

# Final Assessment Report for the 2024-2025 Cyclical Review of the BSc Environmental Science Program

## INTRODUCTION

In accordance with Laurier's Institutional Quality Assurance Procedures ([Policy 2.1](#)), this Final Assessment Report provides a summary of the cyclical program review process for the BSc Environmental Science program, prepared by the Quality Assurance Office, along with an identification of strengths of the program(s) under review authored by the Dean of the Faculty of Science. All recommendations made by the external review committee in their report are listed, followed by a summary of the program's response, and the decanal response.

Recommendations prioritized are listed in the Implementation Plan, with those not being prioritized for implementation noted as well.

The Final Assessment Report is reviewed and approved by the Provost and Vice-President: Academic. Following completion of the Final Assessment Report, it is approved by the Program Review Sub-Committee and Senate Academic Planning Committee. Approval dates are listed at the end of this report. Final Assessment Reports are submitted to Senate as part of an annual report on cyclical reviews, and to the Ontario Universities Council on Quality Assurance for information. Final Assessment Reports and Implementation Reports are posted on the university's [Cyclical Program Review Public Accountability webpage](#).

The Implementation Plan for the recommendations prioritized in the Final Assessment Report can be found at the end of this report. Units will submit their first Implementation Report two years following approval of the Final Assessment Report at Senate. The Implementation Report will include comments from the unit on actions taken toward the completion of recommendations, comments from the relevant Dean(s) related to the progress made, and comments from the Program Review Sub-Committee, which is responsible for approving the Implementation Report and deciding if further reports are required. The Implementation Report is submitted to the Senate Academic Planning Committee for information.

## SUMMARY OF REVIEW PROCESS

The BSc Environmental Science program was last reviewed in 2017-2018 as part of the Department of Biology's cyclical program review. This was the first standalone review of the program, a decision that was made to ensure that it had dedicated and discipline-specific attention during the review process.

The Self-Study was led by the Department of Biology, the program's current administrative home, and authored by a group of faculty from the program's participating departments, including Dr. Matthew Smith, Dr. Mary-Louise Byrne, Dr. Jim McGeer, Dr. Robert McLeman, Dr. Scott Ramsay, Dr. Robin Slawson, Dr. Jason Venkiteswaran, and Dr. Dirk Wallschlager. In addition to the Self-Study (Volume I), the program also submitted a

copy of faculty curricula vita (Volume II), a volume of course syllabi, and a list of proposed external reviewers (Volume III). A draft of the Self-Study was reviewed by the Quality Assurance Office, and the Dean of the Faculty of Science prior to submission of the final version.

Following Laurier's IQAP, the external review committee for the review consisted of two external reviewers from outside the university, and one internal reviewer from Laurier but outside of the unit. The review committee was selected by the Program Review Sub-Committee on September 19, 2024, and a virtual external review took place February 13-14, 2025. The review was scheduled to be in-person, but a winter storm and campus closure necessitated a pivot to a virtual format.

The review committee consisted of **Dr. Sunny Wang** from the Department of Mathematics at Wilfrid Laurier, **Dr. Christopher Buddle** from the Department of Natural Resource Sciences at McGill University, and **Dr. Shaun Watmough** from the School of the Environment at Trent University. During the external review, the committee met with the following individuals and groups:

- Dr. Trish McLaren, Associate Vice-President: Academic
- Dr. Matthew Smith, Chair of the Department of Biology, and Dr. Robin Slawson, Associate Chair
- Dr. Anthony Clarke, Dean of the Faculty of Science
- Full-time faculty members teaching in the Environmental Science program
- Mr. Matt Thomas, Department Head, Information Resources and Ms. Fiona Inglis, Liaison Librarian
- Environmental Science Lab Instructors and Coordinators
- Undergraduate advisors from the Departments of Biology and Geography and Environmental Studies
- Undergraduate students in the BSc Environmental Science program
- Ms. Sally Heath, Associate Director: Academic Program Development and Quality Assurance

The review committee submitted their completed report on March 4, 2025. The executive summary from the report, and its recommendations, are provided below.

