Centre of Excellence for Sustainable Mining and Exploration (CESME)

Annual Report to the Office of Research Services

August 2025

Lakehead UNIVERSITY

CENTRE OF EXCELLENCE FOR SUSTAINABLE MINING & EXPLORATION

Executive Summary

In the past year CESME has achieved the following:

- Co-hosted a successful in-person event associated with the PDAC meeting
- Seen the successful creation of a NOHFC Industrial Research Chair partnering with Kinross Gold with funding from FedNor and NOHFC
- Provided scholarships to support graduate research
- Sponsored in-person workshops and a conference
- Facilitated new research initiatives between local industry and LU researchers

CESME goals & objectives

As outlined in the original proposal to the Senate Research Committee the purpose, rationale, mission and goals of the Centre of Excellence in Sustainable Mining and Exploration (CESME) are as follows:

Purpose

CESME will encourage and support research, education and outreach activities regarding the nature and impacts of mineral resource exploration and extraction particularly in Northern Ontario.

Rationale

Northern Ontario's dynamic mining sector is booming, creating challenges regarding how best to undertake sustainable economic development while ensuring environmental protection and respecting constitutionally protected Aboriginal and Treaty rights. CESME will help address these challenges by linking Lakehead University researchers with partners from First Nation, Métis and local communities, government, and industry. This collaborative approach recognizes that Canadian natural resource development requires sophisticated planning, collaboration, assessment, implementation, and remediation strategies that are calculated to minimize negative environmental, socio-economic, and cultural impacts. CESME uses the term "sustainable" to imply reconciliation of the three pillars of environmental, social equity, and economic demands (2005 World Summit on Social Development) that is now widely recognized by the mining industry. To this end, CESME is structured under three pillars: 1) Mining, Exploration and Mineral Processing; 2) Environmental Impacts; and 3) First Nation, Métis and Local Community Engagement.

Through the Centre academic, community, government, and industry partners will carry out cutting-edge research in discovery, advanced exploration, and development, and address the environmental, social and cultural aspects of mineral extraction.

Mission

CESME will:

- Support the development of community-based research and outreach activities in both the Lakehead University community and the region as a whole;
- Generate research projects that facilitate sustainable resource development in Northern Ontario and evaluate the current and future ecological, social, cultural and economic impacts of development; and
- Apply research outcomes from Northern Ontario projects to broader sustainable development issues in other northern Canadian and international jurisdictions and apply the lessons learned in other jurisdictions to Northern Ontario.

Goals

CESME will:

- Increase the capacity for mineral deposit research at Lakehead University and enhance the reputation of the institution in the region, nationally and internationally;
- Increase the capacity for research into the environmental impacts of mining and the sustainability of this activity in Northern Ontario;
- Increase the capacity for research into the social and cultural impacts of mining, especially the involvement of local and First Nation and Métis communities and the recognition of Aboriginal and treaty rights;
- Increase the capacity for research into mining and mineral processing;
- Initiate interdisciplinary research into these fields and develop multidisciplinary research proposals for funding agencies and research partners;
- Bring together a diverse range of researchers at Lakehead University working in fields related to mining exploration, sustainable mining, and environmental and community impacts; and
- Make Lakehead University the hub for sustainable resource extraction research in Northern Ontario.

Progress towards the Centre's goals

In our original proposal to the Senate Research Committee we indicated that we would achieve the goals of the Centre by undertaking a number of activities. This section lists those activities and highlights progress made.

1. *Initiate discussions with the wider community to shape the research activities of the Centre.*

   We have continued discussions with a diverse group of research partners including First Nations educational organisations. We continue to work with Mining Matters to facilitate their engagement with schools and communities in Northern Ontario.

2. *Generate multidisciplinary research proposals and apply for external funding*

   CESME initiated the conversation and worked with Kinross Gold to establish an NOHFC Industrial Research Chair in Mineral Exploration. This has resulted $500,000 in funding

from Kinross, $440,948 from FedNor and $1,000,000 from NOHFC with an application to the NSERC Alliance program pending. In addition, the Chair's position will be backfilled with a new tenure track position in the Department of Geology.

