

CCCESD – REVIEW OF DEPARTMENTS – 2023

YUKON UNIVERSITY, Earth Sciences

Yukon University continues to offer a two-year diploma mirroring the first two years of a B.Sc. in geoscience, with existing and in-development block transfer agreements to ensure graduate mobility. Enrolment at Yukon University is hovering around historic lows for the second consecutive year, and this is mirrored in introductory geoscience course enrolments. Our introductory offerings (Physical Geology, Historical Geology) have enrolments of 5-10 students, as do some elective courses (e.g., Physical Geography) offered by the department. Core second-year courses (e.g., Mineralogy, Structural Geology) have enrolments ranging from 2-5 students. The number of declared Earth Sciences majors stands at 9, a 25% decrease from 2022. The program graduated 5 students in 2023, 4 of whom immediately continued into B.Sc. programs at southern institutions (Mount Royal (2), UBC-V (1), VIU (1)).

The department has three full-time faculty (J. Cubley, M. Samolczyk, C. Morgan), supplemented with geography instructors from the broader School of Science. An additional group of permafrost and geoscience researchers (5) is housed in the Yukon University Research Centre with variable degrees of engagement with the instructional unit.

Department faculty are engaged in several ongoing research projects funded by NSERC, the National Research Council, National Science Foundation, and the Geological Survey of Canada, among others. This includes the Yukon Virtual Geology project (www.yukonu.ca/virtualgeology), an initiative to develop virtual geology fieldtrips across the territory to heighten geoscience awareness and accessibility. Other projects include investigations into mineral deposits, water chemistry and radon linkages in Whitehorse aquifers; the petrology and geochemistry of manganiferous cherts and their relationship to VHMS deposits in the territory; and Cambrian-trilobite biostratigraphy in northwestern Canada.

YukonU is partnering with Vancouver Island University on a second-year field school on Quadra Island each spring; the first joint offering was a big success in May 2023. This is in response to early-season logistical complexities in the North (snow!), and a desire to further strengthen a block transfer partnership between the two institutions.

The Earth Sciences program remains third-party funded, outside of the core grant provided to Yukon University by the territorial government. Sustainable enrolment remains the biggest concern but given the program's clear alignment with the institution's strategic goals, the program is on stable footing at present.

Joel Cubley

VANCOUVER ISLAND UNIVERSITY – Earth Science Department

Summary:

Overall, enrollments were still lower than desired in the Earth Science Department, but this was across the board in the Science & Tech Faculty. Online-synchronous versions of introductory courses with labs (GEOL 111 and GEOL 112) were delivered in the Fall 2022 and Spring 2023, respectively, and provided more flexibility in learning for students. The GEOL 206 Quadra field school was successfully offered in Spring 2023 with nineteen students attending including five from the Yukon University, leveraging a recent transfer agreement between the two institutions. A GEOL 390 (Special Field Studies) course to the Yukon took place in August 2023. The Earth Science Department will also be initiating a Five-Year Program review in the Fall 2023, following the one that was completed in 2017. VIU is in financial difficulties as a result of a structural deficit accrued over 10+ years (the details of how we got here are too long for this summary!), and compounded by low revenue during the COVID 19 period. Extreme scrutiny is currently being directed at all programs in an effort to cut expenses. This is a rapidly evolving situation and the longer-term consequences for the Earth Science Program (and other Programs across the institution) remain unclear. We are entering a three-year period of drastic expense reduction (10-15% reduction yearly... for now) to return to balanced budgets. It is not yet clear exactly how these expenses will be reduced (e.g. equal percentage across all units vs. targeted Program reductions) as this situation evolves. We will keep you updated!

Course Offerings & Student Numbers:

The four-year BSc Major in Geoscience and the Minor in Earth Science still have relatively low numbers (29 students in total). Two students graduated during 2022-2023, down significantly from seven in 2021-2022. There is room to grow.

Overall, our enrolments in 2022-2023 courses were somewhat similar to 2022-2023, but slightly more promising in key foundation courses like GEOL 115 and GEOL 200.

Efforts to have student declare their Program/study intentions early seem to be paying off as we have a number of early-declaring B.Sc. Geoscience students in our introductory courses. We are also focusing efforts in converting and retention of undeclared students.

VIU has modified its business model to direct resources to Departments based on enrolments and has increased the scrutiny on undersubscribed courses. GEOL 470 (Special Topics) and GEOL 303 (Engineering Geology) set for Spring 2023 were not offered due to low enrollment.

Science and Tech at VIU has now separated labs from lectures for first year science courses for biology, chemistry, and physics. This change was resisted by the Earth Science Department due to several reasons, the key being the ‘separation of theory from practice’, as well as problems with timetabling and articulation with other universities and EGBC.

GEOL 206 Field School:

In Spring 2023 the 2nd year Geology Field School (GEOL 206) on Quadra Island was delivered successfully. Nineteen students (including 5 students from the Yukon University) participated in two synchronous mapping projects, based out of the Discovery Island Kayak Lodge and Taku Camping Resort. This approach allowed for a mid-way sharing of the information and switching of projects, providing a great learning experience to students.

We also had Dr Rhy McMillan join us as a sessional for GEOL 206 and he added his expertise on indigenous lands and cultures by provided a short session on archaeological artifacts that students might encounter and report on during field work such as cedar bark stripping, petroglyphs, and pictographs.

A similar GEOL 206 is planned for Spring 2024 with more students for Yukon University’s Earth Science Diploma anticipated to attend.

Outreach and Enrolments Efforts:

GEOL 111 and GEOL 112 courses have been integrated into VIU’s dual-credit scheme allowing High School students to get a head start on their university education at no cost by taking first year courses.

The bridge program is now available to Forestry Diploma students who wish to transition their qualifications to the B.Sc. Geoscience. A presentation was given in April 2023 to the forestry students outlining these options.

A block transfer agreement formalized with Yukon University has now been used by one Yukon student who with an Earth Science diploma will transfer directly into the 3rd year of BSc Major at VIU. Hopefully others will follow. Discussions are underway with Douglas College for a similar transfer agreement with their Mineral Resources Diploma.

Several professional and career events for geo-students were held during the term to engage students in the options they might have as future geoscientist. The most successful was a student round table discussion with four geoscientists about how they careers developed and changed over time, where their interests came from and what they anticipate in the future.

Personnel:

Sandra Johnstone is working ¾ time as she continues to work towards PhD at Lakehead University. Gerri McEwen our technician is permanent ¾ time and has been helping out forestry during the Spring 2023. She is also in the final stages of finishing her MSc Geology at the University of Victoria. Rhy McMillan and David Terrill were our sessionals for 2022-2023 and provided some great input and enthusiasm into our first-year courses the online GEOL 111 and GEOL 112 and f-t-f GEOL 111. We hope that both will return as sessionals for 2023-2024.

Student numbers

Fall 2022		Spring 2023	
GEOL 111 (Physical Geology)	40	GEOL 112 (Earth History)	15
GEOL 112 Online (Earth History)	11	GEOL 111 online (Phys. Geol)	33
GEOL 200 (Mineralogy)	14	GEOL 115 (Lab+Field)	18
GEOL 300 (Igneous/Metamorphic)	5	GEOL 201 (Sed. Strat)	11
GEOL 305 (Hydrogeology)	8	GEOL 202 (Structures)	7
		GEOL 206 (Field School)	19
		GEOL 302 (Mineral Res.)	14

SIMON FRASER UNIVERSITY, Earth Sciences

Faculty and Staff

We have 14 faculty members consisting of: 2 Associate Professor, 8 Full Professors, 1 Teaching Professor, 1 Senior Lecturer, and 2 Lecturers. We also have 21 adjunct faculty, 4 Associate Members, and 5 Professor Emeriti. Our staff consists of 1 Department Manager, 1 Graduate secretary, 1 Manager of Operations, and a Resource Specialist.

Recent and upcoming Changes

We continue to face important challenges with our faculty compliment. This year, 1 Professor (Dr. Derek Thorkelson) retired, and we have an additional retirement coming in September 2024. Fortunately, we recently received permission to hire a new Tenure-Track position in Geochemistry (to start advertising in January 2024) but continue to work closely with the Dean of Science to make the case for renewal.

Enrollments

Undergraduate enrollments have increased very slightly, and we now have a total of 53 students consisting of 69 declared Majors and 4 Minors. Our undergraduates take streams in either Geology or Environmental Geoscience, both of which lead to Professional Registration with the Engineers and Geoscientists of British Columbia. We continue to focus efforts on Recruitment and Engagement. In spite of the continued net decline in faculty, our Graduate program remains stable with 49 students representing 20 PhD and 29 MSc.

Challenges:

- Faculty coming up for retirement. Concerned about faculty renewal.
- Low Enrollments

Glyn Williams-Jones, Chair

THOMPSON-RIVERS UNIVERSITY

Courses are mostly full in 1st and 2nd year. The micro-imaging lab is moving along, labs are well-equipped, and I am hoping that someday we will have a full geoscience program.

