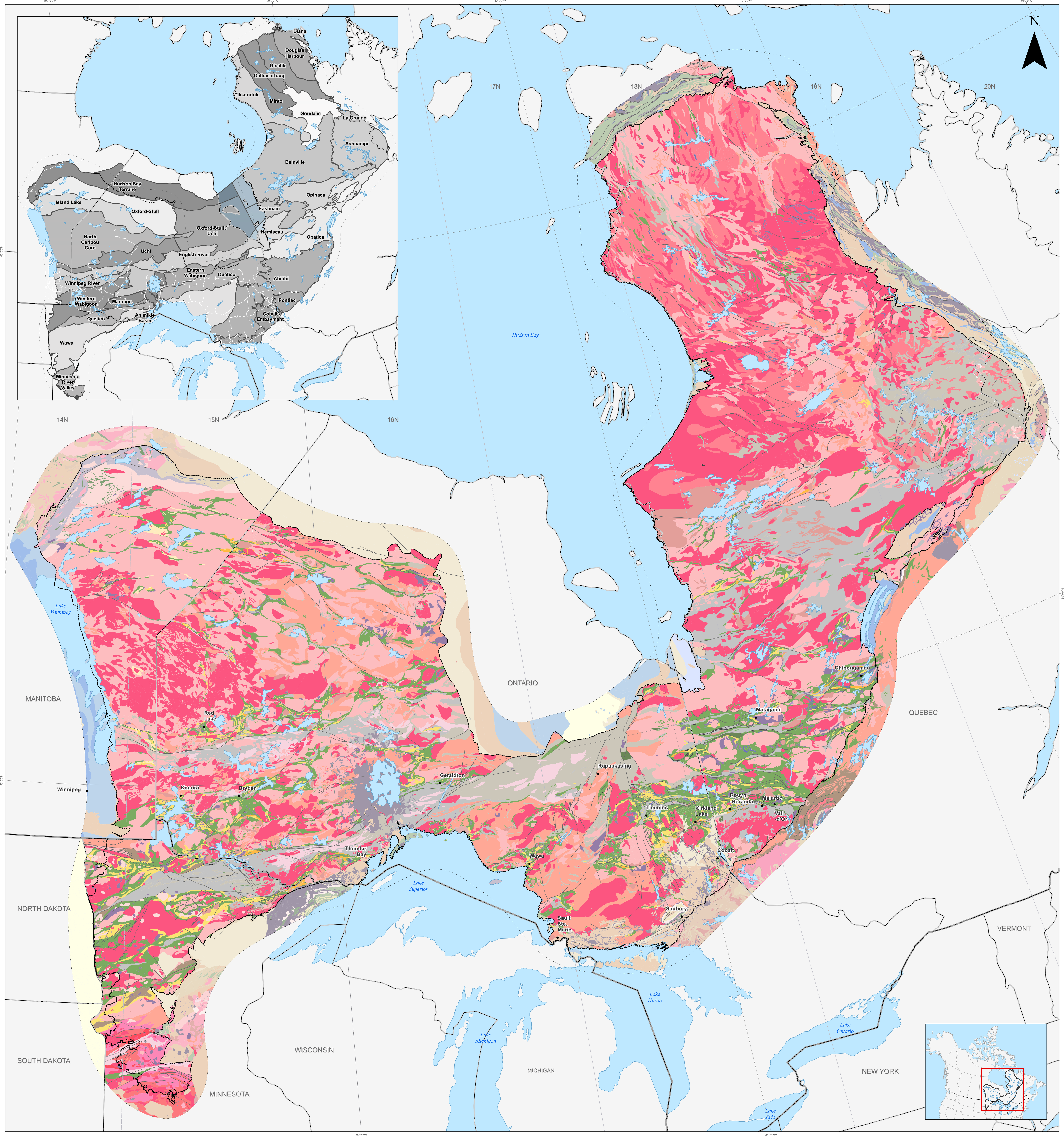

1:2 000 000 Scale Geological Compilation of the Superior Craton

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Abstract

The Superior Craton is the world's largest Archean craton and has been the subject of geologic research for over 100 years. The craton is comprised of amalgamated fault bounded, lithotectonic subprovinces that trend northeast to southwest. Subprovinces alternate between granite-greenstone regions and high-grade gneissic blocks, separated by metasedimentary-dominated domains. The 1:2 000 000 scale compilation presented here integrates recent province/state-scale mapping products from public domain sources for the Superior Craton. The geospatial dataset includes Precambrian bedrock geology layers and geophysical grids. Original work contained within the compilation include new interpretations such as updated subprovince boundaries, reclassified lithologies into a standardized legend and classification of fault traces based on scale. Compilation work was done in collaboration with the Ministère de l'Énergie et des Ressources Naturelles, Ontario Geologic Survey, Minnesota Geological Survey, Manitoba Mineral Resources, and Geological Survey of Newfoundland and Labrador. The map provides a basis for future craton-scale and thematic projects within the Superior Craton as it presents recent regional mapping products throughout the craton and across political boundaries.