3. *Invite and fund proposals for research and outreach activities*

   We continue to solicit proposals from the University community

4. *Recruit and foster faculty, postdoctoral fellows, postgraduate, graduate, and undergraduate student participation*

   CESME is supporting the MSc research of Kevin Duran and Colin Hunter. Kevin is a MSc student in the Department of and is working on the paragenesis of the Sunday Lake Ni-Cu-PGE deposit in Northern Ontario. Colin is a PhD student in Civil Engineering working on "Enhancing Decontamination of Hydrocarbon-Contaminated Land in Clay Soils through Novel Oxygen Delivery Methods". CESME is also supporting the thesis research of Graham Matheson and Natalya Assance, both MSc students in Biology through the John R. Craig Memorial CESME Award. Graham is undertaking a population assessment of lake sturgeon at Whitewater Lake in Wabakimi Provincial Park and Natalya is using Lake Superior's north shore telemetry array to track the movement of walleye through acoustic tags and receivers in Lake Superior.

5. *Establish working relationships with similar national and international centres (e.g., Mineral Deposit Research Unit (MDRU) at the University of British Columbia, Mineral Exploration Research Centre (MERC) at Laurentian, CODES – ARC Centre of Excellence in Ore Deposits at the University of Tasmania, Centre for Exploration Targeting (CET) at the University of Western Australia)*

   We have a very successful collaboration with CODES and continue our partnership with the Mineral Deposit Research Unit at UBC through an ongoing NSERC Alliance grant. We have also participated in an Alliance Mission Grant with researchers at the University of Manitoba

6. *Develop and maintain a website for the Centre*

   We have established a website that highlights CESME activities and acts as a repository for our publications and videos of our guest speakers.

Members of CESME

The Advisory Board for CESME continues to operate efficiently having met a number of times by teleconference in the past year. Following the passing of Dr. Jim Franklin, we have recruited Kurt Boyko to the Board. The membership comprises:

- Ms. Sue Craig, Consultant - Chair
- Mr. John Mason, CEDC
- Mr. Glenn Nolan, Noront
- Dr. Scott Jobin-Bevans, Consultant
- Mr. Gord Maxwell, Consultant
- Mr. Kurt Boyko, Nordmin Engineering Ltd.

The following faculty members have agreed to lead the three research pillars of CESME:

- Dr. Pedram Fatehi continues as the leader of the Mining, Exploration and Mineral Processing pillar
- Dr. Michael Rennie, continues as the leader of the Environmental pillar
- We are currently seeking a leader for the Indigenous pillar.

The following faculty members have signed up as CESME members:

Dr.	Matthew	Boyd	Anthropology
Dr.	Andrew	Conly	Geology
Dr.	Jian	Deng	Civil Engineering
Dr.	Amanda	Diochon	Geology
Dr.	Martha	Dowsley	Anthropology
Dr.	A. Ernest	Epp	History
Dr.	Pedram	Fatehi	Chemical Engineering
Dr.	Philip	Fralick	Geology (emeritus)
Dr.	Scott	Hamilton	Anthropology
Dr.	Rachel	Jekanowski	English, Memorial University
Dr.	Peter	Lee	Biology (emeritus)
Dr.	Kam	Leung	Biology
Dr.	Zhiquan	Li	Geology
Dr.	Baoqiang	Liao	Chemical Engineering
Dr.	Nancy	Luckai	Natural Resources Management (emeritus)
Dr	Rob	Petrunia	Economics
Dr.	Mike	Rennie	Biology
Dr.	Karl	Skogstad	Economics
Dr.	Robert	Stewart	Geography
Dr.	Shannon	Zurevinski	Geology

The following adjunct faculty are also members of CESME:

Dr.	Greg	Ross	NOSM
Dr.	Robert	Mackereth	Centre for Northern Forest Ecosystem Research

In addition, four Postdoctoral Fellows (Moses Angombe, Rellie Goddard, James Tolley and Tobias Stephan) are affiliated with CESME.

Research Projects & Scholarly Activities

Other activities

CESME is continuing to engage with local mining companies by hosting “Discovery Days” when researchers at Lakehead present their work to company representatives in order to develop new partnerships. We participate in both the Roundup and PDAC conferences in order to engage with member of the mining industry.

