

# Earth Sciences

## Colloquium Series

### Trevor Matterson

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## Developing an understanding of metal and trace element distributions in polymetamorphosed banded iron formation northeast of Rankin Inlet, Nunavut and its connections to gold exploration



**Date:** Friday, February 28, 2025

**Time:** 2:00 PM

**Location:** BGS 0153

The Kivalliq region in Nunavut contains banded iron formation (BIF) -hosted gold deposits, including the Meliadine and Meadowbank mines, that are being actively studied. Units of BIF northeast of Rankin Inlet (east of Meliadine) have received less attention. As part of the Geo-Mapping for Energy and Minerals (GEM) -GeoNorth program at the Geological Survey of Canada, our aim is to characterize the pre-mineralization states of BIF in this region as a baseline to understand metal mobilization and concentration during metamorphism. The study area is in a complex transition zone between the Rae and Hearne cratons and is affected by regional Archean and localized Paleoproterozoic deformation at greenschist to amphibolite facies conditions. The goal of this project is to gain insight into the relative timing and paragenesis of minerals in BIF that are known to carry precious metals, and any relationships between metal mobility and tectono-metamorphic processes that would inform exploration in the region.

This study utilizes geochemical and petrological techniques, with a major focus on Laser Ablation Inductively Coupled Plasma Mass Spectrometry (LA-ICP-MS) mapping. The trace element geochemistry of magnetite and pyrite across metamorphic grade will be presented along with the key geochemical signatures related to primary and secondary formation processes. This work will increase the understanding of the paragenesis of BIF-hosted metals in this previously unmapped area of a geologically complex region and will be combined with additional field data to provide a pre-mineralized analogue for future exploration projects.

The G. Gordon Suffel Collection is a global collection of ore suites that was started at Western University in the early 1940s. As a recipient of the 2024-25 G. Gordon Suffel Fellowship for Graduate Studies in Applied Economic Geology, Trevor has spent time working with the Suffel Collection alongside Dr. Alysha McNeil and Dr. Brendt Hyde at the Richard W. Hutchinson Suite, cataloguing samples from the Keno Hill silver mining district in the Yukon, while also volunteering at public events.

*Coffee and donuts will be served.*