Nancy Van Wagoner

UNIVERSITY OF BRITISH COLUMBIA – OKANAGAN CAMPUS

The Department of Earth, Environmental and Geographic sciences currently comprises 5 professors, 7 associate professors, 4 assistant professors, 2 lecturers and 5 staff (2 admin support, 2 lab support, 1 professional programs coordinator). Two faculty have secondments in Associate Dean roles.

Dr. Yuan Chen, who currently has a reduced-time 0.5 FTE appointment, will retire at the end of June 2024. Dr. John Greenough will retire at the end of August 2024. Drs. David Scott and Kevin Hanna are currently on study leave and Dr. Ed Hornibrook is presently on administrative leave. Dr. Kyle Larson has taken on the role of Head of Department.

The department concluded searches for Assistant Professors in Geomorphology, hiring Dr. Alessandro Ielpi, and Nanogeology, hiring Dr. Renelle Dubosq. Advertisements are now posted for a Lecturer position in Earth Observation to develop an instructional stream within an established Master of Data Science professional program in the Faculty and tenure-track Assistant Professor positions in Fire Ecology and Critical Minerals/Petrology. Additional tenured or tenure-track positions in Watershed Science and Fire Management/Policy are planned. Finally, Graham Gilles joined the department as a teaching technician and Dr. Vikas Menghwani joined as a tenure-track Educational Leadership stream Assistant Professor in support of the recently introduced Bachelor of Sustainability degree program.

The department currently has 152 students (majors/minors/honours inclusive) spread between the Earth and Environmental Sciences (EESC), Geographical Information Sciences and Freshwater Sciences programs. The EESC program alone currently has 121 majors and 21 minors. There are currently 14 PhD and 25 MSc in the Earth and Environmental Sciences degree program. The department also has 7 postdoctoral fellows.

Kyle Larson

UNIVERSITY OF CALGARY

The department has undergone a major transformation in the last year, officially changing from the Department of Geoscience to the new Department of Earth, Energy, and Environment starting in Fall 2023. The name change reflects the incorporation of multidisciplinary undergraduate programs in Energy Science and Environmental Science within the department, both of which previously existed under the broader Faculty of Science umbrella. As part of a major reorganization and revitalization strategy, the department is undertaking curriculum modernization and redesign within the Earth program, significantly expanding the Energy Science program with creation of a new major, and will soon undertake a review of Environmental Science program offerings. Main goals of the Earth (formerly Geoscience) curriculum redesign are to better align with the Geoscientists Canada knowledge requirements and to provide more program flexibility both for crossover between Geology and Geophysics streams and to increase opportunities for students to pursue option courses outside their major field. We are moving toward a merged BSc Geoscience degree to replace the existing BSc Geology and BSc Geophysics streams, and have implemented a new common core of courses for both streams (up to end of Year 2) that will roll out starting in the 2024-25 academic year. Further changes to the Earth/Geoscience field school curriculum and technical options for Years 3 and 4 are in development.

Students and Programs

Undergraduate (Fall 2023, all programs)

- Geology: 178
- Geophysics: 44
- Environmental Science: 272
- Natural Science (Geoscience concentration): 62^a
- Energy Science: not available

^a Estimated only based on course selection

Current enrolment numbers for the undergraduate Energy Science concentration are not available, but typically hover around 40-50 students. It is expected that Energy Science enrolment will increase significantly in the future with the upcoming launch of a new program. We have approximately 4,800 students enrolled in service and general interest courses.

Graduate (Geoscience only)

- Total graduate students: 115 (55 Domestic, 63 International)
- MSc thesis: 41
- MSc course-based^b: 15
- PhD: 57
- Visiting/exchange students: 5

^b Moratorium on accepting course-based MSc implemented in 2022-2023.

Faculty and Staff

We currently have 36 faculty members (excluding emeriti and adjunct) that comprise 28 research stream and 8 teaching stream professors, including three seconded to major administrative roles (Associate or Vice Deans, VPR’s office). This complement does not include faculty members currently cross-appointed with the Energy Science and Environmental Science programs noted above, and the faculty complement is expected to organically increase as some members merge into the new department structure. In addition, we are planning for growth of six new faculty members (three pending and three to be advertised) in the next year as part of strategic and transdisciplinary hiring initiatives. In recent years, all administrative and technical support staff have been moved to a central service model within the Faculty of Science, so it is not possible to designate departmental staff numbers.

Ed Cey

MOUNT ROYAL UNIVERSITY, Earth and Environmental Sciences

Enrollment: Though we do not have graduate programs, we do have a number of undergraduate programs (majors, minors, and concentrations) that our department contributes to and on which we are dependent. Our numbers are relative steady over the last few years in our majors and minors. There is a positive trend to our registration numbers in our concentrations in geology and geography. These concentrations are part of a selected degree pathway within the BSc Major in General Science. This is the largest BSc major program at MRU with the last three years seeing enrollment at 540, 499, and 467, and we would like to continued increases in the enrollment in our concentrations within this major.

Program	2020-2021	2021-2022	2022-2023
BSc Environmental Science	189	180	178
BSc Geology	92	83	92
Minor in Geography (across all bachelor degrees)	24	20	20
Minor in Geoscience (across all bachelor degrees)	-	9	9
BSc General Science – concentration in Geology	9	7	14
BSc General Science – concentration in Geography	12	19	24

Faculty & Staff: The department currently has 14 tenured faculty, 3 tenure-track faculty, 1 professor emeritus, 2 full-time lab instructors, 1 senior lecturer, 3 technologists, and 1 administrative assistant. We also have 15 contract faculty teaching in the department this fall. We have 1.5* vacancies at the assistant professor level. These are anticipated to be filled for July 1, 2024. (* the 0.5 vacancy will be added to 0.5 in the Department of Chemistry and Physics to create one position – yet TBD which department will secure it). Research: Being a multidisciplinary department, our research activities cover a wide breadth of science including mineral resources, radiogenic isotopes and tectonics, marine geology, petroleum, ichnology & palaeontology, environmental forensics (arson, wildfires), Digital Earth, ecological engineering and ecosystem reclamation. Faculty are funded through NSERC (Discovery Grants, CREATE, SPG), CFI, CFREF, Metal Earth, and other external grants. The Environmental Forensics and Arson lab (CFI 2022) is up and running. Major renovations to the Science B-Wing in 2024 will increase research and teaching space for Geology.

Highlights: We have resumed international student exchange with the University of Hull. This academic year there are 4 exchange students from the University of Hull registered in our majors (3 Geology, 1 Environmental Science), up from 1 last year. We have also accepted transfer students from Yukon University (4) and Thompson Rivers University (1) into the 3rd year of our Geology Major program. We are working on creating a transfer agreement with Yukon University to streamline the transfer process for future students as we see this as an ongoing intake pathway into our program. We are currently in the process of submitting the LOI for a Post-baccalaureate Certificate in Spatial Data Science, with anticipated intake in 2024-2025.

Challenges: Low enrolment in the Geology Major. Student retention in our majors, minor and concentrations. Finding contract faculty to teach courses. A lack of office space for contract faculty and research assistants. A lack of research space, including specimen storage space, and instrumentation.

Michelle DeWolfe

UNIVERSITY OF ALBERTA

Restructuring of departmental leadership groups was recently imposed upon departments by central administration. Formerly departmental leadership consisted of a department chair, and associate chairs of undergraduates, graduates and research (space and safety). The new leadership structure consists of a department chair and a single assoc chair (undergraduate). The rest of the administration of the department has been centralized into the Dean's office through the addition of Associate Deans. Needless to say, adapting to this centralization of much of our student and research administration is somewhat challenging.

Restructuring of the University, placing the Faculty of Science, within which we reside, within a College of Applied and Natural Sciences together with the faculties of Engineering and Agriculture, Life & Environmental Sciences is similarly challenging. The justification for implementation of the college structure is that it provides for centralization of administrative chores common to all 3 faculties within a single organizational structure. From the departmental perspective, the gains in administrative efficiency attributable to the college structure remain somewhat elusive.

An external review of the department's undergraduate and graduate programs conducted in 2018 decried the lack of a departmental strategic plan. In response we struck an ad hoc Strategic Planning committee whose mandate was to bring forward a comprehensive strategic plan encompassing our research, teaching and administrative structure. Amongst other things, the pandemic played havoc with the committee's timeline, but they finally presented a comprehensive strategic plan in April. A ratification vote is to come forward at the next departmental council scheduled for October 25th. Amongst other things, the plan calls for changing the name of the department to better reflect the diversity of our teaching and research programs (which include human geography and urban and rural planning).

Our undergraduate enrollment numbers continue to climb, but slowly. The major impediment has been administrative. The minimum grade requirement for entry into the Faculty of Science is dictated largely by the huge demand for placement in Computing Science and to a lesser extent Biology. The Faculty is moving toward allowing individual departments to set their own minimum grade requirement which should allow us to set our own grade requirements and hence enrollment. How these students are to be prevented from immediately fleeing to Computing Science once they are enrolled in the faculty remains unclear.