## EXTERNAL REVIEWERS' REPORT EXECUTIVE SUMMARY

The Environmental Science Program at Laurier has much potential and overwhelmingly the stakeholders interviewed are positive about the program and value its multidisciplinary approach (i.e., students take courses across three Departments and in a suite of subject areas), and agree it is a program necessary for today. The program has an interesting history, and there are some impacts still apparent given the relative new-ness of the program, and since (for example) there were previously two Faculties involved as Geography was previously held in Arts. The faculty and staff associated with the program are strong, deeply committed to their work in the classroom and with research activities, and many work in areas that are related to Environmental Science. However, the program is not 'interdisciplinary' in its current form, since students are only exposed to multiple

disciplines because they must take courses from different core disciplines. The program is also structured in a way to offer students little flexibility in elective courses, for example, and for some it is overly complicated, and tries to do too much. While the program has low enrolment and while its enrolment is stagnant, the program remains supported by the Administration and Departments, largely because it relies on courses already offered in other programs. It does not have core, required courses that are unique to Environmental Science. The review committee notes this as a concern, largely because it may be one reason why the program lacks a clear identity. Students in the program are not a cohort, nor are they a cohesive community. Efforts to create such identity and cohesion are important to consider, and these are possible via both curricular and non-curricular means, as described in the recommendations. Overall, there are many reasons for Laurier to make minor, low-cost changes to the Environmental Science, and the review committee believe such changes will help it flourish.

## RECOMMENDATIONS AND RESPONSES

The External Reviewers' Report included 11 recommendations to improve the quality of the BSc Environmental Science program and students' experience in it. All recommendations have been listed verbatim below, followed by a summary of the program's response, and a response by the Dean of the Faculty of Science.

**Recommendation #1: Consider incorporating more flexibility into the admission requirements to be more consistent with Environmental Science Programs of nearby institutions.** There are various options available, but this generally allows not requiring both chemistry and biology as this closes the door to students who only have one of these courses but are also strong in earth and geographical analyses which is one of the 3 core pillars in the program.

**Unit Response:** We found this recommendation to be very helpful and agree that changes should be considered to more closely align with the admission requirements of similar programs offered by nearby institutions. The entrance requirements originally mirrored common entrance requirements from the supporting departments, but the reviewers make a good point that as an independent program, allowing students flexibility within the three-pillar framework makes good sense and should help to attract more students to the program at the outset.

**Decanal Response:** I agree that this is an important issue that needs to be addressed and support the Program Committee's acceptance of this recommendation.

**Recommendation #2: Curriculum mapping exercise.** We do not feel it would be advantageous for the review committee to suggest courses that should become optional rather than prescribed as there are many nuances with this task. Instead, we recommend that the program do a curriculum mapping exercise to identify areas of overlap that could potentially be eliminated. This is especially important if admission requirements change as per our earlier recommendation. This may also involve attempting to streamline the program. For example, why do students take cartography (GESC251) if a students' primary interest is environmental chemistry or why do all students in the program have to take at least 3 second year chemistry (CH233, CH234 and one of CH261 or CH262) courses if they are primarily interested in areas that do not involve chemistry such as hydrogeology. We recognize that individually all these courses are important, but the breadth of environmental science requires

some streamlining that may make program mapping easier. Reducing the number of required courses should be a core objective of this exercise.

**Unit Response:** The participating departments agree with this recommendation and feel that the program has been formalized long enough to undergo a more rigorous examination of curriculum, particularly keeping in mind the three subdisciplines that it encompasses. We agree that a curriculum mapping exercise should go hand-in-hand with modifying admission requirements, and with an eye toward streamlining the program and that this type of exercise will contribute to accomplishing the goal of growing the program.

**Decanal Response:** I fully support the proposed review and mapping of the curriculum.

**Recommendation #3: Create a foundational Environmental Science course.** To create identity for the program we strongly suggest that the units consider at least creating a first or second-year Environmental Science course that is team taught by members from each unit. Such a foundational course would build community and cohesion from a curriculum perspective. Including significant field-based components should be considered.

**Unit Response:** This recommendation was also discussed during the site visit, and while it may take a bit more time to implement, we do agree that program identity would greatly benefit from a foundational environmental science-specific course early in the program. Creating one, or ultimately, two or three such dedicated courses, ideally including field-based components would enhance the student experience greatly.

**Decanal Response:** As the respective Departmental Chairs will know, I am fully supportive of a team-teaching approach to courses, particularly introductory ones, that expose students to experts in the various disciplines areas to be covered, who have the opportunity to share their enthusiasm and cutting-edge knowledge.

**Recommendation #4: Create a dedicated honours course in Environmental Science Program.** The program would benefit from having a dedicated Environmental Science honours thesis course that should be aligned with the existing honours courses within the 3 core units. This could be viewed as a capstone course in Environmental Science.

