & Mildred Fowells Graduate Fellowship
  o Jarecke: Catherine G Bacon Fellowship
  o Batavia: Social Science Award
  o Nelson: Outstanding FES Faculty Member

The following are selected highlights of research in FES, which illustrate the diversity of disciplines and research areas within the department:

• Logan Berner and Bev Law published documentation of a long-term dataset (1999-2014) of plant and plot measurements for 35 tree and shrub species at 239 field sites in Oregon and California. Making these data publicly available helps address the need for standardized, landscape-scale data to further develop Earth systems models. ( 

• Bob Beschta, Bill Ripple and colleagues continued their long-term research on interactions among aspen, elk, wolves, and climate in Yellowstone National Park. Taking advantage of exclosures constructed in the mid 1900s to explore the impacts of herbivory on aspen, they provided evidence that the decline of aspen – a major concern in the northern Rockies – was more likely caused by herbivory than climate change. They also showed that the reintroduction of wolves led to a decline in the number of elk and therefore the recovery of aspen stands.

• Predicting how plant species will respond to climate change – including the possibility of migration – is a major scientific challenge. Dick Waring and colleagues developed a refined model that incorporates geographic and physiological variables related to tree reproduction and movement for 15 tree species in the Pacific Northwest. Their work showed that geographical barriers to movement (such as landscape fragmentation) will substantially impede the natural migration of species, and that assumptions about where different species may migrate based only on climate variables need to be seriously reconsidered.

• Janean Creighton’s research on family forests in Oregon and Washington explored reasons that forest owners are not successful in transferring forests to the next generation within families. Key factors were uncertainty in regulations, financial instability, and pressure for urbanization.

• Ashley D’Antonio incorporated new spatial analysis tools to expand her research on the ecological impacts of recreation use from the site-scale to larger spatial scales to better account for ecosystem-level impacts, particularly to wildlife species. In an extension of this work, she undertook a study with Norwegian researchers to investigate the relationship between
recreation disturbance and cultural ecosystem services in the most popular national park in Norway (Jotenheimen).

- The Betts lab continued research on the effects of fragmentation on pollinator movement and pollination success in tropical forests. Their experiments and observational studies demonstrate the importance of corridors for both hummingbirds and the plants they pollinate. This work has significant implications for the configuration of forest patches and connectivity in tropical landscapes.

- Darrell Ross and colleagues continued field experiments on the use of silver flies from the Pacific Northwest as a biological control agent for hemlock woolly adelgid (HWA) in the eastern US. HWA has caused high levels of mortality in eastern and Carolina hemlocks and is threatening the survival of both species. Classical biological controls have been unsuccessfully deployed for more than 20 years. Research at OSU discovered evidence suggesting that two species of predatory flies native to the Pacific Northwest are the primary controls on populations of HWA in the PNW. Ross and colleagues performed controlled releases of flies in the eastern US in 2015 and 2016, which were followed by free releases in 2017 in three states. Early results are promising, and ongoing research will monitor the effects of releases.

- Reem Hajjar’s research focuses on community forestry and small and medium forest enterprises, particularly in developing countries. Recently, she analyzed documents from 41 countries to assess the potential for these enterprises to effectively participate in REDD+ strategies for climate change mitigation. Results highlighted the need for improvements in the capacities of forest enterprises to most effectively participate in REDD+ schemes.

- Chris Still published several papers related to the importance of fog as in mitigating drought in coastal ecosystems. Studies showed, for instance, that fog drip affects physiological process and plant growth, and that saplings are more susceptible to drought and more responsive to fog. Findings will help inform predictions of how populations of trees will respond under changing climatic conditions.

- Steve Strauss’ lab continued to study the use of RNA interference to target a gene involved in floral organ formation; if successful, this may lead to effective methods to induce sterility in transgenic trees. Their research published in Nature Biotechnology showed that RNAi led to a loss of sexual organ development in field-grown trees, with vegetative development unaffected.

