

Report of the Review Panel of the Graduate Program in Sustainable Forest Management at Oregon State University

November 30, 2017

Introduction

This 10-year review of the Sustainable Forestry Management program was initiated following a 5-year review in the Spring of 2017 performed by internal reviewers from the Graduate Council (Drs. Lisa Price and Patrick Chappell). That review concluded that a 10-year review, rather than a New Program Review, was warranted since the SFM program was re-named and re-organized from programs that existed prior to departmental reorganization. To appropriately evaluate academic and curricular rigor, external reviewers (Dr. David Greene, Humboldt State University, and Doug Mays, Weyerhaeuser Inc.) were included, in addition to Drs. Price and Chappell. All four read the self-study, participated in the site visit on November 13 2017, and contributed to this report. In the earlier evaluation, a handful of issues were noted that prompted minor concern, but the majority of these pertained to questions regarding departmental and college administration, and not to the direction and execution of the program itself. The current review summarizes the evaluation of the inputs listed below by the internal and external review committee.

Inputs

Mission

The SFM program mission describes training graduates to use critical thinking skills to perform rigorous research which poses appropriate questions, and devises collaborative and interdisciplinary solutions to issues in forest management, as well as to communicate these research goals and results to academic, industrial, and public stakeholders. The mission appears well aligned with the broader mission of the College of Forestry “to educate and engage the next generation of scholars, practitioners, and users of the world’s forest resources, to conduct distinctive problem-solving and fundamental research on the nature and use of forests and related resources, and to share our discoveries and knowledge with others.”

Recruitment and Enrollment Trends

The Oregon State University College of Forestry enjoys a superior ranking and reputation among Forestry colleges around the world, and thus often relies on a “passive” recruitment strategy resulting in multiple qualified applicants. Applications and admissions have been steadily on the rise since academic year 2011 (the initiation of the formal SFM program), while matriculations have remained stable. Positive trends in enrollment include steady increases in the international and minority composition of graduate trainees. An increase in student diversity, while incremental, mimics the slight increase in faculty diversity, due to several new hires over the past five years.

Admissions selectivity and other indications of selecting high quality and diverse students

The first SFM program applications (three) were received in winter 2012, with the number rising quickly to a plateau of about 45 per year. The number admitted has settled at about 30; that is, the acceptance rate is at about 67%.

While about 90% of domestic applicants self-identified as white, nonetheless, for a Forestry

Department, the profile of applicants is reasonably diverse. One quarter are female. There has been a conscious push during the last few years to increase the ethnic diversity of the admitted students by favoring international applicants (25%). The largest non-white student applicant groups were Latino and Asian. Relative to other graduate programs in Forestry in the United States, the profile of SFM students is perhaps modestly polychromatic.

The GRE scores of applicants have climbed steadily since 2012, particularly for the verbal and quantitative scores. GPA has shown no change.

Interestingly, the GRE scores and GPA of applicants and matriculated students is about the same. This lack of difference as well as the absolute values, implies a high quality intake at the application stage that permits selection to be based primarily on other factors than academic preparation. To some degree, however, this could also be due to some well-qualified applicants being turned down because potential supervisors in the more popular sub-disciplines already have a full complement of students. In any case, selectivity of graduate applicants has increased, as reflected in the number of applicants denied admission, as well as an uptick in GRE scores of admitted applicants.

The self-study report refers to the recruiting efforts of SFM as “passive”. That is, the program relies primarily on its reputation. There have been a few attempts at comparing North American Forestry units for scholarship; invariably the College at OSU is in the top five (see below). The real recruiting efforts therefore are taking place in professors’ offices across the continent as aspiring seniors ask mentors where they should go for graduate school. This hard-earned reputation has been created during the last few decades by researchers who are now largely gone. But the younger faculty are energetic and productive; there is no reason to suppose that a more active recruiting effort will be necessary in the foreseeable future.

Financial support

Students in the SFM program enjoy a high level of financial support in the form of graduate assistantships and fellowships. These are derived from several sources, including the College, industrial partnerships, and Provost’s initiative funds. These range from 1 to 3 years, with an increasing trend toward a higher duration of support, often sufficient to cover training within the MS and MF programs. The program feels however that it needs to be able to offer more financial support to remain competitive with other programs across the country.