**Unit Response:** We agree that this recommendation would also support a clearer identity for students enrolled in the program, and that it would be a relatively easy change to implement. It would also help simplify program regulations for students in their 4<sup>th</sup> year.

**Decanal Response:** I agree with the Program Committee that this recommendation should be acted on.

**Recommendation #5: Enhance visibility of the Environmental Science Program.** Consider cross listing select courses offered by the three core units (e.g. field studies course (GESC399) so that the program has greater visibility in the calendar.

**Unit Response:** As stated in response to recommendation #2, we feel that the program has been independent long enough to warrant a review of the calendar language and curriculum to enhance its identity and visibility

and agree that such a review should be done with an eye toward opportunities to cross-list courses offered by the three core departments.

**Decanal Response:** I support this response and, again, encourage the review activity.

**Recommendation #6: Joint Faculty appointments.** It is recommended that the University considers faculty licenses that cross disciplines directly, perhaps through cross appointments among the three Departments implicated in the Environmental Science Program (Geography, Biology, Chemistry); these faculty could become champions of the Environmental Science Program, helping bridge gaps, teach in courses that are core to the program, and be models for interdisciplinary. This is not a recommendation for new license requests but instead an encouragement for future licenses be considered through an interdisciplinary lens.

**Unit Response:** We agree that this recommendation would enhance the interdisciplinarity of the program and are open to the suggestion in principle. The move of the Department of Geography and Environmental Studies to the Faculty of Science has perhaps made cross-appointments somewhat more feasible. Indeed, there are other cross-disciplinary appointments within the Faculty of Science. We may be able to learn from these existing cross-appointments and from the experience of other interdisciplinary programs at Laurier that rely on cross-appointments.

**Decanal Response:** It is not clear to me that official cross-appointments are necessary to achieve this recommendation. These appointments become problematic from an administrative perspective regarding assignment of activities (i.e., teaching and service) and more importantly their appropriate oversight. Rather, I suggest that the Program Committee consider inviting faculty members involved in delivering the program to one or two meetings a term where, perhaps, a simple lunch is provided (budgeted for through the Dean's Office). This would provide the opportunity for colleagues to create a sense of community, discuss current issues related to the program and/or its delivery, and foster a deeper sense of responsibility to the interdisciplinary program.

**Recommendation #7: Program leadership.** It is recommended that either a program advisory committee be developed, or perhaps a program director (or coordinator) be assigned to Environmental Science; for the latter, this faculty member would need to exemplify the key attributes of the program (e.g., research areas that are related to environmental sciences) and provide internal leadership for the program and be its point of contact for Department Chairs, students, and other stakeholders. Such an assignment would be considered part of a Professor's Service Portfolio, for example. Minimally, faculty mentors need to be identified for the Program as people to whom students could connect, seek advice and general guidance. Perhaps one or more of these individuals could act as an academic advisor for students in the program after they complete year 1 and need advising at a 'Department' level.

**Unit Response:** We appreciate this recommendation and agree that a clearer administrative/support/mentoring presence for the program would be beneficial for students. The most likely option in the near future would be to establish a program advisory committee, with the goal of assigning a program coordinator role as a service component for a full-time faculty member as soon as possible. In the meantime, we feel that the academic advisors for the three departments can continue to fill the role of academic advisor(s) for students in the

Environmental Science program as well, with, perhaps, clearer communication with the students in the program about where to go with their academic questions.

**Decanal Response:** I agree with the Unit's response. As helpful as it might be to identify a director for the Program, unfortunately the number of current students registered in it simply does not justify the required compensation for such position. Attention to Recommendation #6 would likely help the respective departmental Undergraduate Officers continue to manage the Program. If success is achieved with its growth, then this issue could be revisited at that time.

**Recommendation #8: Team teaching.** It is recommended that for some courses core to Environmental Science, existing teaching resources be allocated for Team Teaching. This may not require new resources but rather creative teaching assignments in some courses to allow for more direct integration of interdisciplinarity in the program.

**Unit Response:** We agree that team teaching is an effective way to enhance interdisciplinarity of the program and feel that this recommendation aligns with the recommendation to develop Environmental Science specific courses. A team-teaching approach to offering such foundation courses makes a good deal of sense and could assist with the initial implementation prior to the eventual evolution of any joint faculty appointments for example. Implementation of team-taught courses would require full commitment from the participating faculty members, their home departments and the dean. Because of the structure of the Collective Agreement, it would be very difficult to introduce one team-taught course in isolation; it would likely require running several team-taught courses involving multiple faculty members at the same time and thus require creativity and lots of coordination between participating departments in order to work effectively.