An ongoing hiring freeze (not quite a total freeze but still pretty slushy) is a significant factor. 'One-time' pots of money provide positions (we

are currently conducting searches for a position in AI-remote sensing funded by CIFAR and a position in Planning funded through a Black cohort EDI program) but don't allow for planned growth or replacement of key positions in the face of retirements and departures. We recently hired Alison Criscitiello as an Assistant Professor to take on the role of Director of the Canadian Ice Core Lab, a position she was filling as a Faculty Service Officer (don't ask) since the retirement of Martin Sharp. Numerous retirements and departures in hydrogeology, remote sensing, environmental sciences, earth science and Planning have left the department teetering on the brink of sustainability. Our dependence upon sessional lecturers is substantial and growing.

After many years of getting by with a dysfunctional front office, the department is now blessed to have a wonderful group overseeing the department's administration. Our front office is staffed by a hardworking, dedicated group who are a pleasure to work with and who, through their collegiality and never-ending efforts on behalf of our students and faculty, have dramatically changed the department's culture for the better.

The department suffered a tragic loss with the death of Associate Professor Maya Bhatia in August. Maya died while conducting field work in the Grise Fjord region of southern Ellesmere Island, Nunavut. Maya was a Campus Alberta Innovation Program (CAIP) chair in Watershed Science. She was pursuing research in the fields of biogeochemistry, the carbon cycle and Arctic climate. Maya represented the future of Earth System Science. She was an award-winning scientist, having just last year received the Early Career Ocean Scientist award from the Canadian National Committee for the Scientific Committee on Oceanic Research. And Maya was a colleague, a friend, a mother of young kids, a wife, a daughter and a sibling.

Stephen Johnston

UNIVERSITY OF SASKATCHEWAN

Faculty complement

We have added one new faculty person in 2022-2023, Tianqi Xie, whose research area is in high pressure mineralogy and petrology related in particular to impact events. This brings our faculty complement to 17. Our faculty includes 2 CRCs (Pickering and George), 1 NSERC IRC (Lindsay), the Murray Pyke Endowed Chair (Eglinton) and the McLeod enhancement chair (Mangano). Of our 17 faculty, 13 are full Professors, 2 are Associate and 2 are Assistant Professor. Research spans most areas of geology as well as geophysics, environmental geoscience and chemistry, and paleontology. Much of our faculty is nearing retirement age. However, financial constraints within the university are such that hiring replacements has not been occurring.

Undergraduate Affairs

We offer undergraduate programs in Geology (46 students enrolled in the program), Geophysics (4), Paleobiology (18) and Environmental Geosciences (11). We are now also offering Certificates (averaging 15 credits) in Geology Fundamentals, Quantitative Geosciences, Sedimentary Geology and Hard Rock Geosciences as we move towards micro-credentials.

Undergraduate student numbers in our programs are still low and are well below their peak values in 2013. However, student numbers in the Geological Engineering program are very high and our 2nd year core courses are close to capacity as a result.

New this year were two 2nd year international field schools for non-majors that required only one 1st year geoscience course as a prerequisite. These took place in Ireland and Asturias (northern Spain) and were both seen as successful. There was additionally a senior level field school run in Asturias. Field schools were also run to Zortman Montana, Flin Flon Manitoba and a Geophysics field school took place in Saskatoon.

Engineering at U. of S. has revamped their first year offerings and all incoming engineering students now take a 3 week modular course in geology. This course was offered for the third time this year. Students transferring from engineering to Arts and Science get credit for fewer courses than before and we believe that this may be partly responsible for the low enrolment in our geoscience programs.

Graduate affairs

Graduate student numbers are down a bit compared with previous years with 29 MSc students and 16 PhD students.

Sam Butler

UNIVERSITY OF REGINA, Geology

Enrollments

Program	2019	2020	2021	2022	2023
BSc Geology	41	41	39	28	26
BSc Environmental Geoscience	15	19	19	16	17
MSc	14	14	14	12	18
PhD	4	6	6	4	4

*Note: BSc programs include Honours students

Our undergraduate programs have seen a decrease in enrollment from pre-COVID numbers. However, we anticipate an increase over the next two years reflecting increased recruiting efforts, a greater presence on campus, and

interest in critical minerals and ongoing environmental change. We have also initiated the process for changing the department name to Earth Sciences, to better reflect the breadth of our teaching, including our revamped Environmental Geoscience program. With respect to our graduate program, overall numbers (MSc+PhD) have been steady.

Faculty and Staff

Faculty and staffing levels have remained consistent over the last several years. Two tenure-track hires (J. McBeth and L. Robbins) joined the department in July 2020, with one retirement in Spring 2021 (J. Dale). Our long-term administrator, Van Tran, left to take on a new role at UR Press. Support staff have been centralized into two hubs within the Faculty of Science, with Jodi Spies being our primary point of contact.

Support for Teaching and Research

We continue to have two full time lab instructors to support teaching. For research support, two thirds of our faculty currently hold NSERC Discovery grants, with two up for renewal this cycle. We also have continued support through Mitacs, NSERC CRD, and NSERC Alliance programs. L. Robbins and J. McBeth were successful in obtaining a CFI John Evans Leadership Fund Award and match from Saskatchewan Innovation for \$382,000 to support the purchase of new research equipment.

Challenges

Since July 2020 we have had significant turnover in the Department Head position, with Dr. L. Robbins beginning a 3-year term July 2023. Our department, has been affected by base budget cuts to the Faculty of Science. This has been most strongly felt in the limited ability to hire sessional lecturers. Our department has also faced the challenge of several faculty members being simultaneously on teaching release, leave, or sabbatical.

Jamie Robbins

BRANDON UNIVERSITY – Department of Geology

Current Faculty:

- 4 Full-Time Faculty (all Full Professors), 1 Half-Time Professional Associate (shared with Northern Manitoba Mining Academy), 1 Full-Time Instructional Associate (Micro Analytical Facility Director), 1 Two-Year Term Full-Time Instructional Associate (1st to 4th Year Geology Labs).

Programs:

- Undergraduate Geology Degrees: 3-Year Major, 4-Year Major, and 4-Year Honours
- Undergraduate Program Streams: Geology, Environmental Geoscience, Palaeontology and Stratigraphy
- Masters of Environmental and Life Sciences (MELS)

Current Student Enrolment:

- Geology Majors (13 students)
- Geology Minors (8 students)
- MELS (1 student)
- Service Course (\approx 90 students)

Major Short-Term Challenges:

- Record low student enrollment (i.e., still going down).
- Two-Year Term Instructional Associate position ends in August 2024.

Simon Pattison

LAKEHEAD UNIVERSITY, Department of Geology

Faculty and Staff: We currently have seven full-time faculty members; however, the department will be facing two retirements in June 2024. While we are requesting two replacements positions, we are concerned if either of these will be granted because of the University's provisional deficit budget for the current academic year. The university's deficit is a structural deficit and is largely product of demographic challenges faced by Ontario's northern universities and policies of the Ontario government (resulting in past tuition reductions and subsequent freezes). However, while the current fiscal situation is concerning the department was granted the opportunity to recruit a Tier II Canada Research Chair in Critical Metal Systems. The selected candidate has submitted their CRC and CFI applications, and if successful will be joining the Department in January 2025. However, this individual will not make up for the loss of faculty who teach full course loads (2.5 FCE).

We continue to rely on sessional support (typically 3-4 instructors per year) to allow faculty course reductions for administrative responsibilities and research chairs, and to cover teaching for faculty on sabbatical leave. The department current has two research chairs (NOHFC IRC Chair in Mineral Exploration and Faculty of Science and Environmental Research Chair). We currently have three emeriti professors (one who is in their last year of a phased retirement), all of whom remain active in the department. We maintain a highly utilized (both internal and external clients) lapidary facility, which is staffed by two full-time technicians. The department is currently

without an administrative assistant. The department also has 11 adjunct professors and 2 professional associates. In addition to instructional staff at the Thunder Bay campus, we recently hired a new limited term instructor for our first-year course offerings at our Orillia campus and our partnership programs at Georgian College.

LUFAs Contract Negotiations: On September 7th, Lakehead University Faculty Association (LUFAs) members voted 90% in favour of strike action. Conciliation has resulted in LUFAs requesting a No Board Report. Multiple mediation sessions are scheduled to take place before October 31, in the hope to avert any form of job action. While pension reforms are a historical issue and remain a key stumbling block, though we did transition to the new CAAT pension plan in January, the main issues for the current negotiations are salary and health benefits. The university is offering a 3-year contract with annual increases well below what has been gained by our colleagues at comparative institutions in Ontario.

