# Mafic magmatism in the Sudbury area: Towards an updated map and GIS database of the Sudbury impact structure and surrounding areas

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Large igneous provinces (LIPs) and their plumbing systems are useful for continental reconstruction of Archean cratonic fragments into their ancestral landmasses, i.e. supercratons. Canada's Superior craton, for example, has been linked to the Hearne (Nunavut), Wyoming (USA), Karelia-Kola (Finland/Russia), Yilgarn (Australia) and Zimbabwe (Africa) cratons. Reconstruction of the ancestral supercraton, i.e. Superia, is largely based on the matching of contemporaneous Paleoproterozoic LIP-scale mafic magmatic events using geochronology, dyke swarm geometries, and apparent polar wander paths. Detailed geochemical comparisons are currently underway. The southern margin of the Superior craton, particularly in the Sudbury area, is host to a high density of mafic sills and dykes affiliated with LIPs involved in the Superia reconstruction, including the Matachewan (2480 to 2450 Ma), Nipissing (2216 Ma), Biscotasing (2170 Ma), and Marathon (2130 to 2100 Ma) dykes and sills. The same area also hosts younger events such as the Sudbury (1235 Ma), and Grenville (590 Ma) swarms. The goal of this project is to provide an updated GIS product built from the existing GIS database (GSC Open File 1787). This update will facilitate access to information directly relating to the Sudbury impact structure (or Sudbury Igneous Complex, SIC) in addition to compiling a new database focused on the local mafic magmatic events (i.e. geochemistry, geochronology). Compiling and constraining these mafic magmatic events is necessary when considering the role of LIPs in the generation of Ni-Cu-PGE deposits. Economic mineral deposits tend to form proximal to magmatic centers. Improved constraints gained from the study of mafic magmatic events in the Sudbury area can be expanded to consider the entirety of Superior craton and will likely improve targeting related to their magmatic centers. The relationships between Superior and its proposed nearest-neighbours are of interest as other cratonic fragments also host Ni-Cu-PGE deposits (i.e. Karelia and the ca. 2058 Ma Kevitsa Mine). Understanding how and if mineralized magmatic events are genetically linked across cratons will provide unprecedented detail in terms of refining the Superia reconstruction and may suggest new exploration targets within Canada and abroad.