- Dana Warren has studied the interactions among pH, dissolved organic carbon, and thermal stratification in eastern lakes that are recovering from historic acidification. Analysis shows that, as temperatures warm under future climates, recovering lakes are likely to provide more refugia for cold-water species of fish. This work highlights the importance of exploring how recovery from impacts that occurred sometimes decades before can have secondary effects on future ecosystem conditions.

- Wildfire in natural ecosystems has heterogenous effects, and ecologists have noticed “fire islands” (or refugia) that persist in the face of repeated fire. Such refugia can play important ecological roles, but relatively little is known about why and where they occur. Meg Krawchuk and colleagues developed and tested a predictive model that included topographic complexity and fire weather conditions. Findings revealed several important drivers of refugia, such as slope, aspect, wetness, but the importance of each driver varied among environments.

- In many countries, poor communities living near protected areas are affected in various ways by ecotourism. Ian Munanura’s research in East Africa explores how local communities can be
effectively engaged in ecotourism and develop more sustainable livelihoods. His recent research on Rwanda’s Tourism Revenue Sharing policy at Volcanoes National Park revealed several structural and policy barriers preventing conservation and livelihood benefits.

- For the past several years, Klaus Puettmann has explored the utility of incorporating concepts from complexity science to help forestry forestry students thing about forests as complex adaptive systems. In a recent paper in *Natural Sciences Education*, he and colleagues present a set of learning outcomes and field exercises they have effectively used and that can be adapted by instructors in a range of contexts.

e. Cooperatives summary

Four research co-ops were active in FES:

- The Pacific Northwest Tree Improvement Research Cooperative (PNWTIRC), led by Glenn Howe, completed a new 5-year plan outlining high-priority research for the future. The PNWTIRC is currently focused on developing genetic markers called single-nucleotide polymorphisms (SNPs) that will be used to enhance the breeding of Douglas-fir and western white pine. Over the longer-term, it will be important to consider how breeding programs can be modified to account for climate change. Thus, future research will focus on the genetics of drought hardiness and breeding for future climates. A graduate student, Erda Celer, recently completed a first step in the drought hardiness research, with the publication of her M.S. thesis, “Douglas-fir Seedlings in the Pacific Northwest: The Genetics of Drought Adaptation.” The plan adopted a new research model (called ‘facilitated research’) in which research projects will be led by one of the PNWTIRC members and PNWTIRC personnel will play a facilitator role by helping to develop the work plan, coordinating interactions among PNWTIRC members, and helping to analyze and report the results. This model will more effectively leverage the infrastructure and expertise of member organizations and address topics that are particularly relevant to them. Finally, the PNWTIRC remains actively engaged with research partners such as the Northwest Tree Improvement Cooperative, Northwest Advanced Renewables Alliance, Inland Empire Tree Improvement Cooperative, US Forest Service, Conservation Biology Institute, and the NSF Center for Advanced Forestry Systems.

- The Northwest Tree Improvement Cooperative, run by Keith Jayawickrama, celebrated its 30th year as a coop and 50 years since the start of the IFA-Progressive Tree Improvement System. Simulation (based on real 2nd cycle progeny test data) was completed on the effect of varying the number of test sites and trees per family, to aid design of 3rd cycle testing programs. The Coop worked with members to install the first series of 3rd cycle tests, a 2nd-cycle realized genetic gain trial for western hemlock, and a 2nd-cycle Douglas-fir realized genetic gain trial. Additionally, the coop has begun work on a new website and more user-friendly database. The coop added eight new members.

- The Tree Biosafety and Genomics Research Cooperative, led by Steve Strauss, continued work on genetic containment methods, high throughput sequencing of mRNA from eucalypts to design containment genes, and modifying floral genes to improve genetic containment. The Strauss lab submitted a major grant to USDA to continue gene editing work and conduct field trials and began a NSF-funded project developing new phenomics tools for in vitro and transformation studies, and GWAS to identify genes affecting transformation.

- The Hardwood Silviculture Cooperative was led by Glenn Ahrens.
4. Internationalize the College

a. Faculty participation in international programs

FES faculty participated in several aspects of international programs, including mentoring international graduate students and post docs, hosting visiting scholars, presenting at international conferences, and serving as experts for international organizations and agencies. Additionally, FES faculty were involved in the college’s Chile initiative, including co-teaching a study abroad course.