Enrolment and Programs: Since 2020 the department has been experiencing steady and consistent growth, marking a turn around in the decade long trend of declining enrolment (from 140 in 2011 to 49 in 2020). We currently have 72 majors across our undergraduate and graduate programs (HBSc Geology, HBESc Earth Science, HBSc Water Resource Science and MSc Geology). Our enrolments trends reflect increased interest in the MSc program (20 students, up from 14 in 2022) and an exceptional increase in the number of majors in first year (20, in contrast to typical number of 10-12). The HBSc Geology program is consistently our most popular program with 35 majors. In 2022-23 we underwent our periodic quality assurance program review. We received a positive report from the external review team, with them noting our core strengths in experiential learning, particularly field-based activities. The review did help drive proposed changes to our bachelor's program in Water Resource Science, our only undergraduate program that currently does not meet the knowledge requirements for professional registration. Consequently, we introduced significant changes to the program requirements (currently under Senate review) to ensure students meet geoscience knowledge requirements.

Andrew Conly

LAURENTIAN UNIVERSITY - Harquail School of Earth Sciences

Enrolment: At the BSc level (Earth Sciences) total enrolment is 53 but distribution is uneven (e.g., we have only 9 students in Y3 of the program and 15 entering Y1). For reference, enrolment over three years between 2018 and 2020 was very consistent at around 72 students in total, including 8 students in the Environmental Geoscience BSc (which was eliminated in 2020). At the graduate level we have 24 students in the PhD program, 20 in the MSc program (thesis-based) and 23 in the course-based Applied MSc program.

Faculty and Staff: Our current faculty complement is nine and our full-time staff is three (one Administrative Assistant and two technologists). We are recruiting one faculty to start in 2024 and there are ongoing conversations to increase faculty complement gradually. At the moment we are relying on some of our colleagues from the Ontario Geological Survey and recently retired faculty to deliver the courses students need in their programs.

Noteworthy: The school delivered a very successful GAC-MAC-SGA conference in May 2023. The Local Organizing Committee was led by Mike Leshner, Doug Tinkham, and Stephane Perroudy.

Research Centres: The Mineral Exploration Research Centre (MERC) was awarded an extension of the Metal Earth Project, to account for delays related to Covid and CCAA. MERC has also developed new projects and continues to receive support from industry partners. (MERC staff, including postdocs and Research Associates, were not counted as part of the Harquail School staff above).
Pedro Jugo

UNIVERSITY OF WESTERN ONTARIO, Earth Sciences

Faculty complement: 21 full-time faculty members,
26 adjunct faculty members

Staff/ Student complement:

- 4 Administrative Staff
- 10 Research and Technical Staff
- 71 graduate students (majority Ph.D. and Geology)
- 147 undergraduate program students in years 2,3, and 4 (over half are in Environmental Science)
- 1,982 undergraduate students registered in service or introductory (i.e., no pre-requisite) courses

Programs:

- Graduate (MSc, PhD, and Accelerated (1 yr. course-based) M.Sc.) programs in Geology and Geophysics
- Collaborative Graduate Programs in a) Planetary Science and b) Hazards, Risk, and Resilience
- BSc Honours Specialization for Professional Registration for Geology, Geophysics, and Environmental Science
- BSc Honours in Environmental Science
- Majors in Geology, Geophysics, and Environmental Science

Major events in past year:

- New faculty hires in Sedimentary Geology, Geomicrobiology
- Endowed Robert Hodder Chair in Economic Geology
- Funding obtained from Faculty of Science for a full-time Environmental Science Indigenous Connector staff position

Goals for coming year:

- Competition for Hodder Chair in Economic Geology
- Growth of Indigenization path for Department and Faculty of Science supported by Western's Office of Indigenous Initiatives, in parallel with EDI-D goals of UWO
- Return of International Field School
- Structural change in Environmental Science program
- faculty renewal while increasing graduate and upper-year undergraduate enrolment

Desmond Moser

UNIVERSITY OF WATERLOO, Earth and Environmental Sciences

Faculty, Staff, Postdocs and Research Associates

There was one new faculty member (our new Dean of Science) and no staff hires in the last year. We had one additional postdoctoral fellow and four additional research associates.

Faculty, Staff, Postdocs and Research Associates

Regular Faculty (tenured & untenured)	22
Lecturers (definite term & continuing)	5
Postdocs	12
Research associates	10
Staff (permanent)	8
Staff (contingent on funding)	7
Research staff (paid by external grants)	30+

Current Student Enrolment

In 2023 we have 292 students in all years combined within our undergraduate Earth and Environmental Sciences programs (Environmental Sciences and Earth Sciences) and an additional 59 in Geological Engineering. This number includes 96 students enrolled in our Environmental Sciences program, specialization in Water Science 2+1+1 international partnership with the China University of Geosciences Wuhan (CUGW). For our Fall 2023 first-year enrolment, we have 26 first year incoming students (a slight decline from last year's all-time highest enrolment of 33 in recent years but similar to the average for the past 5 years), 11 in Environmental Sciences and 15 in Earth Sciences, almost all in co-operative education. The Geological Engineering program enrolled 17 students, all in co-operative education. Our Graduate program enrolment is currently 78 students (40 MSc and 38 PhD). We admitted 9 MSc students and 4 PhD students in 2023.

Undergraduate Students (total, all years combined)

Environmental Sciences	203
Earth Sciences	89
Geological Engineering	59

Graduate Students (total)

MSc	40					
PhD	38					
Undergraduate Fall 1st year enrolment	2018	2019	2020	2021	2022	2023
Earth Sciences	20	24	25	19	33	26
Geological Engineering	17	12	13	10	10	17

Graduate new enrolment	2018	2019	2020	2021	2022	2023
MSc	20	17	20	16	10	9
PhD	8	6	9	5	5	4
Total	28	23	29	21	15	13

Teaching

Teaching (lectures, labs, field) is effectively back to normal (i.e., pre-pandemic). However, we continue to expand our on-line course offerings, building on the material and effort put into the virtual instructing environment during the pandemic. All of our large-enrolment first year courses are now online, and we will soon be working on key second year courses that have potential to attract high enrolments. Some key topics of discussion in the teaching and learning community are student wellness, AI, blended courses and experiential learning.

Other Challenges

While undergraduate enrolments are mostly holding steady, we are greatly concerned that graduate student enrolments are declining. In addition, there are a number (~5) of retirements that are likely to happen in the next two years (3 confirmed), and faculty renewal will be key to ensuring that we can continue to excel as a research-intensive department and are able to comfortably meet the demands of our undergraduate and graduate programs. These topics will be high priorities for discussion as we embark on our strategic planning exercise.

Mario Coniglio

McMASTER UNIVERSITY, School of Earth, Environment & Society

SEES has a complement of 25 fully appointed faculty, and an additional 2 with joint appointments. The 25 include 4 teaching faculty and 19 research professors. 11 of the 19 research professors would be considered either earth or environmental scientists and of these, 10 hold NSERC awards. SEES has research expenditures that range from \$4.5 – \$6.5 Million/per year or about \$250-\$350K per faculty member.

2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
\$6,442,131	\$6,010,178	\$6,516,276	\$4,569,451	\$5,088,881	\$4,492,147

We also this year hired a 3-year contractually limited Assistant Teaching Professor in Earth and Environmental science. This summer we had two retirements, Vera Chouinard in Human Geography and Carolyn Eyles in Geology. This fall, 4 of our newer faculty will be going up for tenure, promotion and/or permanence.

Among our faculty group, 3 members hold CRC chairs: Mike Waddington is a Tier 1 Chair in Ecohydrology, Alemu Gonsamo is a Tier 2 Chair in Remote Sensing of Terrestrial Ecosystems, and Gita Ljubovic is a Tier 2 Chair in Community-Engaged Research for Northern Sustainability. Janok Bhattacharya is the Susan Cunningham Research Chair in Geology, and

Dr. Elli Papangelakis is the Fairley-Gadsby Chair in Fluvial Geomorphology. Both are privately funded. Drs. Altaf Arain and Allison Williams hold McMaster University Faculty of Science Research Chairs. Dr. Bhattacharya was also awarded the SEPM Francis J. Pettijohn Medal of Excellence in Sedimentology and Stratigraphy.

In 2022-23 we had 246 (out of 489) students enrolled as 2–4-year Earth and Environment, or Environmental Science majors. They are evenly split with about 116 PGO certifiable. This is 53% increase since 2016. We also have an additional 74 our 1st year Earth & Environment Gateway program. We also taught 3712 students in our service and 1st year classes. We presently have about 94 graduate students, about 80 are full time, and about 50% are PhD versus MSc and most in earth and/or environmental science.

In response to difficulties access tribal lands for our annual field camp at Whitefish Falls we completely redesigned our field camp, which is still held in the Sudbury Whitefish area and led by structural geologist Dr. Alex Peace. We also offer a 2nd year spring field camp in Northern Ontario funded through the Keith and Tracie MacDonald Gift.

This fall we had an alumni event to celebrate 200 years of excellence in Geology and Geography at McMaster with about 100 attendees. Dr. Paul Hoffman ('64) gave 1-day short course on Snowball earth and Genomics as part of the celebration.

