

Review team: Anja Geitmann (McGill University, Montreal)
J. Keith Gilles (University of California, Berkeley)
Lisa Sennerby Forsse (Swedish University of Agricultural Sciences)

Date of on-site review: May 4-6, 2016

Introduction

This review draws upon a self-study report produced by the Faculty prior to our visit on May 4-6, 2016, as well as a previous review performed in 2009 and the Dean's response to that earlier review. During our on-site visit, the review team had the opportunity to meet with a wide variety of stakeholders from inside and outside the University of Toronto. We were extremely impressed by the effort the Faculty of Forestry put into preparing a comprehensive self-evaluation, their dedication to their mission, and their willingness to honestly acknowledge and speak about problems.

Context and Relevance of the Discipline 'Forestry'

- The importance of forestry issues in the 21st century is unquestionable at this point in time. The effects of climatic change on wildfire frequency and severity, carbon flux in the boreal regions, and forest health will be significant at regional, national, and international scales. Because of the major impact that forest ecosystems have on climate and a wide range of unique eco-services (e.g., tree biomass, biodiversity, recreation, and water), the awareness of the importance of forests is increasing among governments, corporations and the global public. The attention paid to sustainable forest management has never been higher, and in the emerging bio-economy the demand for forest products and services is expected to grow both regionally and internationally. In a country that owns 10% of the world's forest, and 27% of the world's boreal forest, the importance of this resource can hardly be overestimated.
- The University of Toronto is lucky enough to have not only a Faculty of Forestry with long tradition of being thought leaders, but that is currently held in high regard internationally for its leadership in several of the more dynamic aspects of forestry.
- The economic landscape of Ontario is in transition, and while traditional forest-dependent industries are declining in their relative importance, the forest resources of the province are potentially the foundation for a major expansion of the bio-economy into new sectors of the economy. The current Faculty is to be applauded for its constructive engagement with the private sector – this is as important for a Faculty of Forestry as for a Faculty of Engineering. The relationship with the Haliburton Forest is particularly important in this regard, being extremely beneficial for students (providing

them with opportunities for hands-on field experiences) as well as the faculty and the partner (facilitating the development of novel technologies). The value of the in-kind contribution by Haliburton is hard to estimate, but it is certainly enormous.

- There is also increased public acknowledgement of important linkages between forest management and aboriginal issues of cultural heritage, educational opportunity, and economic development. These linkages represent both opportunities and challenges for the University of Toronto.
- Maintaining the University of Toronto's distinguished record of thought leadership in forest does not require a large faculty, although it may require a structure such as Faculty status to realize their potential and fulfill their mission. Some investment in additional faculty positions may be needed, but these are in areas such as the social dimensions of forestry and aboriginal issues in which the University arguably needs to make investments regardless of how the structural issues are resolved.
- Neither the University of Toronto, nor the balance of the higher education system in Ontario, appear to have a viable alternative to continued reliance on the Faculty of Forestry to meet Ontario's need for high quality forestry professionals and scientists. The most comparable programs, those at the University of British Columbia, appear to be relatively differentiated and more synergistic than competitive with respect to the nation's need for centers of excellence in forestry. The faculty of Forestry at the University of British Columbia focuses on a different, more boreal-type forest compared to the mixed hardwoods in Eastern Canada. It is not obvious that the University of British Columbia or other Canadian institutions would be able to build up equivalent competence to that already existing at the University of Toronto. The representatives we met from the forest sector in Ontario clearly stated the importance of the faculty having local expertise, and attested to good relations between them and Faculty of Forestry with respect to dealing with the challenges and possibilities ahead.
- Lakehead University provides Ontario's second forestry program and is both distinct and complementary to the program offered by University of Toronto. Lakehead's program is focused on operational aspects related to the forestry industry, whereas the University of Toronto's program is designed to produce graduates qualified to move rapidly into research or managerial/policy making roles.

Undergraduate Program

- The students we met with were very positive about the program, although they felt that it was difficult for them to "find" the program when searching through the vast range of programs offered through the Faculty of Arts and Sciences. However, they did see the advantage of the program being associated with the Faculty of Arts and Sciences with respect to flexibility in combining a forestry major with other majors or minors. The Faculty of Forestry and, ideally, the Faculty of Arts and Science, should consider how to improve the visibility of the forestry program for incoming students.
- The Faculty of Forestry understands, however, that efforts to increase the program's visibility are largely their responsibility regardless of its institutional home. Resolving persistent staffing problems for the unit would be quite helpful in this regard.