5. Drive toward a diversified, pluralistic College community

a. Contributions by faculty and staff on advising, curriculum and/or participation in the DEIC committee or other DEI training opportunities

The FES department was well represented in many efforts related to the college’s diversity, equity, and inclusion goals. Several faculty were on the core team that drafted the college’s DEI plan, which was adopted in summer, 2017. Many others attended trainings on DEI issues. Department Head Hall was selected as one of five fellows for the OSU ADVANCE program, and Lisa Gario and Meg Krawchuk participated in the ADVANCE summer seminar. The FES Promotion and Tenure Committee began discussions of how to incorporate the new requirements related to diversity, equity, and inclusivity that the Faculty Senate voted last year to include in P&T criteria.

Some faculty were able to acquire external funding to help attract underrepresented students to FES graduate programs. However, despite concerted efforts to attract more diverse students, the FES graduate programs did make progress in this regard (Table 2). However, the MNR program continues to attract a more diverse population than the campus-based MS and PhD programs. By comparison, the College graduate programs is 10% domestic minority (including Asian students).

Table 2. Diversity among FES Graduate Students

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<thead>
<tr>
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<th>AY 2016</th>
<th>AY 2017</th>
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<tbody>
<tr>
<td><strong>FES MS &amp; PhD</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total students</td>
<td>66</td>
<td>66</td>
</tr>
<tr>
<td>Domestic minority (including Asian)</td>
<td>6 (8%)</td>
<td>4 (6%)</td>
</tr>
<tr>
<td><strong>MNR</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total students</td>
<td>51</td>
<td>49</td>
</tr>
<tr>
<td>Domestic minority (including Asian)</td>
<td>9 (15%)</td>
<td>8 (16%)</td>
</tr>
</tbody>
</table>

FES has made considerable progress in the past three years on issues related to departmental governance. Having an effective and accepted governance process helps ensure equity in distribution of responsibilities among members of the unit. For example, voting guidelines were refined and adopted, leading to a more consistent and transparent process for decision making. Development and implementation of a peer teaching review policy brought the department in line with university requirements and should help ensure the greatest possibility of success for all
teaching faculty. The department passed a policy on mentoring committees, which will help faculty, particularly junior faculty, move toward success and productive, healthy work-life balance.

b. Impacts from outreach and engagement

See other sections of this report and report from Extension.

Part B: Goals and Priorities for FY 2018 in the Five Strategic Areas

a. Academic excellence

In the past three years, significant work has gone into refining the FES undergraduate programs. In the upcoming year, a priority is carrying out – in a sustainable, stepwise fashion – the various actions identified during program reviews. For the undergraduate NR program, this includes approval of the new “NR 3.0” curriculum, adoption of a process for assessing student learning outcomes, and tighter integration with OSU Cascades and LaGrande.

One important goal is to effectively market the new TRAL program across campus, the state, and the country. It is critical that enrollment reaches a sustainable level over the next few years. There are excellent opportunities to partner with other programs to incorporate minors and certificates (e.g., the Leadership Certificate) into TRAL students’ programs. It is also important to connect with current efforts by the State and Travel Oregon that are focused on nature-based tourism and outdoor recreation.

The new Integrated Conservation Analysis option in the NR program was developed in response to employer and student input. Thus far, enrollment in the new classes has been limited, and we will need to market this option within NR but also to related programs across campus. Several of our new classes have no parallels in other programs and could be of great benefit to their students.

It has become apparent that the departments in the colleges and even classes within departments have differing expectations for TAs; some classes require a tremendous amount of work by TAs and instructors, while others require much less. We will continue to work with the other departments to develop guidelines for TA allocations. Although this is obviously a financial matter, it is also a matter of academic excellence, both for the students taking courses with TAs and for the TAs themselves.

Another goal for all academic programs in FES is to develop a better mechanism to track graduates so that we can conduct effective post-graduation surveys. All programs have implemented protocols to collect permanent contact information, and this year we will work with the Associate Dean for Undergraduate Affairs to develop a strategy for post-graduate surveys.