Janok P. Bhattacharya

UNIVERSITY OF TORONTO, Earth Sciences

We all breathed a sigh of relief as the academic year started off in a more “normal”, pre-pandemic fashion. While field work and research travel have greatly increased, and most classes are held in-person, we continue to be mindful of ongoing pandemic impacts on student well-being and progress through their degrees.

Research labs

Renovations continue for our new GEMINAE lab, a femto-second laser-ablation mass spectrometry facility for metal isotopes, co-developed by Professors Sio, Gregory and Chu. Renovation delays have pushed the opening of the lab to late 2023 / early 2024. Once the lab does open, we very much look forward to welcoming interested researchers and collaborators from Canada and internationally to use this facility alongside our other Departmental analytical facilities. We are seeking to improve the presentation of our Departmental analytical facilities (SEM, microprobe, several ICP-MS and XRD systems) and research collections on our website so that we can better get the word out that users are welcome.

Teaching

We are pleased to report modest upticks in enrollments in our Earth Sciences programs of studies over the last two years. We attribute those increases to recruitment of wonderful, dynamic and highly engaging Assistant Professors, our focus on experiential learning including field and lab work and research training, as well as growth in our “Earth and Environmental Systems” program. We ran several international trips with undergraduate course components in Chile (Mineral Deposits and Igneous Petrology) and Turkiye (Global Tectonics and Structural Geology), and graduate student field trips to several locations in Ontario and Italy. We have been investing in updates to our undergraduate field and lab-based teaching equipment across geophysics, environmental geoscience and geology. We are proposing two new courses, one in Contaminants and Geoethics and the other in Critical Zone Processes. Those are currently being reviewed by Faculty governance. We are hopeful for approval and these would address student interests and outcomes of our 2021 external review.

Faculty complement

We are very pleased that our recent searches resulted in two outstanding hires: Prof Neil Bennett in Mineral Systems and Prof Rodrigo Correa Rangel in Near-surface Geophysics (starting Apr 1, 2024). We are looking ahead to faculty complement renewal as we have several retirements upcoming in the next few years. We hold annual Departmental retreats in September and based on 2021 and 2022 discussions, we continue to think ahead to faculty complement planning to support research in addressing the climate and sustainability crises. We were saddened this year to hear of the passing of two of our Emeritus faculty, Professor Geoff Norris and Professor Jock McAndrews.

Other projects

Our Reconciliation, Equity, Diversity and Inclusion Committee (established in 2021) set up a monthly drop in last Spring. We are engaged in campus wide activities for example around Orange Shirt Day and curricular efforts on Indigenous content. For example, our graduate student core course students researched land acknowledgements for research study areas. The mandate of the committee is to educate ourselves on equity issues in the geosciences and to ensure that our Department is as welcoming and inclusive as possible. has met and includes faculty, staff, undergrad and grad students.

Sarah Finkelstein, Professor and Chair

QUEEN'S UNIVERSITY – Department of Geological Sciences & Geological Engineering

Departmental Snapshot

- 19 faculty, including two jointly appointed to other units, and numerous highly qualified adjunct instructors
- Programs include B.Sc. (Maj), B.Sc. (SSP), B.Sc., in Geological Science, Environmental Geology, and Geological Engineering
- 146 Geological Sciences + 89 Geological Engineering = 237 undergraduate majors between two programs (students declare major in 2nd year)
- 33 MSc (research) & MAsc (course-based) students
- 23 Master of Earth & Energy Resources Leadership (MEERL) students (80% online – MBA for resource sector)
- 38 PhD students (half domestic, half international)
- 10 post-doctoral researchers

Annual Overview

Queen's University was named first in Canada and third in the world for the Times Higher Education Impact rankings. Our department is strongly positioned within the Queen's Strategic Planning document that pivots around the United Nations' Sustainable Development Goals (UN SDGs). However, similar to other universities in Ontario, Queen's is facing significant budget shortfalls, and after several years of faculty hiring, there is retrenchment except for the most pressing faculty and staff hires. All faculty positions will be returned to central when those who are eligible retire. We have 5-6 faculty that have indicated that they may retire in a 2- to 4-year window, and this may erode our ability to teach our current CEAB and PGO curricula. As such, we are actively engaged in curriculum "streamlining" to minimize workload and adjunct teaching.

For both the GeoScience and GeoEngineering undergraduate programs, students enter in second year. Our enrolment in second-year GeoScience has increased slightly (23 to 24), and student numbers in Geological Engineering have increased more significantly (25 to 31) for 2023-2024. Student mental health continues to be a chief concern at all levels following the end of COVID-19. Queen's has expanded mental health services and our student accommodations office has grown accordingly. We have established a departmental committee to develop a plan for attracting new domestic and international students to the GeoSciences and GeoEngineering however workload has prohibited significant progress. We have an active Museum

coordinator in our department who does significant elementary school outreach but because we "belong" to two faculties, Arts & Science and Engineering, we are commonly "forgotten" in the marketing of our programs. This is not a new issue, but worth mentioning because of our relatively stagnant enrolment.

Our domestic and international graduate student numbers are growing in general, which can be attributed to the addition of new faculty and the success of our Master of Earth & Energy Resources Leadership course-based MSc program. The university has realized the importance of Graduate Students in the research success of faculties and has started a few programs to attract new graduate students to Queen's. A new \$30 million Alumni donation is establishing university-wide funding for 50 new interdisciplinary Ph.D students at \$35K per year. Our number of postdoctoral researchers has remained constant at 10, with one department endowed PDF position (William White PDF – 2 years) and one alumni supported PDF position (. We are trying to find better ways to integrate postdocs into the department through optional teaching opportunities.

Our department is split across 2 buildings (Miller Hall – 1931 & Bruce Wing 1971). Aging infrastructure remains a major challenge, which results in double or triple the costs associated with renovations for new research laboratories or department-run teaching spaces. Almost all faculty hold Tri-Council funding (17 out of 19) and all new faculty have been successful with CFI and OIF grants. Industry funding has been important to research but as in 2022, insufficient numbers of university-funded research associates and technicians remains a challenge. The generosity of our alumni has allowed us to renovate some lab and teaching areas, and to maintain our extensive field learning programs (~300 hours of field contact in our GeoScience stream). We are looking forward to the return of our graduate-level international field school and the Bermuda field trip in May 2023. The Museum received a significant donation of 8 Indigenous paintings of the Woodland Genre. They will be unveiled in mid-November in our museum space.

Dan Layton-Matthews on behalf of Vicki Remenda

CARLETON UNIVERSITY, Earth Sciences

Enrolment: Our four-year undergraduate enrolment has increased from 87 students last year to 128 students this year, spread over 10 programs and concentrations. We also have 10 students in BSc.H. - Environmental Science with Concentration in Earth Sciences, and 50 students taking Minors in Earth Sciences.

Within departmental endowments we are fortunate to have two that are experiential learning themed; the W.H. Collins Memorial Endowment, and Sethu Raman Endowment for Field Education in Field Education in Earth Sciences. These endowments permit us to subsidize every graduate and undergraduate student in our major and combined programs for up to \$3000 each to take one of our several national and international field courses that are offered each year. This funding provides every student, no matter how limited their means, with the opportunity to participate in experiential learning, a pillar of our departmental training philosophy. Experiential learning is now central to our recruiting activity.

In 2022-23 we had 2048 students registered in service or general interest courses, compared to 2415 in 2021-22, the decrease a result of dropping one course from our offerings last year. For 2023-24 we have 40 graduate students, 18 MSc and 22 PhD. Carleton now waives the non-resident tuition for international PhD students.

We have submitted for approval a proposed new undergraduate concentration in Environmental Geoscience, which we are confident will significantly increase our undergraduate program enrolment. We have also submitted for approval two new general interest courses: 'An Introduction to UNESCO World Heritage Geoparks', and 'A Geologic Tour of the National Parks of North America' to be exclusively taught by experience contract instructors. Our analysis has revealed that we have not reached internal saturation with general interest courses and our objective is to have more than 10% of the university population take an earth sciences course in each academic year. As is the case elsewhere, most Carleton students have no background in Earth Sciences in high school, and there is no requirement for students in other departments to take an Earth Sciences course. These offerings may provide the only places where many students, including future K-12 science teachers, will take a university level course in our discipline. These courses should also be attractive to the Ottawa general public, providing an additional important outreach channel for the Department of Earth Sciences.

Faculty and Staff Members: We have grown to 12 faculty members including two cross-appointments with the Institute of Environmental Sciences (IES). We are pleased to welcome two new assistant professors: Dr. Peter Crockford (Ph.D. McGill; Environmental Geochemistry) who joined the department in July 2023; and Dr. Elliott Skierszkan (Ph.D. University of British Columbia, Hydrogeology, cross appointed IES) who will join us in January 2024. In addition, our teaching staff has been bolstered by the

reappointment of Dr. Wasiu Raji, as a term appointment instructor in geophysics. Dr. Geoff Pignotta, our only Laboratory Coordinator, also holds an appointment as a Research Adjunct Professor in the department, which permits him to supervise students. Dr. Giorgio Ranalli who joined the department in 1970 (53 years of service and counting), has just been appointed to another 5-year term as our only Distinguished Research Professor, and Dr. Richard Ernst continues as our Scientist in Residence. We have six additional administrative and technical staff members, including Chris Rogers who has been hired as our new Sample Preparation Technician, to succeed Tim Mount who retired from the position in September 2022. We continue to hire several contract instructors each semester to cover off vacancies due to sabbaticals and other leave of absences.

