

High Resolution Stratigraphy and Chemostratigraphy of the 1.87 Ga Gunflint Formation.

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The primary objective is to build-up a detailed stratigraphy and chemostratigraphy of the 1.87 Ga Gunflint Formation by investigating the drill core from the Ontario Geological Survey. Geochemical analyses will target iron formations, carbonates, black shales, and other associated sedimentary rocks, with an emphasis on redox-sensitive elements (e.g., Mn, Cr, Ce) and non-traditional isotopes (e.g., Fe). The studies have the potential to provide valuable insights into the mechanisms controlling the Paleoproterozoic cessation of iron formation deposition.



High resolution sampling (meter to submeter interval) of the drilled core of the Gunflint Formation in order to build-up the profile. With focus on petrography, geochemistry, and non-traditional isotope studies.

The petrographic and geochemical results from high-resolution core logging and sampling will help identify redox sensitive elements variations and link them to specific facies transitions. This can be achieved through possible Mn or Mn/Fe peaks and petrographic evidence for Mn-carbonate or Mn-oxide overprinting. In addition, stratigraphically systematic shifts in Ce/Ce* and U/Th–V/Cr ratios can delineate chemozones and demonstrate the coupling between water-column oxygenation and diagenetic redox processes, refining the understanding of 1.87 Ga ocean redox evolution. These data may also help explain why iron formation deposition ceased for nearly a billion years.

