Final Assessment Report
Environment and Resource Studies (BES, MES)
Social and Ecological Sustainability (PhD)
May 2016

Summary of the Program Review:
The Environment and Resource Studies programs were last reviewed in 2008. In keeping with the Institutional Quality Assurance Process (IQAP), this final assessment report provides a synthesis of the external evaluation and the internal response of the BES, MES, PhD programs delivered by the School of Environment, Resources and Sustainability (SERS), formerly known as the Department of Environment and Resource Studies (ERS)\(^1\).

The final version of this augmented self-study (Volume I) was submitted to the associate provost, graduate studies in February 2015. This volume presented the program descriptions and learning outcomes, an analytical assessment of the three programs, and program data prepared by the Office of Institutional Analysis and Planning (IAP) as well as the Department formerly known as Environment & Resource Studies, Scott Davis of the Co-Op Office, surveys of alumni and data from GSO. Appended were the CVs (Volume II) for each full-time faculty member in the program.

Two arm’s-length external reviewers - Dr. John Volpe, associate professor, School of Environmental Studies, University of Victoria, and Dr. Brian Cumming, director and professor, School of Environmental Studies from Queen’s University – were ranked and selected by the associate provost, graduate studies, in addition to one internal reviewer, Dr. Jonathan Kofman, from Systems Design Engineering.

Reviewers received the self-study documentation and conducted a site visit on April 20-21, 2015. Their itinerary included interviews with the vice-president, academic and provost; associate provost, graduate studies; associate vice-president, academic; dean of the faculty of environment; the associate dean, graduate studies; associate dean, undergraduate studies; SERS director; associate chair undergraduate studies; associate chair, graduate studies; faculty; a librarian; staff; and a group of students. The reviewers also toured the following facilities: SERS Biogeochemistry Lab; Soil Ecosystem Dynamics (SED Lab), Conservation and Restoration

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\(^1\) SERS members were pleased that the reviewers agreed that the unit should be called the School of Environment, Resources, and Sustainability. The Board of Governors approved the name change as of November 2015, and the change became official January 4, 2016.
Ecology (CaRE Lab), SERS Ecology teaching lab; Interdisciplinary Centre on Climate Change; the three environment buildings; and the Library.

This final assessment report is based on information extracted, in many cases verbatim, from the self-study, the external reviewers’ report and the program response.

Program characteristics:

*Bachelor of Environmental Studies (BES)*
Since 2008, the focus of the bachelor program has been to educate students by using a transdisciplinary framework that intermixes the social, natural, and physical sciences and the arts. Faculty and students examine environmental policy and governance theories and how these translate into the areas of water, energy, and food. The more ecosystem science-based courses also focus on areas where the human-nature intersection occurs and often clashes.

*Masters of Environmental Studies (MES)*
SERS provides advanced education guided by the long-established concept of "sustainability". Three conceptual themes guide much of the teaching, learning, and scholarly enquiry fostered through the MES: 1) assessing the theoretical foundations and practical implications of progress toward a sustainable society, and application of this analysis as a broad context for specific work; 2) understanding socio-ecological systems as self-organizing systems exhibiting the phenomenon of surprise, especially when over-stressed by human activities; and 3) examining conventional and alternative social arrangements, including institutions and tools of governance, as means of improving human wellbeing and environmental responsibility. The Masters program now has two facets: 1) the traditional thesis-based, two-year version; and 2) the Major Research Paper (MRP) version. The former is geared more towards earlier-career students interested in scholarly careers or a scholarly approach to problem-solving. The MRP tends to be geared toward later-career students who still value scholarship, but are more interested in a career-based project, often related to their current employment or desired future employment.

*Social and Ecological Sustainability (PhD)*
The PhD program expands upon the MES, and is based upon the three broad conceptual themes mentioned above. The PhD program emphasizes work in three overlapping fields: 1) resource analysis and stewardship - this field focusses on the analysis of existing resource systems as well as creative and innovative ways of utilizing the earth's resources in a sustainable fashion; 2) socio-ecosystem function and renewal - this field critically examines ways to apply our knowledge of ecological systems towards renewing human relationships with the broader environment; and 3) sustainability policy and governance - this field considers...
existing and new forms of governance and policy with respect to sustaining healthy and resilient human communities and biophysical systems.

