

The Frobisher Suite of Mafic, Ultramafic, and Layered Mafic-Ultramafic Sills, Southern Baffin Island, Nunavut

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The Frobisher suite is a newly recognized magmatic province comprised of mafic, ultramafic and mafic-ultramafic sills of southern Baffin Island. We present geochemical data from mafic/ultramafic samples collected during the 2014 field season on Meta Incognita Peninsula; and U-Pb geochronological results for a leucogabbroic sample from the upper portion of a layered mafic-ultramafic sill. The Frobisher suite sills are emplaced into the psammitic to pelitic metasedimentary strata of the middle Paleoproterozoic Lake Harbour Group, and vary in thickness from several meters to one hundred meters. Layering within both mafic and mafic-ultramafic bodies occurs at the centimetre- to metre-scale. Disseminated sulphides are present in the sills, and in some cases, the adjacent host psammite. Lithologically, the sills vary from pyroxenite/peridotite at the base to gabbro/leucogabbro at the top. Similar sills have been documented throughout southern Baffin Island (including Foxe, Hall, and Meta Incognita peninsulas), and a mantle-derived, mafic-ultramafic magmatic province of this size may represent the exposed plumbing system of a Large Igneous Province (LIP). Based on major and trace element chemistry, the Frobisher suite can be divided into four subgroups. U-Pb dating was undertaken on a leucogabbroic sample from the top of a layered mafic-ultramafic sill using the Sensitive High Resolution Ion MicroProbe (SHRIMP) and isotope dilution-thermal ionization mass spectrometry (ID-TIMS). A minimum crystallization age of ca. 1900 Ma is suggested based on the preliminary data.