

**Council of Chairs of Canadian Earth Science Departments
CCCESD Meeting, online, 28-29 October 2021**

[Click here to join the meeting](#)

AGENDA – all times in Eastern Standard Time

Thursday, 28 October 2021

11:00 – 11:10 Introduction and welcome (Jeff McKenzie - Chair)

11:10 – 11:15 CCCESD Finances (John Greenough)

11:15 – 11:25 CCCESD statistics (Rob Raeside) – attachments, p. 3

11:25 – 11:40 Report from CFES (Sam Butler)

11:40 – 12:00 Frank Arnott Award – Next Generation Explorers Award

Tim Dobush, Mike Villeneuve

12:00 – 12:20 Interactions between Canadian Earth Science departments and geoscience professional regulators (update – Craig Nichol)

12:20 – 2.00 Open for round-table discussions

Open time to update CCCESD on issues within the departments and schools, develop points for discussion with NSERC, CFI, etc.

2.00 – 2.30 Break

2:30 – 3.00 News from the Geological Survey of Canada

Daniel Lebel, Director General, GSC

3:00 – 5.00 Open for round-table discussions (continued)

Friday, 29 October 2021

11.00 – 12.00 NSERC Session

Liz Boston, Director, Mathematical, Environmental and Physical Sciences

Tiffany Lancaster, Program Officer

Kenn Rankine, Program Officer

12:00 – 12:30 Geoscientists Canada

Andrea Waldie, CEO; Kevin Ansdell, President

12.30 – 1.15 Canada Foundation for Innovation

Mohamad Nasser-Eddine, Director

Claire Samson, Vice-President

1.15 – 2.50 Open time for follow-up discussions

2.50 – 3:00 Executive changes

List of members in CCCESD

| | |
|-----------------------------------|-----------------------------|
| Memorial University | Waterloo |
| Greg Dunning | Mario Coniglio |
| Penny Morrill, Deputy Head | Western University |
| Christine Campbell, Corner Brook | Patricia Corcoran |
| Cape Breton University | Windsor |
| Deanne van Rooyen | Joel Gagnon |
| St. Francis Xavier University | Laurentian University |
| Lisa Kellman, chair | Doug Tinkham |
| St. Mary's University | Lakehead University |
| Pierre Jutras | Andrew Conly |
| Dalhousie University | Manitoba |
| Djordje Grujic | Alfredo Camacho |
| James Brenan (on leave) | Brandon University |
| Acadia University | Simon Pattison |
| Rob Raeside | Regina |
| UNB Saint John | Maria Vélez |
| Lucy Wilson | Saskatchewan |
| UNB Fredericton | Sam Butler |
| Joe White | Mt. Royal University |
| Karl Butler (on leave) | Gwen O'Sullivan, chair |
| Université du Québec à Chicoutimi | Jeff Pollock |
| Réal Daigneault | Calgary |
| Université Laval | Stephen Hubbard |
| René Therrien | Alberta |
| McGill University | Tom Chacko |
| Jeff McKenzie | UBC Okanagan |
| Université du Québec à Montréal | Ed Hornibrook |
| Fiona Darbyshire | Thompson Rivers University |
| Ottawa University | Nancy Van Wagoner |
| David Schneider | Simon Fraser University |
| Carleton University | Glyn Williams-Jones |
| Brian Cousens | UBC Vancouver |
| Queen's University | Philippe Tortell |
| Vicki Remenda | Victoria |
| York University | Jay Cullen |
| JinJun Shan | Vancouver Island University |
| Toronto | Jerome Lesemann |
| Sarah Finkelstein | Tim Stokes |
| Toronto at Mississauga | Yukon University |
| Jochen Halfar | Joel Cubley |
| Brock University | |
| Frank Fueten | CCCESD treasurer |
| Francine McCarthy | John Greenough, UBC-O |
| McMaster University | |
| Bruce Newbold | |