A goal for the FES MS and PhD programs is to reach resolution on outstanding issues related to program requirements (namely, coursework requirements and proposal requirements). For the
MNR program, several issues were identified in the 5-year review (spring, 2017), and plans and progress need to be made on all of these. The FES MS and PhD programs will have their 5-year review in 2017-18.

b. Stabilize financial health

The FES department has operated within budget in recent years and we do not anticipate any substantial changes. However, we are aware that graduate student tuition remissions is a major cost without an existing policy for distributing remissions. We will work with the other departments and Dean’s office to develop guidelines for allocation and tracking of remissions. Additionally, we will consider whether to increase caps on Ecampus courses that are taught by graduate students to ensure that the costs of the students’ tuition can be covered by students taking their Ecampus classes.

A goal for the upcoming year will be to work with FES faculty to develop criteria for prioritizing spending of departmental discretionary funds.

FES will participate in discussions about how to increase indirect cost recovery for grants and ways to incentivize/reward faculty for grants with full overhead.

c. Commitment to research excellence

We will carry on as usual and recognize significant research achievements.

d. Internationalization

New faculty who have international research programs will continue to develop materials for their courses that incorporate international cases, policies, and practices. It is likely that FES faculty will co-teach study abroad in Chile (Mountains to Sea) and Borneo.

e. Diversity, equity and inclusivity

FES will support implementation of the college’s DEI plan, through service on the standing committee and ad hoc committees.
Appendix A. Courses taught by FES faculty in FY2016-17

Summer 2016

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<td>Scientific Methods for NR Problems</td>
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<td>NR 351</td>
<td>When Science Escapes the Lab</td>
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<td>Managing NR For Future</td>
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<td>Fox</td>
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<td>Natural Resource Decision Making</td>
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Appendix B. FES Refereed Publications in 2016


**Books and Book Chapters**


Conference Proceedings


Appendix C. Presentations by FES Faculty, January 1, 2016 - December 31, 2016


Ahrens, Glenn Robert (Author & Presenter), Hood River Master Gardener Training, "Trees and Tree Problems - What Master Gardeners Need to Know," Hood River, OR. (February 10, 2016).


Berner, Logan (Author & Presenter), Law, Beverly (Author), American Geophysical Union, "Multiscale assessment of water limitations on forest carbon cycling in the western United States," San Francisco, CA. (December 12, 2016).


Betts, Matthew G, OSU Cascades Science Pub, "Conserving pollination services in tropical forest landscapes," Bend, OR. (May 2016).


Boag, Angela (Author & Presenter), Hartter, Joel (Author), Hamilton, Larry (Author), Oester, Paul (Author), Christoffersen, Nils (Author), Stevens, Forrest (Author), Ducey, Mark (Author), Palace, Michael (Author), Society of American Foresters Annual Convention, "Barriers to climate adaptation among private forest owners in eastern Oregon," Madison, WI. (November 1, 2016).
Celer, Erda (Author & Presenter), Howe, Glenn Thomas (Author & Presenter), Plant Breeding Symposium, St. Paul, MN. (March 15, 2016).


D’Antonio, Ashley (Author & Presenter), Monz, Christopher (Author), Peter, Newman (Author), Heaslip, Kevin (Author), Taff, Derrick (Author), Noon, Daniel (Author), Newton, Jennifer (Author), Fuentes, Antonio (Author), 13th Biennial Scientific Conference of the Greater Yellowstone Ecosystem, "A collaborative, systems-based approach to visitor use planning: An example from the Moose-Wilson Corridor in Grand Teton National Park," Grand Teton National Park, Wyoming. (October 5, 2016).


Davis, Emily Jane (Author & Presenter), Nuss, Meagan L (Author), Society for Ecological Restoration Northwest Regional Conference, "Oregon’s forest collaborative groups: characteristics, motivations, and perceptions of success," Portland, OR. (April 7, 2016).


Davis, Emily Jane, Strategic Conservation Gathering, "The Roles of Community-Based Organizations in Forest and Community Stewardship," World Forestry Center, Portland, OR. (November 29, 2016).