Summary of strengths, challenges and weaknesses based on self-study:

Strengths

- Strong support from current students, alumni, and employers on the skills and learning achievements and preparation as outcomes of the programs
- Unique program at the University in terms of combining social, natural and physical sciences in a transdisciplinary and problem-centered approach to learning and skills building; that ties into post-graduation success in the job market and academia (as per the 1st point)
- Unique focus on the interrelationship of how the sciences (especially those related to ecology, policy, and governance) can be analyzed to create actions that produce measurable outcomes, especially with respect to sustainability
- Course evaluations specifically indicate high levels of satisfaction, even given high standards across ENV and the University as a whole
- Despite some challenges below, there is a strong sense of community and interaction amongst students and especially between students and professors that is very strong

Challenges

- To expand experiential learning and skill building for undergraduate and graduate students yet minimize overload on professors
- To provide more SERS core courses, especially in first year
- To decrease the practice of scheduling tests worth a large percentage of the final grade
- To establish a consistent assignment of FTE to teach ERS 215, ERS 315, ENVS 200 and ENVS 444
- To reduce administrative loads to allow for more time for research including grant applications
- To provide more opportunities for short courses or other legally protected certifications (e.g. Ecological Land Classification)
- Establish a more stable social network to better engage alumni and leverage high profile opportunities; the current network is quite active and viable but the issue is that it depends too much on personal contacts – while extensive, this means there can be inefficiencies and threats if a professor retires or passes away and they were the main or only point of contact for many alumni
Weaknesses

- Some SERS undergraduate elective courses have too much redundancy; others take too much of a didactic approach - students suggested re-focusing, re-ordering, and incorporating more experiential learning
- Lack of common space for SERS undergraduate and graduate students

Summary of key findings from the external reviewers:

SERS’ interdisciplinary and transdisciplinary research on environmental issues is clearly recognized at the national level. Students can have either a Science or Arts focus - thereby diversifying the students in the program. The flexibility of the SERS program is one of its most defining and attractive features. This diversity is positive for the program, moreover, the co-op option, strong faculty, and a unique hands-on program results in high-quality applicants.

Program response to external reviewer recommendations:

Recommendations

1. A review of the undergraduate program by SERS faculty should be undertaken to identify core courses, as well as identification of courses in areas of specialization to SERS. Advice to students regarding taking courses within these specializations should be discussed.

Response

This action has been completed as of the date of this report by the Director and Undergraduate Studies Committee (Dr. McCarthy, Dr. Quilley, Dr. Larson, Dr. Wolfe, a SERS major as the Undergraduate Student Representative, Patti Bester - undergraduate staff administrator). All of SERS (all voting faculty members, cross-listed adjuncts who have voting rights, staff members, undergraduate student representatives on the School Council, and graduate student representatives) vetted four iterations of the course review.

During a day-long retreat in April 2016, there was a unanimous vote to adopt course changes, backed with a summary and action plan relevant to the cyclical seven year review.
2. Propose a name change to School of Environment, Resources and Sustainability (SERS) – as it better reflects the mandate, transdisciplinary approaches, and aspirations of the program. The SERS website should also be updated with advice and options to SERS undergraduate students with possible options of joint degrees, as well as to options of certificates.

Response
The revisions are visible on the SERS website: [https://uwaterloo.ca/environment-resources-and-sustainability/](https://uwaterloo.ca/environment-resources-and-sustainability/). The site was revised by the three staff members and the SERS director and associate directors. The Director reallocated staff tasks and time. This reduced basic clerical functions in favour of increased media communications via the University of Waterloo web space, Twitter, and Facebook.

The impact of these changes is expected to result in an additional 10% of undergraduate students by fall 2018; however, the numbers of graduate students will be harder to increase as they are currently at a historical high. Hence, graduate (as well as undergraduate) numbers will continue to be monitored to measure the effect over time.

The Director and Associate Directors, with the help of staff, will also monitor all changes and outcomes that might be related to the name change. It is estimated that only ~5% of University of Waterloo webpages still refer to the old ERS name. It will be harder to assign any increase in undergraduate enrolments to the name change itself; what will be monitored is whether there is a rise in these enrolments over the next three years, being cautious of ascribing correlation to causation.

3. Establish an informal academic advisors event in the first-term of the fall that would allow students to ask a variety of questions concerning degree options. Consider inviting your Departmental Student Council to organize such an event.