CCCESD Treasurer's Report 2020-2021

To: Members of CCCESD

Listed below are the transactions and deposits since the last CCCESD meeting, and account status as of October 19, 2021, just prior to our October 28, 2021 meeting.¹

| Date ² | Comment ³ | Amount | Balance |
|-------------------|---|-----------|-------------|
| November 3, 2020 | Bank balance for 2020 meeting | | \$18,919.93 |
| January 18, 2021 | Carleton membership cheque for 2019 | \$100.00 | \$19,019.93 |
| February 26, 2021 | Lakehead membership direct deposit | \$100.00 | \$19,119.93 |
| March 01, 2021 | UNB membership direct deposit | \$100.00 | \$19,219.93 |
| March 05, 2021 | St. Mary's membership direct deposit | \$100.00 | \$19,319.93 |
| March 10, 2021 | U. Saskatchewan membership dir. Deposit | \$100.00 | \$19,419.93 |
| March 23, 2021 | U. Windsor direct deposit | \$100.00 | \$19,519.93 |
| April 08, 2021 | Deposit of 19 membership cheques | \$1900.00 | \$21,419.93 |
| May 06 2021 | Mount Royal direct deposit | \$100.00 | \$21,519.93 |
| June 03, 2021 | Deposit of 8 membership cheques | \$800.00 | \$22,319.93 |
| July 05, 2021 | Canadian Federation of Earth Sciences Membership Fees | -\$500.00 | \$21,819.93 |
| October 13, 2021 | Laurentian membership direct deposit | \$100.00 | \$21,919.93 |
| October 19, 2021 | Bank balance for 2021 meeting ¹ | | |

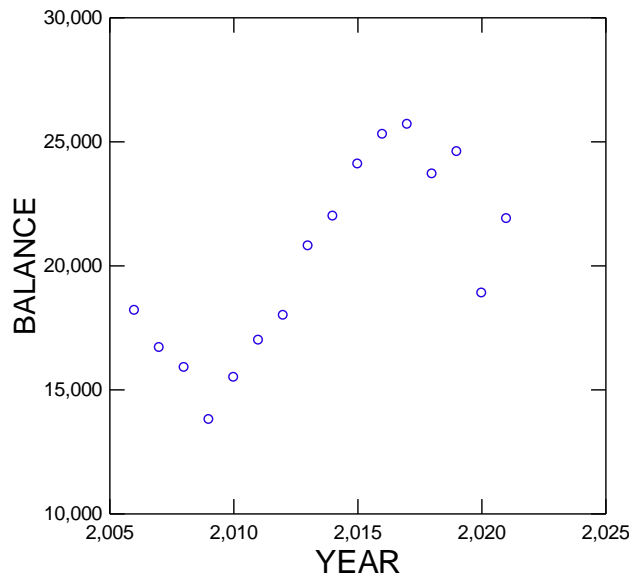
¹ There have been no bank transactions since October 19, 2021 that I know of.

² For cheques (debits to account), "Date" is the date the account was debited by the bank. For CCCESD Membership fees, "Date" is the date the cheques (or direct deposits) appeared in the account.

³ The attached spreadsheet lists CCCESD members who paid the voluntary membership fees (\$100.00) this year (2021) for the 2020 year and compares contributions from previous years.

Comments: The number of membership contributions for the 2020 year (34) is the highest since we started collecting these voluntary memberships in 2009 but this is thanks to Yukon U. joining the CCCESD. We have recovered from the very low membership contributions in 2019 related to COVID. Our account balance is strong (\$21,920) but still below the 2017 maximum of \$25,700. It is well above the balance in 2009 (\$13,812.71) when we initiated the voluntary membership contributions. We did not incur the normal ~\$2000 meeting expenses last year and there are no meeting expenses this year due to having the meeting on line.

Our annual account balance since 2006 is plotted below.



I assumed the treasurer position in 2006 and have records back to that year. In 2009 we initiated voluntary contributions because we lost support from the GSC? and the trivial annual operating costs were sliding us into oblivion. These contributions resulted in our bank balance increasing until 2017. Meeting and operating costs started exceeding contributions after 2017. The overall reason for the somewhat low balance in 2018 significantly reflects two CFES payments in one year due to us not receiving a bill in 2017. The exceptionally low balance in 2020 largely reflects a \$5000.00 payment to Geoscientists Canada along with poor contributions from members during the start of COVID. Our balance this year looks healthy but it reflects a year where we had no meeting expenses and next-year's budget will probably be similarly positive (no in-person meeting expenses). However, the writing is on the wall if we want to continue having in-person meetings. Our balance is plunging even without meeting expenses. We need to consider an increase in voluntary membership contributions.