CESME participated in the Cen Can Expo in Thunder Bay where we co-hosted a booth with the Economic Development team. We have organized geoscience outreach activities as part of Lakehead University's Research Week and an event in Sioux Narrows

Educational Activities

CESME sponsored two short courses organized by the Lakehead University SEG student chapter. The first short course was on "Structural Geology and it's Implications in Mining and Exploration" by Brett Davis. The workshop took place on August 30th, 2024 with ~35 attendees. The second course took place over two days on March 15 and 29 covering the fundamentals of QGIS and the Geology of Ontario with 25 people attending each day. In addition, CESME sponsored the 51st Annual Symposium of the Ontario Archaeological Society that was held in Thunder Bay from October 25-27, 2024. The meeting brought together 119 archaeologists to Thunder Bay.

Undergraduate and graduate training

We have supported four graduate students through two CESME scholarships as discussed above.

There are currently four Post Doctoral Fellows associated with CESME: Drs. **Moses Angombe, James Tolley, Rellie Goddard and Tobias Stephan**. All are actively engaged in research and the mentoring of MSc students. Dr. Stephan will be finishing his Fellowship in September 2025 when he will be starting a position as an Assistant Professor in the Geology Department at Lakehead University.

Financial statement

The main CESME account has been relying on residual funds left from running our conference and occasional donations. These funds have been expended meaning that the only funds available to directly support CESME activities come from the Research Support Fund. While this support is appreciated there are limits to how those funds can be used which may impact future activities.

The statement provided below covers the 2025-2025 financial year.

Item	Credit	Debit
Carry Forward	$00.00	
Transfer from Research Support Fund	$20,0000	
Donations		
Travel & Conferences (*this includes cost for Hollings to attend Roundup in Jan 24 and PDAC in March 24*)		$ 8647.61
Sponsorship (*SEG Workshops & OAS Symposium*)		$2250.00
Printing		$145.72
Booth at Cen Can expo		$2740.36

PDAC booth		$2831.55
PDAC Breakfast		$3107.95
Promotional materials		$422.53
Subtotal	$20,000.00	$20,145.72
Balance		**$-145.72***

*I was allowed to carry the negative balance of $145 through to the next year

One-year and five-year plans

The immediate goals of CESME are as follows:

- Work with the Advisory Board to implement the new Strategic Plan for CESME and the Action Items within it
- We continue to seek funding both from research councils and donors to support graduate and undergraduate research.
- We are still considering the possibility of hosting another conference at Lakehead or alternatively providing support to other related events on campus.
- We continue to engage with faculty across campus to encourage them to participate in and identify CESME activities.

Having met one of our medium-term goals of establishing a research Chair under the Mining and Exploration Pillar we are still seeking to establish two research chairs, one related to each of the remaining CESME pillars (Environmental Impacts and First Nation, Métis and Local Community Engagement). These chairs are critical to the long-term success of CESME as they will provide the core researchers around which Centre activities can be developed. In addition to funding the Chair we are seeking ways to support graduate students and Post-Graduate Fellows who will undertake much of the research. We are investigating a number of mechanisms to fund these chairs, including:

- Corporate donations;
- Philanthropy

We are working closely with the Office of Research Services and External Relations to achieve this goal.

2025-2026 Budget*

Item	Cost
Attend PDAC meeting to promote CESME (booth costs and travel)	$7,500
Attend Roundup meeting to promote CESME (2 x$2,000 people)	$4,000
Conferences for CESME members	$4,000
Promotional materials	$1,000
Invited speakers	$3,500

* Scholarships provided by CESME are not included here.

Emerging Trends

Both the Federal and Provincial Governments are placing increasing emphasis on the importance of critical minerals for the country's economy. CESME is uniquely placed to play a key role in these activities. Our location in the heart of Northern Ontario means we are ideally placed to play a critical role in fostering partnerships and communication between the various parties working to sustainably develop the resources in the region. We are also playing a role in education of the public as to the importance of minerals in our lives which has the added benefit of exposing the next generation to the opportunities available through the Geology program at Lakehead University.

Appendix 1

Media reports, posters and publications

Lakehead University Student Chapter SEG and Brett Davis (PhD) short course: Structural geology and it's application in mining and mineral exploration

Friday August 30th @ Lakehead University

Brett Davis - PhD

Brett is widely regarded in the international exploration and mining industry for his application of applied structural geology to numerous commodity types and mineral deposit styles. The approach Brett has brought to understanding mineralising environments globally is a product of the integration of modern structural geology and techniques married with several decades of applied research. Brett has held various technical and senior managerial roles at consultancy groups and in mining and exploration companies prior to running his own international geology consultancy, Olinda Gold Pty Ltd. In addition to consultancy assignments, Brett runs a modular structural geology training course that can be tailored to individual sites/companies or presented in a multi-client environment. Brett currently holds an Adjunct Senior Research Fellow position at James Cook University. He is a Member of the Australian Institute of Geoscientists and a Fellow of the Society of Economic Geologists. He is also the geological content editor for Coring Magazine, the world's largest drilling magazine.

