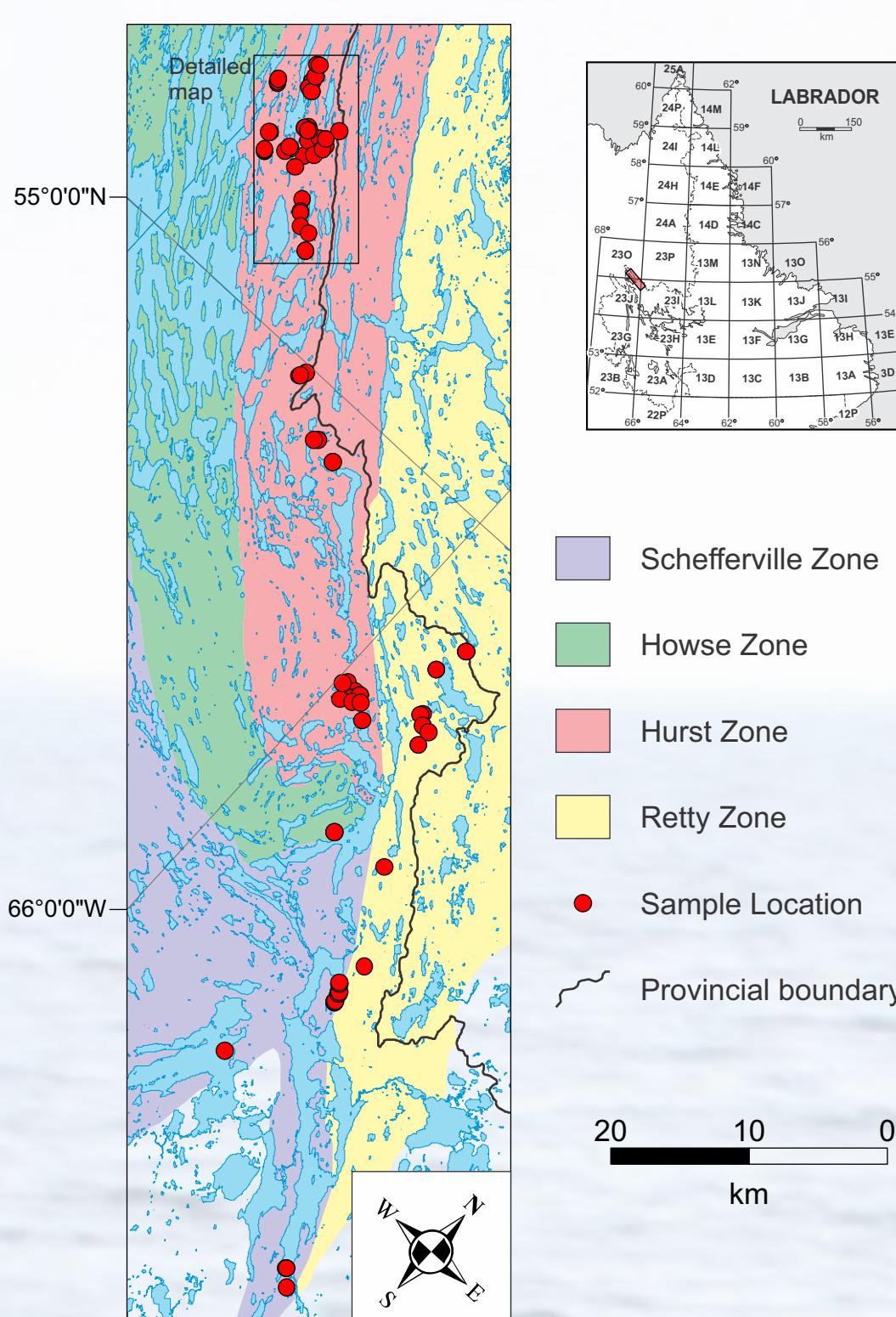


METALLOGENY OF THE LABRADOR TROUGH

James Conliffe

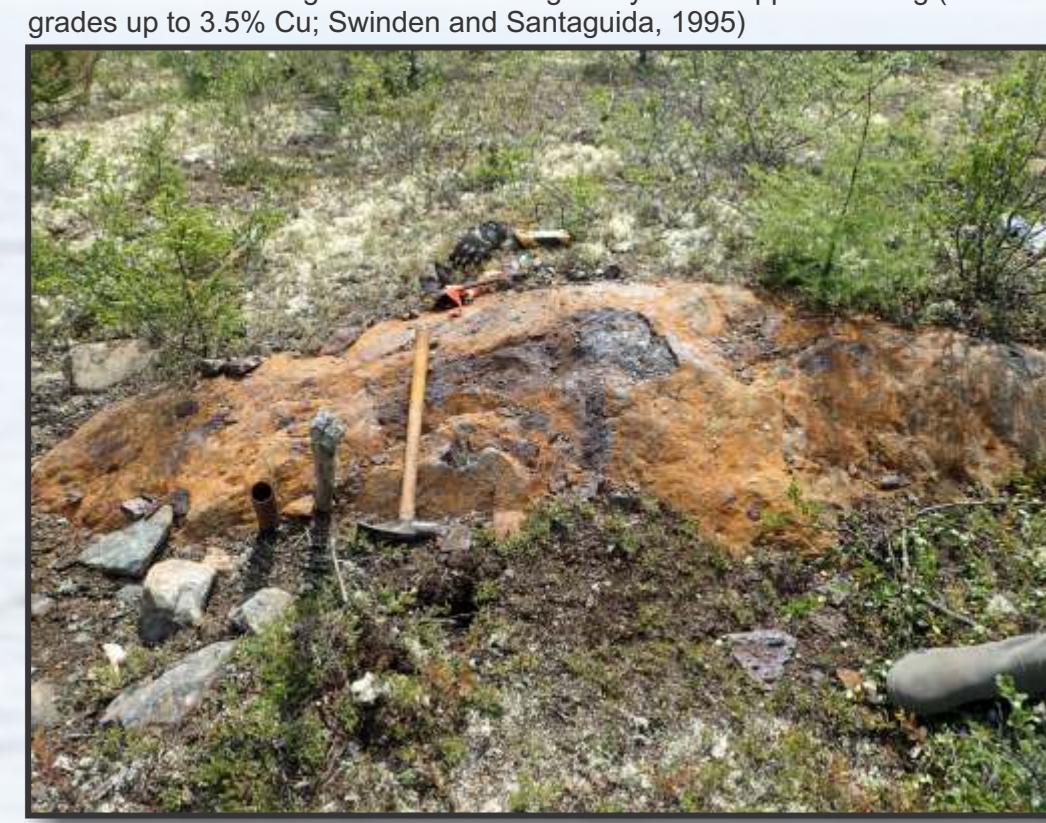


Lithotectonic zones of the Eastern Labrador Trough (from Clark and Wares, 2007), showing sample locations from 2017 GSNL fieldwork

The geology of the eastern margin of the Labrador Trough is comprised of a series of Paleoproterozoic (2.17 to 1.87 Ga) sedimentary and volcanic rocks, which have been subdivided into a series of distinct lithotectonic zones. Numerous mineral occurrences are known in this region, which include the following deposit types:

- Magmatic Ni-Cu-PGE showings hosted in gabbro sills (e.g. Howse Lake)
- Base and precious metal showings in graphitic mudstones (e.g. Martin Lake)
- Late-stage Cu-Au mineralization of possible orogenic origin (e.g. Montgomery Lake)