Legend

- Towns and cities
- Highways (inset map only)
- Fault traces
- Canada - United States border
- Waterbodies
- Political boundaries
- UTM zone boundaries
- Boundary of the Superior Craton (exposed at surface)
- Area of interest (50 km buffer to Superior Craton)

Tectonic Subdivisions (inset map only)

1 Abitibi
2 Animikie Basin
3 Ashuanipi
4 Beinville
5 Cobalt Embayment
6 Diana
7 Douglas Harbour
8 Eastern Wabigoon
9 Eastmain
10 English River
11 Goudalie
12 Hudson Bay Terrane
13 Island Lake
14 La Grande
15 Marmion
16 Minnesota River Valley
17 Minto
18 Nemiscau
19 North Caribou Core
20 Opatica
21 Opinaca
22 Oxford-Stull
23 Oxford-Stull / Uchi
24 Pontiac
25 Qalluviartuuq
26 Quetico
27 Tikkerutuk
28 Uchi
29 Utsalik
30 Wawa
31 Western Wabigoon
32 Winnipeg River

In general, older bedrock units are named after younger ones.

PHANEROZOIC (present - 542.0 Ma)
QUATERNARY (present - 2.58 Ma)
17us Unconsolidated Quaternary sediments
PALEOZOIC (251.0 Ma - 542.0 Ma)
Carbonate units[2]
16cu Unsubdivided carbonate
16cd Dolomite
16cl Limestone
PRECAMBRIAN[1] **(0.542 Ga - <3.85 Ga)**
PROTEROZOIC (0.542 Ga - 2.50 Ga)
Impactites[2]
15is Sudbury units (1.85 Ga)
15ic Carbonatites **Age varies. Varies from broadly gabbroic units to suevite*
Granitoids[2]
14gu Unsubdivided granitoid units: *Includes all units listed below in areas without detailed maps*
14gg Massive granodiorite to granite: *Massive to foliated granodiorite to granite*
14gd Diorite-monzonite- granodiorite suite: *Diorite, tonalite, monzonite, granodiorite, syenite and hypabyssal equivalents*
14gm Muscovite-bearing granitic rocks: *Muscovite-biotite and cordierite-biotite granite, granodiorite-tonalite*
14gf Foliated tonalite suite: *Tonalite to granodiorite – foliated to massive*
14gt Gneissic tonalite suite: *Tonalite to granodiorite – foliated to gneissic – with minor supracrustal inclusions*
14gp Pyroxene-bearing granitic rocks: *Granitic rocks containing pyroxene, including charnokites, enderbites etc.*
Mafic and ultramafic intrusions[2]
13mu Unsubdivided mafic and ultramafic intrusions: *Generally based on geophysical interpretation*
13mm Mafic intrusions: *Gabbroic units, fine to coarse grained*
13mi Ultramafic intrusions: *Vary from anorthosite to various pyroxene-bearing units to dunite*
Clastic metasedimentary[2]
12su Unsubdivided clastic metasedimentary units: *Largely based on regional mapping or geophysical interpretation*
12si Iron formation: *Dominantly oxide facies minor sulfide, carbonate & silicate facies*
12sc Coarse clastic metasedimentary units: *Dominantly coarse clastic metasedimentary rocks (sandstone to coarse conglomerate), with minor, mainly alkali, mafic to felsic metavolcanic flows, tuffs and breccias*
12sf Fine grained clastic metsedimentary rocks: *Wacke, arkose, argillite, slate, marble, chert, minor metavolcanic layers*
12sm Migmatized supracrustal rocks: *Migmatized metasedimentary rocks with minor migmatized metavolcanic content*
Metavolcanic units[2]
11vu Unsubdivided metavolcanic units: *Based on reconnaissance mapping – largely mafic*
11vm Mafic to ultramafic metavolcanics: *Mafic metavolcanic rocks with minor komatiite, minor metasedimentary, and minor pyroclastic rocks*
11vi Mafic to intermediate metavolcanics: *Basaltic and andesitic flows, tuffs and breccias, chert, iron formation, minor metasedimentary and intrusive rocks, related migmatites*
11vf Felsic to intermediate metavolcanics: *Rhyolitic, rhyodacitic, dacitic and andesitic flows, tuffs and breccias, chert, iron formation, minor metasedimentary and intrusive rocks; related migmatites*
ARCHEAN (2.5 Ga - <3.85 Ga)
Granitoids[2]
4gu Unsubdivided granitoid units: I*ncludes all units listed below in areas without detailed maps*
4gn Diorite-Nepheline syenite suite: *Pyroxenite, diorite, monzonite, syenite, nepheline syenite*
4go Granitic orthogneiss and migmatite: *Granitic orthogneiss and migmatite units from the Minnesota River Valley Gneiss (MRVG) suite. Possibly later than other MRVG units listed below.*
4gga Massive granodiorite to granite: *Massive to foliated granodiorite to granite*
4ggb Granitoid gneiss with dioritic to amphibolitic enclaves: *Granitoid gneiss from the Minnesota River Valley Gneiss suite. Probably representing engulfment of earlier supracrustal units by granitoid units; produces moderately high and varied gravity and magnetic signatures.*
4gd Diorite-monzonite- granodiorite suite: *Diorite, tonalite, monzonite, granodiorite, syenite and hypabyssal equivalents*
4gm Muscovite-bearing granitic rocks: *Muscovite-biotite and cordierite-biotite granite, granodiorite-tonalite*
4ga Amphibolitic to dioritic gneiss: *Relic volcanic units within the Minnesota River Valley Gneisses*
4gf Foliated tonalite suite: *Tonalite to granodiorite – foliated to massive*
4gta Gneissic tonalite suite: *Tonalite to granodiorite – foliated to gneissic – with minor supracrustal inclusions*
4gtb Foliated to gneissic tonalite and granodiorite: *Amphibole and/or pyroxene bearing gneisses from the Minnesota River Valley Gneiss suite*
4gp Pyroxene-bearing granitic rocks: *Granitic rocks containing pyroxene, including charnokites, enderbites etc.*
Mafic and ultramafic intrusions[2]
3iu Unsubdivided mafic and ultramafic intrusions: *Generally based on geophysical interpretation*
3im Mafic intrusions: *Gabbroic units, fine to coarse grained*
3ii Ultramafic intrusions: *Vary from anorthosite to various pyroxene-bearing units to dunite*
Metasedimentary units[2]
2sma Migmatized clastic and chemical metasedimentary units: *Migmatized clastic and chemical metasedimentary rocks with or without komatiites*
2smb Migmatized Successor Basin units: *Migmatized Successor Basin metasedimentary units with undefined or mixed grain size classification*
2sua Clastic and chemical metasedimentary units: *Clastic and chemical metasedimentary rocks with or without komatiites*
2sub Unsubdivided Successor Basin units: *Mixed conglomerate and wacke Successor Basin units*
2si Iron formation: *Dominantly oxide facies minor sulfide, carbonate and silicate facies*
2sca Coarse clastic metasedimentary units: *Dominantly coarse clastic metasedimentary rocks (sandstone to coarse conglomerate), with minor, mainly alkali, mafic to felsic metavolcanic flows, tuffs and breccias*
2scb Coarse Clastic Successor Basin units: *Late (2680-2675 Ma), conglomerate dominated, Timiskaming-type sedimentary units*
2sfa Fine grained clastic metasedimentary units: *Wacke, arkose, argillite, slate, marble, chert, minor metavolcanic rocks*
2sfb Fine Clastic Successor Basin units: *Early (2690-2680 Ma), wacke dominated, Porcupine-type successor basin units*
Metavolcanic units[2]
1vu Unsubdivided metavolcanic units: *Based on reconnaissance mapping – largely mafic*
1vm Mafic to ultramafic metavolcanics: *Mafic metavolcanic rocks with minor komatiite, minor metasedimentary, and minor pyroclastic rocks*
1vi Mafic to intermediate metavolcanics: *Basaltic and andesitic flows, tuffs and breccias, chert, iron formation, minor metasedimentary and intrusive rocks, related migmatites*
1vf Felsic to intermediate metavolcanics: *Rhyolitic, rhyodacitic, dacitic and andesitic flows, tuffs and breccias, chert, iron formation, minor metasedimentary and intrusive rocks; related migmatites*