Retirements: Professor Sharon Carr, our structural geologist, will retire at the end of 2023, and we have applied to have this position replaced by a junior faculty position in critical minerals research, with expertise in structural geology.

In Memoriam: The department is saddened to report the recent passing of economic geologist Professor Dave Watkinson (Ph.D. Penn State, 1965) on September 11, 2023, in his 86th year. Dave was a faculty member in the department for 35 years (1970-2005) and was chair in 1982-83 and again from 1993-1996. Through

Department Events: The department, founded in 1953, continues to celebrate its 70th Anniversary. There have been many alumni events that have taken place to celebrate the milestone, including a very successful 'Extreme Geology' whitewater rafting student-alumni expedition down the Grand Canyon in May (led by professors Tim Patterson and Lyle Nelson). Our alumni weekend, featuring local field trips and a gala dinner was very well attended with alumni in attendance from all over North America, and from as far afield as Scotland.

Tim Patterson

UNIVERSITY OF OTTAWA, Earth and Environmental Sciences

Human Resources

Overall enrolment in our undergraduate and graduate programs remains relatively stable, maybe with a slight increase most notable in Y1 and Y2 courses.

- 264 BSc students (Honours, majors): 150 in the environmental science program and 64 in geology, 36 environmental geology, and 14 geology-physics programs
- 3 PDFs, 21 PhD students, and 20 MSc students
- Faculty of Science enrolment continues to increase; FoS is the second largest Faculty behind Social Science; uOttawa total enrolment is 49K
- The GEO programs meet different requirements of Association of Professional Geologists of Ontario (PGO), and the EVS program is certified under EcoCanada
- 15 faculty members, including:
 - 1 CRC II Professor (in AMS technology, applications and development)
 - 1 Newmont Chair in Economic Geology
 - 1 University Research Professor
- 1 replacement professor
- 2 teaching support staff
- 4 administrative support staff
- 2 research associate
- 20 research staff

HR updates:

- Shaping up to be a busy year: after the announcement of Keiko Hattori's and Bill Arnott's retirement, we are advertising for two tenure-track positions (petrology and sedimentary geology), and a permanent, teaching-focused Long Term Appointment position.

Physical Resources

- Continuing issues (it bears repeating on an annual basis since there is no improvement): difficult to recruit researchers who require substantial lab space and/or start-up funds. Substantial CFI allocations allotted to CRC positions only. Slow response by Facilities / physical resources for lab renovations once funds are in place.

Noteworthy

- Retired professor André Desrochers has been very busy. Since leaving his teaching position at uOttawa, André has been the Scientific Director responsible for creating a new UNESCO World Heritage site in Canada. Anticosti Island, Quebec, is at the mouth of the St. Lawrence River, and possesses unique rock formations that contain evidence for the first of five mass extinction events in geological history, dating back about 445 million years ago. This rare exposure has now been identified by UNESCO, and will become a natural laboratory to study deep time climate change and extinction events.
- uOttawa-hosted, NSERC-funded iIMAGE CREATE (image-create.ca) has been very successful. It is supporting 27 graduate students in 6 universities (Ottawa, Carleton, Dalhousie, Memorial, Toronto, Mount Royal) with another 25+ affiliates. At any given time, at least 3 or 4 students are getting experience at sea or in the field with support from the program. Our own graduate enrolment has seen an increase because of the CREATE, with 10 funded MSc and PhD students. The CREATE program can be a boost for geoscience departments.

Challenges

- Continuing to be mindful of mental health challenges.
- Need to grow to stay alive. Ideal rate is +2% / yr, but at the Faculty-scale, this is unsustainable.
- The new (2022) graduate student admission scholarship procedures (quota system) does not seem to be affecting recruitment of new graduate students.
- But, another round of major budget cuts at the University, trickled down to the Faculty resulting in the loss of ~10 TA positions in EES for 2023-2024.
- Teaching capacity is still down 20%; very difficult for bilingual program (Francophone students are ~30% of university student population).
- Many discussions about ramping up virtual teaching (distance learning), not as a result of covid measures, and certainly not as hastily assembled courses, but a well-planned and executed online curriculum. Arizona State University is the model, where 50% of their students are virtual. Within FoS, Biology seems to be taking a lead role in this experiment.

David Schneider

McGILL UNIVERSITY, Earth and Planetary Sciences

Academic year 2023–2024

Over the past year, academic life in EPS has largely returned to normal. Field schools and field trips resumed last year, and they will run this year in formats similar to pre-pandemic times. Researchers and graduate students have resumed field research, with heavy travel schedules for each of the past two summers. Except in rare cases, teaching is entirely in person. Departmental events have restarted, with in person PhD defences and celebrations, graduate student field trips, and homecoming gatherings all happening. Many students and staff continue to work remotely part of the time, but student offices and lounges are once again teaming with people.

Students

Undergraduate enrollment across our major and minor programs remains anomalously low by historic standards, although the total numbers are marginally better than the previous two years. In addition to students that are solely enrolled in our program, we have students in the joint major in Physics and Geophysics (joint with the Physics Department) and the Earth System Science Program (joint with the departments of Atmosphere and Oceans and Geography), and a few other joint or faculty programs.

Drawing students from the CEGEP system remains a challenge, but the department has invigorated its recruitment efforts, spurred in large part by the fortuitous term hire of a staff person dedicated to outreach and recruitment. Thus, we are hopeful that we are past the minima in undergraduate enrollments.

Our graduate student numbers remain strong, dominated by PhD students, and many of our students are supported by major fellowships, including NSERC Vanier, PGS/CGS-D, CGS-M, and FRQNT doctoral fellowships, as well as endowed departmental scholarships. Approximately 60% of our graduate students are international.

Student enrollment numbers

PhD: 48

MSc: 9

BSc in Earth and Planetary Sciences: 11

BSc in Earth Systems Science: 17

BSc Honours in Planetary Science: 1

BSc Physics and Geophysics: 6

BSc Environment–Earth Sciences and Economics: 5

BA Environment–Ecology and Earth's Environment: 6

Minor in Earth and Planetary Sciences: 7

Minor in Earth System Science: 4

Faculty and Staff

Earth and Planetary Sciences currently has 17 tenured and tenure-track faculty (2 of which are jointly appointed to other departments) and one faculty lecturer. One of the tenured faculty is retiring, and no new hires are foreseen this academic year. One emeritus professor and one adjunct professor continue to be heavily involved in the department, specifically in graduate student supervision.

Our faculty includes 1 CRC-Tier 1 and 4 CRC-Tier 2 chairs, as well as a James McGill Professor (university equivalent of a CRC-1), a William Dawson Scholar (university equivalent of a CRC-2), and three endowed chairs. One faculty member was just elected to the RSC, while another was awarded the prestigious AGU Macelwane Medal.

We currently have 17 post-docs in the department. This large number has been supported by a post-doctoral program funded by a donor, which is now winding down, such that this high number of post-docs will likely begin to decline in the future.

We also have 4 research associates in our department funded on soft money by individual researchers, along with two technical laboratory staff, supported in part by instrumental user fees.

One major change in the department over the past year has been the restructuring of our administrative support, with all administrative staff being centralized into a 'pod' that serves three similar units (Geography and Atmospheres and Oceans). Due to the passing of one of our previous support staff a few years ago, the retirement of another, and a lateral move a third staff person, we now lack any staff with prior experience in our unit or that are dedicated to the day-to-day functioning of EPS. The aggregated administrative team, while working tirelessly to maintain a level of service to our faculty and students, is now critically short-staffed. In the current environment, recruitment and retention of new staff is difficult, meaning it will likely be many months or more before we have a full complement of administrative support staff. The administrative staff sit in another building on campus and cycle through our departmental office, such that we have one staff person in our department office for about 3/4 of a day, 4 days a week.

Research

Our department remains research intensive, with most of our tenure-track faculty supported by NSERC Discovery grants, along with diverse public and

private funding sources. A recent successful CFI will finance the replacement of our electron microprobe. Other research infrastructure includes a dual inlet isotope ratio mass spectrometer, a gas chromatograph-isotope ratio mass spectrometer, a gas chromatograph mass spectrometer, multiple cavity ringdown analyzers, an ICP-MS, an ICP-OES, and experimental petrology facilities, along with numerous sample preparation laboratories and more specialized equipment. Our access to analytical infrastructure and technical expertise is greatly enhanced by the participation of most members of our department in the Geotop Research Centre in Earth System Dynamics, based at UQAM. The research centre is currently up for renewal with the Fonds de Recherche du Québec.

