

Earth & Planetary Sciences



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CHAIR'S WELCOME

By Galen Halverson, EPS Chair since September 2023

What a year—the past 12 months have been rocky, to say the least! Despite the many changes and stumbling blocks, EPS rolls along on the backs of our excellent students, dedicated faculty and staff, and always supportive alumni. This year's newsletter provides an opportunity to peer through the difficulties we've faced and celebrate our accomplishments and successes, as well as welcome new members of the EPS community. As this academic year winds down and we anticipate the next, we look forward to transforming challenges into new opportunities.

First, I would like to express our deep gratitude to Anne Kosowski and Kristy Thornton, who for decades led our front office as Administrative Officer and Graduate Program Coordinator. To many of our students past and present, Anne and Kristy were the face of our department. While it was painful to see them go, the administrative reshuffle presented them with the occasion to explore lives outside EPS. We are grateful that they stay involved in the department and continue to lend us and the new, combined EPS/Geography/Atmosphere and Oceans (Earth Systems) administrative staff their knowledge and secrets to navigating McGill's bureaucracy.

I would also like to acknowledge Professor Olivia Jensen's half a century (!) of service to McGill and her extraordinary commitment to teaching into our undergraduate program. Olivia does not officially retire until the end of the summer, but already the department feels her departure. And we will soon bid adieu to Professors Christie Rowe and Jamie Kirkpatrick, who will be relocating to the University of Nevada Reno to take on exciting new roles. EPS is thankful for their years of high-quality teaching, research, and service, which have continued into their final days here.

Sadly, we have also lost other members of the department in the past few years, including longtime Emeritus Professor Reinhard Hesse, Adjunct Professor Bjørn Sundby, and Professor and former Chair, Colin Stearn, along with several EPS alumni.

On a more positive note, we have gained two valuable members of the team, thanks to support from Bob Wares: Jamie D'Souza began as our new Communications Administrator in May 2023, while McGill EPS alumna Erin Eves rejoined our department as a Field Research Assistant in November 2023.

We also use this newsletter to highlight the many awards and honours bestowed upon our faculty, staff, and students. Although we pride ourselves in consistently punching above our weight, this year really stands out. The awards received are nearly too many to list, but we try nonetheless!

Amidst the upheaval of the past year and motivated by an impending Academic ('Cyclical') Review, EPS banded together to pen a new Strategic Plan for 2024–2028. The review was ultimately postponed due to McGill's unanticipated budgetary crisis, but having initiated the process, we felt compelled to complete it. Penning the [Strategic Plan](#) served as an occasion to reflect on who we are as a department, while the completed document will help guide us through what will surely be an era of change as we adapt to new realities in educating the next generation of Earth scientists, seeking research funding, and striving to make EPS and the Earth Sciences welcome and equitable to all.

Finally, I return to the alumni and donors who contribute to the success of our department. It is through their generosity and commitment to EPS that we continue to attract and support exceptional students, run exciting and enriching field trips and field schools, and plan events that bring all of our community together, like our annual September BBQ, October Homecoming celebration, and our Convocation party. These events will continue next academic year, so if you find yourself in Montreal, consider yourself invited!

EPS NEW HIRES



Jamie D'Souza
Communications Administrator

I joined the EPS department in May 2023. My role is to raise awareness about Earth Sciences and promote our department, programs, and courses. Although my background isn't in geology or science, learning about all of the incredible research the EPS community does has been amazing.

So far, I've updated our website, launched an EPS Instagram account (@eps.mcgill), and organized multiple events to engage with prospective students (see our outreach and recruitment photos on pages 46 & 47). I am hopeful that our engagement with different audiences will help boost our undergraduate numbers and help grow our department!

Working with the faculty and students at EPS has been a very rewarding experience so far, and I can't wait to see what the next semester will bring us!



Erin Eves
Field Research Assistant

I started in the position of Field Research Assistant in November 2023, but I have been a part of EPS for many years, first as an undergrad (BSc 2019) and then as a grad student (MSc 2023). My role is to assist in the planning and execution of field-based research happening in EPS. Though my background is in structural geology, it has been exciting to be exposed to other branches of the Earth sciences. So far, I have been involved with a seismic survey of the Island of Montreal and surrounding areas and am assisting in the ongoing gas sampling at both active and inactive landfills in and around Montreal.

While my role is primarily focused on providing support in the field, I have also been working on some projects at FDA to help EPS research go a little more smoothly. I developed a sample and data management strategy for EPSers to adopt into their workflow and am currently helping with the improvement of the rock preparation laboratories.

The field season is only just getting started in EPS, and I am excited to assist in other field studies coming my way over the summer!

DEPARTMENT UPDATES

Retirees:

- Anne Kosowski, Administrative Assistant
- Isabelle Richer, Technician Geochem Labs

On to new adventures:

- Kristy Thornton, Student Affairs Coordinator



Kristy and Anne at the 2023 Homecoming party

New administrative staff:

- Samantha Farina, Student Affairs Coordinator
- Aneta Klima, Administrative Assistant
- Olivia Marino, Administrative Coordinator

A FEW WORDS FROM ANNE KOSOWSKI

EPS Administrative Assistant retired on 01 May 2023

After almost 43 years of working at McGill, I decided that it was time for me to retire, effective 01 May 2023. My decision was not an easy one, but given the Faculty of Science's mandated re-org combining the administrative staff of EPS, ATOC, and GEOG into the Earth Systems Admin Unit (shared services) and located to Burnside Hall meant that Kristy and I would no longer be in the EPS main office full-time.

Another factor was that I would no longer be reporting to the Chair of EPS. So, I made the very difficult decision to retire. My hope was that retirement would be as rewarding and enjoyable as my time had been working with the students, academics and non-academics in Earth & Planetary Sciences. I truly appreciate and am very grateful to the Department for all the opportunities that I have been given while working in Earth & Planetary Sciences.

Working every day in the Department was truly a pleasure, filled with challenges along the way but also with a great deal of satisfaction. I am very thankful that I was given the opportunity to be a part of the Department for over 35 years. Since retirement, I have greatly missed interacting with everyone in EPS—students, academics, and non-academics.

Working with everyone over the years in Earth & Planetary Sciences has been an honour and privilege.



Bailey was an amazing retirement gift from Willy, Vincent, and their research groups



Anne at the 2024 graduation party

ADAMS 211: OUR OWN ACTIVE LEARNING CLASSROOM

By Jeanne Paquette, Professor

Until 2016, alumni visiting the department often mentioned that looking into our classroom Adams 211 was like stepping back in time. It had hardly changed since the Frank Dawson Adams Building opened its doors.



Picture snapped by John Stix of Adams 211 in 2016, before its renovation

In 2015, FDA 211 was selected for renovation as an Active Learning Classroom. Since 2009, this program has transformed 17 classrooms (in 11 buildings) across the university campus. Active Learning Classrooms can be booked by the entire McGill community but they can be designed to accommodate the needs of specific groups. We saw an opportunity to design a versatile space for teaching in a setting where students could engage with Earth materials, technology and each other.



The long black tables were replaced by eight tables with sturdy tops similar to those of wood truck bed floors. Our vintage chairs with their tubular metallic frames gave way to height-adjustable wheeled chairs that are easily moved.

The green blackboard was replaced by four projection screens that can be used to project from two sources: a podium or laptop computer, a document camera or from a station where a microscope or some other tabletop demonstration can be installed.

Microscopes and collections are kept in cabinets hidden behind the projection screen, leaving the classroom uncluttered for multiple other uses. The tables sit up to 8 students and are well suited to group activities where teams use smaller movable white boards to work out solutions to problems and present them to the rest of the class.

ADAMS 211: OUR OWN ACTIVE LEARNING CLASSROOM (CONT.)

Since the fall 2017, our courses in mineralogy, introductory petrology, igneous petrology, invertebrate paleontology and general geology for engineers have been held in this classroom.

Above the specimen storage cabinets, an array of larger specimens invariably catches the attention of students and visitors. They are used in teaching out outreach activities by instructors and students alike.

Our teaching collections were culled and consolidated as they were moved back following the renovations. Since then, we have photographed many hand specimens and thin sections during the summer to populate a digital catalogue. Durable laminated labels are gradually replacing the older ones, preserving information about their origin.

This classroom provided crucial safe space during the pandemic. Students could use their petrographic microscope for learning or research while keeping their distance.



Since the end of the pandemic, several other McGill courses now book this welcoming active learning space for instruction, crowding the schedule. However, the classroom space was designed so that teaching assistants and an instructor can use workbenches behind the projection screens. They may select teaching material for an upcoming exercise while a lecture is taking place in the main area. Several small-enrolment courses also share the space during their practical exercises, providing access to students who need more time with the teaching material.

In a context where the pace of improvements to our university infrastructure is often criticized, the redesign of Adams 211 has been a collaborative success.



GRADUATING STUDENTS

2023

Graduating Bachelor students

- Mohammed Belahouane: *Major Chemistry, Minor Geochemistry*
- Briana Bellomo: *Major Geology*
- François-Xavier Bonin: *Major Geology, Minor Geographic Information Systems & Remote Sensing*
- Alex Briand: *Honours Earth System Science, Minor Atmospheric Science*
- Zhen Dai: *Major Chemistry, Minor Geochemistry*
- Elena Frie: *Honours Earth System Science, Minor Concentration in Anthropology*
- Dasha Gousseva: *Major Earth System Science, Minor Concentration in Sociology*
- Kiera Hamel: *Major Geology*
- Samantha Loutet: *Honours Earth System Science, Minor Natural History*
- Andrew Mack: *Major Chemistry, Minor Geochemistry*
- Isabelle McIntyre: *Honours Earth System Science*
- Nathalie Redick: *Major Anthropology, Minor Concentration in Science*
- Quentin Sapin: *Honours Planetary Sciences*
- Clara Schryer: *Honours Earth System Science, Minor Geology*
- Joshua Shatz: *Major East Asian Studies, Minor Concentration in Science*
- Elizabeth Sullivan: *Major Geology, Minor Environment*
- Kaiyuan Wang: *Honours Geography, Minor Geology*
- Jasper Zarkower: *Honours Earth System Science*



Profs Christie, Jeanne and Jeff at the Spring 2023 convocation

Graduating Master students

- Lea Baumser
- Maude Bilodeau
- Erin Eves
- Hannah Guiney
- Emilienne Hamel
- Arvid Gonzalez Gonzalez
- Maxwell Kaye
- Tanya Matitia
- Gavin McNamara
- Julia Morales-Aguirre
- Raven Polk
- Jeremy Roffman
- Molly Urquhart
- Margaret Whelan



Graduating PhD. students

- Debarati Das: *Understanding Gale crater's latestage aqueous history as recorded by B and Li in Ca-sulfate veins.*
- Regina Gonzalez Moguel: *Using radiocarbon to trace methane emissions from natural and anthropogenic sources in two Canadian ecosystems*
- Wilder Greenman: *Reconstructing the depositional history of the terminal Mesoproterozoic Bylot basins of northeastern Laurentia*
- Mathilde Jutras: *Physical And Biogeochemical Drivers of Deoxygenation In The Gulf and Lower St. Lawrence Estuary*
- Marko Kudrna Prasek: *Fractionation processes of platinum-group-elements in natural systems and experiments*
- Duncan McLeish: *The nature and origin of the bonanza-grade Brucejack epithermal Au-Ag deposit, northwestern British Columbia Direction*

GRADUATING STUDENTS (CONT.)

2024

Graduating Bachelor students

- Béatrice Duval: *Major Software Engineering, Minor Earth System Science*
- William Eaton: *Major Physics and Geophysics*
- Elise Ferrante: *Major Environment, Earth Sciences and Economics*
- Eva Goblot: *Honours Earth System Science*
- Natasha Kelly: *Honours Earth System Science*
- Eugene Lee: *Major Microbiology & Immunology, Minor Geology*
- Ariane Legault: *Major Geology, Minor Concentration Anthropology*
- Magdalena Mroz: *Major Mining Engineering, Minor Geology*
- Charlotte Sampson: *Major Anthropology, Minor Concentration in Science*
- Aelis Spiller: *Honours Earth System Science, Minor Concentration in Hispanic Studies*
- Thomas Tobin: *Major Earth System Science, Minor Computer Science*
- Lekima Yakuden: *Major Physics and Geophysics*



Lea, Molly & Emilienne at the Fall 2023 convocation

Graduating Master students

- Hiba Aoid
- Ajani Bissick
- Kira Fuller
- Emily Perry

Graduating PhD. students

- Erin Gibbons: *Advancing Mars Life Detection: Insights from a Glaciovolcanic Analogue and Enhanced Rover Survey Techniques*
- Kyle Henderson: *Metal enrichment in Middle Devonian black shales of the Richardson Trough, Yukon, Canada: an integrated mineralogical, geochemical, and isotopic study*
- Keavin Moore: *Coupled Models of Water on Terrestrial Planets Orbiting M-Dwarfs*
- Florentine Zwillich: *Unraveling a magmatic system: Saba (Lesser Antilles)*



Lekima, William, & Magdalena at the 2024 spring convocation party

UNDERGRADUATE STUDENT AWARDS

2022-2023:

- Logan Gold Medal: Francois-Xavier Bonin
- David Harrigan Memorial Prize: Clara Schryer

In 2022, the following 13 undergraduate students (ranked below by their yearly grade point average) were rewarded with Osisko scholarships (total \$33,444) and other awards (total \$15700). The amounts awarded to students ranged from \$5300 to \$2400.