Strength of the curriculum

Students choose from one of six areas of concentration (AOCs): operations, policy and economics, biometrics, silviculture and disturbance, soil and watershed, and engineering. The MF students can enroll in one of three programs: business, geospatial, or silviculture and disturbance. As elsewhere in North America, an option involving fire (in this case the AOC focused on silviculture, fire and forest health) is the most popular with about half the students. The engineering AOC presently has zero students but this is mainly due to recent losses in supervisory capacity in this area, a problem that will shortly be rectified by tenure-line searches.

The SFM program requires 12 units of core courses for all SFM students plus an additional two required AOC-specific core courses depending on the graduate student area of concentration within the SFM program.

The 12 units of core material required of all students includes sustainable management, critical thinking, statistics or econometrics, and ethics. This core is similar to other graduate programs in Sustainable Forest Management in the United States.

A number of students felt that the statistics course was problematic as the background preparation of the class varied so widely that teaching to the median student bored the better prepared and intimidated the least prepared. This is a widespread problem at other universities as well but it is not clear that there is any solution other than the expensive one of running different versions of the class, varying with students' preparation.

A standing complaint of students, evidenced in both prior exit interviews and the panel's meeting with students, is that there are insufficient stand-alone graduate level classes. This complaint however mainly reflects perhaps the situation a few years ago when there were still too few faculty to teach specialized courses. More generally, the wish list of any graduate student would include remarkably specialized, small-enrollment classes that dovetail with their specific interests, a desire that is of course opposed to the need of the College to keep costs reasonable. The College requires a minimal enrollment of only 5 students at the graduate level, and thus the main impediment to running more courses is the number of graduate students, which in turn is limited by the number of supervising faculty.

At present, the panel feels there are a sufficiently large number of stand-alone, narrow graduate courses; certainly, the number is not less than at most other large graduate programs in this country.

Quality of personnel and adequacy to achieve missions and goals.

Quality of support staff is evaluated elsewhere.

The global renown of the faculty is indisputable; as mentioned previously, this College is considered one of the premier destinations for aspiring students around the world. While there has been a great deal of turnover in the past half-decade (about two thirds of the faculty have retired or resigned), their replacements are first-rate. Indeed, the reputation of the College does not merely assure that the cream of recent BS students applies to OSU, but likewise recent PhD and post-doctoral students consider a tenure-line job at Oregon State an emblem of having risen to the top of their discipline. In short, there is every reason to think that the quality of the professoriate will continue to be world-class.

The teaching policy of the College sets a minimum expectation of three courses taught annually, one of them typically a graduate level course in their area of expertise. This standard is typical at R1 universities and should not constrain either scholarly productivity or the capacity to closely supervise students. Likewise, supervisory loads are reasonable. The present tenure-line number of 18, bolstered by a large number of non-tenure-line faculty, of course sets a limit on total graduate enrollment, but is sufficient to ensure a diversity of relevant expertise on students' committees.

Level and quality of infrastructure.

The College manages several working forests with perhaps the 4000-hectare MacDonald-Dunn Forest the most important because of its proximity. The wide range of on-going experiments at these sites, many of them long-term, are a benefit for many of the students. A large number of important publications arose from these forests in the past and that productivity should continue.

The demolition of Peavy Hall has caused a temporary but nonetheless clearly negative effect on the present cohort of graduate students. With students scattered among a large number of locations, many reported to the panel a sense of being disconnected from one another, and from the Department. Nonetheless, important facilities such as greenhouses and wet and dry labs have been unaffected and thus the main consequence for students has been a sense of isolation.

The new Peavy Hall will be ideal for subsequent students. There will be adequate space for graduate student desks, computational labs, and dry labs. (Wet labs will be relocated to a different building.) Indeed, proximity may foster a greater sense of belonging than the old building where most students were housed within the supervisor's lab.

Quality of organizational support.

The graduate program is supported by the FERM Administrative Manager, who doubles as a resource for both the undergraduate and graduate programs, and the Graduate Program Coordinator. The latter processes applications, maintains records, and is the first contact for graduate students seeking clarification or advice on a number of issues.

Both the Administrative Manager and Graduate Program Coordinator have received awards recognizing superior service to faculty and graduate students. The panel's meeting with the graduate students elicited enthusiastic praise of these two administrators, both for their competence and for their generosity and friendliness. Student exit interviews showed a similarly high regard.