**Decanal Response:** As with Recommendation #3, I support this Recommendation and encourage the Program Committee to explore team-teaching opportunities for this interdisciplinary program, as well as for their own respective programs.

**Recommendation #9: Continue to foster interdisciplinarity.** It is recommended that the home Departments continue to directly foster and facilitate interdisciplinary approaches to scholarship, research, teaching, and administration, as these connections will allow programs such as Environmental Science to be supported and thrive. Highlighting and integrating research into teaching in the program, especially that which crosses traditional disciplines, is important.

**Unit Response:** We agree with this sentiment and feel that the desire to foster interdisciplinarity is a common theme that underlies and will be reinforced by many of the changes that emerge from the reviewers' recommendations. We also agree that integrating research into teaching will be an important aspect of these efforts.

**Decanal Response:** I fully support this recommendation and response.

**Recommendation #10: Recruitment/Marketing and Program identity.** It is recommended that efforts be made to support more effective promotional materials for the program, to increase its visibility both within Laurier, and externally, including for potential students.

**Unit Response:** We agree with this recommendation and feel we are better positioned to adopt a more targeted approach to program advocacy now that it is no longer split between two faculties. Recent Open Houses have seen a great deal of interest in the program and some of the questions asked by prospective students revolved around how Laurier's program differed from those at neighbouring institutions. Thinking about that aspect will greatly assist us in developing promotional material as we make improvements to program structure and identity.

**Decanal Response:** I fully support this recommendation and response.

**Recommendation #11: Student cohesion and community.** It is recommended that efforts be devoted to creating a sense of community among students in the Environmental Sciences program, whether simple email introductions, facilitated social events (e.g., coffee meetings), or facilitating the development of a student club around the program. Faculty mentors or faculty champions could facilitate such activities and be role models for the students in the program.

**Unit Response:** We agree that attention needs to be devoted to promoting student cohesion and community and feel that establishing a faculty member as Program Coordinator and primary mentor for students in the program will greatly assist with this recommendation. The program is in need of a "champion" that assists with outreach to students and keeps them feeling connected to the program and the departments that support it. If we can establish this as a service role, this individual can work toward improving cohesion of the student cohort. As well, once student numbers begin to increase in the program, it will become easier to establish events and/or a club where students feel they belong to a strong cohort.

**Decanal Response:** I fully support this recommendation and response.

## PROGRAM STRENGTHS

**Dean of the Faculty of Science:** The significant strength of this program is that draws from the expertise of faculty members engaged in successful research programs focussed on environmental issues, both local and afar, from the perspective of both social and natural sciences. Drawing courses from our strong chemistry, biology and geography majors, the program provides students with comprehensive foundations in physical, chemical and biological processes, involving valuable experiential learning opportunities in both the lab and the field.

## OPPORTUNITIES FOR IMPROVEMENT AND ENHANCEMENT

**Dean of the Faculty of Science:** Unfortunately, the program does not appear to be attractive to potential students, as reflected by the low number of registrations over the years. The “Program Committee” thus needs to work with advice and recommendations made by the Reviewers to address this significant issue.

## SIGNATURES

Dr. Heidi Northwood

September 1, 2025



## APPROVAL DATES

**Approved by Program Review Sub-Committee:** September 15, 2025

**Approved by Senate Academic Planning Committee:**

**Submitted to Senate (for information):**

**Implementation Report Due Date:**

## RECOMMENDATIONS PRIORITIZED FOR IMPLEMENTATION AND ACTION PLAN

*The following Implementation Plan was created by the Dean of the Faculty of Science as part of the Decanal Response.*

Recommendation to be Implemented	Responsibility for Implementation	Responsibility for Resourcing (if applicable)	Anticipated Completion Date	Additional Notes
<p><b>Recommendation #1:</b> Consider incorporating more flexibility into the admission requirements to be more consistent with Environmental Science Programs of nearby institutions. There are various options available, but this generally allows not requiring both chemistry and biology as this closes the door to students who only have one of these courses but are also strong in earth and geographical analyses which is one of the 3 core pillars in the program.</p>	<p>“Program Committee” Science Divisional Council Senate Academic Planning Committee Senate</p>	n/a	May 2026	
<p><b>Recommendation #2:</b> Curriculum mapping exercise. We do not feel it would be advantageous for the review committee to suggest courses that should become optional rather than prescribed as there are many nuances with this task. Instead, we recommend that the program do a curriculum mapping exercise to identify areas of overlap that could potentially be eliminated. This is especially important if admission requirements change as per our earlier recommendation. This may also</p>	<p>“Program Committee”</p>	n/a	May 2026	

