

New Program Progress Report

Climate and Environmental Change (BSc)

October 2024

Background

The University of Waterloo submitted a proposal for the Climate and Environmental Change (CEC) Bachelor of Science (BSc) program to the Ontario Universities Council on Quality Assurance (Quality Council) on December 5, 2022, for their appraisal. The program received approval to commence from the Quality Council on January 27, 2023. The first cohort of students enrolled in the program in Fall 2022.

As part of the approval, a second report was requested by July 2024 to provide an update on the hiring of new faculty in the area of human dimensions of climate change (HDCC). We have now completed the hiring process, and Dr. Seth Wynes started in the role of Assistant Professor (Tenure-track) on July 1, 2024. Dr. Wynes will be instrumental in teaching required and elective courses for the CEC program, including GEOG 417 Climate Change Communication (a fourth-year required course), GEOG 359 Low Carbon Transitions (a third-year elective course), and GEOG 452 Climate Change and Environment Project (a fourth-year capstone course). Dr. Wynes' CV is attached to this report.

In addition, although not specifically hired under the HDCC theme, Dr. Peter Crank joined our department on July 1, 2023 as an Assistant Professor. Dr. Crank's background includes training as a meteorologist, and his research is focused at the intersection of urbanization, climate change, mental health and extreme heat. He will be teaching at least two required courses for the CEC program and two elective courses in the program.

Enrolment

Year	Anticipated Enrolment	New	Actual New Enrolment	
			Regular	Co-op
2022-2023 (1 st year)	20 – 25	0	8	
2023-2024 (2 nd year)	30	0	20	
2024-2025 (3 rd year)	30	3	7	

Progress on Implementation

The implementation of the Climate and Environmental Change (CEC) program has proceeded smoothly to date, with no major alterations to the original implementation plan, nor significantly different developments/initiatives.

The Climate and Environmental Change (CEC) program enrolled the first cohort of students in Fall of 2022. The inaugural cohort was 8 students, although there was significantly greater interest in the program, with strong application numbers including 153 applications to the CEC honours coop (resulting in 121 offers) and 26 applications to the CEC honours regular (resulting in 17 offers). Initially, 11 students accepted their CEC honours coop offers although only 8 matriculated in the program. No students accepted the honours regular program offers. In addition to the 8 students who enrolled in Year 1 in Fall 2022, 4 upper-year students transferred into the program. All 8 first-year students continued their studies into second year during 2023-2024.

For the Fall 2023 intake, application numbers remained healthy, albeit slightly lower than 2022. There were 137 applications to the CEC Honours coop program (resulting in 99 offers) and 24 applications to the CEC Honours regular program (resulting in 12 offers). Initially, 21 students accepted offers to the program, resulting in 20 matriculations. Two of these students transferred to different programs by the end of first year; however, four additional students transferred into the program, resulting in a total enrollment of 34 students across all four years of the program in the first two years. For the Fall 2024 intake, there were 109 applicants to the CEC Honours coop program and 20 applicants to the CEC Honours regular program, resulting in 85 and 13 offers, respectively. Ten students accepted their offers and matriculated in Fall 2024 (7 in the CEC honours coop and 3 in CEC honours regular), with an additional three transfers from upper-year students. As of Fall 2024, there are 46 students active in the CEC program, in both coop and regular streams.

While program numbers are to date lower than expected, all courses used by the CEC program are also used by other programs in GEM and thus draw from a larger pool of students. GEM is also exploring opportunities to include some of the upper-year climate courses (e.g., GEOG 409 Energy Balance Climatology) in specializations offered by programs in the Faculties of Math and Engineering.

During recruitment events, while interest in the CEC program is high, several students and parents noted hesitation about enrolling in a brand-new program. This suggests that there is significant demand for the program, although more time is needed to improve the conversion of offers to acceptances. We continue to work on offer conversions through various events (e.g., March Break Open House that includes sample lectures from CEC-related courses), personalized letters to students, and social media posts that highlight the activities and achievements of current students.

We will consult with students and employers to learn more about current training needs for careers as next-generation climate professionals and consider revisions to the curriculum to ensure that CEC courses continue to meet these needs. We will work with the University's Marketing and Undergraduate Recruitment specialists to refine the program branding and messaging to better connect the in-program training experience with career choices post-graduation.