Exit interviews also highlighted an appreciation for the College's Computer Helpdesk. This 10-person staff assists graduate and undergraduate students in research design, and also advises on statistical analyses. Most Forestry units in the United States would have only one or two individuals serving in this capacity.

Productivity

4 and 8-year graduation rates for masters and doctoral students

The College of Forestry (CoF) currently has 190 graduate students enrolled in four areas of study—Forest Ecosystems and Society, Master of Natural Resources, Sustainable Forest Management (SFM), and Wood Science. 55 graduate students are directly enrolled within one of the 6 areas of SFM concentration, another 17 are enrolled through related programs for a total of 79 in the program. Since 2012, the CoF has awarded 42 masters' and 2 doctoral degrees via the SFM program. The median time required for degree completion was 6.6 terms for masters and 14 terms for doctorates in 2017.

Based on CoF supplied data, the SFM program has graduated masters' candidates at a 4-year rate of 73%. This is derived from the percentage of students entering the 2013 fall term cohort that received at least one master's degree from fall 2013 to summer of 2017. Doctoral students 8-year graduation rate was 50%, as calculated on a similar basis (Ph.D candidate cohort dating back to 2009).

SFM Program	Graduation rate	1-year retention	2-year retention	Degrees 2012-17
Masters (4-year)	73%	100%	100%	42
Doctorate (8-year)	50%	75%	100%	2

Student retention rates over the past two years indicate that the CoF is committed to ensuring that students achieve satisfactory progress toward their degree. Student interviews and CoF documentation verified that a robust annual review process is in place—the student, major professor, and department head all sign off individual performance against a specific rubrics of learning outcomes for each degree. SFM graduate students achieved a noteworthy average GPA of 3.77 for the 2016 academic year.

Overall program productivity is acceptable, although it was noted that the total number of graduate students advised per graduate faculty member is approaching the upper limit of 4.0, compared to the target range of 2.0 to 4.0. This number will likely improve as the two vacant faculty positions are filled. Total enrollment in the graduate program has recovered since a low in 2009 and appears to be on a favorable trend, leadership expects total enrollment to reach 85 once the new building is completed. Department leadership also noted that each year some applicants have been rejected due to a lack of major advisor capacity.

In summary, the CoF has admitted high quality students that graduate at an acceptable rate compared to the total number of program enrollees.

Publications or evidence of other scholarly work by students and faculty

CoF SFM graduate program students and faculty have produced a noticeable increase in the number of referenced journal articles and research publications in 2016, surpassing the prior 3-year average numbers by 13% and 27% respectively. This trend is likely attributed to generational faculty turnover that has occurred since the creation of the SFM graduate program in 2011. Grant activity has experienced a very favorable 3-year average trend, 2015-17 averaged \$4.6 million per year, a 57% increase over average annual levels of grant funding achieved from 2012-14. A 70% increase in funding of total scholarships, fellowships, and travel awards speaks to the program's ability to position themselves to improve future scholarly work productivity. SFM students do produce numerous presentations associated with symposiums, while they are also required to prepare at least one poster and an oral presentation as a part of their degree. Faculty are required to instruct an average of 3 CoF courses (2 undergrad, 1 grad). Faculty viewed this recent change in policy as acceptable and it will likely enhance a more even distribution of

professor workloads across the entire program. In theory, this should also improve future scholarly output.

The CoF has garnered much public attention due to their promotion of research efforts to expand leading-edge forestry-related technologies. The following exemplifies that the CoF is well-positioned to expand its portfolio of scholarly work:

- The school research forests provide easy to field access for faculty and staff, facilitating both short and long-term research efforts—676 school forest (past and present) research projects are available for CoF personnel in a searchable database
- The new Peavy Hall will foster an improved research environment with state of the art teaching and lab space
- The Center for World University ranked the CoF program as Number 2 in the world and number 1 in the nation, President Ray has publicly stated this as an achievement highlight for OSU

Interviews also confirmed leadership, faculty, and students were energized and optimistic about the emerging culture of collaborative research among industry, governmental agencies, and the USDA forest research center.