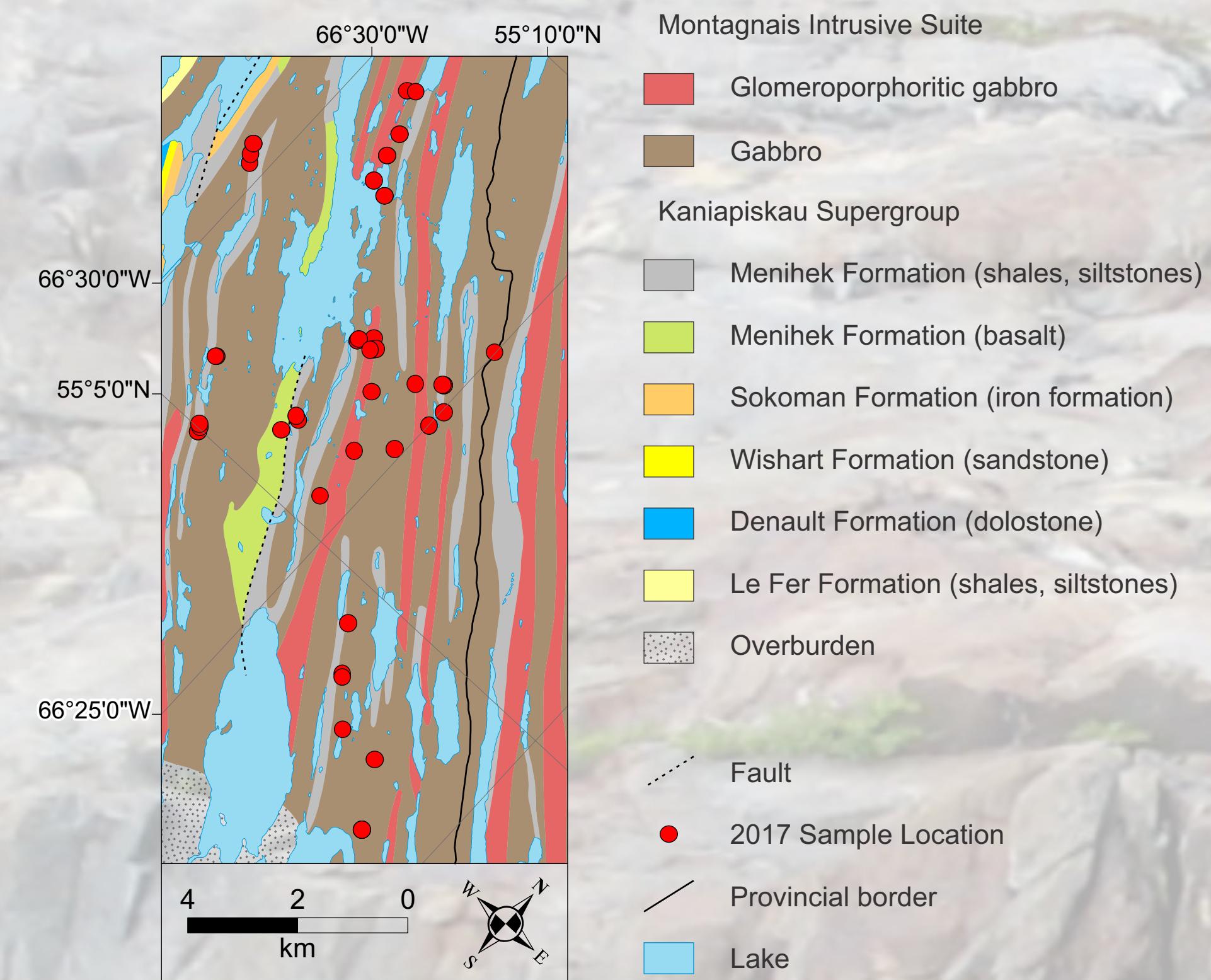
This project is investigating the genesis of these deposit types, and aims to create a metallogenic framework for the eastern Labrador Trough to aid future exploration in the region.



