The Department of Geography and Environmental Management (GEM) is ranked in the top 150 of the QS World University Rankings of Geography departments and occupies the fifth position in the country. It is also ranked in the top 75 Geography Departments according to the Shanghai Academic Rankings of World Universities. On both counts, our success rests on the strong commitment of its faculty, staff and students to academic excellence in scholarship and learning and its vibrant, supportive and engaging environment within the Faculty.

2021-2022 was a challenging year for the Department with the continued upheaval of all our teaching and research programming as a result of the global pandemic. The impact of COVID-19 has been significant with field research seasons significantly curtailed, international and local field-based courses cancelled, and access to University buildings for staff, faculty, students restricted resulting in significant impacts on the way we teach, learn and conduct research individually and as a community. Despite these very major constraints, GEM has risen to the challenge of providing high quality undergraduate and graduate programming and conducting nationally and internationally recognized research. This has involved everyone’s effort including staff, faculty and students and at this time of the year, it is important to recognize everyone’s contribution, however large or small, in helping to ensure that the Department continues to thrive.

Academic Plans
The department offers undergraduate plans in Geography and Environmental Management, Geomatics, and Geography and Aviation; all but the Aviation program are available as regular and co-op streams. There is continued activity in the 2+2 and 1+2+1 undergraduate plans with Chinese universities, including Wuhan University, China University of Geosciences (Wuhan), China University of Geosciences (Beijing), Capital Normal University (Beijing). Our graduate thesis programs (Masters and PhD programs) continue to be strong. The Masters in Climate Change (MCC) program continues to strengthen with students being drawn from across Canada to this and the online Graduate Diploma in Climate Risk Management that was launched in September 2018. A new BSc in Climate and Environmental Change has been approved and will be launched in 2022.

The department also partners with a number of other academic units in the delivery of undergraduate and graduate plans. The Department makes a significant contribution to the program in Masters of Economic Development and Innovation, based in the School of Environment, Enterprise, and Development. We also contribute strongly to the University’s Collaborative Water Program which is delivered by multiple departments through the Water Institute and also the Faculty if Science’s Water Science Specialization. Through our partnership with the Department of Geography and Environmental Studies at Wilfred Laurier University, the Waterloo-Laurier Joint Graduate Program in Geography continues to offer world class graduate programming in geography.

Faculty and Staff
GEM is home to 31 faculty including three Canada Research Chairs (Tier 2): Sarah Burch (SSHRC), Maria Strack (NSERC) and Christine Dow (NSERC). It is also home to three University Research Chairs (Daniel Scott, Claude Duguay and Susan Elliott). This year we said
farewell to Clare Mitchell and Jonathan Price who retired after long and distinguished contributions to the department. Between them, they contributed 60 years of outstanding scholarly, teaching and university service and we wish them well in their future endeavours.

We have had a mostly stable year on the staff front. The department is very fortunate to have a highly skilled complement of staff who are essential in maintaining the high quality and level of service to students and faculty alike. Susie Castela continues as the Department Administrator while Alan Anthony and Teresa Wilson continue as Graduate Program Administrators. Miljana Kovacevic is the Undergraduate Program Advisor for Geomatics and Geography. Jesse MacLeod left his position as the undergraduate advisor for Aviation and international undergraduate programs but we have recently welcomed Sophie Dallaire into this important role.

Research

Figure 1. 2021-22 GEM research income by sector relative to the Faculty total in each category.

Research continues to be a high priority activity, with GEM faculty securing increased research funding on 2021-21 totalling $6.2 million (47% of the $13.2 million total Faculty research funding) and the highest per capita funding of units in the Faculty. Major new and ongoing funding sources include:

- Tri-council SSHRC and NSERC. This includes Partnership, Insight, Discovery, New Frontiers in Research grants.
- Provincial sources of funding include the Ontario Centres of Excellence, Alberta Innovates, Ontario Ministry of Agriculture, Food and Rural Affairs.
- The Department is also a very active player in the Global Water Futures (a federally funded CFREF project) with substantial funding to team leaders Merrin Macrae and Claude Duguay.
- Private sector research partners include International Olympic Committee, World Bank, Caribbean Development Bank, Suncor Energy, and Climate Change Emissions Management Corporation. Our international research partnerships also continue to grow.

Faculty researchers also participated in funded research collaborations (e.g. SSHRC Partnership, Networks of Centres of Excellence [AllerGen and Meopar], CFI, NSERC CRF, PICS) with other universities. Furthermore, private sector research partnerships continue to be important, as funding is received both directly and through NSERC and OCE collaborations.