Student satisfaction with their education and mentoring experiences

Interviews with students reveal all were extremely satisfied with the quality of their education; most mentioned they appreciated the flexibility within the program to take cross-campus qualifying coursework. This opinion though came as a surprise to the panel since many students also felt the number of stand-alone graduate-level forestry course offerings was too low.

A common theme emerged. While students highly value and respect the mentoring ability and expertise of CoF professors, they felt there were problems with the core graduate forestry classes. Forest economics, remote sensing, geomatics, and business were given as examples where they would prefer more forestry-centric instruction versus taking offerings taught by other schools at OSU. Since 2014 the number of stand-alone graduate forestry course taught by CoF faculty has steadily increased, so it appears this issue has been targeted for improvement.

Some students voiced concern over a general lack of transparency related to scheduling and navigating through the process of defending their thesis and qualifying for graduation. A detailed flow diagram for SFM graduates was found on the CoF website as listed in SFM Graduate Program guide. Other online resources were also available that provided in-depth explanation for graduation requirements—checklists were clearly posted for the MS, MF, and Ph.D. candidates. This may be an opportunity to re-educate or improve the faculty and student orientation process.

Students expressed some minor frustrations during the early phases of their graduate work to identify and onboard with their major professor/advisor. Some decided to switch professors, but

there were no consistent or troubling issues to address. Personality nuisances were the major reason students switched. It appears students do have the flexibility to ultimately work with their professor of choice. Without exception, all appeared satisfied with their current major professor and were genuinely pleased with their support.

They also highly value the program staff's ability to troubleshoot day-to-day administrative issues and to facilitate coordination of important scheduling needs with their professors. Students are also very excited about simply having all their professors, staff, and resources located together, housed under one roof, in the new Peavy Hall.

Viability of scholarly community within which students can interact

The ability of students to work successfully appears to be at an acceptable level, despite the fact CoF is currently working in temporary locations until Peavy Hall is completed. All acknowledged that fostering community and student interaction today is very difficult because the CoF is located across a myriad of other facilities. Although, this is viewed as a temporary distraction from an idealized scholarly interaction, it does pose a risk to maintaining a viable community. For this reason, the review committee recommends that interim steps need to be taken to improve opportunities for the students to have more interaction amongst themselves and with faculty.

Many students commented that they had recently attended a faculty meeting featuring an update of faculty research; this was highlighted as the kind of action that built a sense of being part of a scholarly community. Several observations and statements also support that there is concern about the FES and FERM departments having diminished opportunity for interaction as well. To complicate this situation further, Dean Maness remains understandably limited in his ability to have daily on-campus interaction with his leadership team as well as the greater CoF community. Although not ideal, faculty were very appreciative that the Dean has shared his concerns and helped address this by delegating some of his daily duties to Anthony Davis.

Outcomes and Impacts

Equity, Inclusion and Diversity

The data on diversity in the graduate student body includes women, foreign citizen students and those with race or ethnicity noted. Excluding the three or four students who did not disclose their race/ethnicity in 2016 and 2017 we have the following profile. There has been a fairly steady and relatively proportional growth of women to men in the program over the years of the program with the current count being 16 women to 38 men in the program as of fall 2017. The number of non-US citizen/international students enrolled has remained steady with numbers ranging from 9-12 with 2017 having nine international graduate students in the program.

One point of concern in the self-study is the very low representation of US ethnic or racial minorities in the program with a mere one or two in the graduate student body each year between 2013 and 2017. There were few applications from Black or American Indian/Native Alaskan individuals over the years of the self-study. Non-white applications were submitted mainly by Latino and Asian individuals, and a small number identifying as mixed. The extremely

low number of minority applicants and trainees may in part be related to “passive recruitment”. The superior standing of the program ensures sufficient applications each year and no programmatic need to engage in active general recruitment to meet student numbers. From 2012 – 2017 there were 257 graduate applications to the program. Of the 257 only 11 applicants over these same years identify as being from a minority race or ethnicity. This lack of domestic diversity in the student applications and body is visible in the data presented and is recognized and stated in the self –study “Our domestic student population is not ethnically diverse” (p. 9).

Meanwhile, the faculty has gone through a transition with the retirement/departure of senior faculty. The program took advantage of new openings to diversify the faculty. The former faculty was 95% White and 95% male. The current faculty, based on the 15 hires made in 2012, is 76% White and 80% male.