Yours truly

John D. Greenough
Treasurer CCCESD

Contributions for the 2020 year made in winter 2021¹

| Institution | Potent. Contribu.? | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | Contr. 2020 ³ | Number ⁷ | Amount ⁷ |
|------------------------------|--------------------|------|------|------|------|------|------|------|------|------|------|------|--------------------------|---------------------|---------------------|
| Acadia U | 1 | Y | Y | Y | Y | Y | Y | Y | Y | Y | N | Y | Y | 1 | 100 |
| Alberta, U | 1 | Y | Y | N | Y | Y | Y | Y | Y | Y | Y | Y | Y | 1 | 100 |
| Brandon | 1 | N | N | N | Y | Y | Y | Y | Y | Y | Y | Y | Y | 1 | 100 |
| Brock | 1 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 1 | 100 |
| Calgary, U | 1 | Y | Y | Y | Y | N | Y | Y | Y | Y | Y | Y | N | 1 | 100 |
| Cape Breton U | 1 | Y | New | N | N | N | Y | N | N | N | N | Y | Y | 1 | 100 |
| Carleton | 1 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 2 | 200 |
| Chicoutimi, U Quebec | 1 | Y | Y | Y | Y | N | N | Y | Y | Y | Y | N | N | 1 | 100 |
| Dalhousie | 1 | Y | Y | N | Y | Y | Y | Y | Y | Y | Y | Y | Y | 1 | 100 |
| Guelph, U | Y | Y | Y | Y | N | X | Y | Y | Y | Y | Y | Y | Y | 1 | 100 |
| Lakehead | 1 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 1 | 100 |
| Laurentian | 1 | Y | Y | N | Y | N | Y | Y | Y | Y | Y | Y | Y | 1 | 100 |
| Laval | 1 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 1 | 100 |
| Manitoba | 1 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 1 | 100 |
| McGill | 1 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 1 | 100 |
| McMaster | 1 | Y | Y | Y | Y | Y | Y | N | Y | N | Y | Y | Y | 1 | 100 |
| Memorial U. | 1 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 1 | 100 |
| Montreal, U Quebec | 1 | Y | Y | Y | Y | Y | Y | N | Y | Y | Y | Y | Y | 1 | 100 |
| Mount Royal U | 1 | Y | Y | Y | Y | N | Y | Y | Y | Y | Y | N | Y | 1 | 100 |
| New Brunswick, U | 1 | Y | N | Y | N | Y | Y | Y | Y | Y | Y | Y | Y | 1 | 100 |
| Ottawa, U | 1 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 1 | 100 |
| Queens | 1 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 1 | 100 |
| Regina, U | 1 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 1 | 100 |
| Saint Mary's | 1 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 1 | 100 |
| Saskatchewan, U | 1 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 1 | 100 |
| Simon Fraser U. | 1 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 1 | 100 |
| St. FX | 1 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 1 | 100 |
| Thompson Riv. | 1 | Y | Y | New | Y | N | N | Y | N | Y | N | Y | Y | 1 | 100 |
| Toronto, U | 1 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 1 | 100 |
| UBC Okanagan | 1 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 1 | 100 |
| UBC Van | 1 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 1 | 100 |
| Vancouver Is U | 1 | Y | Y | New | Y | Y | N | N | N | N | N | Y | Y | 1 | 100 |
| Victoria, U | 1 | Y | Y | Y | Y | Y | Y | Y | Y | Y | N | Y | Y | 1 | 100 |
| Waterloo, U | 1 | Y | Y | Y | Y | Y | Y | Y | Y | Y | N | Y | Y | 1 | 100 |
| Western ON, U | 1 | Y | Y | N | Y | Y | N | Y | Y | Y | Y | Y | Y | 1 | 100 |
| Windsor, U | 1 | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | 1 | 100 |
| York | 1 | Y | Y | N | Y | Y | Y | Y | Y | Y | Y | N | N | 1 | 100 |
| Yukon | 1 | 1 | | | | | | | | | | Y | Y | 1 | 100 |
| Count = SUM for fall meeting | | | | | | | | | | | | | | | |

Notes:

¹ Contributions for the previous year are generally made in the winter of the following year. Thus, Contrib 2009 is the contribution for 2009 made in the winter of 2010. First year for voluntary contributions was 2009 (contributions were made in winter 2010).

² Potent. Contrib.? = Departments that are, pretend-to-be, or were members of CCCESD over the past ~10 years. Guelph departed.