Response
SERS requires an increased allocation of staff and professor time so that there are more academic advisors for students (especially first year) to answer questions about options and paths. At present, the challenge is that two-thirds of the personnel allocated to academic advising also have research-related faculty appointments and associated teaching and administrative relief, and therefore little time for advising. The Director and Associate Directors will be reviewing which non-essential tasks might be reduced and/or eliminated in favour of providing more time for student advising.
4. Consider alternative options for mounting field-based courses such as collaboration with other environmental programs.

**Response**

The Director intends to bring a package of collaborative initiatives on experiential learning to SERS for consideration. If approved, the Director will seek approval from the Dean, Faculty Council, and Senate for an approximate launch in fall 2018. The outcome will be more offerings of certification courses in ecology against reduced resource needs on an annual basis because these will be spread over several institutions; this saves a projected $20,000 per year (most of these costs are in terms of sessionals).

5. Investigate a number of modes to provide a sense of community among the graduate students, particularly additional student space. Reviewers suggested that SERS strengthen student and faculty engagement and a unit-wide culture by building their own traditions such as weekly seminar series, creating a graduate student society, hosting special events (e.g., Iron Chef Competition at UVic).

**Response**

SERS feels that a broader sense of community can best be achieved by having more core courses at the undergraduate level and a firmer set of elective course choices that appeal to more of the unit at the graduate level. If students are grouped together - early and often - then a sense of community is easier to promote. Some of the initiatives indicated would have to come from the graduate students; the problem there is that many are ambitious and do research overseas once they finish year 1 – that limits opportunities. Similarly, two-thirds of the professors have major research or administrative positions that limit time spent unit-wide (though the supervisors are generally very good at ensuring cohesion and activities within their research groups).

The reviewers and students indicated that much of this issue is actually about space; for example, SERS does not have proper space for students to congregate, save for a very busy small foyer near the director’s office. Moreover, there have been over a dozen separate graduate student complaints over the past three years about the amount and quality of space. At last word, there were indications that the University was about to send instructions about space for Master’s students campus-wide. The SERS Director, Associate Directors, and delegates to the Faculty of Environment Space Committee will continue to raise this pressing need with the Faculty of Environment Space Committee. SERS does not control space decisions, hence solutions are limited.
6. The faculty should seek additional lab space for equipment and storage needs for the SERS program.

Response
Similar to the student space issues mentioned above, SERS and other Faculty of Environment (ENV) personnel share labs and these small spaces are getting overcrowded (e.g. an extreme example is where one 750 ft$^2$ research lab serves four professors, 26 graduate students, 18 undergraduate students, one post-doctoral fellow and one professor emeritus). These additional space challenges will be added to the discussions with the Faculty of Environment Space Committee as indicated in item 5.

SERS identified many of the same issues that were highlighted by the external reviewers, in addition to the aforementioned items SERS would like to address the following:

- The messaging of SERS needs to be clearer and consistent not only in social media and the web, but it must also permeate recruitment and course content.

- The departure of a key faculty instructor created a gap in some teaching areas around community (city/town/neighbourhood) scale sustainability but is also an opportunity to explore possible alternatives for this position with the dean such as local governance/community based sustainability with a focus on teaching experiential education.

- SERS took on the delivery of ENVS 200 and is considering offering to do the same for ENVS 195, as SERS already delivers ENVS 444. There may be some room to consider how to deliver other ecologically based courses as a better package, in consultation across the Faculty of Environment and outside ENV. SERS is also a key developer of an online course in Sustainability, open to students outside of ENV.

- SERS continues to fine tune its social media use, especially when it comes to alumni relations, but also with its current and potential students. With increased competition for students - internal and external - SERS has increased work with the recruitment group on strategies to get more applications to their undergraduate and graduate programs.
### Implementation Plan:

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<th>Recommendations</th>
<th>Proposed Actions</th>
<th>Responsibility for Leading and Resourcing (if applicable) the Actions</th>
<th>Timeline for addressing Recommendations</th>
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<tr>
<td>1. A review of the undergraduate program by SERS faculty should be undertaken to identify core courses, as well as identification of courses in areas of specialization to SERS. Advice to students regarding taking courses within these specializations should be discussed.</td>
<td>During a day-long retreat in April 2016, SERS members reviewed and discussed the undergraduate courses and courses related to specializations, etc.</td>
<td>The Director and Undergraduate Studies Committee (Dr. McCarthy, Dr. Quilley, Dr. Larson, Dr. Wolfe, a SERS major as the Undergraduate Student Representative, Patti Bester - undergraduate staff administrator)</td>
<td>This action has been completed as of the date of this report. There was a unanimous vote in April 2016 to adopt the course changes backed with a summary and action plan.</td>
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<td>2. Proposed name change to School of Environment, Resources and Sustainability better reflects the mandate, transdisciplinary approaches, and aspirations of SERS.</td>
<td>School of Environment, Resources and Sustainability (SERS), formerly known as the Department of Environment and Resource Studies (ERS) Update SERS website.</td>
<td>Director and Associate Directors</td>
<td>The Board of Governors approved the name change as of November 2015, and the change became official January 4, 2016.</td>
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<td>Revised by the three SERS staff members and the SERS Director and Associate Directors.</td>
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<td>Completed. The updated SERS website: <a href="https://uwaterloo.ca/environment-resources-and-sustainability/">https://uwaterloo.ca/environment-resources-and-sustainability/</a></td>
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<td><strong>3.</strong></td>
<td>Establish an informal academic advisors event in the first-term of the fall term that would allow students to ask a variety of questions concerning degree options. This will be organized in conjunction with ERSSA (the School’s undergraduate student association)</td>
<td>Requires an increased allocation of staff and professor time so that there are more academic advisors for students (especially 1st year) to answer questions about options and paths. Will solicit feedback from undergraduate students (key informants and a system wide survey)</td>
<td>Directors and Associate Directors SERS Communications team is tasked with developing the information and materials needed for this and related purposes Directors and Associate Directors</td>
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<td>By Fall 2016 will have reviewed which non-essential tasks might be reduced or eliminated in favour of providing such advisors. By fall 2016, SERS will take action and construct and advise on 'guided pathways' as per the reviewers' recommendation. Complete feedback survey by 2018.</td>
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<td><strong>4.</strong></td>
<td>Consider alternative options for mounting field-based courses such as collaboration with other environmental programs. There should be more collaboration with other programs outside of the University of Waterloo on experiential learning.</td>
<td>There is some existing collaboration external to University of Waterloo, but more can be done. Discussions have begun with Laurentian and will continue with (at least) Trent, Laurier, Queen’s, and York.</td>
<td>Director and Associate Directors</td>
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<td>In progress - specific collaborations are being vetted by all stakeholders. By fall 2017, director intends to bring a package of collaborative initiatives on experiential learning to SERS. If approved, the director will seek approval from the dean, Faculty Council, and Senate.</td>
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<td>5.</td>
<td>Investigate a number of modes to provide a sense of community among the graduate students, particularly additional student space</td>
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<td>7.</td>
<td>The unit shall clarify and provide consistent messaging across communications platforms</td>
<td>Clearer and consistent messaging in social media, the web, and recruitment materials and course content</td>
<td>Director and SERS Communications Team</td>
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<td>8.</td>
<td>Increase FTE to compensate for loss of 1 FTE in teaching and research capacity in a specific area (community scale sustainability)</td>
<td>Loss of a FTE created an opportunity to explore possible alternatives for this position with the Dean such as local governance/community based sustainability with a focus on teaching experiential education.</td>
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<td>9.</td>
<td>Increase participation in ENV courses.</td>
<td>Considering offering ENVS 195 (SERS already delivers ENVS 200 and ENVS 444). Consider how to deliver other ecologically based courses as a better package, in consultation across ENV and outside ENV.</td>
<td>Director</td>
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<td>10.</td>
<td>Increase recruitment of 1st year students in all SERS programs</td>
<td>Work with recruitment group on strategies to get more applications to SERS undergraduate and graduate programs</td>
<td>Director</td>
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The Director, in consultation with the Dean of the Faculty shall be responsible for monitoring the Implementation Plan.
Date of next program review: ______________________________ 2021
Date

Signatures of Approval:

_________________________                          ______________________
Chair/Director                           Date

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AFIW Administrative Dean/Head (For AFIW programs only)  Date

_________________________                          ______________________
Faculty Dean                           Date

_________________________                          ______________________
Associate Vice-President, Academic
(For undergraduate and augmented programs)  Date

_________________________                          ______________________
Associate Provost, Graduate Studies
(For Graduate and augmented programs)  Date