Placement and success of graduates

Graduates of the program have been rewarded with numerous job opportunities; interviews confirmed that current students were unconcerned about finding a forestry-related career. An overview of past graduate placements dating back to 2003 reveals a nearly equal distribution between private industry (34%), state and federal agencies (36%), and Universities (30%)—most were directly employed in a forest related field. This balanced output of career choice also supports the notion that the SFM program is executing and aligned with the CoF mission—“...to educate and engage the next generation of scholars, practitioners, and users of the world's forest resources, to conduct distinctive problem-solving and fundamental research on the nature and use of forests and related resources...”.

The large number of graduate students becoming academics is a sign of a nationally-renowned program and further underscores the pre-eminence of this College in Forestry in the United States.

There were no observable metrics to realistically judge the success of graduates; it is inferred that all have launched a career of their choice.

Satisfaction of students and graduates with their education and post-graduation employment success

Current student interviews provided a consensus that most were satisfied with the quality of their education. As mentioned earlier, common themes were noted regarding a lack of student connectivity within the CoF related to Peavy Hall relocation and nuisances associated with navigating the curriculum. An exit interview survey conducted by the CoF since 2013, verifies that 84% of graduates felt they had met their academic goals, while only 2% stated they did not. Notably, over 90% would recommend the SFM program to others. The survey also found that graduates were drawn to the SFM degree because of the CoF’s first-rate reputation.

There was no real evidence to evaluate satisfaction with post-graduation employment success. The external reviewers surmised that post-graduation success is healthy since graduates are

finding full employment. Certainly, in today's forest sector job market, there are more entry to mid-career level employment needs than qualified, available candidates.

This presents an opportunity for the SFM program to consider developing a formal 2- to 5-year post-graduate survey. In particular, this survey could gauge satisfaction with the former student's new career.

Professional or national rankings/ratings

By any measure available, the College is ranked highly both in North American and globally. NRC ranks the three OSU departments as 2 to 8 in the country on the basis of reputation, and ranks them as highly for scholarship.

Learn.org ranks OSU in the top three for Forestry.

The Center for World University Rankings places OSU at number 2 globally.

The site TopUniversities ranks Forestry at OSU at #13 in the world based on ten years of data.

Laband and Zhang (2006; Journal of Forestry) ranked OSU #1 based on total citations in forestry journals. But only #28 based on citations/faculty. Likewise, these authors rank OSU Forestry #1 for total publications in forestry journals but only #24 for number/faculty.

According to the self-study, the faculty are now averaging about 3.5 refereed publications per year. Given that the bulk of the tenure-line faculty are just starting out, we expect this value to increase.

In summary, for publications per capita and for reputation OSU Forestry is highly regarded. The only non-stellar result is for per capita publications and citations within Forestry journals, a "problem" merely due perhaps to OSU faculty not feeling constrained to publish within such a narrow list of journals.

Community engagement activities.

The panel is puzzled by the inclusion of this topic in the review panel report template. Community engagement activities were not discussed in the self-study nor did the topic arise during the panel's interviews with members of the program.

Conclusion and Recommendations for Improvement

The overall recommendation of the Review Panel for the College of Forestry is to maintain this program, which is currently strong. We congratulate the program directors and faculty for successfully developing a new graduate program while dealing with a 67% turnover in the tenure-line ranks. Their success insures that OSU Forestry will remain a coveted destination for graduate students within the United States and internationally.

Our more specific recommendations are:

Recommendation: There is too much confusion among students in navigating the process of defending their thesis and qualifying for graduation. A more thorough orientation for students and faculty is required.

Recommendation: The Panel feels the program should not wait to move into Peavy Hall before addressing the students' concerns about feeling isolated from the Department. That is, interim steps need to be taken to improve opportunities for the students to have more interaction amongst themselves and with faculty.

Recommendation: In order to increase the diversity of the US student body an active recruitment strategy to enhance the number of US minority graduate student applicants and those entering in the program is recommended.

Recommendation: The SFM program should consider developing a formal 2- to 5-year post-graduate survey. In particular, this survey could gauge satisfaction with the former student's new career.

Recommendation: Given the turmoil with FERM during the last half-decade, the Panel feels it is important for unit cohesiveness that Dr. Davis remain in his new position serving as the acting Dean until Dean Maness is able to fully resume his on-campus activities.