³ Under Contrib 2020, Y = got cheque in winter 2021. Note Count/sum for this column is lower than Number because some cheques were for previous year. Carleton sent a cheque for the past year.

⁷ Under "Number" and "Amount", is the number of \$100 contributions from each department since the CCCESD meeting in Fall 2020. Some contributions may be for the previous year. If so I update the contributor list for the previous year.

Guelph dropped out 2012.

SUMMARY OF UNIVERSITY ENROLMENTS AND STAFFING IN EARTH SCIENCE DEPARTMENTS IN CANADIAN UNIVERSITIES, TO DECEMBER 2020

Compiled by Rob Raeside, Acadia University, and Alan Beck, UWO

Response rate*: 31/38

Fig. 1. Number of BSc (> year 1), MSc and PhD program registrants

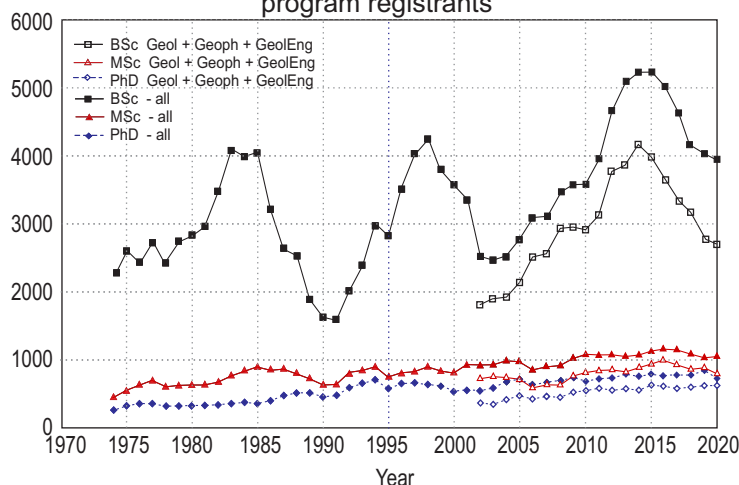


Fig 2. Registrants in service and pre-year 2 courses

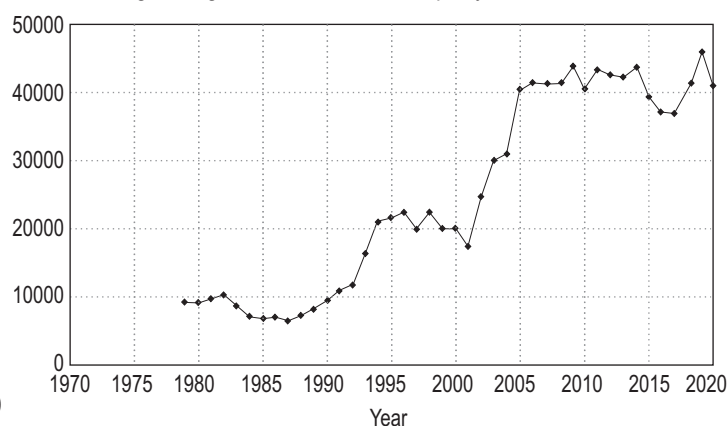


Fig. 3. Numbers of graduated students

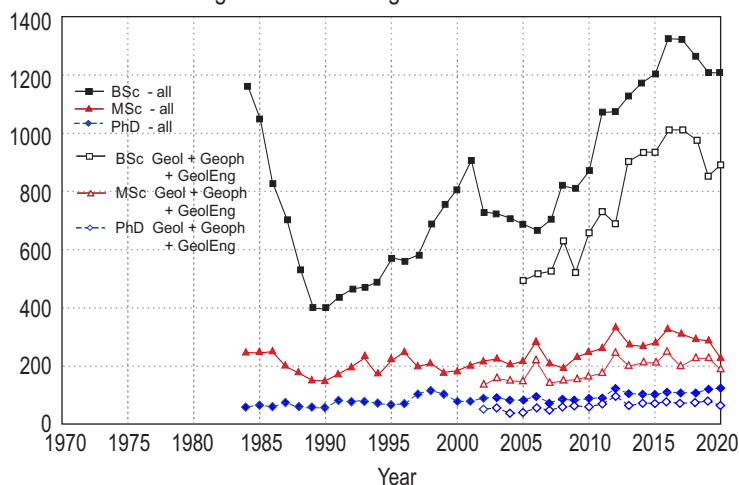


Fig 4. Percentage of females in each of undergraduate, masters, doctoral, and faculty levels