- Briana Bellomo, Major Geology
- Francois-Xavier Bonin, Major Geology
- Kieran Daly, Major ESS
- Eva Goblot, Honours ESS
- Kiera Hamel, Major Geology
- Ariane Legault, Major Geology
- Dana Marino, Major Geology
- Isabelle McIntyre, Honours ESS
- Clara Schryer, Honours ESS
- Aelis Spiller, Major ESS
- Elizabeth Sullivan, Major Geology
- Lekima Yakuden, Physics & Geophysics
- Jasper Zarkower, Honours ESS



Lekima Yakuden receiving the Logan Gold Medal in Spring 2024

2023- 2024:

- Logan Gold Medal: Lekima Yakuden
- David Harrigan Memorial Prize: Eva Goblot

In 2023, the Osisko scholarship (total of \$33,400) combined with other awards (total of \$13,146, ranging in value from \$4K to \$800) were used to reward 9 undergraduate students ranked below by yearly grade point average. The amounts awarded ranged from \$6800 to \$3700.

- Eva Clancy, U1, Geology Honours
- Kieran Daly, U2, ESS Major
- Ava Fuch, U2, ESS Honours
- Liam Greig, U1, ESS Major
- Dana Marino, U2, Geology Major
- Clea Phillips-Kennedy, U1, ESS Major
- Briac Poilane, U2, Environment (Earth Science and Economics)
- Sophie Piret, U1 ESS Major
- Lekima Yakuden, U3, Physics & Geophysics

GRADUATE STUDENT AWARDS

2024 Mountjoy Scholarship: Marcus Lin, MSc.

Marcus is investigating how microbial communities interact with sugar kelp (*Saccharina latissima*) in the dense biofilms that form on their surfaces. It remains unclear whether the kelp selectively recruits certain types of microbes or if these associations happen by chance. In dynamic coastal environments, the initial microbial colonization of kelp is random and unpredictable, and its impact on successive microbial communities is not well understood. This summer, Marcus will conduct his research at the Woods Hole Oceanographic Institute, sampling microbial communities from sugar kelp in a controlled mesocosm environment over six weeks. He will track changes in the kelp's microbiome, the surrounding seawater, and the health of the kelp, focusing on the establishment of early microbial populations and their development over the experiment. Additionally, Marcus will study how these interactions shift under rising temperatures, as heat stress is known to harm kelp populations and alter seawater microbial communities. Since kelp plays a significant role in carbon and nitrogen cycling in coastal ecosystems, understanding microbial settlement and the utilization of kelp organic matter is essential for these geochemical processes, highlighting the importance of kelp in future climate scenarios.



2024 Mountjoy Scholarship: Selsey Stribling, PhD.

My research investigates how climate-driven changes, specifically increased air temperature and precipitation, influence groundwater discharge to a lake in Canada's Arctic Archipelago. The Arctic is experiencing warming rates two to four times higher than the global average, resulting in significant environmental changes, such as permafrost thaw. These changes alter groundwater storage and flow paths, posing a threat to the recharge of lakes and rivers in Arctic environments.

We use a groundwater numerical model that represents a vertical subsurface "slice" extending from the top of a nearby hill down to the lake. We evaluated four distinct time periods characterized by increasing temperature and precipitation: modern baseline conditions, the 2020s, the 2050s, and the 2070s. As temperatures rise, the shallow subsurface remains unfrozen for longer periods each year, enhancing groundwater flow to the lake. Further simulations indicate that temperature primarily drives the increase in groundwater discharge, as it dictates the duration until winter freezing occurs.

Understanding groundwater discharge to northern surface water bodies in a rapidly changing climate is essential, particularly since there are many northern sites contaminated by activities such as mining and fuel spills. With warming, these contaminants could be mobilized by newly active groundwater flows, thereby threatening water resources for northern communities.



GRADUATE STUDENT AWARDS (CONT.)

2024 Lynch Scholarship: Rachel Lackey, PhD.

Rachel is exploring the impacts of climate change on groundwater in permafrost environments. Increasing temperatures and changes in precipitation can lead to thawing of permafrost, altering groundwater flow. In partnership with the Community Government of Whatì, Rachel is working to better understand the community's drinking water resource. Whatì, located in central Northwest Territories is one of the three communities in the Northwest Territories that rely on groundwater for their drinking water. To better understand the community's groundwater resource, Rachel has coordinated and installed a groundwater and permafrost monitoring network. Data collected from this network is being used to characterize the current groundwater resource and evaluate the long-term effects of permafrost thaw on groundwater vulnerability. Findings from this research will help guide a source water protection plan for Whatì, enabling community resilience to climate change. Furthermore, this research will provide an understanding into how groundwater-permafrost thaw feedback occurs in wetland and fractured rock environments, two widespread environments in the Canadian North. This knowledge will be used to improve hydrological models and forecasts, to better predict the effects of permafrost thaw on water resources across Canada.



2024 McGregor Scholarship: Jared Splinter, PhD.

My research revolves around characterizing exoplanet atmospheres through the utilization of infrared spectroscopic phase curves—an optimal method for probing the three-dimensional structure of exoplanet atmospheres. Employing a technique known as spectral retrieval, I use these observations to map exoplanetary atmospheres, construct energy balance models, determine wind and cloud patterns, and unveil the chemical composition of these remote worlds' atmospheres. My expertise is currently being applied to study the ultra-hot Jupiter, WASP-121b, utilizing high-quality thermal emission data collected by the James Webb Space Telescope (JWST) using the Canadian instrument NIRISS. The observation comes as part NEAT (NIRISS Exploration of the Atmospheric Diversity of Transiting Exoplanets) Guaranteed Time Observation. The goal of the NEAT survey is to use the enhanced capabilities of the JWST to characterize the atmospheres of transiting exoplanets with unprecedented precision. This observation will be used to help develop an exoplanet phase curve analysis pipeline, providing the exoplanet community with a universal way analysis method. Combined with work to benchmark spectral retrieval techniques, my research will help find the best method of analyzing exoplanet phase curves in anticipation for the launch of the European Space Agency's ARIEL telescope in 2029.



GRADUATE STUDENT AWARDS (CONT.)

Internal Awards 2023

- Jacob Asomaning: *Leroy*
- Kiera Broda: *Wares*
- Justin Chien: *Davidson*
- Robert Collar: *Prochnau*
- Tom Crouzal: *Leroy*
- Mahesh Herath: *Mountjoy*
- William Fajzel: *Mountjoy*
- Bernardo Filgueiras: *McGregor Klein*
- Gary Fung: *Panneton*
- Aube Gourdeau: *Soutar MSc.*
- Amy Lu: *Davidson*
- Susanne Mikhail-Lee: *Howard*
- Kevin Ng: *Prochnau*
- Niklas Peterson: *Leroy*
- Evan Slater: *Wares*
- Jared Splinter: *Lynch*
- Selsey Stribling: *Soutar PhD*
- Jake Tiong: *Howard*
- Eole Valence: *Mountjoy*
- Antoine Vigne: *Leroy*



Faculty of Science Scholarships and Awards reception 2024

External Awards 2023

- Abdullah Al Faisal: *Vanier*
- William Fajzel: *NSERC CGSD*
- Mahesh Herath: *FRQNT*
- B Parazin: *Tomlinson*
- Alia Sanger: *FRQNT & NSERC CGSD*
- Gustavo Villarruel: *FRQNT*



Faculty of Science Scholarships and Awards reception 2024

FACULTY AWARDS

We take pride in the quality of our faculty in EPS, and thanks to a proactive awards committee, have enjoyed great success in faculty awards and distinctions over the years. But this year stood out as exceptional, with five members of the department being invited to the annual McGill Bravo awards in March to honour awardees over the previous year.



Professors Christie Rowe, Natalya Gomez, and Nic Cowan at McGill's annual Bravo gala.

Professor **Nicolas Cowan** received the Arthur B. McDonald Fellowship from NSERC (2023). This prestigious award provides Nic with two years of teaching and administrative release so he can focus on his research. He'll need all the time he can get given his role as Canadian lead on the European Space Agency's Ariel mission, amongst his many other projects and collaborations.

Professor **Natalya Gomez** received the James B. Macelwane Medal (2023) from the American Geophysical Union for outstanding contributions to Earth and Space sciences by an early career researcher. Natalya also received the International Union of Geodesy and Geophysics Early Career Award (2023).

Professor **Jamie Kirkpatrick** received the W.W. Hutchison Medal from the Geological Association of Canada. As part of his award, Jamie has been traveling across the country between his teaching and many other commitments to give research seminars in other Canadian Earth science departments.

Professor **Christie Rowe** was inducted as a fellow into the Geological Society of America (GSA), which was richly deserved given her many contributions to GSA and the broader geoscience community over the years.

FACULTY AWARDS (CONT.)

Professor **Galen Halverson** was inducted as a fellow into the Royal Society of Canada Academy of Sciences. He joins fellows Anthony (Willy) Williams-Jones and Al Mucci from EPS in the academy, along with Nic Cowan, who was elected to the College of New Scholars, Artists, and Scientists the previous year.



Professor Galen Halverson at the Bravo gala

Professor **Nagissa Mahmoudi** has been selected as the recipient of the 2024 Geological Society of America (GSA) Geobiology & Geomicrobiology Division Pre-Tenure Excellence Award. This award recognizes Nagissa's accomplishments in research, mentoring, service and leadership in the geobiology and geomicrobiology community. Nagissa was also selected as a Scialog Early Career Fellow by the Signatures of Life in the Universe Initiative, which will entail participating in workshops over the next several years to address scientific challenges of global significance.



Professor Nagissa Mahmoudi

LONG VALLEY CALDERA FIELD TRIP EPSC 530 VOLCANOLOGY

By the 2022 Field Trip Participants

Day 1 (October 8th): On Saturday, October 8th, 2022, our class set out from Montréal-Pierre Elliott Trudeau Airport at 3:15 AM for San Francisco. After a lengthy fight for minivans at the car rental counters, we secured 2 vehicles and set off to our first stop. Off we went, out of San Fran, through the Central Valley at nearly 40 degrees Celsius, and then finally, a spectacular drive in twilight from Merced to Mariposa, driving through surreal fruit and nut trees with the full moon overhead. We arrived at the night's accommodation: the Yosemite Bug Hostel. We had dinner as a group and planned our next day's travel.

Day 2 (October 9th): We set out on a ~ 40-minute drive bright and early from our accommodations at the Yosemite Bug Hostel to Yosemite National Park. Once we arrived at Yosemite, we drove to the Valley View lookout spot, where we took in the spectacular view of El Capitan Peak, Sentinel Rock, Cathedral Rocks, and Bridalveil Fall. Following this picturesque moment, the class drove back down into the valley of Yosemite, where we hiked up to a waterfall. Following our amazing day in Yosemite National Park, we drove to our next accommodation, condos in Mammoth Lake.

Day 3 (October 10th): On the third day of the trip, we visited Devil's Postpile in the morning. It is an amazing spot to understand the cooling processes of the columnar basalt erupted from the volcanic vents. The surface of the basalt also shows striation from past glaciers. Later, we went to Earthquake Fault to look at the large-scale pulled-apart faulting system. On the way to the next site, we stopped on the road to look at an Inyo Plinian pumice fall deposit. Different sizes of pumice found there imply we were not far from the vent of eruption. Then, we went straight ahead to Horseshoe Lake and Lake Mary. The highlight of the day goes to a region of dead trees near Horseshoe Lake caused by the high CO₂ content in the soil. This is evidence of active magmatic activity in Long Valley Caldera. The day came to an end with an extra stop at Unconsolidated Gold Mine No.2. site to investigate the mineralogy of rock fragments there.



LONG VALLEY CALDERA FIELD TRIP (CONT.)

Day 4 (October 11th): Tuesday morning involved a tour of the geothermal plant just outside of Mammoth Lake. In this tour, the plant manager explained how hydrothermal fluid is extracted from the ground through pipes. This is then used to heat up a working fluid that turns the turbines to generate energy. The tour concluded with looking at a natural fumarole venting steam just outside of the power plant. The next stop was an overlook of the Bishop Tuff deposits, where the columnar jointing could be seen clearly along the side of a canyon. We then went to a pumice quarry to look at the pumice falls and distal ash flows. The Glass Mountain ashfalls were next on the field trip. The beautiful exposure of this outcrop allowed us to practice our sedimentology and make inferences about the fluvial and lacustrine depositional environments for these ash falls. The final stop of the day was to the Owens River Gorge, where the columnar jointing of the Bishop Tuff occurred on massive scales and in rosette patterns, recording fossil fumaroles.