Of particular note is that all students enrolled in the program have been passing their courses with a high level of success (e.g., many students have averages of 80% or higher). There have been no instances of first-year student struggles, with only three students receiving a conditional standing on their progress to date (mainly due to one low grade in their special major average). All other students are in good (13 students) or excellent standing (22 students).

Recommendations

The external reviewers report for the Climate and Environmental Change program included three recommendations:

1. The BSc program in Climate and Environmental Change should be approved.

Status: **Completed**

Details: The program has been approved with the first intake of students occurring in Fall 2022 and continuing to present.

2. The Department should consider adding a required course with a focus on Indigenous communities and climate and environmental change or more fully integrating Indigenous perspectives into several of the existing required courses. Both of these approaches would benefit from the priority hiring of an Indigenous geographer who can contribute to teaching and research in this area.

Status: **In progress**

Details: We acknowledge and agree with the reviewer's recommendation, and some progress is being made toward implementation. Consultation between the department and members of the Indigenous campus community has highlighted the importance of curriculum Indigenization efforts being led by Indigenous colleagues in the spirit of "nothing about us, without us". However, GEM continues to lack capacity in colleagues who identify as Indigenous, and a failed search for an Indigenous faculty hire in 2022 has delayed the process considerably. This is now being compounded by the introduction of a university-wide limited hiring program in response to significant budget challenges across the university. However, the department, Faculty and university remain committed

to integrating Indigenous knowledge and Indigenous perspectives into our programs. Recent progress and ongoing initiatives include:

- a) In 2022, the Faculty of Environment developed a new role of Associate Dean of Equity, Diversity, Inclusion and Justice. Efforts are underway to inventory and streamline the integration of Indigenous knowledge and perspectives across all programs and relevant courses within the faculty. A key early step in this process is a Faculty-wide survey that will be launched in Fall 2024.
A new position, Manager of Indigenous Initiatives for the Faculty of Environment, was filled in January 2024. This person is Indigenous and will be instrumental in helping to integrate Indigenous perspectives into several existing courses, along with other approaches (e.g., optional workshops and events). The Chair of GEM has already had multiple meetings with the Manager of Indigenous Initiatives to discuss strategies and best practices for the department to pursue toward decolonization and, ultimately, Indigenization of our curriculum and research.
- b) The Centre for Teaching Excellence (CTE) has hired a Senior Educational Developer, Indigenous Knowledges and Anti-Racist Pedagogies. This individual has been supporting faculty aiming to integrate Indigenous knowledge and ways of learning in their courses.
- c) Consultation on creating a new course for the CEC program with a specific focus on Indigenous knowledge and climate change is at an early stage involving the Manager of Indigenous Initiatives for the Faculty of Environment and the Indigenous Knowledges team at CTE. Further progress will depend on available resources in GEM for development and teaching. We hope to be in a position to provide a further update on this course at the next program review.

3. The department should review the need for GEOG 181 as a required course in the program.

Status: Completed

Details: As recommended, in 2023 we conducted a review of our introductory GIS/Geomatics curriculum as it pertains to CEC students. GEOG 181 contains foundational knowledge on geographic coordinate systems, map projections, mapping quantitative data, and the impact of maps on society. Faculty members consulted agreed that these skills are fundamental and required for all students in the CEC program. As such, we have elected to retain GEOG 181 as a required course in the CEC program.

We believe that this recommendation stems from concerns expressed regarding overlap



in content between GEOG 181 (Introduction to Cartography) and GEOG 281 (Introduction to Geographic Information Systems (GIS)). In our scaffolded curriculum, GEOG 281 builds on GEOG 181, with students applying their cartographic knowledge while learning to store, manipulate and analyze spatial data within a GIS program.

GEOG 281 has undergone a major redevelopment over the past year to reduce the overlap between these courses, so that there is a more coordinated transition as students' progress from GEOG 181 to GEOG 281.



Date of first program review: 2028-2029

Date

Signatures of Approval:

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Nov 12, 2024

Chair/Director

Date

A handwritten signature in blue ink.

Nov 12, 2024

Faculty Dean

Date

Note: AFIW programs fall under the Faculty of ARTS; however, the Dean does not have fiscal control nor authority over staffing and administration of the program.

A handwritten signature in blue ink.

Oct. 29, 2024

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

Date