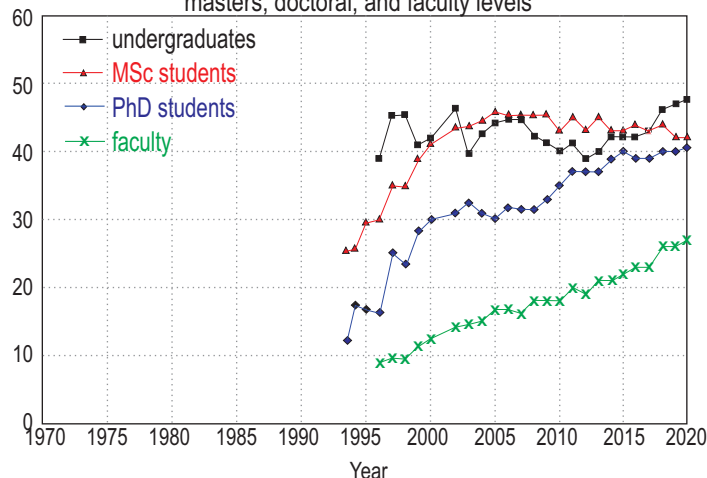


Fig. 5. Numbers of faculty, post-docs and support staff

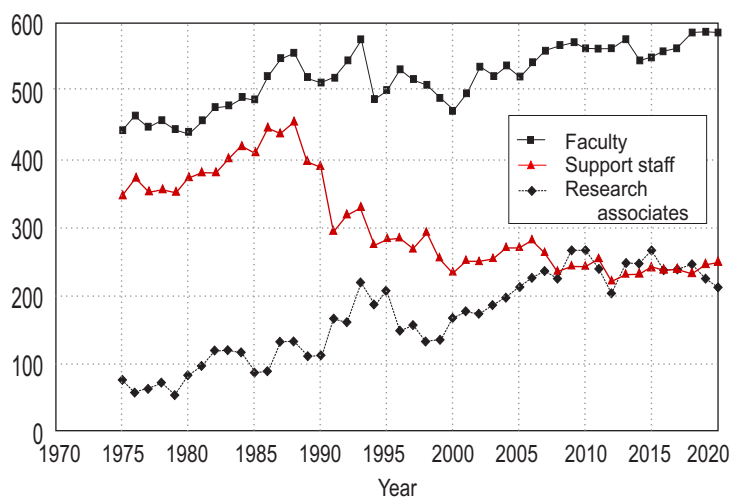
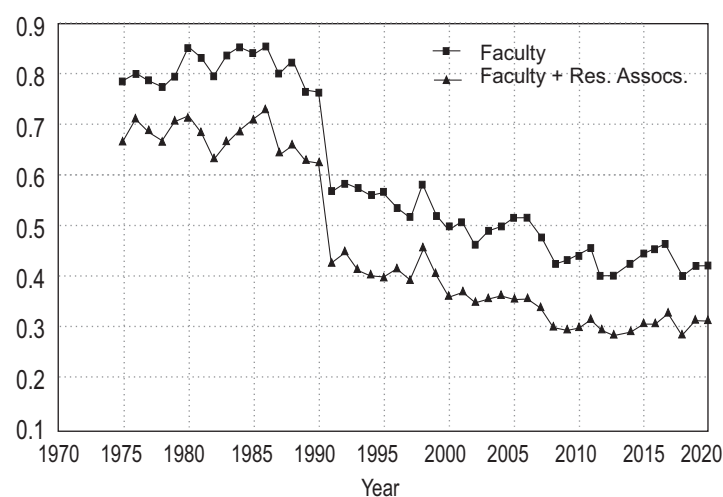


