

## ***Final Report for the Cyclical Review of the Undergraduate Environmental Science Programs***

Submitted June 17, 2015 by Steven Cooke, Director of the Institute of Environmental Science and Chair of the ENSC Undergraduate Program Review Committee

The Carleton University Committee on Quality Assurance (CUCQA) reported that they categorized the undergraduate programs in Environmental Science (ENSC) as being of good quality with report. We were required submit a Final Report before June 30th, 2015 to address six issues (see below). In late fall of 2014 we prepared an “action plan” which we have updated to serve as the Final Report which is intended to be a combined strategic and academic plan to ensure the long-term sustainability of the ENSC program.

### ***A. Strategic enrolment management***

It is apparent that we are unable to continue to grow and maintain student experience without either an increase in faculty positions or by altering the program. We have initiated a plan to do both with a core goal of modernizing the program such that we can increase enrollment AND maintain or improve the student experience. One of the bottlenecks in the program has been the second year field course which has traditionally been held at a religious camp in Cobalt ON. Transportation, finances, food (we hire cooks and purchase all the food...) and liability issues have constrained further growth. With the retirement of a faculty member that instructed that course for 15+ years (even during his sabbatical) we have taken the opportunity to revisit the structure of the course to make it more “turn-key” and scalable. We will be incorporating the field course into the semester with one or two weekends away rather than running it over a two week period prior to the start of the semester. We have successfully done this with a third year field course so we expect that this change will enable us to better use resources (should reduce costs substantially) and be able to deliver the course to a large number of students. We are also instituting a minimum grade (GPA of 8.5) within the honours program to trigger the ability of students to participate in the thesis project. Much effort was being devoted to very few students and it was difficult to find supervisors for students with low grades. We are conforming to the practices used in many other units in the Faculty of Science. We also continue to think about how technology can be exploited to maintain high levels of student contact and engagement within the face of growing enrollment. We have a plan for growth that is tied to increases in research-active tenure-track faculty positions within the unit (see D below).

### ***B. Defining and developing program distinctiveness in relation to comparable programs in Ontario and Canada***

In our report for the QU process we failed to clearly articulate how our program was distinctive relative to other programs in Ontario and Canada. We have carefully reflected on our program and evaluated other such programs and identified a number of ways in which our program is indeed unique. The primary unique tenet of our program is student engagement at a level that is unparalleled in other programs. We do so through extensive field courses in both second and third year, through a hands-on group project in third year and via a practicum course in third year. We end with a capstone thesis course for honours students. We also have a co-op option and have increasing enrollment in that

program. Our students receive highly relevant programming that connects them to the external community (e.g., NGOs, government at various levels, industry). Indeed, we also benefit immensely from what Carleton calls the “Capital Advantage”. In our unit we consider this to be more than just a tag line – it is a reality. From first year (in the seminar course) through to the thesis program, students have the opportunity to interact with scientists and policy makers in allied agencies headquartered in Ottawa/Gatineau including Parks Canada, Environmental Canada, Agriculture Canada and Fisheries and Oceans Canada. Many of our students spend time on their internships working with professionals within those organizations and subsequently do thesis projects with co-supervisors from government. In our third year field course students spend a day on Parliament Hill interacting with Parliamentarians and learning about political processes. This IS the Capital Advantage. Because of both proximity and program structure, we are able to exploit these opportunities to provide students with unique training opportunities that help them to do relevant science and understand how it is mobilized and used to inform policy and management actions. We are also one of the few programs to hold ECO Canada certification and indeed were among the first in the nation to earn such a designation – a factoid we use for recruitment.

#### ***C. As a consequence of b.: the achievement of national and provincial program distinction***

Although we certainly emphasize the points covered in “C” when interacting with potential students, we have not fully articulated these opportunities in our existing marketing materials (websites, brochures). Once in-program our students quickly become attuned to the notion that their learning community extends beyond the campus to include allied agencies. Nonetheless, by building more connections with external members of the university community we can help to realize the Capital Advantage and leverage it to benefit current students while using it as a recruiting tool for future students. One practical way to do so is to build a formal list of off-campus partners and formally connect them to our unit through adjunct professorship appointments. At present we have no adjunct professors specific to ENSC and simply rely on other units to make such appointments or engage off-campus professionals independent of the adjunct professorship structure. We are also improving communication with our ENSC students and sharing with them opportunities to attend seminars and workshops put on by allied agencies in the National Capital Region. The Canadian Center for Evidence-Based Conservation and Environmental Management was just launched as a research and training initiative connected to the ENSC program. As this initiative develops we see much opportunity for engaging undergraduate students in the activities of the Center (including extensive stakeholder engagement, evidence assimilation and analysis) which will further add to program distinctiveness.

#### ***D. Faculty renewal and resourcing***

The Environmental Science program has reached a size (doubled since 2008) where it requires dedicated academic support, and the need to develop longer-term academic leadership. There are both teaching and research components to this, including the ability to develop collaborations between different units on campus and in the broader community for project, thesis, and research development. The ability to further grow the program is constrained by the fact that there are only 3 tenured/tenure track faculty members in the unit, all with partial appointments specific to ENSC (Cooke is 67%, Vermaire is 80% and

Amos is 67%). At present we rely heavily on contract instructors which are largely retired professors who are no longer research active. We simply lack the critical mass to do anything more than maintain a stable position (assuming no sabbaticals). We have identified a number of creative ways to scale the program but cannot do so without additional faculty support. Providing our undergraduate students with high-quality engagement through group projects and thesis requires extensive mentoring from faculty; with pressures on faculty members to take students from other units our students have a difficult time finding thesis supervisors. Our desire would be to have five research active professors with majority appointments (i.e. > 67% of teaching) in ENSC, one of which would serve in the position of unit Director. We have a search for a new tenure-track assistant professor underway which would bring our faculty complement to four. When several of our long-standing (retired faculty members) CIs formally retire from instruction we will have serious deficiencies so we have been working on succession plans and doing extensive co-teaching and mentoring to enable cross-pollination of ideas.