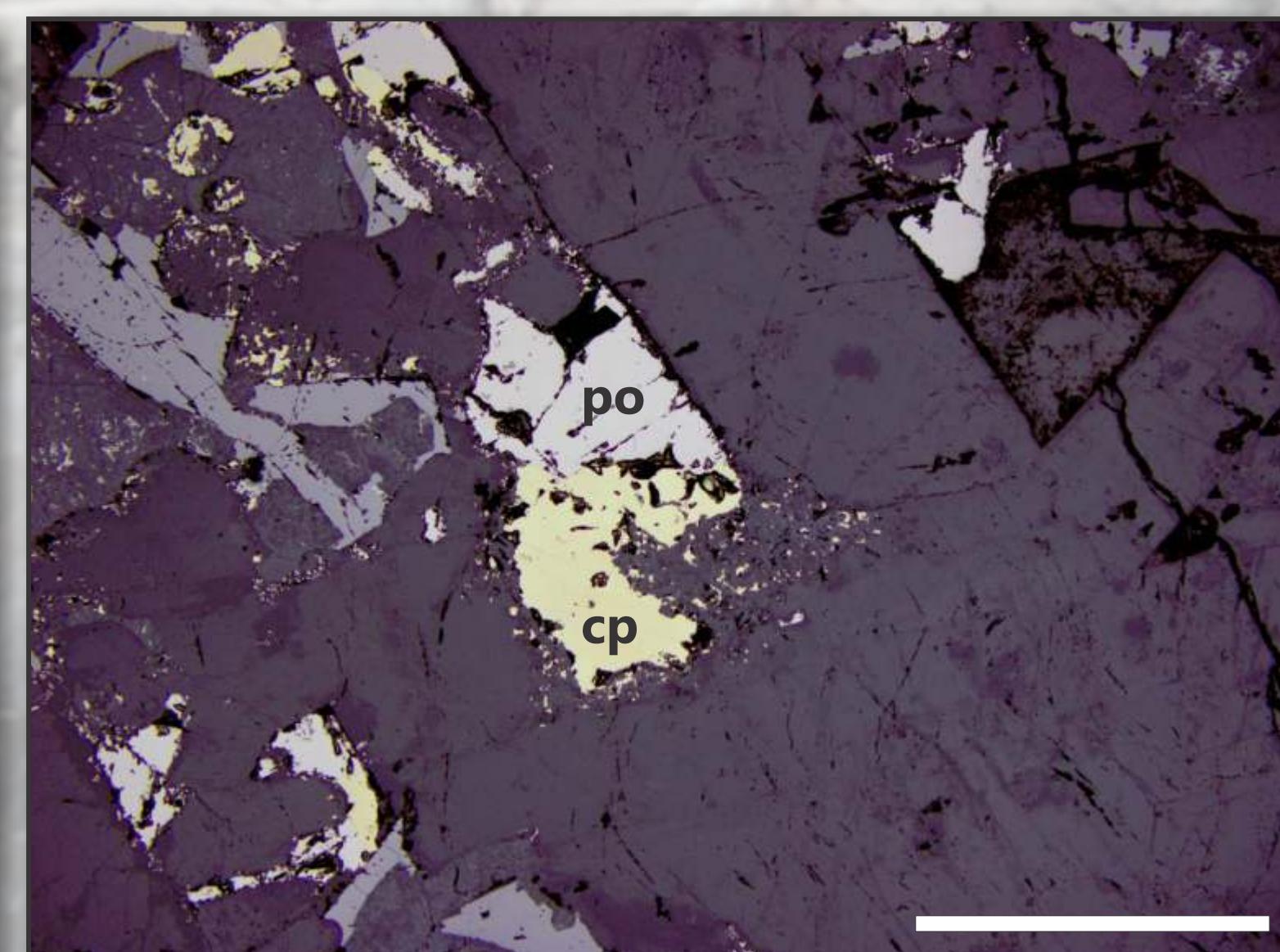
Ni-Cu-PGE Potential of Montagnais Gabbro Sills

Gabbro sills of the Montagnais Intrusive Suite have long been considered possible hosts for magmatic Ni-Cu-PGE deposits, and recent exploration in Québec has identified significant mineralization at the Huckleberry prospect (highs of 14% Cu, 1.2% Ni and 17g/t PGE + Au: Northern Shield Resources). Fieldwork in 2017 focused on the Ni-Cu-PGE potential of Montagnais gabbro sills in western Labrador. A number of known occurrences and new showings in the Howse Lake and Moss Lake areas were visited, and samples of mineralized gabbro were collected for whole-rock geochemistry and isotopic analysis.

These data form part of a B.Sc. (Hons.) project by Andrew Smith at Memorial University. Petrographic analysis of polished thin sections and SEM-MLA analysis will determine detailed petrographic relationships and host minerals for PGE mineralization. Sulphur isotope analysis and whole rock geochemistry will be used to determine the source of the sulphur within the mineralized gabbro, classify the deposit types, and create a genetic model for exploration. Initial results from this project will be published in 2018 as a Current Research article.



Detailed geological map of the Howse Lake area, showing sample locations from 2017 GSNL fieldwork



Outcrop of rusty, sulphide bearing gabbro from the Howse Lake area

Medium grained gabbro from the Howse Lake area, with disseminated interstitial sulphides (pyrrhotite and minor chalcocite). A ruler scale bar is shown in centimetres (0 to 8).

Photomicrograph of interstitial pyrrhotite (po) and chalcocite (cp) in mineralized gabbro from the Howse Lake area (reflected light, scale bar 0.5 mm).