Day 5 and 6 (October 12th and 13th): Our class had so much fun these days that we've lost the journal entries for them! here are some highlights:

- Mono Lake, with its high alkalinity, tufa towers, and massive rafted pumices (which floated!)
- Gary's surprise birthday party, with lots of potato peeling competitions
- The Inyo Domes, with their vesicular textures and mixed and mingled magmas
- A nighttime hot spring dip under the stars



Make sure to check our Gary's [drone video](#) from the trip

LONG VALLEY CALDERA FIELD TRIP (CONT.)

Day 7 (October 14th): This was our last day at Long Valley, and we started bright and early! The first stop was Hot Creek, which its name suggests, had geothermally heated hot water feeding into a narrow stream and pools. As we hiked down the trail leading to the water, we checked out the perlitic cracks of obsidian, which indicate a hydrated paleoenvironment. We were so excited to see the geysers and fumaroles up close as we walked along the stream. The Rhyodacite Dome 7403 was next on our itinerary, or what we affectionally call 'Baby Dome'. Besides its relatively low elevation, Baby Dome also got its name from the miniature columnar basalts, which resembled those at Devil's Postpile! We could also spot our next stop, Glass Mountain, from the top of Baby Dome. Glass Mountain was one of our favourite spots as it is home to red and black obsidian that we were looking forward to. We later learned that the red parts were finer-grained than the black parts and hence had a greater surface area and were more oxidized. The obsidian covered the entire hill, and we had to be careful not to trigger obsidian avalanches in our trail as we ascended toward the rock wall. At the top, we were rewarded by amazing spherulites, which are secondary silica and feldspar minerals that crystallized in a spherical shape during the devitrification of obsidian.

As the day came to a close, we gathered back at the house to spend our last night at the accommodation together. As we streamed into the living room and got comfortable around the TV, drinks and snacks were passed and lights were dimmed. We were in the mood for good tunes as we resumed watching *Mama Mia* and hung out with the Bella's in *Pitch Perfect*.



Day 8 and 9 (October 15th and 16th): Today, we began our journey back to Montreal. We packed our cars and departed from our lovely accommodations in Mammoth Lake. As we headed to the San Francisco airport, we drove through Yosemite National Park and watched from the cars as the landscape changed and evolved around us. For lunch, we pulled off of Tioga Road and picnicked along the shore of Tenaya Lake (Kiera B went swimming). We were treated to spectacular views as we finished off what was left of our latest grocery haul for lunch. We continued our drive through the winding Tioga Pass, where we stopped a mere 3 times for the bathroom along the way. As the landscape flattened out, we took in the townships and urban areas around us.

After nearly 5 hours of driving, we entered San Francisco. We navigated John through the winding streets in an attempt to find the Golden Gate Bridge viewpoint. Once we found the spot, we were greeted with the frigid air and thick fog that hung along the Golden Gate Bridge. This didn't stop us from taking multiple selfies and enjoying the hazy views!

We got a whopping 3 hours of sleep before heading off to the airport and heading home! We were at the San Fran airport EVEN EARLIER than at Trudeau. But again, the flights home were flawless, with a tight but successful connection in Detroit, and the only hitch was that Molly and Gary got stuck in Immigration in Montreal, from whence they emerged about an hour later relatively unscathed (I think). We said our various goodbyes, and that was that! An epic trip!

PORTUGAL- SPAIN SEDIMENTOLOGY EXCURSION

By Galen Halverson, T.H. Clark Chair

After a long hiatus due to the pandemic and other circumstances, the advanced sedimentology field trip associated with Galen's Sediments to Sequences (EPSC 425) class returned for the March reading break (1-9 March, 2024). This trip has historically been run mainly in the Almería region of southeastern Spain, due to the fabulous geology, generally reliable early spring weather, ease of logistics, and fantastic tapas.



Predictably, while the Paleontology instructor and students fixated on ammonites, the more structurally inclined pondered a fault. From left to right: (front) Dr. Katie Maloney, Si Kaur, Charlotte Spruzen, Alexandra Liercke, and Eva Goblot; (back) Joe Smith-Dostmohammed, Dana Marino.



We mixed it up this year by beginning the trip in Portugal and by combining it with students from Invertebrate Paleontology (EPSC 334), with post-doc and instructor Katie Maloney co-leading the trip. After meeting up in Lisbon, our group of 14 set off for the Lusitanian basin, a Mesozoic rift basin associated with the opening of the Atlantic Ocean.

Blustery and rainy weather added some excitement during our two days on the mid-Portugal coast, but we still managed to explore Jurassic coastal plain swamps and channels, carbonate platforms, and ammonites preserved in many different ways in dramatic coastal outcrops before setting off for southeastern Spain.

PORTUGAL- SPAIN SEDIMENTOLOGY EXCURSION (CONT.)

Near Granada we intersected with Fernando Garcia-Garcia, a sedimentologist from the University of Granada who has worked extensively on the Neogene basins of the Granada-Almería region. After examining alluvial deposits, Gilbert deltas, tide-dominated, mixed clastic-carbonate cycles, Miocene vertebrate fossils and much more around Guadix, we dropped into deepwater turbidites to look at the famous 'Solitary Channel Complex' in the Tabernas basin, which is home to 'Little Hollywood' where *The Good, the Bad, and the Ugly* was filmed.



When Prof. Garcia-Garcia speaks, the students listen (and take notes); an overview of the geological evolution of the Guadix basin.

During our last two days we examined the sedimentary products of Milankovitch cycles and the Messinian Salinity Crisis in basins that were marginal to the Mediterranean, including fascinating selenite gypsum-marl cycles. We spent our last day together driving across the driest part of Europe through a torrential downpour, which hopefully helped alleviate the drought that had wracked southeastern Spain for the past decade while also staunching the slightly less severe drought in sedimentology field trips in EPS.



We are grateful to the Wares, Dawson, and Ian & Helgi Soutar field studies funds for making this trip possible.

THE WILLY TRIP 2024 : CHILE AND ARGENTINA

By Ludovick Bernier-Michaud, Earth Science and Economics



From Classroom to Field

Every year, for the past 40 years, students in the faculty of Earth and Planetary Sciences nominate and vote on a country to visit with interesting geology. This Trip is entirely organized and run by the students participating. Professor Anthony Williams-Jones has accompanied these students every year for which the trip takes his namesake, Willy, as he guides us through these geological features. This year we spent 12 days in Southern Chile and Argentina studying the geology, geography and environment of this fascinating region while learning field practice, visit mines, and working with local organizations and researchers to gain a deeper understanding of the country's unique landscape and ecosystem.



Photo: Perito Morena Glacier

The Geology

From the Andesite mountains (Andes), to glaciers, we were able to study incredible geological features with notable mentions including double synclines in opposite directions, basaltic columnar jointing, salt lake evaporates and other fascinating outcrops (contact us and we'll show you photos!). The Perito Moreno glacier is a 250 km² ice formation, 30 km in length, is one of 48 glaciers fed by the Southern Patagonian Ice Field located in the Andes system shared with Chile which has a small part of the origins of the glacier. This ice field is the world's third largest reserve of fresh water.

Economic Geology:

We were able to visit an oil and gas operation, run by CGC, the 5th biggest Oil and Gas company in Argentina where the geologists and engineers in charge taught us about the geology of the Palermo Aike formation.

We also spent a day visiting the producing Yacimientos Río Turbio coal mine which has been operating for over 75 years. Their head geologist showed us the mineralization and deposit features.



Photo: Palermo Aike, basaltic volcano with pahoehoe's, aa's and crater

The Willy Trip must continue

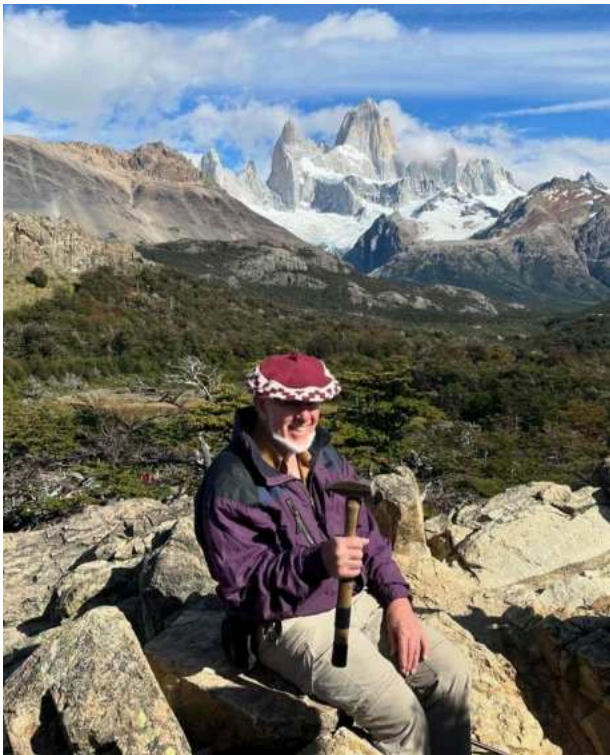
If late night lectures by the fire-side, studying rare geological features and working with local experts to understand the relationship between geology, mining and culture in a country of your choice sounds appealing reach out to: ae.williams-jones@mcgill.ca for the 2025 trip. This trip student led, so you must take initiative for it!

This year's participants: Ludovick Bernier-Michaud, Noah Singer, Briac Poilane, Alejandro Escobar, Magda Mroz, Maria El Dahdah, Myriam Gallant, Taran Franck, Justin Trudel, Georgina Shrimpton, Alix Hourdin, Samuel Massey, Tomas Alvarez, and Teo Schubert.

THE WILLY TRIP 2024 : CHILE AND ARGENTINA (CONT.)

The Willy Trip was an amazing experience. Even though it was not a traditional class experience, we still learned a ton about the tectonic setting and natural resource formations, especially oil and gas. Overall, the trip was out of this world and definitely, my favourite destination I have visited with McGill.

- Samuel Massey, Minor Geology



THE WILLY TRIP 2024 : CHILE AND ARGENTINA (CONT.)

Earlier this year, I had the opportunity to journey across the globe to Patagonia, both Chile and Argentina, for a 13-day trip alongside fellow students and Willy on the annual Willy trip. Many memories rush to mind when I think about the wonders and happy moments we've shared on this adventure. However, my most memorable souvenir of the trip must be the landscape. We travelled from Puerto Natales to El Calafate, passing through the Torres del Paine National Park, and my jaw never fell to the floor as fast! The mountains, the water, the blue sky, the bushes, and the flowers combined demanded attention from all of your five senses; there is no other way one can appreciate all of it. Hopefully, the following pictures can show you what I mean (the pictures do not do it justice!). These are just one example of what this lovely place has to offer!

Myriam Gallant, Honours Geology



THE MOJAVE DESERT, CALIFORNIA TRIP 2024

FIELD SCHOOL I

By Jamie D'Souza, EPS Communications Administrator

In early May 2024, I was invited to join students, professors, staff, and TAs on the Field School I trip to California. After having seen and used numerous pictures from past trips as recruitment tools, I couldn't pass up the chance to experience it firsthand.

Our first stop was to the Mojave Preserve. The first two days were dedicated to getting acquainted with camping, breaking in our hiking boots and sightseeing before diving into the schoolwork. We hiked around Hole in the Wall by the campground and the Teutonia Peak Trail. The next day, before settling into the Owl Campground, we visited Pisgah Crater and the Calico Folds.



For the students' first assignment, we went to Rainbow Basin, where they were tasked with mapping the area. They identified strikes, dips, faults, and geological features to produce a detailed map. As someone with no geological experience, I opted to observe rather than participate in the assignment. However, I did some hiking around Rainbow Basin and found the views and geological formations astonishing. It still amazes me that places like this exist.



After leaving Rainbow Basin, we visited the Coso Geothermal Energy plant, Fossil Falls, and the Eastern California Museum. The environment was completely different from the rocky area we had just left because we were now surrounded by trees, the Sierra Nevada, brisk air, and water! Being in this breathtaking environment, I decided to participate in the students' next assignment. This assignment was more focused on earth science, examining plant types, soil, and tree sizes to understand how climate change will impact carbon content and the environment.