- A closer re-examination of the undergrad program's relationship with the Faculty of Arts and Sciences before our visit would have been appropriate, but the failure to do so seemed to be due to a simple communications problem between the leadership of the two Faculties. We suggest that this take place in the near future to clarify expectations with respect to the future of the major and the cooperative mechanisms under which it will be offered.
- A good example of the need for better communication between the Faculty of Forestry and the Faculty of Arts and Sciences leadership was the significant divergence between their understanding of the institutional imperative to offer Specialist degrees compared to their shared opinion of their value and attractiveness to students.
- An important opportunity for visibility for any program is high-enrollment first year courses. The members of the Faculty of Forestry seemed very interested in participating in delivery of such courses with respect to their general areas of expertise, or redesigning some of their less specialized courses so that they could be more broadly attractive or appropriate for satisfaction of the coursework requirements for other majors. There was a clearly expressed sense that their expressions of interest in doing so had been effectively blocked due to potential impacts on other units' finances due to the activity-based budget model that drives the University of Toronto's resource allocation decisions.
- The program's lack of accreditation was identified by students as a priority to rectify, because the lack of accreditation significantly increases the effort that has to be expended to obtain a professional license.
- The most significant problem identified by students was that several courses are not offered regularly. In particular, they felt that a failure to regularly offer the field course at the Haliburton Forest was problematic with respect to giving them appropriate grounding in field skills and that failure to provide such a course limited students' opportunity to evaluate forestry as a potential major. The practical experience gained from working on "real" forest management issues is highly valued by potential employers.
- The students emphatically asserted that they were interested in majoring in forestry, not more generally in environmental science. They were clearly able to articulate their understanding of the professional dimension of forestry and the attractiveness of a forestry-style systems approach to the environment relative to the broad brush or narrowly-specialized approaches to the environment that characterize many environmental science programs. An education in forestry is truly interdisciplinary in a way that cannot be easily replicated by simply taking a variety of stand-alone courses on the relevant topics.
- The students appreciated the atmosphere of community created by the accessibility of the members of the Faculty of Forestry, their helpfulness, and the out-of-classroom enrichment opportunities in which they encouraged students to participate.
- The recent establishment of a student union clearly reflected the students' energy and high esprit de corps as well as their belief in a future for the faculty and the forestry educational programs.

Master of Forest Conservation (MFC) Program

- From the University of Toronto's perspective, the Faculty of Forestry should be applauded for creating a viable professional Masters program with limited resources. The MFC program is clearly viewed as a success from the perspective of the current students, the alumni and employers. The graduates of the program are highly valued for their qualifications, find work easily, and seem to have collectively risen to key leadership positions in Ontario with startling rapidity.
- The MFC program seems to have had particular success in one of the most difficult aspects of such programs – the successful integration of students with BSc and BA backgrounds. This is a critical factor for success, given that the target demographic for such programs often makes their career decisions only after acquiring five to ten years of post-baccalaureate work experience.
- The program seems to have achieved a good balance between the hard skills (e.g., analytics) and soft skills (e.g., communication, problem solving, team work, project management) necessary for leadership in the field.
- They seem to have done this through effective use of peer-to-peer learning and a network of supportive practicing professionals in ways that expand on the bandwidth and expertise of faculty.
- The students in the program are trained without an ideological orientation for or against the industrial, governmental, or non-governmental segments of the forestry sector. The emphasis on pragmatic approaches to problems seems to be effective not just in training high caliber students for careers, but in creating a network of graduates working in diverse settings that are capable of identifying opportunities for collaborations between different stakeholders and organizations.
- Students speak highly of the program in terms of it providing value-for-money, and the recent certification of the program speaks of acceptance in the broader professional community.
- Many other strong institutions have struggled to establish similar programs. The speed with which the MFC program has achieved success is impressive. At this point in time the program quality arguably rivals that of long-established elite programs such as those at Yale or the University of Michigan.
- The MFC program has further growth capacity, particularly with international students, but achieving such growth will require the faculty to continue fine-tuning the curriculum and modest resource investments, e.g., in staffing for the analytic courses in which some students need more support, in identifying appropriate internship opportunities and in matching students to these opportunities, and in offering a small number of additional elective courses.