Fig. 6. Ratio of support staff to faculty and post-docs



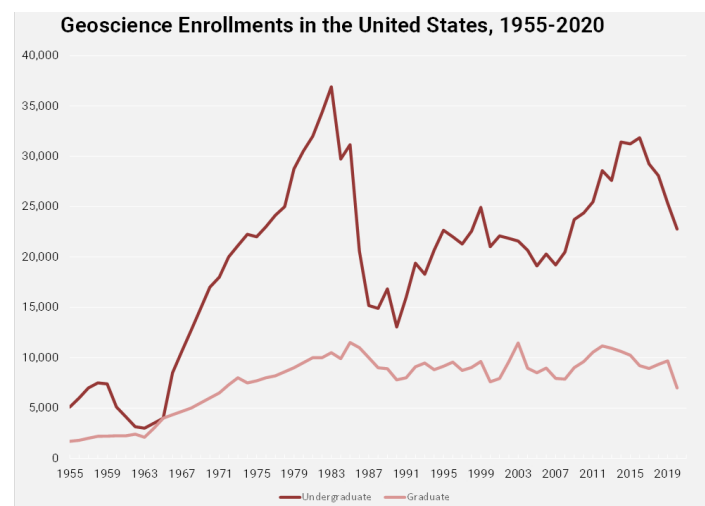
*31 out of 38 universities have responded to date this year - for those departments not responding, last year's data were used. Non-responding departments represent approximately 34% of all undergraduate enrolments.

U.S. Geoscience Enrollments and Degrees Collapse in 2019-2020

U.S. geoscience enrollments, 2019-2020

Enrollments in U.S. geoscience programs experienced marked declines in the 2019-2020 academic year. Though the number of departments reporting enrollments was the same as the prior year, undergraduate enrollments dropped 10% and graduate enrollments dropped 27%. Internal to the graduate programs, enrollments in master's degree programs dropped 23% while doctoral enrollments dropped 29%.

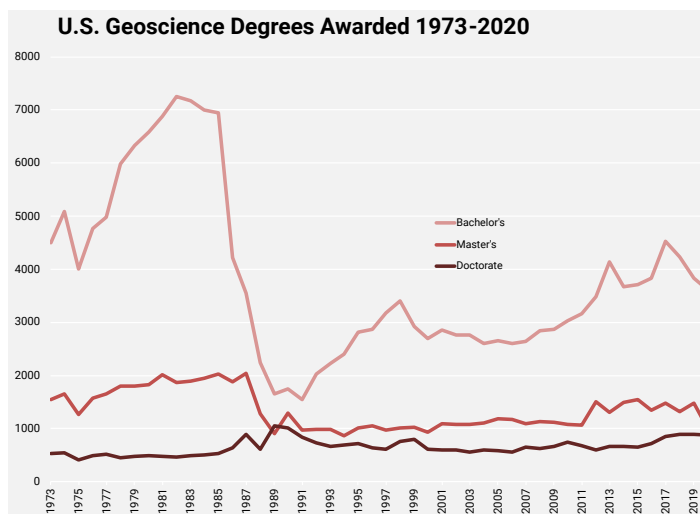
The decline in undergraduate enrollments extends the ongoing trend, but the decline in graduate enrollments represents the first major deviation in enrollment levels in over a decade. The experiences in 2019-2020 are complicated by the onset of the COVID-19 pandemic. Many programs were shifting to online teaching during the reporting period and may have had uncertainty on the enrollment status of some students. Likewise, disruptions to ongoing research may have also led to underreporting of graduate enrollments. However, the major softening in employment in the energy sector cannot be ruled out as a major driver for the declines, especially at the graduate level. Enrollment reporting for the 2020-21 and 2021-22 academic years will clarify if the pandemic impacts were temporary forces on reported enrollments or exacerbated longer-term trends.



Credit: AGI; data from AGI's Directory of Geoscience Departments Survey

U.S. geoscience degrees granted in 2019-2020

U.S. geoscience degrees awarded have been impacted by recent lower enrollments and potential hits from both the pandemic and softer energy sector hiring. Bachelor's degrees awarded were down 5% to 3,622, and doctoral degrees were down 1.8% to 873. Most notable was the 31% decline in master's degrees awarded. This drop could be driven by both a soft job market, for which most master's students are earning their degree for active employment, and the impacts of the pandemic which could disproportionately impact the more condensed schedule of most master's programs because of reported project delays in AGI's COVID-19 study.



Credit: AGI; data from AGI's Directory of Geoscience Departments Survey



NEXT GENERATION EXPLORERS AWARD



The Frank Arnott – Next Generation Explorers Award (NGEA™)

The world future generations will inherit will be one highly dependent on meeting a growing demand for metals and minerals. With new deposits being more difficult to discover, innovative new exploration strategies are required to meet this demand. The mining exploration industry is facing its most significant skills shortage in decades and the global talent pool is having trouble keeping up. If mining exploration is to meet the challenges of tomorrow, it must be active in preparing and training the geoscientists of today. On behalf of the Next Generation Explorers Award Association, I would like to enlist your help in building a strong future for the mining exploration industry by requesting your support in promoting the NGEA™ without the Canadian university ecosystem.