Foote, Gabriel A. (Author), Fettig, Christopher J. (Author & Presenter), Runyon, Justin B. (Author), Ross, Darrell W. (Author), Coleman, Tom W. (Author), Gaylord, Monica L. (Author), Graves, Andrew D. (Author), Lowrey, Laura L. (Author), McMillan, Joel D. (Author), Mortensen, Leif A. (Author), Munson, A. Steve (Author), Mafra-Neto, A., Society of American Foresters National Convention,

Frank, Aline (Author & Presenter), Howe, Glenn Thomas (Author & Presenter), Sperisen, Christoph (Author & Presenter), St. Clair, Bradley J. (Author & Presenter), Schmatz, Dirk R (Author & Presenter), Heiri, Caroline (Author & Presenter), SAF National Convention, "Relative risk of maladaptation to climate change in three major European tree species in Switzerland: management implications," Madison, Wisconsin, USA. (November 4, 2016).

Frederick, Stacey (Author & Presenter), Olsen, Christine Shaw (Author), 2nd International Smoke Symposium, "Public perceptions of smoke and agency relationships before and after an active fire season: Longitudinal panel results from northern California," Long Beach, CA. (November 15, 2016).

Frey, Dave (Author & Presenter), Hatten, Jeffery A (Author), Stokely, Thomas (Author), Betts, Matthew G (Author), Vegetation Management Research Cooperative Annual Meeting, "Effects of the interplay between wildlife, plant communities, decomposition, and soils on productivity in intensively managed forest plantations," Corvallis, Oregon. (December 1, 2016).

Frey, Dave (Author & Presenter), Hatten, Jeffery A (Author), Stokely, Thomas (Author), Betts, Matthew G (Author), Soil Science Society of America Annual Meeting, "Effects of the interplay between wildlife, plant communities, decomposition, and soils on productivity in intensively managed forest plantations," Phoenix, Arizona. (November 6, 2016).

Frey, Dave (Author & Presenter), Hatten, Jeffery A (Author), Stokely, Thomas (Author), Betts, Matthew G (Author), Ecological Society of America Annual Meeting, "Effects of the interplay between wildlife, plant communities, decomposition, and soils on productivity in intensively managed forest plantations," Fort Lauderdale, Florida. (August 12, 2016).


Hall, T. E. 2016. Studying how humans interact with Natural Resources. Invited presentation, USFS Region 6 Social Science Forum, March 8, 2016, Corvallis, OR.


Houtz, Jennifer, Rivers, James W, Horton, Brent, Betts, Matthew, Pennsylvania State System of Higher Education Undergraduate Research Conference in Science, Technology, Engineering, and
Mathematics, "Evaluating the influence of forest herbicides on offspring sex ratio in an early-successional forest songbird," Millersville, PA. (September 2016).


Howe, Glenn Thomas, "Forest genetics from science to management," Zurich, Switzerland. (June 30, 2016).


Jayawickrama, Keith (Author), Ye, Terrance Zhihong (Author & Presenter), Howe, Glenn Thomas (Author), Kling, Jennifer (Author), Kolpak, Scott E (Author), NWTIC Annual Meeting, "Genomic Selection in Douglas-fir: A preliminary study," Aurora, Oregon. (October 17, 2016).

Kerns, Becky (Author & Presenter), Krawchuk, Meg (Author), Zald, Harold (Author), Vaillant, Nicole (Author), Kim, John (Author), Naylor, Bridget, Ecological Society of America, "Ecosystem change in the Blue Mountains Ecoregion: exotic invaders, shifts in fuels structure, and management implications.", Ft. Lauderdale, FL. (2016).

Klocko, Amy (Author & Presenter), Strauss, Steven H (Author & Presenter), Advanced Hardwood Biofuels Final Meeting, "Efficacy of RNAi and CRISPR Containment Technologies in Poplar," Walla Walla, WA. (August 2016).

Klocko, Amy (Author & Presenter), Strauss, Steven H (Author), Plant and Animal Genome, "Genetic Containment of Forest Trees by RNAi Suppression of LEAFY," San Diego. (January 2016).