Fill out the google form to register, or email seg.geology@lakeheadu.ca
https://forms.gle/EaqvcEFgvAtAmBFS9

Professional fee: $250
Student Fee: $50
Lunch and refreshments provided!

Centre of Excellence for Sustainable Mining & Exploration

Lakehead UNIVERSITY

SEG LAKEHEAD UNIVERSITY STUDENT CHAPTER

Questions?
Email: seg.geology@lakeheadu.ca

QGIS Short Course

Single day course outlining the basics of QGIS. Data importing, formatting and map making will be covered. The course will have a focus on early-stage exploration with an afternoon exercise using exploration data.

Who is the course for:
Anyone that is looking to learn the basics of data importing/display and map creation in QGIS (students, geologists, prospectors etc.).

No GIS experience required!

Room CB3031 at Lakehead University, March 15th 2025

Course is **FREE** for NWOPA, SEG and GALU members

Hosted by:

For more information about the course and to register, please contact:
Percy Clark (percy@clarkexploration.com)
AND
Turner Green (seg.geology@lakeheadu.ca)

GeologyOntario Course

Join Genevieve Meyer and Justin Jonsson from the OGS Resident Geologist Program for a free half-day course on accessing and using spatial data from GeologyOntario - Ontario's web-based portal for geoscience and mineral exploration databases.

GeologyOntario underwent a major redesign in 2023, and now includes powerful features to spatially and thematically tailor searches.

Attendees encouraged to bring computers with GIS (QGIS/ArcGIS) software to computer to follow along during the course.

Hosted by:

Room CB3031 at Lakehead University, 10-3 pm March 29th 2025

Attendance is free and all are welcome!

For more information about the course and to register, please contact:
Percy Clark (percy@clarkexploration.com)
AND
Turner Green (seg.geology@lakeheadu.ca)

Lunch and persians provided by the Lakehead University Centre of Excellence for Sustainable Mining and Exploration

ONTARIO ARCHAEOLOGICAL SOCIETY

51st ANNUAL SYMPOSIUM PROGRAM

Gathering Around Gichigami (Lake Superior): Archaeology Beyond Borders

October 25-27, 2024

LAND ACKNOWLEDGEMENTS

TERRITORIAL ACKNOWLEDGEMENT

We respectfully acknowledge that the 51st Annual Symposium of the Ontario Archaeological Society (OAS) will take place on the boreal forest Traditional Lands of the Anishinaabeg of Anemki Wajiw (Thunder Mountain or Mount McKay), Fort William First Nation, signatory to the Robinson-Superior Treaty of 1850, and the Homelands of the Métis Nation of Ontario and Red Sky Métis Independent Nation. We acknowledge the history that many nations hold in the areas around our meeting, and are committed to a relationship with First Nations, Métis, and Inuit Peoples based on the principles of mutual trust, respect, reciprocity, and collaboration in the spirit of reconciliation.

ONTARIO ARCHAEOLOGICAL SOCIETY

(For Across Ontario)

We would like to acknowledge that our OAS events are taking place on traditional Indigenous territory. There are many Indigenous Nations in what is now known as Ontario and they have shaped the history of this land for thousands of years. On these lands, Indigenous Peoples have developed distinct languages, customs, economies, laws, and ways of life. We want to show respect for this by acknowledging that we are on the land of the Algonquin, Cree, Oji-Cree, Delaware, Mississauga, Odawa, Ojibway, Pottawatomi, Haudenosaunee (Mohawk, Onondaga, Onoyota'a:ka, Cayuga, Tuscarora, and Seneca), Huron-Wendat, Métis, and Inuit

Thank you to OAS Summer Experience Opportunities student Lauryn Eady-Sitar for creating the OAS 51st Annual Symposium logo and assisting with organizing the symposium!

ONTARIO ARCHAEOLOGICAL SOCIETY

51st ANNUAL SYMPOSIUM SPONSORS

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