Graduate Studies - Research Stream (MSc, PhD)

- The self-study did not contain outcomes data with respect to graduates over past decade that would allow us to put high offer rate in context; we assume data will be forthcoming.

- Outcomes data are particularly important for evaluating these programs because a direct comparison to offer rates in most other science fields (e.g., cell biology or physics) is not straightforward given that there are far fewer similar programs Canada-wide or internationally, and individual forestry programs are known for very different strengths. As a consequence, potential candidates may apply to only one or two programs, whereas a student interested in cell biology or physics may apply to 5 or 10.
- The evidence presented for the productivity of the research programs, which is obviously correlated with graduate student quality, is quite clear.

Faculty/Research

- The Faculty of Forestry doesn't aspire to cover all the bases in forestry; it has appropriately focused on domains with local relevance and advantage.
- Urban forestry provides an excellent example of an area in which the Faculty of Forestry was an early thought leader in a field where the local environment of the institution provided it with environment for achieving excellence. The progressive attitude of local residents towards achieving sustainable urban landscapes resulted in a synergism between local government efforts and the research and outreach efforts of the faculty, as well as providing a strong market for graduates of both the undergraduate and MFC programs. The end result is a forestry program that reflects the priorities of a rapidly urbanizing population.
- Toronto has an urban forest with an estimated 10.2 million trees covering approx 18,000 hectares. Forty percent of this valuable resource is situated on public property, including an estimated 3.5 million trees within a parkland system and approximately 600,000 trees on the streets. Even with the current strength of the Faculty of Forestry in urban forestry, the institutional reputation for leadership in this field could be enhanced by closer linkage to the efforts of the Faculty of Landscape Architecture and Design. Historical interactions between the two faculties seem to have been placed on hold at least in part because of the uncertain future of the Faculty of Forestry. This struck the review team as a very clear example of how indecision with respect to the program's status has not served the larger interests of the University of Toronto.
- The research of the Faculty of Forestry on biomaterials is both of a high caliber and important to the potential of the bio-economy to capitalize on the natural assets of the Ontario forest landscape despite the declining economic opportunities associated with the lumber and paper industries. It was clear from our discussions with representatives of major industries such as automobile manufacturing that they have confidence in the faculty to be able to provide research and development outcomes sufficiently valuable to justify significant investments in those efforts.

Organizational and Financial Structure

- We appreciate the activity based budgeting process utilized by the University of Toronto and the Province of Ontario to hold itself to a high standard of accountability

for resource allocation decisions. The problems posed by the small size of the Faculty of Forestry under this business model were evident, given that most of our interactions with institutional leadership revolved around these problems.

- On the other hand, the rationale for the University of Toronto to maintain a small center of excellence in forestry, particularly in the areas of urban forestry, biomaterials, and the social dimensions of forestry, including aboriginal interests, is so evident given the increased practical and political importance of these dimensions argues for institutional creativity over standard practice in deciding how to meet the institution's social contract with the people of Ontario.
- Some resolution of the status of the Faculty of Forestry is long overdue. The indeterminacy under which the unit has had to operate for many years is more than unfortunate. The resilience of the faculty and students in the program under this indeterminacy is frankly remarkable.
- Discussions with stakeholders outside the institution made it clear why the Faculty of Forestry feels that having a leader with the title "dean" is important to the program's visibility – the title confers legitimacy with respect to standing to speak to forestry issues in a way that individual faculty or the leadership of a large, but less focused, faculty unit be unlikely to have.