Klocko, Amy L (Author & Presenter), Ault, Kori (Author & Presenter), Lu, Haiwei (Author & Presenter), Jones, Kristin (Author), Elorriaga, Estefania (Author), Ma, Cathleen (Author), Morel, Alice (Author & Presenter), Huang, Jian (Author & Presenter), Heliwell, Emily (Author), Magnunson, Anna (Author), Betts, Matt (Author & Presenter), Zhao, Dazhong (Author), Howe, Glenn Thomas, Strauss, Steven H (Author & Presenter), National Institute of Food and Agriculture, "Poster Efficacy and Ecological Impacts of Transgenic Containment Technologies in Poplar." (2016).


Law, Beverly E (Author), Wolf, Sebastian (Author & Presenter), Keenan, Trevor (Author), Baldocchi, Dennis (Author), Richardson, Andrew (Author), European Geophysical Union, "Carbon-Water Interactions during Warm Spring and Summer Drought," Vienna, Austria. (April 23, 2016).


Lu, Haiwei (Author & Presenter), Howe, Glenn Thomas (Author & Presenter), Horvath, David P. (Author & Presenter), Dharmawardhana, Palitha, Priest, Henry D. (Author & Presenter), Mockler, Todd C. (Author & Presenter), Strauss, Steven H. (Author & Presenter), In Plant Dormancy Workshop, "Extensive transcriptome changes during natural onset and release of vegetative bud dormancy in Populus," San Diego, CA. (January 9, 2016).


Luoma, Daniel Lewis (Author & Presenter), Eberhart, Joyce L (Author), Mycological Society of America Annual Meeting, "Removing trees for healthy forests: impacts on the American matsutake mushroom resource," Berkeley, CA. (August 9, 2016).


Ma, Cathleen (Author & Presenter), Society for In Vitro Biology Annual Meeting, "Extensive Natural Variation in Callus and Shoot Regeneration in relation to Agrobacterium - Mediated Transformation of Wild Black Cottonwood (Populus trichocarpa)," San Diego. (June 2016).

Mosel, J. and B. Lachenbruch. 2016. Physiological and morphological characteristics of Douglas-fir and loblolly pine seedlings from varying provenances under repeated drought. Annual Meeting of the Ecological Society of America, Aug. 7-12, Ft. Lauderdale, FL. (Poster)


Needham, Mark D (Author & Presenter), Szuster, Brian W (Author), World Leisure Congress, "Recreationists swimming with manta rays: Conflict, sanctions, and management," Durban, South Africa. (June 27, 2016).


Nelson, Michael Paul, Science Pub, "How Will We Live with Wolves?* From Isle Royale to Oregon, from Science to Ethics - *seriously, folks, how are we going to do this?," Cottage Grove. (October 25, 2016).


Nelson, Michael Paul, Student Organized Earth Week seminar series, "It’s Not Only Stupid, It’s Also Wrong to Wreck the World," OSU. (April 21, 2016).


Olsen, Christine Shaw (Author & Presenter), Toman, Eric (Author), Frederick, Stacey (Author), 2nd International Smoke Symposium, "What influences public acceptance of smoke?" Long Beach, CA. (November 15, 2016).

Olsen, Christine Shaw, Pyro-maniacs, "People manage fires: a social science perspective on fire and smoke management," Corvallis, OR. (February 24, 2016).


Ott, Daniel S. (Author & Presenter), Fettig, Christopher J. (Author), Munson, A. Steve (Author), Ross, Darrell W. (Author), Meiner, Rick (Author), Wallin, Kimberly F. (Author), International Congress of Entomology, "Physiological, physical, and chemical characteristics of Engelmann and blue spruces related to spruce beetle host selection, colonization, and reproduction," Orlando, FL. (December 2016).
Pluess, Andrea R. (Author & Presenter), Frank, Aline (Author & Presenter), Rellstab, Christian (Author & Presenter), Vendramin, Giovanni Giuseppe (Author & Presenter), Howe, Glenn Thomas (Author & Presenter), Sperisen, Christoph (Author & Presenter), Heiri, Caroline (Author & Presenter), Oddou-Muratorio, Sylvie (Author & Presenter), Genomics and Forest Tree Genetics, "Evidence for local adaptation and potential maladaptation to climate change in Fagus sylvatica: Genome-environment and phenotype-environment associations at regional scale," Arcachon, France. (May 30, 2016).