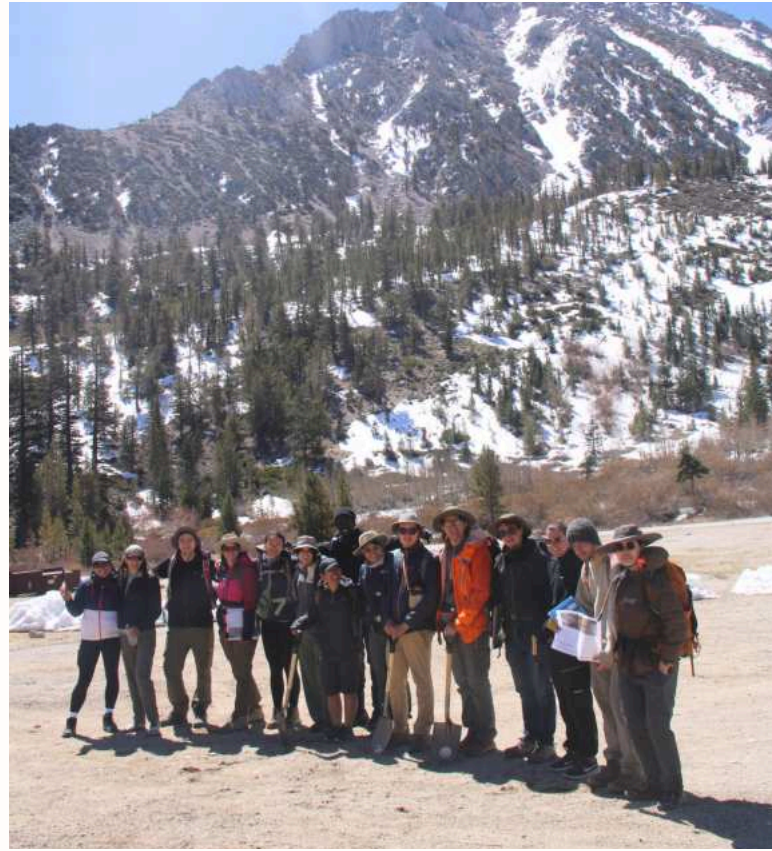
THE MOJAVE DESERT, CALIFORNIA TRIP 2024 (CONT.)

While some students preferred this environment to the dry desert air, many were eager to return to learning about geology and seeing rocks. Over the next two days, we explored Death Valley, fully immersing ourselves in the desert. We visited the Father Crowley Overlook, hiked Mosaic Canyon, and explored the Mesquite Sand Dunes. We went to Ubehebe Crater, the Furnace Creek Visitor Center (where temperatures reached 35 degrees Celsius), and Badwater Basin the following day. I thoroughly enjoyed this part of the trip, and the fascinating geological insights shared by Christie (prof), Rachel (TA), Charlotte (TA), and Erin (staff) were incredible.

The final part of the trip took us to Shohane, California, at the SHEAR center. The students were tasked with another mapping assignment in Dublin Hills. Unfortunately, my trip ended on the first day of mapping, so I didn't get to test my new knowledge—maybe next year. The students returned to Montreal in good spirits, so I like to think it went well.

From day one, the group's dynamic was evident. While many students knew each other from EPSC 240 (Geology in the Field), new friendships quickly formed. It was fascinating to see the diversity of programs represented. We had students from Geology, Physics and Geophysics, Economics and the Environment, Computer Science, and even Management. All of them were eager to learn about geology in the field beyond the confines of a classroom.

I should add that, in addition to hiking, learning about rocks, and studying environmental phenomena, students were also responsible for cooking and cleaning for our entire camp. I was pleasantly surprised by the quality of the food they prepared. From taco night to souvlaki over the fire to chili and pasta, it was truly gourmet camping!



THE MOJAVE DESERT, CALIFORNIA TRIP 2024 (CONT.)

Overall, this was an incredibly unique experience, and I'm grateful that EPS allowed me to participate because it has given me a new appreciation for field school and geology. And I finally understand why students in and outside our department are always raving about this trip!



THE SOCIETY OF ECONOMIC GEOLOGISTS TRIP 2024

THE GLOBAL GREEN ENERGY TRANSITION – CRITICAL METALS

IN WESTERN AUSTRALIA

Gary Fung, MSc. Student & Robert Collar PhD. Student, both in the Hydrothermal Geochemistry Group

A team of eight students from the McGill University Student Chapter of the Society of Economic Geologists (SEG) and the University of Western Australia embarked on a geological excursion in Western Australia from May 1st to May 15th, 2024. The primary focus of the trip was to study deposits of critical minerals, such as lithium, rare earth elements, and nickel, which are the strategic resources of modern society. Additionally, the group visited the Golden Mile in Kalgoorlie to gain insight into the geology of one of the world's premier gold mining districts.



The journey commenced in Perth with a visit to Australia's national science agency, the Commonwealth Scientific and Industrial Research Organisation (CSIRO). At CSIRO, students and researchers delivered talks and exchanged ideas. These were followed by a tour of the CSIRO lab facilities. The next day, we went to Greenbushes, the largest hard-rock lithium mine in the world, where lithium is produced from spodumene-bearing pegmatites. Afterwards, we drove six hours east to Kalgoorlie-Boulder, where we visited the St. Ives gold mine, KCGM gold mine, Mt. Marion lithium mine and Black Swan nickel mine. These mines are spectacular, especially the KCGM super pit for its immense size and productivity. Driving four hours north to Laverton, we visited the Mt. Weld mine, where the saprolite above a carbonatite complex is mined for rare earth elements. Mt Weld is one of the largest rare earth element mines in the world, with grades reaching more than 26 wt % rare earth oxide. We concluded the trip with a scenic drive back to Perth via Esperance and Margaret River.

THE SOCIETY OF ECONOMIC GEOLOGISTS TRIP 2024 (CONT.)

Each mine visit was complemented by a geological presentation, open-pit and/or underground operation visit and core discussion. Students had the opportunity to fully examine outcrops and drill cores to develop their interpretation. We also had the chance to interact with industry experts and professionals in the field, which enhances our understanding of the mineralization and regional geology. At Mt. Weld, we had the opportunity to visit their concentration plant and to learn about the processing of ore, from crushing to flotation and delivery.



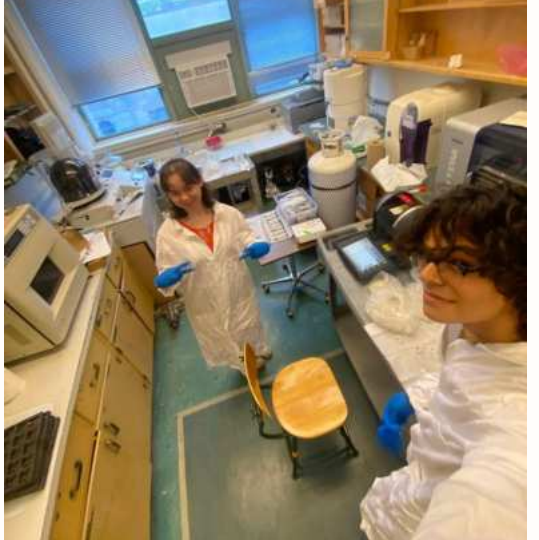
On our journey back to Perth, we seized the opportunity to explore Mammoth Cave in the Leeuwin-Naturaliste National Park, renowned as one of the longest cave systems worldwide.

In contrast to the ~2.6 Ga ore deposits we visited in the Yilgarn Craton, the recent karst landscape at Mammoth Cave was refreshingly young. We observed stalactites, stalagmites and fossils of *Zygomaturus*, a now-extinct mega-marsupial once endemic to Australia. The coastal scenery and beaches along the southern shore of the Western Australia brought a wonderful conclusion to our trip.

We extend our heartfelt gratitude to EPS for its continued support of the SEG trip. Its sponsorship has been instrumental in providing students with invaluable opportunities to explore and learn about ore deposits across the globe. We remain committed to offering students exposure to such enriching experiences in the coming year. To any EPS students intrigued by the fascinating world of ore deposits, we extend a warm invitation to join us. We look forward to welcoming you aboard for our future SEG trips!

FRANCE FIELD SCHOOL, 2024

Images from Georgina Shrimpton (Major Geology) and Joe Smith-Dostmohamed (Major Geology)



EPS RESEARCH

ECOHYDROLOGY LAB – FIELDWORK AT THE GAULT NATURE RESERVE

By Alina Kostyuk, MSc. Student in the Ecohydrology Lab

As the weather has been getting nicer and nicer the past few weeks, the Ecohydrology Lab, under the supervision of Genevieve Ali, has been hard at work since the end of April starting up fieldwork at the Gault Nature Reserve. This reserve is owned and operated by McGill University and is located on Mont Saint Hilaire, about 1 hour from Montreal. In the past few weeks, the forest has been truly waking up. The leaves have sprouted, filling up the canopy, while spring flowers are blooming in the understory. At the same time, the animals in the woods are becoming more active, with countless birds singing during the day and many chipmunks, squirrels, and deer making their way through the forest. Even the elusive fisher, an animal rarely seen on the mountain, has made an appearance!

While the forest is reawakening, our lab group has begun its work on studying Western Creek, flowing through the woods towards the main lake of the reserve. Firstly, an autosampler, a machine which will automatically collect water samples from the stream, was installed at the outlet of the creek. The autosampler may be programmed to take a sample at any rate, from 1 sample a day to 1 sample every hour. In order to investigate how much moisture there is in the soil, soil profile loggers were installed in areas close to the stream. This installation process was very labourious, requiring a very heavy generator, a jackhammer, a handheld auger, and a hammer in order to dig a deep enough hole for the instrument. After an entire field day, 5 instruments were successfully installed, but one was unfortunately not deployed. It is stuck in the ground, unretrieved, as no one in the team was able to pull it back out of the ground. This instrument has been thereafter renamed “Excalibur”, and it is still at Gault, waiting for the Chosen One to pull it out.



After all the necessary field equipment was deployed, our lab group was able to return and start collecting a variety of water samples: from the surface streams in the area, from a nearby wetland, and from a groundwater spring. While the autosampler had some issues in the first few weeks, as it only successfully collected 1 stream water sample when it needed to collect closer to 24, all the issues have now been resolved. Newly hired summer students from the departments of Geography and Environment have experienced their first few field visits and have helped immensely in collecting and analysing the water samples. Things are finally running mostly smoothly!

While some of the hard work is done, there is still plenty more that needs to be done. In the next few weeks, several shallow groundwater wells will have to be installed in a process similar to installing the soil moisture profilers, but a much bigger and deeper hole will have to be made. Hopefully, this installation will be more successful, and no extra pieces of equipment will remain stuck in the ground; there is already one Excalibur at the Gault!

EPS RESEARCH

STUDYING THE EVOLUTION OF THE VOLCANIC AND HYDROTHERMAL SYSTEM OF THE POÁS VOLCANO

By Gustavo Villarruel, PhD. Student in the Volcanology Lab

Hi! My name is Gustavo Villarruel, I'm from Argentina and I started my PhD in Fall 2023 at EPS in the Volcanology Lab under the supervision of Dr. John Stix.

My research focuses on the use of Unoccupied Aerial Systems (UAS, aka drones) to study active volcanoes. More specifically, I am interested in volcanoes prone to phreatic eruptions. Phreatic eruptions involve the explosive discharge of shallow water in a volcano due to the input of magmatic heat and fluids. These eruptions are among the most unpredictable and dangerous geologic events, given the lack of precursors and the complexity of multiple factors at play. Examples of the powerful yet dreadful nature of these phenomena include the eruption of Mount Ontake (Japan) in 2014, that resulted in more than 60 casualties and the eruption of White Island (New Zealand) in 2019, which took the life of 27 tourists and was recorded in a Netflix documentary. These examples show that anyone in the surroundings of an active volcano hosting a hydrothermal system is in danger.



Plume in the crater at Poás volcano [credit: McGill Volcanology Group Website].



DJI Matrice 100 drone with Multi-GAS sensor attached underneath, used in Campi Flegrei field campaign in March 2004.

For my research I will focus on Poás volcano, Costa Rica. This stratovolcano exhibits frequent phreatic eruptions, the last of which occurred in January and April this year. To study the evolution of the volcanic and hydrothermal system of Poás I will deploy a thermal infrared sensor, gas sensors, and LiDAR using drone platforms during multiple field campaigns. The data generated through these techniques will allow me to study the evolution of thermal anomalies, gas emissions and ground deformation at Poás. I will also analyze seismic data provided by OVSICORI (Observatorio Vulcanológico y Sismológico de Costa Rica). By analyzing and comparing these different datasets, I hope to gain insight into different potential precursors for phreatic eruptions in Poás to better prepare communities against this type of hazard and understand the physical and chemical processes involved.

EPS RESEARCH

STUDYING THE EVOLUTION OF THE VOLCANIC AND HYDROTHERMAL SYSTEM OF THE POÁS VOLCANO (CONT.)

In preparation for fieldwork at Poás, and under the mentorship of my advisor, I built a miniaturized Multi-GAS sensor capable of detecting and measuring carbon dioxide, water vapor and hydrogen sulfide in volcanic plumes. We were able to successfully test this device in a field campaign in March to Campi Flegrei volcano, Italy. This volcano has two main fumaroles that have been continuously degassing over the last 20 years. Our gas data, along with plume speed data determined by velocimetry algorithms and provided by Dr. Alessandro Aiuppa from the University of Palermo, allowed to calculate CO₂ fluxes. Our results are in close proximity to independent CO₂ flux calculations from Dr. Aiuppa and Dr. Stefano Caliro from the INGV (Istituto Nazionale di Geofisica e Vulcanologia). During the field campaign we also tested a sonic anemometer and thermal infrared camera provided by Dr. Margaret Kalacska's lab (Geography Department). The data collected with these sensors and with the MultiGAS is under current study and will be used to create an automated processing program to analyze the data collected at Poás.



Gustavo Villarruel, John Stix, Jessica Salas-Navarro (from McGill Volcanology Lab), and Stefano Caliro (INGV) during field campaign in Campi Flegrei, March 2024.