[1] Subdivisions of Precambrian geologic time and units characterized by a range of ages are cited in terms of Ga. The subdivisions of geologic time correspond to international standards. All ages of individual units cited in the legend are based on high precision U/Pb zircon ages, and are cited in terms of Ma.
[2] Rocks in these groups are subdivided lithologically. The order does not imply age relationship within or among groups.

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Disclaimer

These compiled GIS layers were prepared for the sole purpose of portraying recent, publically available bedrock geology layers of the Superior Craton at 1:2 000 000 scale. It should not be used for any other purpose. Use of this compilation map/dataset is governed by the following principles:

1) The compilation map is scale dependent. Use of the information from the compilation at any scale other than 1:2 000 000 is unwarranted and will result in erroneous conclusions.
2) To enable the rapid dissemination of information, this digital compilation has not received a thorough technical edit. Discrepancies may occur for which the Mineral Exploration Research Center does not assume liability. The compilation does not fully portray the complex geology of the Superior Craton and users should verify critical information.
3) New data and observation are continually collected, synthesized and compiled. Users should be aware that the digital compilation was current at time of posting, but new information may substantially change the interpretation in any area. Users should verify the currency of data in any area before proceeding. Users are also directed to check the Metal Earth Website (http://merc.laurentian.ca/metalearth/superior_compilation) for future updates and any newer versions of this map/data compilation.
4) The GIS layers were prepared from compilation of available province/state-scale products from relevant public surveys. These maps were updated within the confines of the available time with information collected post–1990. No attempt was made to check source material published prior to the creation of the manuscript maps.
5) The geology was subdivided to aid identification of economically important rock units.

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