Challenges and Future Outlook

In addition to our staff support issues, a long-term challenge in EPS is the poor state of our building and physical plant. Many of our laboratories underperform due to frequent power issues (unplanned and planned outages, unstable power supply), floods, poorly built and maintained structures, and limited HVAC capability. Some of these issues may be alleviated in the planned future move to the old Royal Victoria site, but the proposed completion date of that site is an optimistic six years away, and no decisions have yet been made regarding whether all or part of EPS will be involved in the move. We are therefore in a position of having to make do with our current space for the foreseeable future.

Despite these challenges, EPS remains strong and committed, buoyed by our committed faculty, excellent students, and the continued support and backing of our alumni. A planned academic review of EPS in winter 2024 will present an opportunity to plan strategically for the future of our department, retool and revitalize our academic program, and perhaps even improve the state of the building in which we will reside for at least the next six years.

Galen Halverson

UNIVERSITÉ DU QUÉBEC À MONTRÉAL – Sciences de la Terre et de l’atmosphère – 2023

Since February 2022, all teaching and training activities at UQAM have been fully in-person, though we have preserved a hybrid format for special activities such as research seminars and thesis defences. Many of the resources like virtual field trips, developed for the COVID period, remain available to staff and students in perpetuity, and are proving to be a useful resource. Some summer 2023 field activities were affected by the forest fires

in central and northern Québec, which led to travel/access restrictions for certain parts of the province and impacts on students’ projects or internships.

Enrolment

We are hopeful that the numbers for the BSc geology program, which have been dropping since 2016, will start to trend back upwards in the coming few years. The certificates remain a cause for concern, with numbers continuing to decrease. A major update of the energy-resources program is on the horizon, which we hope will serve to attract new cohorts of students. Enrolments remain relatively stable for the graduate programs, though we will need to keep an eye on the MSc numbers to better understand this year’s decline across all three programs.

Program	2020	2021	2022	2023
BSc in geology	85	57	45	46
BSc in atmospheric sciences	34	32	29	31
Certificate in applied geology	15	22	14	11
Certificate in sustainable energy resources	42	30	28	19
Certificate in atmospheric sciences	11	12	10	10
Major in geology	3	0	4	2
MSc in Earth sciences (without thesis)	13	15	16	13
MSc in Earth sciences (thesis)	29	28	26	23
MSc in atmospheric sciences (thesis)	15	16	16	10
PhD in Earth and atmospheric sciences	28	28	35	32

Faculty/staff

Following 2 recent retirements, the Department currently has 21 regular faculty (including 1 in semi-retirement) and another on a special 1-year term contract. A new Quaternary geochronology specialist will join us in January 2024, and we will be advertising for a new satellite-remote-sensing professor at the end of 2023. As of autumn 2023, we have 3 emeritus professors, 15 adjunct professors, and 17 sessional lecturers. Our departmental staff includes 3 administrative personnel, 2 IT technicians, 2 laboratory technicians and 3 research officers.

Research activities

Research within the department spans a wide range of themes and disciplines, including geochemistry, geochronology, fundamental and applied geophysics, hydrogeology, Quaternary geology, structural and economic geology, paleoclimatology, and environmental sciences. Several of the geoscientists also have active collaborations with the atmospheric sciences, particularly in terms of paleoclimatic studies and interactions between climate and water resources. The majority of departmental research is carried out with strong links to research institutes, either affiliated directly to UQAM or externally funded groups of which UQAM is a member. These include UQAM's environmental science institute, the Geotop research centre in Earth system dynamics (a multi-institutional strategic cluster funded by the FRQNT, with 45 regular members including 21 from our department), the ESCER climate-modelling institute, and the RIISQ network for flood research. Other active partnerships include the Canadian Space Agency, NASA, Environment and Climate Change Canada, provincial/federal governmental organisations dedicated to environment, weather or natural resources, and industry (e.g., mining, exploration, water-resource management). These affiliations facilitate a broad range of interdisciplinary and inter-institutional collaborations, including training of graduate students and postdocs. Our success rate in research funding (federal, provincial, government and industry partnerships) is very high, and several researchers play an active role in international projects as PIs, co-PIs or collaborators.

Challenges

Student enrolment is still a major concern; we hope that the small uptick in BSc student numbers this year will be the beginning of a longer-term upward trend, and that we can reverse the decline in numbers for the certificates and the short-term decline in graduate student enrolments. University funding is largely based on undergraduate enrolments, and underfunding translates into challenges for the upkeep of our programs via, for example, the availability of funding for technicians and other support staff, equipment maintenance, scientific equipment for teaching and others. Depending on the outcome of current negotiations between the professors' union and the university for the new collective agreement, hiring of new faculty may eventually also be affected by fluctuations in student enrolment, adding an extra level of uncertainty.

Inflation has proved to be a major challenge for the department, especially for laboratory infrastructure/ consumables and the significant rise in costs associated with field camps (e.g., accommodations, vehicles, fuel) that

are taking place at the same time as budget freezes or budget cuts at the university.

At the time of writing this report, the implications of the recent announcement by Québec's ministry of education regarding the proposed doubling of tuition fees for out-of-province Canadian and international students are still unclear for the province's French-speaking universities. Our department welcomes a large number of international students in our undergraduate and professional graduate programs, and such a dramatic rise in tuition fees could have a significant impact on enrolments.

Fiona Darbyshire

University of New Brunswick, Earth Sciences

While undergraduate enrolments remain a concern, and a pressure point with the university administration, the Department was buoyed up this year by an uptick in students entering our core second year courses. The Department hosts undergraduate programs in Earth Sciences and Environmental Geoscience which provide curricula meeting the requirements for P.Geo. licensure, as well as a more flexible Geological Studies program. We also offer programs jointly with other departments including Environmental Science, and Geological Engineering (GE). Our declared program majors (years 2 – 4 only) currently number ~30, split roughly equally between our GE and Science programs. At the graduate level, our student numbers have held relatively steady over the past few years at ~25 PhD and MSc students combined.

It was an active field season in terms of departmentally organized activities, with three field schools running in April/May, followed by two endowed field trips in May and June. For the first time, our optional first year field school included four half-days of lab exercises, intended to make it (and our second year courses) more accessible to students who had completed only part of the first year Earth Science program requirements. Our second year students completed mapping exercises at sites along the coastline of the Bay of Fundy at St. Andrews and near Amherst. At the third year level, students applied hydrogeochemical, hydrogeophysical, and hydrological techniques to study acid rock drainage and environmental remediation at a closed coal mine in central NB. Our two endowed geological field trips ran for the first time since 2019, before the pandemic – one introducing undergraduate students to the geology and volcanology of southern Italy, and the other taking graduate students to study mineral deposits in Newfoundland.

In July, our Quaternary/Engineering Geologist Professor Bruce Broster retired after 35 years of distinguished service. Fortunately, we were

successful in refilling the position and look forward to welcoming Dr. Kynan Hughson, with his expertise in remote sensing, planetary and surficial geology to the department in January, 2024. Our full-time faculty complement will then return to 10, plus former CRC Chair Dr. John Spray who maintains an active research group in planetary materials. Collectively, we span a broad range of research expertise including structural geology, sedimentology, igneous & metamorphic petrology, ore deposits, geochronology, planetary geology, paleoceanography & climate, geomicrobiology, remote sensing & surficial geology, and engineering/exploration geophysics. We have one administrative assistant, and three technicians, as we await permission from the administration to advertise for replacement of our microanalytical technician who retired in September.

Over the past six years, the department has boosted its strength in environmental geoscience by replacing retiring faculty with emerging researchers in palaeoceanography and climate, geomicrobiology and hydrogeochemistry, and most recently remote sensing and surficial geology. We expect the interests and enthusiasm of these new faculty, displayed in their teaching, outreach and otherwise, will help to capture the attention of a broader range of students who might not otherwise have considered a future in geoscience.

Karl Butler

ACADIA UNIVERSITY, Dept. of Earth and Environmental Science with focus on Geology and Environmental Geoscience programs

At Acadia University enrollment in geology continues to be low relative to the mid-2010s though our departmental numbers are steady due to increased environmental science enrollment. Our 2+2 program with colleges, which has been very successful over the past 30 years, was recently impacted by the closure of the Geoscience streams at Sir Sandford Fleming College. This year numbers in Geology and Environmental Geoscience have increased slightly over 2022, likely a continuing post-Covid anomaly.

This year we have 12 first year students and 40 majors in our geoscience programs (Geology and Environmental Geoscience). Our departmental faculty numbers are holding steady, we have had 2 positions replaced with TT positions in the last 4 years though a recently requested TT position was unfortunately filled with a contract-limited term appointment; we hope for better this year. We presently have 8 faculty with 2 support staff along with between 3 – 5 per course allocations required every year to maintain our programs. We will have 2 faculty and 1 instructor retiring in the next 4 years. We currently hold 3 NSERC grants, 1 SSHRC grant and have faculty funded through NSERC Engage and CREATE as well as MITACS.