I am very excited to be part of EPS and I look forward to contributing to the department through my research and participation in outreach activities.

I want to thank all the people and research labs mentioned here for their support in my research, as well as the McGill GREAT Award and McGill Graduate Mobility Award for their important financial support for my fieldwork.

EPS RESEARCH

SHORT-CHAIN FATTY ACIDS, A NEW TOOL TO DECIPHER THE PAST CHANGE IN THE FOOD WEB

By Estelle Allan, a postdoctoral researcher at Geotop–McGill

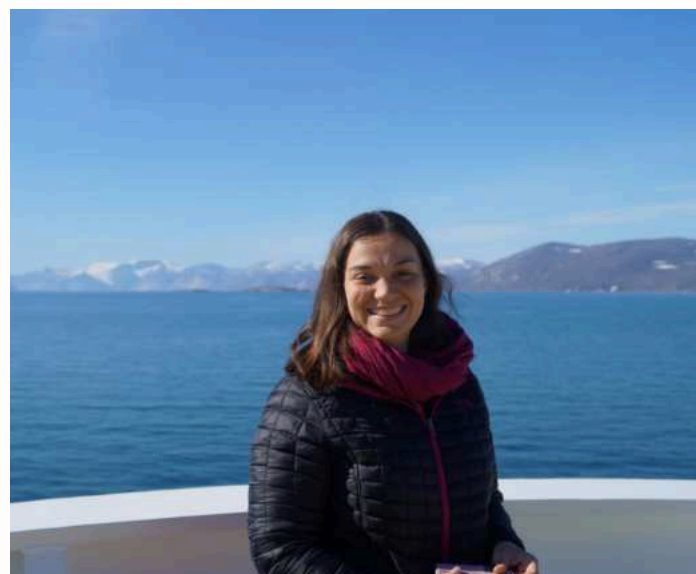
This project is funded in part by the Geotop collaborative research projects

Climate changes are causing ocean warming, which has dramatic consequences for the biogeography of organisms ranging from phytoplankton to marine mammals, forcing species to migrate poleward or to deeper waters to remain within their optimal environmental niche (IPCC, 2019). The polar oceans have already experienced warming in the geological past, notably, during the Holocene Thermal Maximum (HTM), although on a longer time scale and with natural causes. Around Greenland, the HTM warming included a sea ice retreat, a decline of the Greenland Ice Sheet mass, and a loss of many glaciers, leading to an increase of meltwater discharge to the ocean. These high meltwater discharges have been linked to strong marine water stratification and an increase in primary productivity.

Ocean primary productivity is a key process in the ocean carbon cycle, as almost half of the photosynthesis on Earth that is carried out by phytoplankton in the ocean. During photosynthesis, phytoplankton absorb carbon dioxide from the atmosphere, but most of this CO₂ is released again during the respiration of the phytoplankton itself or when it is consumed by zooplankton, bacteria, fish, or marine mammals. A small amount of the carbon fixed during photosynthesis is converted to organic matter (OM), and can sink into the deep ocean, but a lot of it is consumed by microbes and other heterotrophs on the way down. Of the OM produced in the photic zone, typically less than 20% reaches the deep ocean, and in deeper water, less than 1% of the total OM produced at the surface is eventually preserved in marine sediments. But in the coastal ocean, about 10% of OM escapes oxidation and is buried. The other 90% is partly remineralized through microbially-mediated aerobic or anaerobic pathways. All the same, the OM deposition in the sediments can be an important sink of atmospheric carbon dioxide.

Fatty acids are lipids composed of chains of carbon and hydrogen atoms. The chain length indicates the sources of OM, with long chain fatty acids being produced by terrestrial plants whereas short chain fatty acids originate from algae and bacteria. Hence, the chain length of lipids preserved in sediments can be used to reconstruct OM sources and paleoenvironmental conditions.

Our work is focused on the analysis of the short chains of fatty acids, notably the palmitic acid (PA) (i.e., 16 carbon atoms). PA can be produced by phototrophic and heterotrophic algae, as well as by microbes. PA is abundant in marine sediments and the determination of its hydrogen and carbon isotopic compositions ($\delta^2\text{H}$ and $\delta^{13}\text{C}$) can be carried out relatively small sediment samples. PA can be a useful tracer of the source of labile carbon and the metabolisms involved in its production. It is also a potential indicator of the trophic level of organic matter and/or carbon recycling.



EPS RESEARCH

SHORT-CHAIN FATTY ACIDS, A NEW TOOL TO DECIPHER THE PAST CHANGE IN THE FOOD WEB (CONT.)

Our initial research led us to do a calibration of the $\delta^{2}\text{H}_{\text{PA}}$ and $\delta^{13}\text{C}_{\text{PA}}$ in surface sediments from the Baffin Bay and the Labrador Sea. We found evidence that the relative abundance of photoautotrophic and heterotrophic metabolisms influences the PA isotopic composition. Specifically, less negative isotopic values, or higher $\delta^{2}\text{H}_{\text{PA}}$ and $\delta^{13}\text{C}_{\text{PA}}$, are caused by higher heterotrophic biodegradation in the water column and/or in the sediment.

Using the same methodology, we went back in time with the investigation of the core SA13-ST3-20G, which was collected offshore of Nuuk on the southwest Greenland margin. With this research, we were able to reconstruct the changes in the marine food web from the last 12,000 years. We discovered that during the Holocene Thermal Maximum, the large increase in primary productivity in the southwest Greenland margin was almost fully counteracted by heterotrophic respiration, and did not lead to increased carbon burial, contrary to what we expected.



We propose that isotopic analysis of short-chain fatty acids preserved in the sediment can provide insights into unresolved questions regarding the response of marine ecosystems and carbon burial to climate change. This approach will be crucial for understanding the feedback mechanisms of the carbon cycle to future climate change, including predicted increases in primary productivity in polar oceans.

For this project, I had the help of the Geotop researchers Peter Douglas, an expert in the application of isotope and organic geochemistry in paleoclimatology and biogeochemistry, Anne de Vernal, an expert in polar and subpolar marine palynology and paleoceanography, Yves Gélinas, an expert in organic geochemistry and analytical biogeochemistry and Alfonso Mucci, an expert in aqueous geochemistry, carbonate isotope geochemistry, and sedimentary biogeochemistry.

EPS RESEARCH

ANTARCTIC POLAR EARTH OBSERVING NETWORK (POLENET) FIELD WORK

By Erica Lucas, Postdoctoral Fellow in the Gomez Research Group

Erica Lucas, a postdoctoral fellow in the Gomez Research Group, was a member of the Antarctic Polar Earth Observing Network (POLENET) field team for the Winter '23-'24 season. POLENET currently consists of ~30 autonomous seismic and GNSS stations deployed across much of West Antarctica. An active network since 2007, POLENET has helped to drastically improve the coverage of geophysical observations in Antarctica.

The POLENET datasets have not only helped to improve our understanding of the geological history and geophysical structure of Antarctica but have been critical for advancing constraints on solid Earth – ice sheet feedback processes which influence the past, present, and future behavior of the Antarctic Ice Sheet. During the '23-'24 season, the POLENET field team visited 14 sites across West Antarctica, including stations located on Thwaites Glacier, in the Transantarctic Mountains, in Marie Byrd Land, and on Thurston Island.

The team was based out of Union Glacier Camp in the Ellsworth Mountains and took day trips in a Twin Otter fixed-wing ski plane to service the field sites. A typical site visit entailed fixing broken station components, replacing old batteries, and retrieving the seismic data. Unlike the GNSS data, which can be telemetered, the seismic data cannot be telemetered and, therefore, must be retrieved from the station during site visits. As a number of sites had not been serviced for several years, extensive digging was required to reach seismic sites deployed in high snow-accumulation areas.



The POLENET field team on Backer Island. Credit: Nikko Bayou



Installing a new seismic site on Gould Knoll. Credit: Nikko Bayou



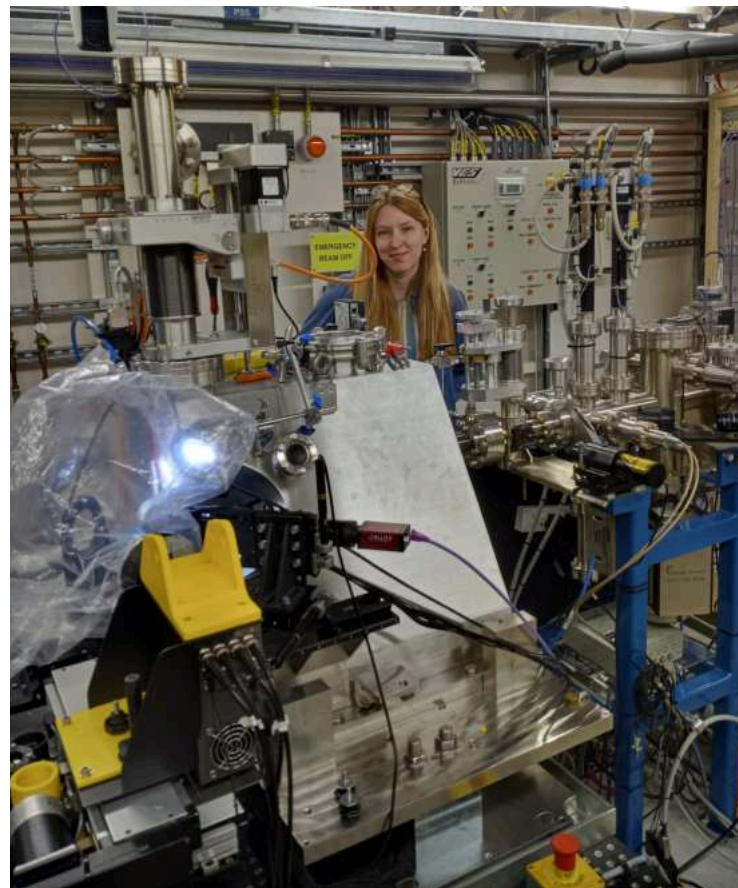
Servicing a GNSS site in the Transantarctic Mountains. Credit: Nikko Bayou

EPS RESEARCH

HOW CLIMATE CHANGE AFFECTED DINOSAURS

By Don Baker, Professor

Prof. Don Baker continues his research on volatiles in magmatic systems and their influence on igneous processes. Working together with an international team he published two significant papers on volatiles in nakhlite meteorites from Mars (Baker et al., 2023) and in the Deccan Traps large igneous province (Callegaro et al., 2023). These works investigated sulfur and halogens in the magmatic systems by combining measurements of these volatiles in phenocrystic clinopyroxenes with experimentally determined partition coefficients to determine their concentrations in the melts from which the clinopyroxenes grew. With this knowledge of the volatiles in the melt we can estimate both the concentrations of volatiles in the source regions of the magmas and the amounts released into the atmosphere.



Raven and the I18 beamline at Diamond Light Source

The nakhlite study indicated that source region of the magmas that cooled and crystallized to form the nakhlite meteorites had a S concentration between 20 (5 % melting) to 120 ppm (30 % melting), Cl between 16 to 97 ppm, and F between 14 to 48 ppm.

These concentrations in the nakhlite magma source region are similar to previous estimates for the martian mantle; our calculated source region concentrations of F and Cl agree best with previous estimates if the martian mantle undergoes 10 to 20% melting to produce primary magmas that evolve to be parental to nakhlites. However, our maximum estimated sulfur concentration of the source (calculated for 30 % melting) is near previous minimum estimates for the martian mantle, suggesting the possibility that the nakhlite source region is depleted in sulfur relative to much of Mars' mantle. Our study also demonstrated strong enrichment of the rims of clinopyroxenes in sulfur and chlorine indicating significant assimilation of sulfur by the nakhlite magmas near the end of crystallization, a phenomenon we have yet to document in terrestrial rocks.

EPS RESEARCH

HOW CLIMATE CHANGE AFFECTED DINOSAURS (CONT.)

In the study of the Deccan Traps large igneous province (Callegaro et al., 2023) we found that the amount of sulfur released could have triggered a global drop in temperature around the world—a phenomenon known as a volcanic winter. Our research demonstrates that climatic conditions were almost certainly unstable, with repeated volcanic winters that could have lasted decades, prior to the extinction of the dinosaurs. This instability would have made life difficult for all plants and animals and set the stage for the dinosaur extinction event. Thus our work helps explain this significant extinction event that led to the rise of mammals and the evolution of our species. The findings mark a step forward in piecing together Earth's ancient secrets and pave the way for a more informed approach to our own changing climate.

Don and his students, most recent graduates Maude Bilodeau (M.Sc. 2023) and Raven Polk (M.Sc. 2023) continue the research on nucleation delay in magmatic systems (Maude) and the assimilation of sulfates by magmas (Raven). Current Ph.D. student Tom Crouzal is demonstrating the surprising effects of volatile enrichment or depletion around bubbles on their ascent and interaction in magmatic systems.