Long-Range Planning Challenges

- It was not possible to judge the alignment of the strategic vision presented by the Faculty of Forestry with the overall University's academic plan based upon the documents made available to the review team, other than to say that some aspects like an increased focus on aboriginal issues were consistent with some of the priorities expressed verbally to the team by administrators. The representative of the first nations' interests who met with the review team spoke eloquently with respect to the importance of having more aboriginal students engaged with the program in the future.
- Stabilizing the staffing situation for the Faculty of Forestry, even making a modest investment in their faculty complement, is probably necessary to expect the unit to be capable of pursuing their most promising opportunities for fundraising initiatives for field courses (in response to student demand), research in aboriginal issues (in response to the University's evolving recognition of that portion of its social contract with its citizens), biomaterials (nanofibers, etc.).
- Communicating how forestry as a field has evolved away from a simple focus on harvesting trees for the lumber or paper industry to an integrated systems approach to the social, biological, and physical science dimensions of the protection and utilization of forested landscapes to potential undergraduate students will be critical for the program to achieve a defensible size in terms of the activity based budgeting model that is driving University decisions – but the same communication needs to take place with the administration of the University if they are to be expected to understand why a cohesive forestry unit will be needed to address the nexus of biodiversity, climate change, sustainability, economic development and other problems that define modern forestry. For this to happen, the faculty needs to prepare a case for a well-defined and

supported Faculty of Forestry that meets the needs of both academic administrators and development officers.

- The demographics of the faculty is a matter of some concern. Only one tenure-track hire has been made since 2005 and the person in question has left since then. Long-term planning by University of Toronto for the Faculty of Forestry should take into consideration the need for younger faculty who need to grow through the ranks.

Recommendations

- The Faculty of Forestry's argument for modest investments in faculty positions to address the social sciences and aboriginal issues (bringing the faculty size to about 10 FTE) is compelling with respect to both the Faculty of Forestry's needs and opportunities. The curriculum enhancement that this would permit would potentially provide significant benefits to students in other programs.
- If the resources can be found to make these investments, they should be made with clear expectations for both program growth and service teaching that would be beneficial for related undergraduate programs.
- While the undergraduate program would certainly benefit from more staff and faculty advising support, it is arguably more important in the short term for the student experience to simply provide reliable forecasts of which courses will actually be taught one to two years out.
- Accreditation of undergraduate program should be seriously considered to ensure its long-term viability.
- The students expressed a desire for more information on how to become Registered Professional Forestry, what this entails. Achieving these objectives will logically require regularly having practicing RPFs on campus and utilizing them to provide the kind of practice-based mentoring that it will be difficult for most faculty to provide.
- Visibility and branding are crucial for the future of the forestry program at the University of Toronto. The efforts to overhaul the Faculty of Forestry web site are both timely and critical to support efforts in student recruitment, visibility of the faculty and their research programs, and development efforts. Individual faculty members should make efforts to highlight their research programs by providing details in accessible language and imagery, and publication lists and other information should be impeccably up-to-date. At least one outside (alumni) stakeholder proposed a name change from "Forestry" for the Faculty to include the word "conservation" to reflect how the definition of forestry has changed in the past decade.
- Reinstating the undergraduate field course at Haliburton Forest should be a high priority for curriculum enhancement, and the program's alumni should be challenged to provide financial and/or in-kind support to accomplish this goal.
- For the MFC program, the priority should be to provide more elective courses, possibly in entrepreneurship or scientific writing and communications.

- The Faculty of Forestry acknowledged the need for a better and more transparent procedure to match MFC students to internships, and their efforts to do so should be reevaluated in a year or two.
- The Faculty of Forestry should be encouraged and supported in efforts to use their existing infrastructure and network of personal relationships to pursue international activities such as joint degrees to the extent that this is consistent with the overall campus strategic plan. For the Faculty of Forestry, such arrangements would likely have secondary benefits in recruitment into both their MFC and research track graduate programs, as well as in identifying suitable internship opportunities for the MFC students.
- Efforts should be continued and strengthened to include aboriginal issues. This can and should occur at the curriculum level (traditional knowledge, worldview), aboriginal student recruitment (requires working with elders who have significant influence on students' career choices as well as drawing on existing resources to provide a support system for these students) and recruitment of faculty with aboriginal backgrounds.
- Consolidation of the Faculty of Forestry with School of Environment would resolve current problems with the campus activity based budgeting model, but likely at the expense of a significant loss in institutional capacity to engage in effective interdisciplinary, problem-driven research on forestry issues over time. However, interaction between the two units could certainly be improved. For example, involvement in the School's Master Program in Sustainability should be considered.