The NGEA™ is an international competition that provides a means for geoscience students to bridge the **real-world skills gap** by working collaboratively on an unstructured problem (i.e. one without a pre-ordained “right” answer). The participants are required to work with their peers using primarily high quality, government sponsored data over regional terrains with a proven mineral endowment and a high likelihood of additional resources. Following a series of preliminary judging cycles, the final contestants will present at the 2022 PDAC convention in front of international representatives of the mining, government and educational industries.

Our objective is to embed the NGEA™ as a permanent component of the global university curriculum in a similar way to the oil industry’s successful [Imperial Barrel Award](#). To accomplish this, we must align the education and mineral resource sectors to address key industry challenges:

Readiness - Studies show that the recruitment and retention of skilled geoscientists in the mineral resource sector continues to be problematic. It is becoming more difficult to find geoscientists with +5 years’ experience especially in hiring environments with 20 per cent turnover.

Risk Reduction - Recognising that effective integration and visualisation of data remains a key aspect of exploration risk reduction particularly as we explore deeper and under cover.

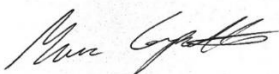
Successful Collaborative Explorers - It is imperative that we develop a sustainable source of enthusiastic and skilled geoscientists with the ability to collaborate and integrate multidisciplinary knowledge and approaches with the soft skills necessary to foster positive community and stakeholder engagement.

Diversity - We must do more to tap into the “buried talent pool” in the mineral resource industry. Diversity has many facets of which gender, capacity-building (in particular students from outside of Australia and North America) and thinking (i.e., machine-learning) are key focuses of the Award.

With your support, the NGEA™ will be integral in exposing young geoscientists to the collaborative challenges needed to find the next generation of mineral deposits. We look forward to working with you to meet these challenges and ensure the global mining industry remains strong for decades to come.

To learn more about NGEA™, please visit www.frankarnottaward.com or email us at NextGenerationExplorersAward@gmail.com.

Yours truly,

A handwritten signature in black ink, appearing to read "Marc Gasparotto".

Marc Gasparotto
Vice-President, Next Generation Explorers Award Association

Encouraging Words from Previous Winners

Victor Torres Pacheco and Sylvie Littledale, Inca Team, 1st Place - NGEA 2021

"Our team found the NGEA to be an amazing and realistic exploration experience as we were able to work with a complete geo-database and a multidisciplinary team with different levels of expertise and backgrounds. This allowed us to generate viable and robust exploration targets that considered ESG (environmental, social, governance) factors while striving for scientific excellence for the next discovery on the Yukon Plateau.

Taking part in this competition during the Covid-19 pandemic, despite its challenges, allowed us to work closely as a team with members in multiple countries. The NGEA also gave us the opportunity to build connections with others based on collaboration and foster friendships which we will always have going forward."

Rebecca Montsion, PhD Candidate, Laurentian University and the University of Western Australia

"The 2017 Frank Arnott Award (FAA) Challenge provided me with the opportunity to explore new techniques that greatly benefit my current research. As a result of my participation, I was exposed to many aspects of mineral exploration that are often not part of academic research. I have become a much more rounded and informed geoscientist thanks to the FAA Challenge."

Dr. Graham Heinson, Professor, University of Adelaide

"As a teacher, the project has changed my philosophy in how I engage with students, from 'what students learn' to 'how they learn'. Decoupling learning from summative assessment provided a sense of freedom to experiment with no penalty for failure. I am changing my approach in working with students from being a teacher to a mentor and team member."

About Frank

Frank Arnott (1951–2009) was an exceptional exploration industry leader. He championed innovative techniques that maximise the value of the multidisciplinary data that underpin modern exploration campaigns. Frank always looked for new and innovative ways to improve data processing methodologies and integrate multidisciplinary exploration datasets.

Frank was never constrained by convention and he was just as happy working on global datasets as he was working at the prospect scale. He was equally comfortable engaging with academia as he was with industry and often sought innovation in unfamiliar areas such as biomedical imaging, bringing back ideas to help solve exploration problems. His enthusiasm was infectious, and he was a wonderful mentor, a talented scientist, always passionate and committed to geophysical exploration.





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