Finally, Suzanne Kearns became the founding Director of the Waterloo Institute for Sustainable Aeronautics with membership from across the entire campus.
Awards
During the year colleagues received significant recognition for their scholarship and discipline-specific contributions. This year Suzanne Kears was recently ranked by the Women's Executive Network (WXN) as one of the 100 most powerful women in Canada and also receive one of the University’s Distinguished Teaching Award. Jonathan Li was awarded the prestigious the Geomatics Award from the Canadian Institute of Geomatics and was named a Fellow of the Engineering Institute of Canada. These are all significant accomplishments recognizing the major contributions colleagues have made in their fields.

Academic Programs
The Department’s delivery of high quality teaching and learning is dependent on our faculty and sessional instructors. However, it is also underpinned by the Associate chairs and advising staff whose work is vital to the success of our educational program.

Graduate – Chris Fletcher continued as Associate Chair, Graduate Studies this year and Brent Doberstein stepped in as the acting Director of the Masters of Climate Change degree program. Alan Anthony continued as the Graduate Program Administrator for MES, MSc, MA and PhD programs while Teresa Wilson continued as Graduate Program Administrator for the Masters of Climate Change and the Graduate Diploma in Climate Risk Management. Our graduate programs continue to be in demand. This year, 14 new PhD students and 67 Masters students (24 in GEM, 43 MCC/GDip) entered the grad program. The total current enrollment consists of 151 Masters and 83 PhD students in our graduate program for a total of 234 students (full time and part time). Success by geography graduate students in receiving external awards is very high with students winning three SSHRC, two NSERC, seven OGS. These successes means that about one third of our incoming thesis masters and doctoral research students received external scholarship awards. During the 2021 calendar year, 22 students received their Master’s Degree in Geography and five students received their PhD. Additionally, the total number of MCC students receiving their degree was 19 with a further five receiving their Graduate Diploma.

As part of our ongoing efforts to improve the graduate program, we have conducted a complete curriculum overhaul with an emphasis on professional development. In addition, our administrative systems have been enhanced to increase student support through the strategic and democratic use of departmental scholarship awards, improvements to the TA experience (e.g. training and evaluation) and the instigation of regular social activities to build cohort and maintain safe connections through the pandemic.

Undergraduate – Ian McKenzie continued to serve as Director for Aviation, and Associate Chair, Undergraduate for international plans (2 + 2 and 1 + 2 + 1) and Erin O’Connell served as Associate Chair, Undergraduate studies for GEM and Geomatics plans. Jesse MacLeod served as the undergraduate program advisor supporting the Geography and Aviation program and the International programs. Miljana Kovacevic serves as the undergraduate program advisor, handling Geomatics and GEM plans. A total of 136 new students entered Geography plans in the 2021-22 academic year (51 Geography, 39 Geomatics, and 46 Geography and Aviation). Within these first year admits there were two new 2+2/1+2+1 international students, along with six internal transfer students to our programs. In total, across all years and plans, there are 712 students enrolled in GEM representing.

At Convocation ceremonies in Spring and Fall of 2021 a total of 79 students received a BES Degrees in Geography, Aviation, or Geomatics with 14 students receiving a minor in Geography. A grand total of 93 students (majors and minors) graduated in 2021.
Outreach and Awareness and curriculum development

The Department’s Committee on Undergraduate Recruitment continues to conduct significant outreach to well over 750 high schools in Ontario and 1500 teachers. Along with our regular in-person undergraduate curriculum offerings, a new course, “How Pandemics Change the World”, was launched in 2021-22. We now have six CEL online courses available to students on and off campus; in 2021-22 1300 students were enrolled in these courses.

Administration

Contributions in the past year to University and Faculty level administration include: Jean Andrey continued as the Dean of the Faculty and Johanna Wandel as the Associate Dean for Strategic Initiatives. Peter Deadman continued the acting Associate Dean for Graduate Studies and Sarah Burch taking over as the Director of the Interdisciplinary Centre on Climate Change. Dan Scott continued as the Director of the Masters in Climate Change with Brent Doberstein stepping in as acting director in September as Dan took sabbatical. Suzanne Kearns is the founding Director of the Waterloo Institute for Sustainable Aeronautics (WISA). Sanjay Nepal is currently the Director of UW/WLU Graduate Program in Geography. The department also makes a substantial contribution to the university governance through substantive representation in the Faculty Association of the University of Waterloo (FAUW) Faculty Relations Committee, University Awards Committee and Senate.