***E. Maintaining and improving the quality of the program***

The ECO Canada accreditation in particular, and to a lesser extent the external review as part of the QA process, has led to curriculum changes. Moreover, we have had two retirements and an unfortunate death of long-standing faculty members – all members that were not overly research active. With three research active tenure-track faculty members now in ENSC we are focused on modernizing and streamlining the program to improve the student experience. The current faculty complement (two of the three are new within the last two years) are technologically inclined and are thinking creatively about how to revise the curriculum to achieve learning outcomes and do so in ways that better engages students. For example, we have relied on oral thesis defences in ENSC until this year that were all done behind closed doors. This took three faculty members and weeks of time. We have instead created a one day capstone event where students do presentations in front of their peers and all ENSC faculty attend. Moreover, the 4<sup>th</sup> year thesis presentations will be incorporated into an in-class element for the 3<sup>rd</sup> year “thesis preparation course” to demonstrate for them the type of work that is possible. This is an example of how we have streamlined and modernized the program while also improving engagement by enabling students to share their work with peers and those about to embark on their theses. For the first time since 2005 (when the “longest standing” faculty member joined ENSC at Carleton), we have an active curriculum committee devoted to strategic development related to program improvement as well as enrollment growth as outlined in A.

***F. A governance structure that facilitates the achievement of a-e: the Committee felt that the self-study was ambiguous with respect to the roles of the Advisory Council and the Board***

We apologize that the roles of Board and Advisory Council were unclear. The Institute has its own Board to coordinate and plan for all activities within its programs. The Board operates in accordance with University Senate Planning for all Schools, Departments, Colleges and Institutes and involves appropriate student representation; currently the 4th year representative of the Environmental Science Student Association (ESSA). The IES Board is comprised of the Director (Chair), two Faculty members, a full-time Instructor, one Contract Instructor, a 4th year student representative, and five associated faculty members, for specific committee work, one from each of Biology, Chemistry, Earth Sciences, Geography

and Environmental Studies, and Technology Society Environment Studies. From within this unit we strike our curriculum committee, tenure and promotion committee and recruitment and retention committee (realizing that the membership of some of those committees is limited to individuals with specific employment status – we follow university and union rules in that respect). This group meets monthly or as needed with subcommittees meeting as needed.

The Advisory Council is a means of engaging the broader university community with an interest in environment science such that we have an eager and willing group of mentors for our students. Indeed, at the simplest level, being a member of the council means that one has an “open door” for students in ENSC. We depend heavily on faculty members in allied units on campus (within and beyond the Faculty of Science and our sister units) to mentor our students in group projects and thesis projects. The council provides a means of formally recognizing and connecting those faculty members with an interest in ENSC. We share the list of council members with our ENSC student community so that they know those individuals have the “open door” we desire. We meet once annually where we discuss strategic issues of relevance to ENSC where we seek broad input. We also update them on general aspects of the program. The council has no formal role in governance and is simply advisory as needed. As mentioned above, the council is primarily intended to serve as a means to identify those friendly faces willing to interact with and supervise our ENSC students. We have clear mandates established for the committees (we shared them in response to the site visit and will do again in the final report).

<b>Recommendation</b>	<b>Action</b>	<b>Responsibility</b>	<b>Timelines</b>
A – Develop plan for strategic enrollment management	Revise and modernize program such that it is scalable	Director and ENSC Curriculum Committee	Finalize refinements by Feb 2015 and implement.  UPDATE This is not a one-off task rather an ongoing effort. We are rolling out the first modifications this fall (e.g., 2 <sup>nd</sup> yr field camp) and will assess in early 2016.
B – Define and develop program distinctiveness	Better share our distinctive elements via outreach tools (e.g., website, brochures); Continue to develop and foster relationships with scientists and policy makers in allied agencies to fully exploit the “Capital Advantage” (e.g., explore formal	Director and Unit Administrator	Update materials continually; Consider addition of a number of adjuncts for ENSC (June 2015)  UPDATE Adjunct process still focused on our sister “Department” units given that they have active grad

	adjunct status for such individuals)		committees to vet the adjunct applications.
C – Achieve program distinctiveness	We have it – need to better share it with the community in recruitment and marketing materials	Director and Unit Administrator	Ongoing (see B above)  UPDATE – Continued efforts to share what we do with the community (sharing with CU communications staff), interaction/outreach with stakeholders
D – Faculty renewal and resourcing	Recruit additional faculty member in spring 2015 and ideally one in 2016 to reach tenure track complement of 5 (one being Director)	Director in partnership with the Dean of Science and VP Academic	Advertise in 2014 for spring 2015 hire; repeat following year  UPDATE – We have a search for a TT assistant professor underway. We will take a year off to assess our position before seeking additional hire(s).
E – Maintaining and improving quality of the program	Streamline courses and curriculum; Ensure meeting or exceeding ECO Canada accreditation requirements	Director with support from Curriculum Committee	Ongoing – Plan to introduce key revisions to curriculum by Feb 2015  UPDATE – Ongoing – We have made a number of changes to course descriptions and the director has met with the CI delivering the professional practice course to ensure it is meeting learning objectives.
F – Clarify governance structures	Revise wording to further clarify the specific roles and responsibilities of the board and advisory council	Director	Feb 2015  UPDATE – Clarified in action plan.