Our graduate program remains robust at 5 students in Geology and 6 in Applied Geomatics and 2 in the Environmental Science geoscience stream (total 13); accessing both internal and external funding for graduate students continues to be difficult. We continue to partner with industry and federal government agencies but difficult conditions at the NS level may impact future graduate student opportunities.

Deanne van Rooyen

DALHOUSIE UNIVERSITY, Earth and Environmental Science

Enrollments

Earth Science undergraduate student enrolments have been relatively stable over the past five years, with an overall increase in Environmental Science undergrads of 52% over the same time period. Enrolment in the EARTH 2nd yr required courses, which is a good measure of program health, are seeing steady gains. Enrolment in EES-taught first year courses have exceeded their caps. Graduate student enrolments have been relatively constant since 2020-21, with a decrease in MSc students more than balanced by an increase in PhD students.

Year	2019-20	2020-21	2021-22	2022-23	2022-23 (so far)
Total UG years 2-4	89 (ENVS) 50 (ERTH)	95 (ENVS) 38 (ERTH)	122(ENVS) 58 (ERTH)	126 (ENVS) 53 (ERTH)	135(ENVS) 55 (ERTH)
Total grad	10 PhD 13 MSc	14 PhD 11 MSc	17 PhD 10 MSc	21 PhD 8 MSc	17 PhD 8 MSc
Total enrollment	162	158	207	208	215

Faculty and staff

In July of 2023, the department welcomed Dr. Sian Kou-Giesbrecht, whose research focuses on terrestrial carbon and nitrogen cycling under global change and how it is simulated in Earth System Models. Dr. Kelvin Fong, who was hired as the Elizabeth May Chair in Sustainability and Health, is leaving Dalhousie as of 31 Dec 2023 to take up an appointment in the Faculty of Public Health at George Washington University. The department is now conducting a search for his replacement. With that replacement the department faculty complement will be 15 faculty and 5 full-time instructors. James Brennan will be stepping down as chair (after 7 years) as of 31 December and there is an internal search for a replacement.

Support for Teaching and Research

The National Facility for Seismic Imaging has made successful deployments of its next-generation ocean bottom seismometers in the Gulf of St. Lawrence, and has secured funding for deployments in Cascadia, New Zealand and Baffin Bay. EES researchers received CFI funding (\$600K) to establish a Microplastics Characterization Laboratory. Dalhousie was successful in the most recent CFREF round, receiving \$154 million for “Transforming Climate Action”, in which there were several EES participants. As a result of the EES merger, and starting in 2019, the department embarked on significant renovations to teaching and research space that should finally be complete by November.

Challenges and Progress

COVID is still an issue, affecting faculty, staff and students in terms of absenteeism and ongoing mental health challenges, but things are getting better. There have been significant delays to infrastructure upgrades to the department due to reduced workforce involving skilled trades and supply-chain disruptions.

The department held an external review in 2022-23. It was a rather time-consuming process, but provided the opportunity for self reflection, summarized important metrics, and focused us on a way forward. The department really appreciates the effort and feedback from the external reviewers Ed Hornibook (UBC) and Catherine Eimers (Trent).

James Brennan, chair

ST. MARY’S UNIVERSITY

Students & programs

- Current student enrolment for the Fall 2022 is
 - BSc Geology Majors: 33 students, of which
 - Honours: 5 students
 - BSc Geology-Environmental Science Double: 2 students
- BSc Geology Minor: 5 students
- MSc Applied Science (Geology): 11 students
- PhD Applied Science (Geology): 9 students
- Currently undergoing a department review

Faculty and staff

- Dr. Pierre Jutras (Sedimentology/Stratigraphy) is retiring July 2024. A new faculty search for Igneous/Metamorphic Petrologist is under way

- Currently 7 full-time faculty, of which
 - 5 tenured professors, including 1 CRC tier II (2 full, 2 associate, 1 assistant)
 - 1 senior lecturer
 - 1 tenure-track assistant professor
 - 1 post-doctoral fellow
- 2 professors emeritus, 6 part-time faculty
- 2 full time technicians (one new as of March 2023)
- 1 full - time secretary
- In January 2022, Dr. Erin Adlakha started a 5-year term as chair to replace Dr. Pierre Jutras

Erin Adlakha

ST. FRANCIS XAVIER UNIVERSITY

We've had significant changes in our geoscience faculty complement with 3 retirements in the last several years (Murphy, Melchin, Anderson), one continuing (Braid; on sabbatical) and one new TT (Cunningham, sedimentologist). Backfill LTA (2) and sessions fill in many of our geoscience-focused courses at present. Our environmental TT faculty (Risk, Beltrami, Kellman) remain at 3 with a cross appointed member (MacDougall; Climate and Environment Program) and one supporting LTA to backfill teaching for a research appointment to Risk.

We've undergone a significant revision of our program and course offerings, and many changes in course names and levels in an effort to address our reduced TT faculty complement and declining student enrollment, particularly in our Geoscience courses. We are currently in year 2 of the revised program offerings. We have been forced to rely heavily on limited term and sessional teaching appointments to fill the gaps in many areas at the present time. We continue to offer a core departmental program with concentration options in Geoscience and Environmental Science.

Our research program remains by far the strongest of all StFX programs in terms of external grant funding. We continue to bring in MSc students through our StFX program, and PhD student enrollment through arrangements with other institutions (a formal arrangement with MUN, primarily).

Lisa Kellman

CAPE BRETON UNIVERSITY

While down from a staffing high of five faculty (mostly lab instructors), during an enrolment spike in Engineering and Public Health between in F2019-W2022, to three today, we have increased the number of *permanent* staff: one each of a tenure track professor (new hire: 2022), Senior Instructor (promotion), and Lab Instructor (change to permanent). This

stabilization/increase in number of instructors has allowed us to move towards increased course offerings. We are currently proposing a new Oceanography course this year, with additional courses planned for future years; our goal is to offer sufficient courses to support a two-year geology transfer path from Cape Breton to other regional institutions. Enrolment continues to grow within our general interest courses, while decreasing in several of our service offerings, due to a shift away from interest in our Bachelor of Engineering Technology (BET) programs. We have moved to adapt several of our classes to a changing service role, with an emphasis on more human and societal connections. We have also had success attracting co-op and work study students, RAs, and supporting Honours projects in adjacent disciplines.

Our current faculty all hold PhDs in various areas of sedimentology or paleontology, with two additional paleontologists employed by Biology. This fortuitous expertise concentration has created opportunities to build upon Cape Breton’s historical contributions in these disciplines/traditional work in public communication/education (via school programs and the Cape Breton Fossil Centre). All of our faculty are active in outreach/service work, including with the AGS, EdGeo, and the CFES.

Jason Loxton

MEMORIAL UNIVERSITY

Students

Undergraduate Enrolment

Enrolment (total of majors) in the BSc/BSc(Hons) Earth Sciences program was at an all-time high in Fall 2014 (with 194 undergraduate students enrolled). Enrolment continued to fall each year until 2022. In Fall 2023, we are seeing an increase in both the number of majors (~14% over last year) and the number of students registered in first year EASC courses (highest enrolment in EASC 1000 in a fall semester since 2013). Many students are looking for a career path which will see them working toward climate change action and environmental stewardship.

Graduate Enrolment

Graduate numbers are stable; seven more arriving in January will bring us to 72 total. International students are still having difficulty in securing VISAs/study permits.

Faculty complement

One faculty member newly hired jointly with Geography Dept in Marine Geology/GIS, (Jan, 2024).

Total = 23 faculty members (including two University Research Professors) plus one more cross-appointed with GEOG and BIOL

- One CRC Tier I in Boreal Biogeochemistry
- One CRC Tier II in Marine Geology
- One Hibernia Project chair in Tectonics of Sed Basins
- Ten retired emeritus or Honorary Research professors
- Five adjunct faculty, all active in department activities
- Five post-doctoral fellows

Staff

Five office staff and 10 research, technical and instructional support staff

Challenges

- University budget cuts – most faculty hiring now frozen.
- Continuing low enrolment of undergrad majors; 1st year enrolment is up.
- Staffing in the department office – potential loss of 1 position. With new union agreement, there were major improvements to staff salaries at the low end of scale for new employees and recent hires, with 8K to 12K higher minimum starting salary.
- Cost of living is dramatically out-pacing graduate student income.

Year	Fall 2020	Fall 2021	Fall 2022	Fall 2023
Undergrads				
EASC majors/hons 2 nd -4 th year	59	47	55	63
Grads				
MSc	50	39	37	39
PhD	27	26	30	26
Total grad	77	65	67	65

Other notes

Completing Academic Unit Planning exercise this year, first in over a decade.

New triple-quad ICP- MS installed, operational

New low- level trace element clean lab essentially complete after multiple delays.

New IRMS ordered, expect to be installed in 2024 for stable isotope group.

Greg Dunning