Read more about this study:

- [CTV News](#)
- [Washington Post](#)
- [Forbes](#)

EPS RESEARCH

THE PRECAMBRIAN RESEARCH OFFICE (AND PUBLICAN SOCIETY): LOOKING FOR LIFE IN ALL THE RIGHT PLACES

By, Galen Halverson, Professor

The PROPS research group uses the sedimentary record to investigate the co-evolution of life and environment, with an emphasis on the Proterozoic geological record and the evidence and impact of increasing biospheric complexity. We have had a busy few years since the post-pandemic resumption of travel and fieldwork; ongoing graduate student and postdoc projects include:

1. The cyclostratigraphy of the Terminal Ediacaran Nama Group and the role of astronomic forcing on early animal evolution (Bissick),
2. The composition and evolution of Neoproterozoic reef systems as a window into increasing biospheric complexity (Spruzen),
3. Early algal habitats (Maloney),
4. The geological record of eukaryogenesis (i.e., the origin of eukaryotes; Lechte and dos Santos), and
5. Sequence stratigraphy and geochronology of the lower Paleozoic succession in Quebec (Musajo and Zimmt).

This exciting research, supported by a variety of public and private funding sources (e.g. NSERC, FRQNT, Simons Foundation, PCSP), includes a large field component; in the past year and a half, we have worked in southern Namibia, west-central Yukon, Death Valley, the Montreal area, Anticosti Island, Western Australia, and the Iron Ranges of Minnesota, mapping, logging outcrops and drill cores, analyzing sedimentary facies, and collecting samples for micropaleontology, geochemistry, and geochronology.

Additionally, Maloney, Spruzen, Musajo, and I ran a fieldtrip to Portugal and Spain in March, officially relaunching EPS' advanced sedimentary geology and sequence stratigraphy field trip (see separate section on departmental trips in this newsletter for more info).



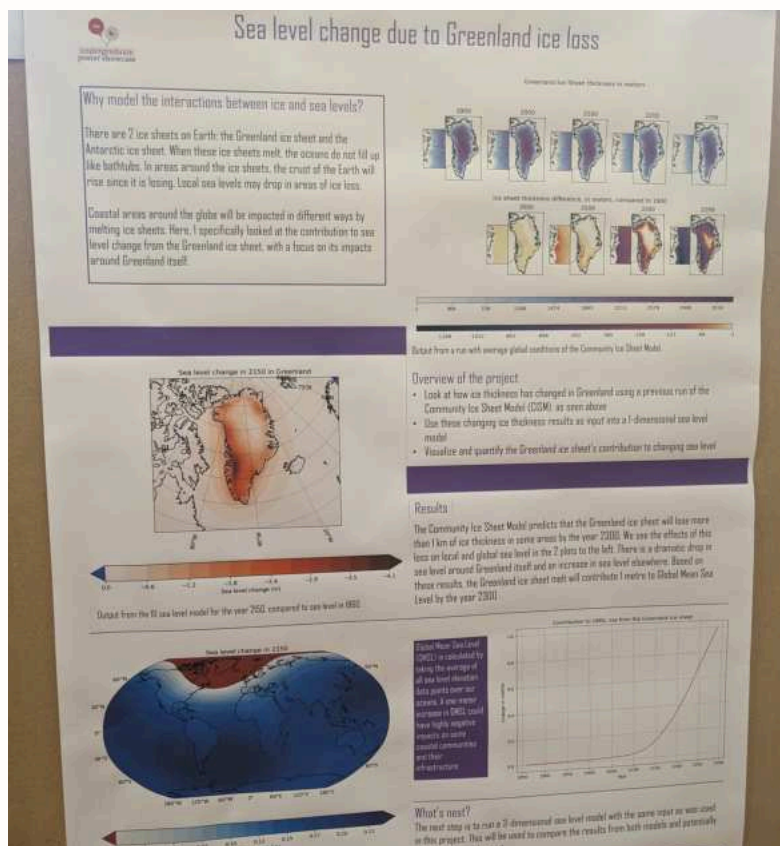
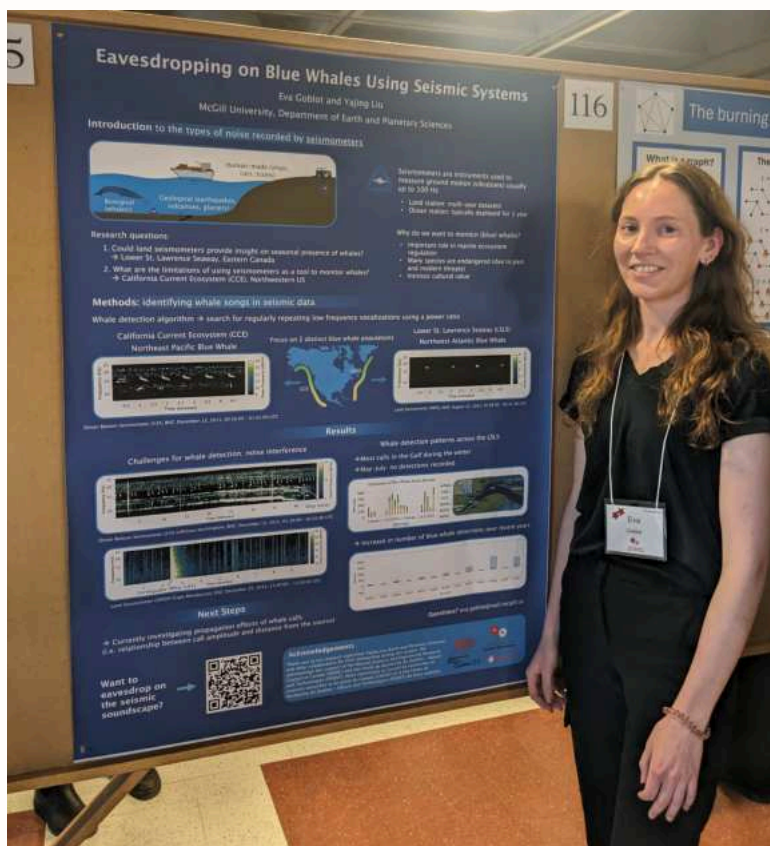
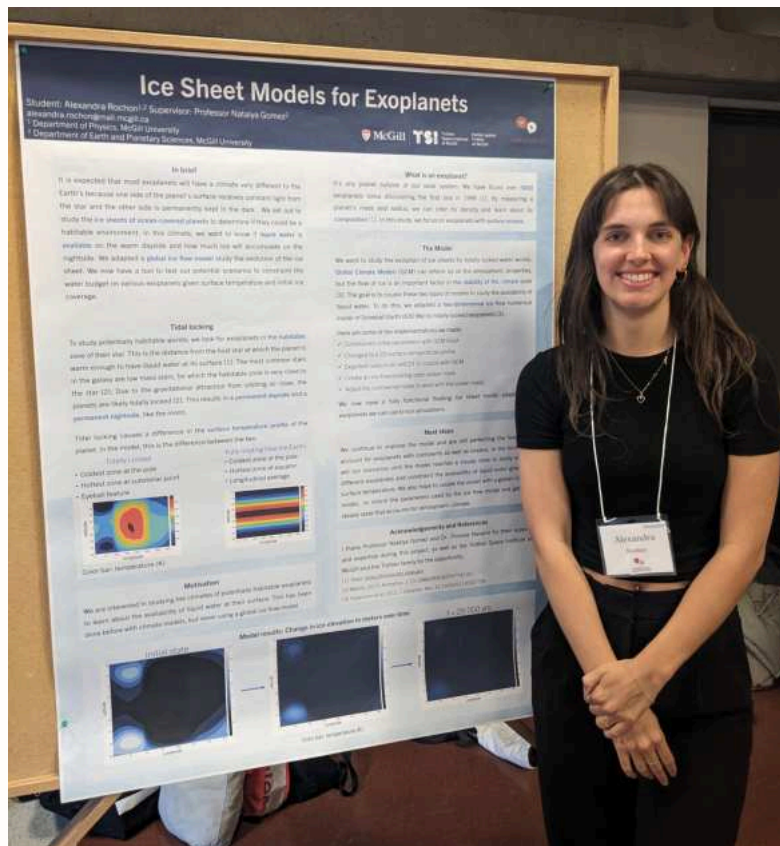
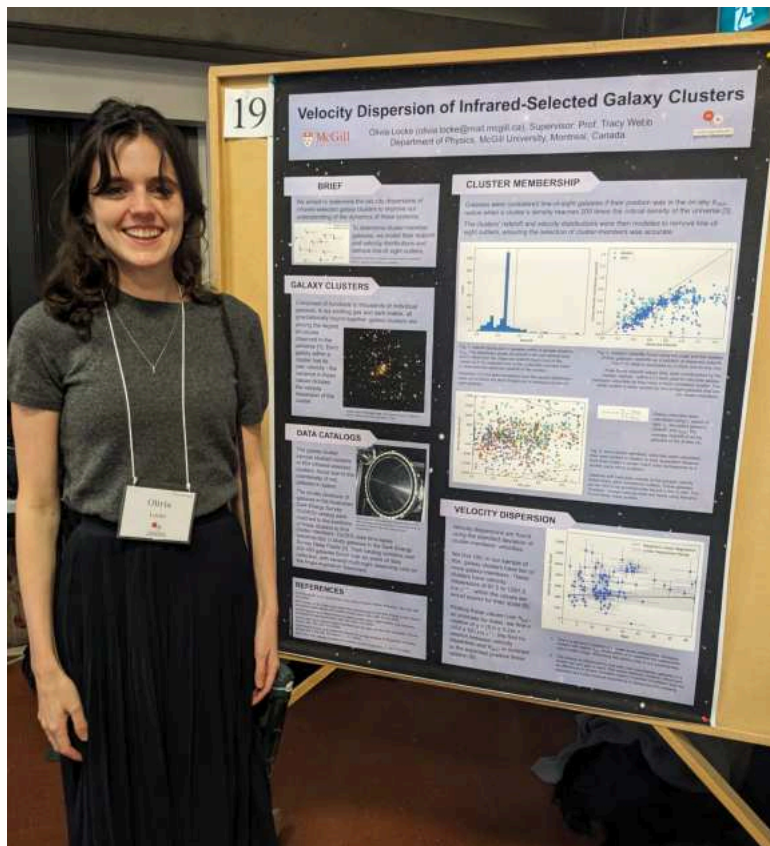
Cycles, cycles everywhere! Bianca Spiering, Frits Hilgen (both from the University of Utrecht) and Ajani Bissick contemplate the astronomical origins of Schwartzrand Formation cycles in the southern Nama Basin of Namibia.



Time for a photo! Max Lechte (in foreground) prepares to take a picture of the field party walking towards the ca. 815 Ma Reefal Assemblage of the Fifteenmile Group (background) in the Ogilvie Mountains, Yukon.

EPS TALKS

Undergraduate Poster Showcase



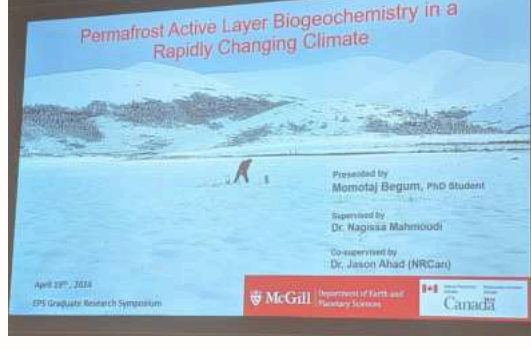
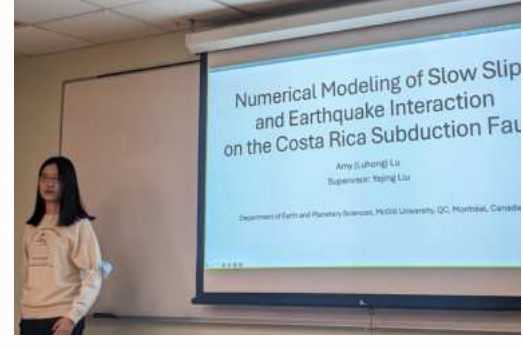
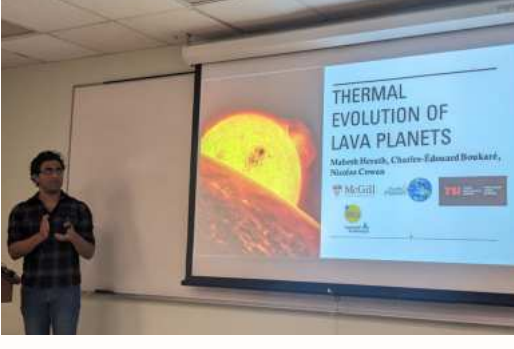
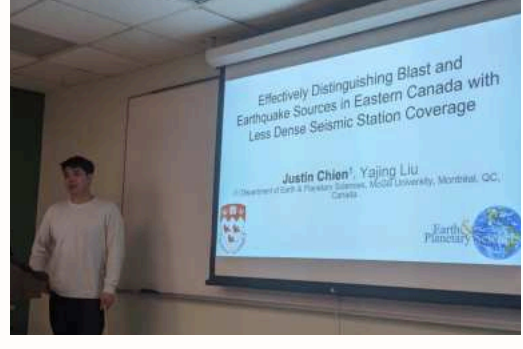
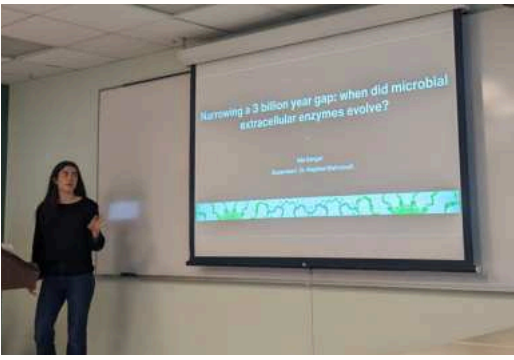
EPS TALKS