Puettmann, Klaus Johannes (Author & Presenter), Annual Meeting, "Small woodland owner as a critical part of complex adaptive forestry systems," Olympia, WA. (June 16, 2016).

Puettmann, Klaus Johannes (Author & Presenter), IUFRO International Workshop on Uneven-aged Silviculture, "Managing for the parts of the sum," Little Rock, Arkansas. (June 2, 2016).

Puettmann, Klaus Johannes (Author), Puettmann, Maureen (Author & Presenter), Oneill, Elaine (Author), FPS Annual meeting, "Life Cycle Assessment: Quo Vadis?," Portland, OR. (June 28, 2016).

Puettmann, Klaus Johannes, Pacific Northwest Collaboratives Workshops, "Restoration treatments in Douglas-fir forests," Hood River, OR. (March 31, 2016).


Ripple, William John, "Human behaviors affect environment and predators." (October 5, 2016).

Rivers, James W, Annual meeting of the Oregon Forest and Industries Council, "Evaluating the effects of intensive forest management on songbird productivity," Sun River, OR. (October 2016).


Rose, Kathleen (Author), Toman, Eric (Author), Olsen, Christine Shaw (Author), 2nd International Smoke Symposium, "Framing messages about prescribed fire and smoke emissions," Long Beach, CA. (November 15, 2016).


Rushing, Jaclyn (Author & Presenter), Needham, Mark D (Author), Western Forestry Graduate Research Symposium, "To visit or not to visit? Constraints and place attachment in Portland Metro parks," Corvallis, OR. (April 22, 2016).

Schmidt, Andres (Author & Presenter), Law, Beverly E (Author), Still, Chris (Author), American Geophysical Union, "Changing carbon cycle dynamics in Oregon’s urban-suburban-forested-agricultural landscapes in a bioenergy land-use change scenario," San Francisco, CA. (December 15, 2016).

Soto, Daniel (Author & Presenter), Puettmann, Klaus (Author), IUFRO Landscape Ecology - Latin American Congress, "Forest Ecosystem Dynamics in Times of Change," Temuco, Chile. (November 28, 2016).
Soto, Daniel (Author & Presenter), Puettmann, Klaus Johannes (Author), IUFRO International Workshop on Uneven-aged Silviculture, "Ground disturbance improves natural regeneration in high-graded old-growth forests," Little Rock, Arkansas. (June 1, 2016).


Still, Christopher J (Author & Presenter), Botany and Plant Pathology Seminar Series, "What can we learn from thermal imaging of forests?" Oregon State University. (March 2016).

Still, Christopher J (Author & Presenter), FES 520: Posing Researchable Questions, "How can we determine how clouds and fog influence coastal forest distributions and ecological processes?" Oregon State University. (November 2016).


Still, Christopher J (Author & Presenter), Seminar Series, "Taking the Temperature of Forest Canopies Using Thermal Imaging," Vancouver, WA. (October 2016).

Still, Christopher J (Author & Presenter), Swiss Needlecast Coop Annual Meeting, "Just dew it: measuring and modeling dew formation," Corvallis, OR. (December 2016).

Still, Christopher J (Author), Cotton, Jennifer (Author & Presenter), Mosier, Thomas (Author), Cerling, Thure (Author), Ehleringer, Jim (Author), Hoppe, Kathryn (Author), American Geophysical Union Fall Meeting, "Climate changes decrease C3/C4 gradients across the Great Plains by the end of the century," San Francisco, CA. (December 2016).

Still, Christopher J (Author), Griffith, Dan (Author & Presenter), American Geophysical Union Fall Meeting, "Drivers of inter-annual variability in C4 abundance in mixed C3-C4 grasslands," San Francisco, CA. (December 2016).