<p>involve attempting to streamline the program. For example, why do students take cartography (GESC251) if a students' primary interest is environmental chemistry or why do all students in the program have to take at least 3 second year chemistry (CH233, CH234 and one of CH261 or CH262) courses if they are primarily interested in areas that do not involve chemistry such as hydrogeology. We recognize that individually all these courses are important, but the breadth of environmental science requires some streamlining that may make program mapping easier. Reducing the number of required courses should be a core objective of this exercise.</p>				
<p><b>Recommendation #3: Create a foundational Environmental Science course.</b> To create identity for the program we strongly suggest that the units consider at least creating a first or second-year Environmental Science course that is team taught by members from each unit. Such a foundational course would build community and cohesion from a curriculum perspective. Including significant field-based components should be considered.</p>	<p>“Program Committee” Science Divisional Council Senate Academic Planning Committee Senate</p>	<p>n/a</p>	<p>May 2026</p>	
<p><b>Recommendation #4: Create a dedicated honours course in Environmental Science Program.</b> The program would benefit from</p>	<p>“Program Committee”</p>	<p>n/a</p>	<p>May 2026</p>	

<p>having a dedicated Environmental Science honours thesis course that should be aligned with the existing honours courses within the 3 core units. This could be viewed as a capstone course in Environmental Science.</p>	<p>Science Divisional Council Senate Academic Planning Committee Senate</p>			
<p><b>Recommendation #5: Enhance visibility of the Environmental Science Program.</b> Consider cross listing select courses offered by the three core units (e.g. field studies course (GESC399) so that the program has greater visibility in the calendar.</p>	<p>“Program Committee” Science Divisional Council Senate Academic Planning Committee Senate</p>	<p>n/a</p>	<p>May 2026</p>	
<p><b>Recommendation #6: Joint Faculty appointments.</b> It is recommended that the University considers faculty licenses that cross disciplines directly, perhaps through cross appointments among the three Departments implicated in the Environmental Science Program (Geography, Biology, Chemistry); these faculty could become champions of the Environmental Science Program, helping bridge gaps, teach in courses that are core to the program, and be models for interdisciplinary. This is not a recommendation for new license requests but instead an encouragement for future</p>	<p>“Program Committee”</p>	<p>Office of the Dean</p>	<p>May 2026</p>	

licenses be considered through an interdisciplinary lens.				
<b>Recommendation #7: Program leadership.</b> It is recommended that either a program advisory committee be developed, or perhaps a program director (or coordinator) be assigned to Environmental Science; for the latter, this faculty member would need to exemplify the key attributes of the program (e.g., research areas that are related to environmental sciences) and provide internal leadership for the program and be its point of contact for Department Chairs, students, and other stakeholders. Such an assignment would be considered part of a Professor's Service Portfolio, for example. Minimally, faculty mentors need to be identified for the Program as people to whom students could connect, seek advice and general guidance. Perhaps one or more of these individuals could act as an academic advisor for students in the program after they complete year 1 and need advising at a 'Department' level.	"Program Committee"	n/a	May 2026	
<b>Recommendation #8: Team teaching.</b> It is recommended that for some courses core to Environmental Science, existing teaching resources be allocated for Team Teaching. This may not require new resources but rather creative teaching assignments in some	"Program Committee" Dean of Science	n/a	May 2026	

courses to allow for more direct integration of interdisciplinarity in the program.				
<b>Recommendation #9: Continue to foster interdisciplinarity.</b> It is recommended that the home Departments continue to directly foster and facilitate interdisciplinary approaches to scholarship, research, teaching, and administration, as these connections will allow programs such as Environmental Science to be supported and thrive. Highlighting and integrating research into teaching in the program, especially that which crosses traditional disciplines, is important.	“Program Committee”	n/a	Ongoing	
<b>Recommendation #10: Recruitment/Marketing and Program identity.</b> It is recommended that efforts be made to support more effective promotional materials for the program, to increase its visibility both within Laurier, and externally, including for potential students.	“Program Committee”  Office of Student Recruitment	Office of Student Recruitment	May 2026	
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