Undergraduate Research Symposium (hosted by the Monteregian Society)



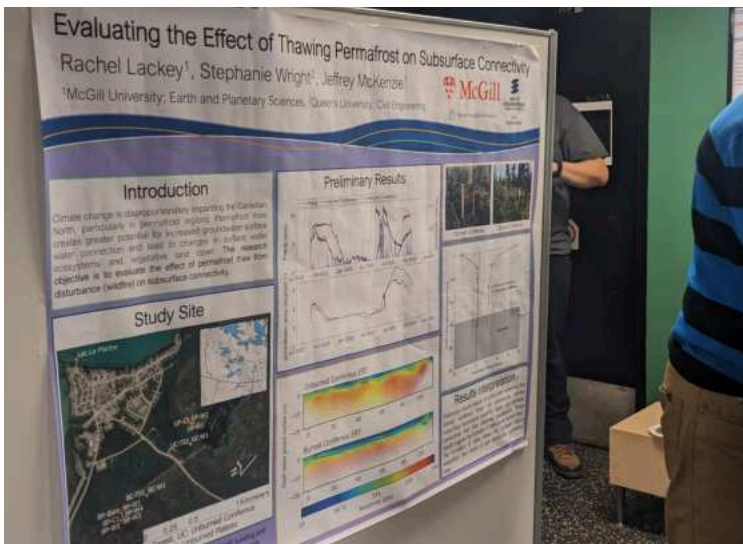
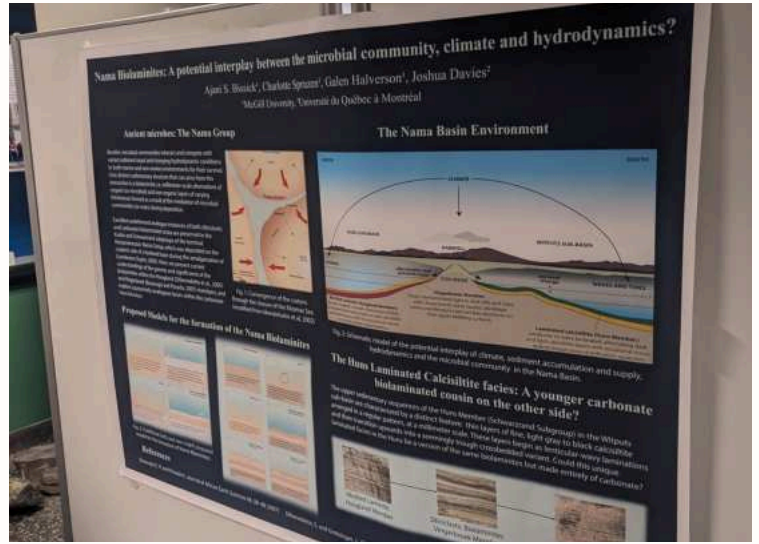
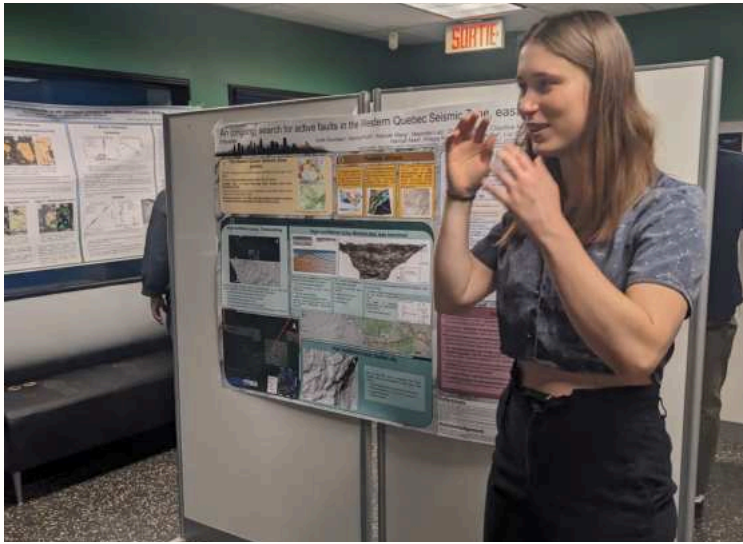
EPS TALKS

Graduate Student Research Symposium



EPS TALKS

Graduate Student Research Symposium (cont')



EARTH SYSTEM SCIENCE UPDATES

By Bill Minarik, ESS Undergraduate Advisor

The majors and minors of the Earth System Science program form an essential part of our community. Earth System Science is a science major combining the fields of Atmospheric and Oceanic Sciences, Earth and Planetary Sciences, and Physical Geography. Since the first students finished in 2009 we have graduated 72 Majors, 22 with Honours (starting in 2014).

Earth System Science students feel at home in each of the three departments and have a dedicated room/lounge in Burnside Hall. They are active in the Monteregian Society and most years plan an ESS May field trip: the last two took place in Newfoundland and Iceland.

Below is a sampling of the diverse research thesis topics of our Earth System Science majors:

- Greenhouse gas emissions from cranberry fields under irrigation and drainage in Quebec
- A climatology of North American air masses and their extremes in Montreal, Quebec
- Exploring the effect of a changing landscape on water storage in the Schullcas River Basin
- Development of an automated tool in R to compute complex linear home range (CLHR)
- Bayesian Updating of Land Cover Classifications
- Estimation of Ice Wedge Volume on Frosheim Peninsula, Ellesmere Island, Canadian High Arctic
- Modeling particulate behavior in GEOTRACES trace metal data
- Modeling Basal Sea Ice Melt in the Viscount Melville Sound
- Measuring sea level variations using reflection techniques: An assessment of coastal GPS stations in Greenland
- Investigating Volcanic Seismicity in the 2007-2008 Nazko Earthquake Swarm
- Rare Earth Elements in the St. Lawrence Estuary and Saguenay Fjord
- Coastal Sea Ice Break Up Events in Beringia
- Late Holocene record of processes controlling carbon burial in Lake Melville, Labrador
- Characterizing microbial community composition and diversity in the Gulf of St. Lawrence.
- Dynamic rupture model for the 2019 Mw 7.1 Ridgecrest earthquake
- Examining the dynamics and drivers of mercury in over 200 years in sediment records from low-impact Canadian lakes
- A Global Perspective on Hunter-Gatherer Time Allocation
- Threat Networks Impacting Global Freshwater Biodiversity: The Interconnected Nature of Multiple Threats
- The comparison between ice thickness derived from a model and cosmogenic nuclide ice thickness data in the Ross Sea drainage basin
- Weather-Driven Complementarity between Daily Energy Demand at One Location and Renewable Supply at Another
- Climate Signals in the St. Lawrence River Water Levels and Discharge
- Interruptions of the Atlantic Meridional Overturning Circulation in a global coupled model, with and without freshwater forcing
- Detecting Blue Whale Calls in the Northeast Pacific Using Seismic Systems



Check out the newly updated [Earth System Science website](#)

HOMECOMING 2023

As per tradition, EPS hosted a celebration on the second floor of FDA during McGill Homecoming. The party was well attended and a welcome diversion from the busy semester and a month of bad news. Spirits were high and what we had thought were ample party provisions were handily consumed by early evening. In addition to many students past and present, Anne and Kristy attended, providing for a reunion with emeritus professor and two-time former department chair, Andrew Hynes, along with his partner Myrna, as well as with our other (more recently) retired two-time former chair, Al Mucci. A fine homecoming, indeed!



GRADUATION PARTY 2024



OUTREACH AND RECRUITMENT ACTIVITIES



Fall Welcome Activity



“Can You Make The Earth Shake?”



Tabling activities at McGill and John Abbott College



OUTREACH AND RECRUITMENT ACTIVITIES (CONT.)



Open House 2023



Eclipse Viewing Fair

Space and Earth Trivia & Rocks and Minerals



THE ADAMS CLUB UPDATES

On the weekend of September 23rd, 2023, the annual Department of Earth and Planetary Sciences Graduate Camping Trip was held at Parc National de Frontenac. With 19 graduate students, both new and old, joining we had multiple cars go up on the Friday and return on the Sunday. The highlight of the trip was on Saturday when the group rented canoes and paddled around the lake, stopping at various beaches and campsites along the way to eat lunch and enjoy the sun for 4 hours before heading back to the campsite. During our 2 nights of camping, we played many games, more active ones while the sun was up and games that could be played around the campfire at night (ex, cards and werewolf).



Together, we cooked, shared snacks and stories around the campfire and became better friends. By Sunday, many did not want to leave, and some continued the adventure by hiking nearby. The EPS Graduate Camping Trip offers an amazing opportunity for graduate students to bond, especially offering new students a warm welcome to the tight-knit community of EPS. This trip, among many other aspects of graduate student life, would not be possible without the generous contributions of donors, so from the bottom of our hearts, we thank you.

By Jared Splinter (PhD. Student) and Gary Fung (MSc. Student), EPS Camping Trip Organizers 2023

THE ADAMS CLUB UPDATES (CONT.)

The Adams Club also went apple picking a few weeks later and Inga Boianju, the Oleg representative, organised a few talks where graduate students talked about their fieldwork and experiences.



The Québécois Cinéma night has now been running for more than 1 year! Aube and Maude wanted to facilitate access to Québécois and francophone culture in EPS by hosting a monthly cinéma night, projecting Québécois movies in French with English subtitles. Here, you can see a picture that was taken during the projection of "Monsieur Lazhar" by Philippe Falardeau. Stay tuned for the summer sessions! SCOOP: we will probably project "1981" by Ricardo Trogi, "Niagara" by Guillaume Lambert, and "Les Rose" by Félix Rose.

If someone wants to take over, feel free to reach out to Aube Gourdeau! She will graduate at the end of the summer!



MEMORABLE MOMENTS



Fall BBQ on Mount Royal



Geology in the Field visit to the Gault Nature Reserve

MEMORABLE MOMENTS



EPS Bring Your Pet to Work Day

MEMORABLE MOMENTS



EPS Christmas Party

MEMORABLE MOMENTS

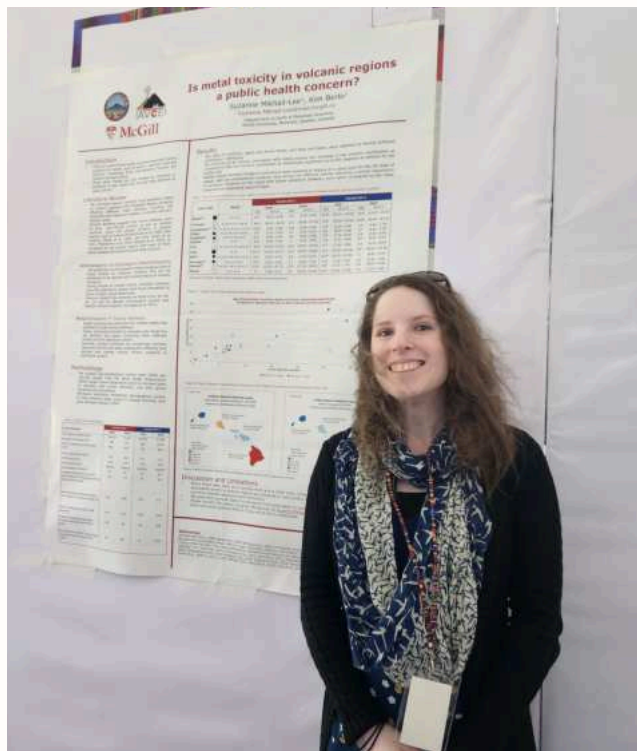


Prospectors and Developers Association of Canada convention



Geotop Conference 2024

MEMORABLE MOMENTS



Suzanne Mikhail-Lee, PhD, presenting her research on the potential for metal toxicity in volcanic environments at the 12th iteration of the Cities on Volcanoes conference in La Antigua, Guatemala



A side view of a fossilised oyster found in the Tabernas Basin and gypsum crystal from the Lorca Basin, taken by Charlotte Spruzen, PhD., during the Portugal- Spain Sedimentology Excursion

MEMORABLE MOMENTS



Faculty of Science Scholarships and Awards reception



Aube Goudreau, M.Sc., presented her research on active faults in Eastern Canada at the Seismological Society of America Annual meeting in Anchorage, Alaska.

MEMORABLE MOMENTS



A group of students/ alumni from Willy's group attended GAC-MAC-PEG 2024 at Brandon University in Manitoba on 19th-22nd May and celebrated the end of conference on the last day.