Still, Christopher J (Author), Lluvia, Flores (Author & Presenter), Waring, Kristen (Author), Cushman, Sam (Author), Eckert, Andrew (Author), Wehenkel, Christian (Author), Whipple, Amy (Author), Wing, Michael (Author), Kolb, Tom (Author), Sniezko, Richard (Author), IUFRO Genomics and Forest Tree Genetics Conference, "Blending Ecology and Evolution using Emerging Technologies to Determine Species Distributions with a Non-native Pathogen in a Changing Climate," Arcachon, France. (2016).

Still, Christopher J (Author), Schmidt, Andres (Author & Presenter), Law, Bev (Author), American Geophysical Union Fall Meeting, "Dynamics of carbon, water and energy cycles in a heterogeneous landscape and a changing climate," San Francisco, CA. (December 2016).

Still, Christopher J (Author), Voelker, Steve (Author & Presenter), Merschel, Andrew Gregory (Author), Meinzer, Rick (Author), Spies, Tom (Author), American Geophysical Union Fall Meeting, "Fire suppression has led to greater drought-sensitivity in dry conifer forests: tree-ring carbon isotope evidence from Central Oregon," San Francisco, CA. (December 2016).

Still, Christopher J (Author), Waring, Kristen (Author & Presenter), Cushman, Sam (Author), Eckert, Andrew (Author), Flores, Lluvia (Author), Lintz, Heather (Author), Sniezko, Richard (Author), Wehenkel, Christian (Author), Whipple, Amy (Author), Wing, Michael (Author), Society of American Foresters National Convention, "Collaborative Research for Sustainable Management of Southwestern White Pine." (November 2016).


Strauss, Steven (Author & Presenter), Elorriaga, Estefania (Author & Presenter), American Society of Plant Biology, "CRISPR/Cas9 Efficiency and Biological Impacts in Transgenic Poplars and Eucalyptus," Austin, TX. (July 2016).


Strauss, Steven (Author & Presenter), Salem Chamber of Commerce monthly lecture, "Are we using GMOs wisely?" Salem, OR. (March 2016).

Strauss, Steven (Author & Presenter), Willamette Valley Habitat and Restoration Annual Meeting, Corvallis Public Library, "GBS Analysis of aspen phylogeography," Corvallis. (March 2016).

Strauss, Steven H (Author & Presenter), Cochran Biotechnology Fellow Training, "Genetically engineered trees: Rationale, progress and constraints," Michigan State University. (June 2016).

Strauss, Steven H (Author & Presenter), Cochran Biotechnology Fellow Training, "Regulatory experiences and ideas for GMO Crops," Michigan State University. (June 2016).


Strauss, Steven H (Author & Presenter), Webinar presented to Regulatory Framework Information Forum of Biotechnology, Mexico, "GMO crops: Their use, impacts, and evolution," Monterrey, Mexico. (June 2016).


Vasquez Fernandez, Andrea (Author & Presenter), Hajjar, Reem (Author), Innes, John L (Author), Kozak, Rob A (Author), NAISA Annual Meeting, "Indigenous Federations in the Peruvian Amazon: Addressing Conflicts and Striving for a Collective Self-Determined Well-Being," Honolulu. (May 18, 2016).

Wallin, Kimberly F. (Author & Presenter), Arsenault-Benoit, Arielle (Author), Gaimari, Stephen D. (Author), Havill, Nathan P. (Author), Mayfield, Albert E. (Author), Ross, Darrell W. (Author), Whitmore, Mark C. (Author), USDA HWA Biological Control Technical Committee Meeting, "Preliminary findings from silver fly (Leucopis spp.) predators under field conditions near the leading edge of the HWA range in the eastern United States," Annapolis, MD. (2016).


Warren, Dana, FES/FW 452 - Forest management and biodiversity conservation, "Riparian zones." (May 2016).


Warren, Dana, Hubbard Brook Ecosystem Study 51rd Annual Cooperators Meeting, "Will stand development shift HBEF streams from light to nutrient limitation." (July 2016).
Warren, Dana, Oregon Forest & Industry Council (OFIC) annual Board meeting, "Fish and forest management in headwater ecosystems," Corvallis OR. (June 2016).