EPS Hockey Team: The Stoners

MEMORABLE MOMENTS



The extended PROPS Group at a going away dinner for Max Lechte, who returned to Melbourne, Australia after nearly 5 years as a post-doc in EPS. Katie Maloney and Joshua Zimmt will also soon be parting for new positions.



The McGill SEG Student Chapter organized a mine visit to Nouveau Monde Graphite Matawinie deposit at Saint-Michel-des-Saints on 28th May 2024, in collaboration with UQAM and Cornell SEG Student Chapter

The Anne Kosowski Fund

Celebrating her dedication to supporting EPS Graduate students

From students to postdocs, staff and visitors – everyone who has passed through the second floor of the Adams building since 1983 has had their experience shaped by Anne.



In April 2023, Anne, the veritable legend who has held the Earth and Planetary Sciences (née Geology) Department together for nearly 40 years, retired. In celebration of her contributions to our community, we are proud to launch the Anne Kosowski Fund to support graduate students in times of need – just as Anne did during her long service to the Department.

Anne was famous for fixing bad paperwork, identifying precious resources, crafting annual EPS newsletters (enough to fill a shelf in the Schulich Library), and rescuing scores of grad students in difficult positions – always with a smile. The numerous annual Departmental events she planned and hosted created that unique sense of family that was felt by all during their time at McGill and beyond.

We invite you to join us in honouring Anne's many contributions that helped to shape the educations, careers, and quality of life of students, postdocs and colleagues. While it's hard to imagine EPS without her steady hand at the wheel, the Anne Kosowski Fund will retain her legacy of graduate student support.

We have set a goal of raising \$75,000 by December 31, 2023, to establish this support fund in perpetuity. Thank you for considering supporting this initiative and making a difference.

MADE
by McGill

"I've learned that people will forget what you said, people will forget what you did, but people will never forget how you made them feel."

-Maya Angelou

Donate to the Anne Kosowski Fund

WWW.MCGILL.CA/EPS



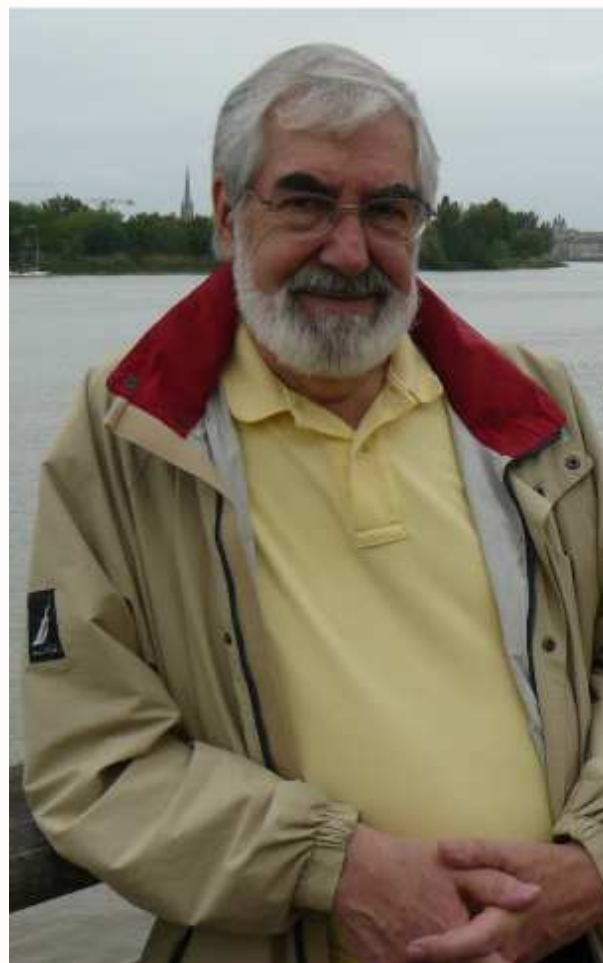
IN MEMORIUM

Bjorn Sundby

Bjorn Sundby, an adjunct professor in EPS and emeritus professor at Université du Québec à Rimouski, passed away in January 2023 while in Nice with his wife, Danièle.

Bjorn was born and educated in Bergen, Norway, where he obtained all formal university degrees in chemistry and physical chemistry. He was granted a Doctor of Philosophy (chemical oceanography) from the University of Bergen in 1987.

In 1966, Bjorn moved to the U.S.A., where he was a Senior Research (soap) Chemist at the Colgate Palmolive Company in New Jersey. In 1972, he moved to Canada, where he held a post-doctoral fellowship at the Bedford Institute of Oceanography in Dartmouth, Nova Scotia. In 1974, he took on a position as a National Research Council of Canada (NRC) Research Associate at Université du Québec à Rimouski (UQAR). In 1984, he became a Professor of Oceanography (Marine Geochemistry) at UQAR. After a sabbatical leave at Chalmers University of Technology and the University of Gothenburg in Sweden, he moved to Holland in 1984, where he was Head of the Department of Chemical Oceanography and Marine Pollution at the Netherlands Institute for Sea Research in Texel and Chair of the Chemical Oceanography Commission at the Netherlands Council for Sea Research. In 1987, he returned to Quebec, where he was Director of the Physical and Chemical Oceanography Branch at the Department of Fisheries and Oceans' Maurice Lamontagne Institute in Ste-Flavie.



After getting a taste of the bureaucracy, in 1992, he returned to full-time research as Professor of Marine and Environmental Geochemistry at l'INRS-Océanographie in Rimouski. After a short stint at INRS-Eau in Québec City, he returned to the Department of Oceanography at UQAR from which he retired in 2010. In 1996, Bjorn and his family (Danièle and their daughter Kim) settled in Montreal for a sabbatical year in the Department of Earth and Planetary Sciences (EPS) at McGill. He became an adjunct professor in the department, co-supervised and advised a multitude of graduate students in EPS, and spent the rest of his life with his family in Montreal. Many of the graduate students whom he befriended over the years referred to his office as "Bjorn's coffee shop" because he would offer them a strong cup of coffee when they visited to discuss their research, life, and many other topics. His balanced and optimistic perspective and input are deeply missed.

Bjorn served the national and international oceanographic community in various capacities, most noteworthy of which was Secretary of the Canadian National Committee for SCOR (Scientific Committee on Oceanic Research) between 1996 and 2000 and Chair of the same committee between 2003 and 2006. Between 2004 and 2008, he served as the International President of SCOR.

We all lost a good friend and an outstanding scientist. He taught many of us so much and was a kind mentor. On April 14, 2023, a celebration dinner of his life was held at the McGill Faculty Club. It was attended by family, former students, and friends.

IN MEMORIUM

Colin Stearn

Colin Stearn was born on July 16, 1928 in Bishop's Stortford, England and immigrated to Canada as a child. He spent his formative years in Hamilton, Ontario, graduating from McMaster University in 1949 with a B.Sc. in Honours Geology. A newly minted PhD graduate from Yale University in 1952, he was hired that same year as Assistant Professor in our department of Geological Sciences. He taught historical geology, invertebrate paleontology and paleoecology until 1993.

With T.H. Clark, Colin Stearn co-authored in 1960 textbook *The Geological Evolution of North America* in which the geosynclinal theory of mountain building was a paradigm. Stearn updated the text in later editions with McGill University's professor Robert Carroll (Biology) to include plate tectonics. The book remained a standard in university-level geology well into the 1980s. Stearn also co-authored with Carroll the textbook *Paleontology: the Record of Life*.

His research interests included the Silurian and Devonian stratigraphy of the Western Canada Sedimentary Basin, the Arctic Archipelago and the Hudson Bay Lowland. His interest in the nature of mid-Paleozoic reefs was focused on their principal builder, the stromatoporoids. In 1972, he outlined their link to sclerosponges, a new order of poriferans discovered in Jamaica. The resulting taxonomic revision of the genera of Paleozoic stromatoporoids, compiled with collaborators B. D. Webby, H. Nestor and C.W. Stock, still appears in the *Treatise of Invertebrate Paleontology*.

In the seventies and early eighties Stearn and his students worked on the growth and destruction of modern reefs in Barbados, adding Recent invertebrate subfossils to the departmental teaching collections.

Colin Stearn also served as departmental Chair from 1969–1974. His retired colleague Andrew Hynes wrote us "I cherish the extent to which he encouraged the Department to let the younger members, such as myself and Don Francis, to be heard and listened to at departmental meetings."

On retirement, Colin Stearn was named Emeritus Professor but soon moved to Kitchener, Ontario, closer to family. He visited the department the year before the pandemic and was pleased to see that his teaching collection remained in use in the newly renovated Adams 211 classroom. He passed away on January 2022 in Waterloo, Ontario.



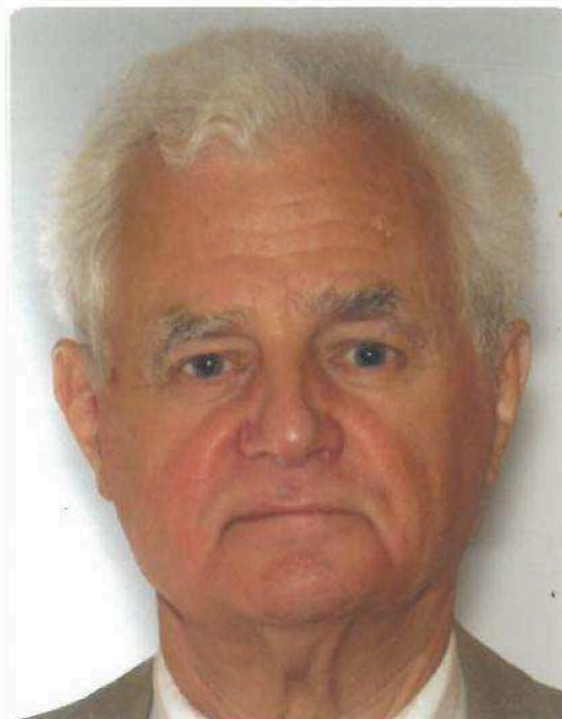
IN MEMORIUM

Reinhard Hesse

Reinhard Hesse died on May 3, 2023 in Montreal, Canada at the age of 87 after a fulfilling life. At the time, he was Emeritus Professor at the Department of Earth & Planetary Sciences of McGill University, which he originally joined in 1969 as an Assistant Professor.

Through his years as a professor in the Department, he taught clastic sedimentology and diagenesis through undergraduate and graduate courses and memorable field trips along the St. Lawrence River and into the Maritimes. Professor Hesse was an internationally renowned earth scientist who made wide-ranging contributions to the disciplines of sedimentary and marine geology.

He participated in several legs of the Deep Sea Drilling and Ocean Drilling expeditions. He investigated the diagenesis of biogenic siliceous sediments, reported the discovery of clathrates in deepwater terrigenous sediments, applied clay mineralogy to the mapping of diagenetic grade of sedimentary rocks of the Appalachians and wrote about the origin of sedimentary concretions.



As a result of his group's pioneering work on the Northwest Atlantic Mid-Ocean Channel (NAMOC) system of the Labrador Sea, the sedimentation processes are better known in the Labrador Sea than on any other glaciated continental margin and have become an essential reference for related studies around Antarctica and elsewhere.

Professor Hesse retired from McGill in 1996 after which he became an Honorary Professor at the Ludwig Maximilians University of Munich where he organized interuniversity short courses and lectured at the Institute of Geology, Geophysics and Mineralogy of Bochum, Germany.

In 2009, he was awarded the Michael J. Keen Medal, by the Marine Geosciences Division of the Geological Association of Canada (GAC). His last major accomplishment is the 2021 textbook *Diagenese klastischer Sedimente* (Diagenesis of Clastic Sediments) written and edited with Reinhard Gaup.

Roger Webber

Roger Webber died on January 22, 2021, at the age of 94. Roger taught geology at McGill University and, in retirement, became a watercolour artist.

Joan Webber

Joan Webber died on March 29, 2024 at the age of 93 years old. She was predeceased by Roger, her loving husband and constant companion for 67 years.

Martin Heiligmann

Martin Heiligmann died on April 15, 2023 at the age of 56. A lover of nature and of the great outdoors, he will be missed by his many friends and colleagues and by the wider geological community.

STAY CONNECTED

Upcoming EPS Events

- EPS Welcome Activity (TBD)
- Fall Picnic (September 24, 2024)
- Homecoming 2024 (October 25, 2024)
- EPS Alumni Reception at PDAC (March, 2025)
- Convocation Party (May, 2025)



Alumni tell us what you've been up to!

Fill out the form on the [EPS website](#) and we'll feature you.

STAY CONNECTED

Instagram: [eps.mcgill](https://www.instagram.com/eps.mcgill)

Twitter: [eps_mcgill](https://twitter.com/eps_mcgill)

LinkedIn: [The Department of Earth and Planetary Sciences, McGill University](https://www.linkedin.com/company/the-department-of-earth-and-planetary-sciences-mcgill-university)



Special thanks to Jamie D'Souza and Galen Halverson for reviving the EPS Newsletter!

And thanks to everyone who provided content. These newsletters are not possible without you

Our last newsletter went out in 2021; you can read it [here](#), along with newsletters from previous years.