GEOLOGICAL DATABASES FOR MINNESOTA

Data from the MGS, DNR, and NRRI

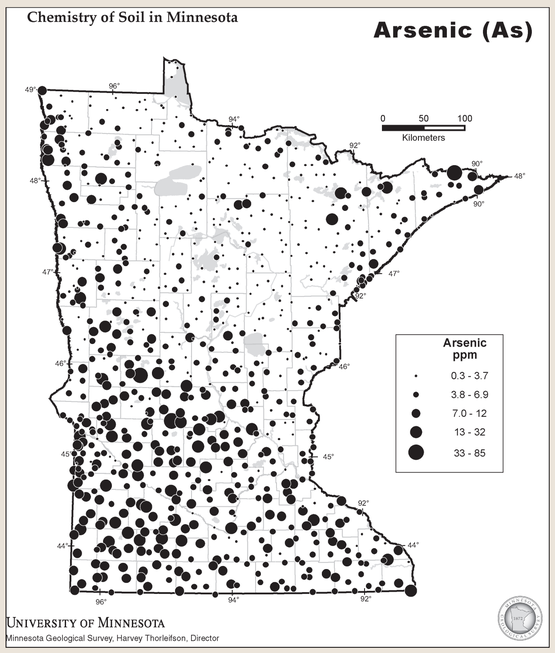
The exploration community in Minnesota is well served by systematic geology, geophysics, and geochemistry databases produced by the Minnesota Geological Survey, by the Department of Natural Resources, & by the Natural Resource Research Institute and the University of Minnesota Duluth

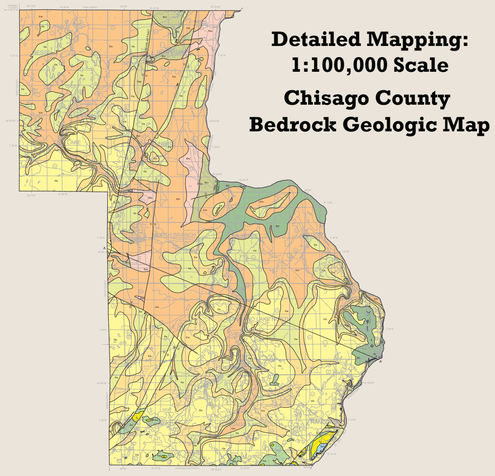
Minnesota Geological Survey (MGS):

* Multi-layered, digital geologic map, 2011
* Detailed geologic mapping ongoing statewide
* Statewide geochemical atlas released, 2009
* State aeromagnetic database fully reprocessed
* State gravity database fully reprocessed

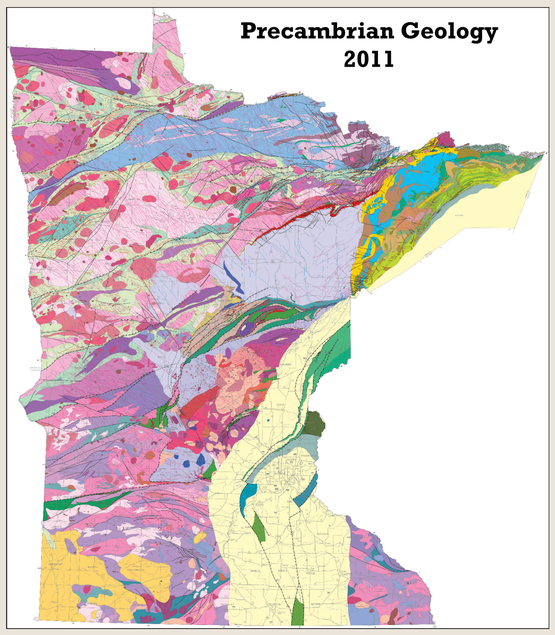
http://www.mngs.umn.edu/

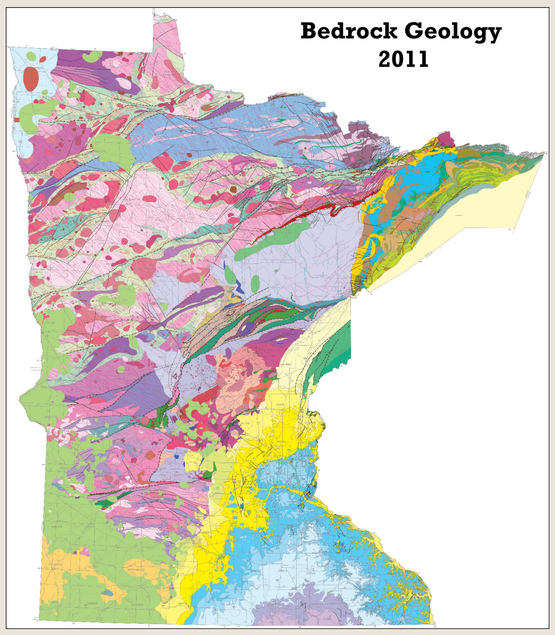
Geochemical Mapping



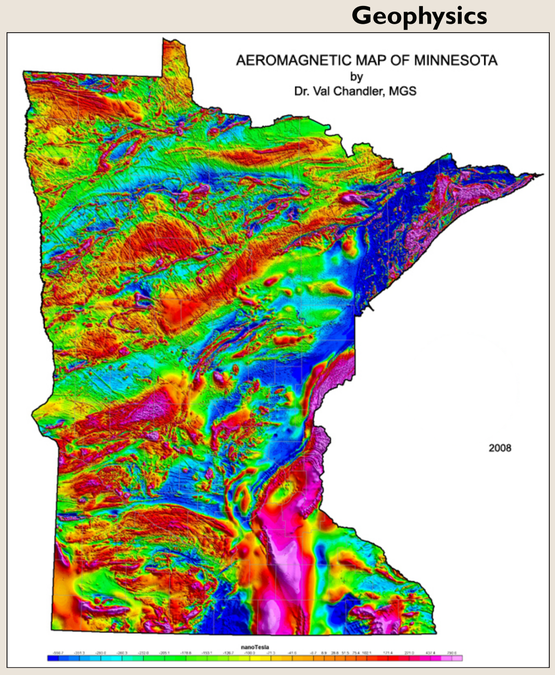


Geological Mapping

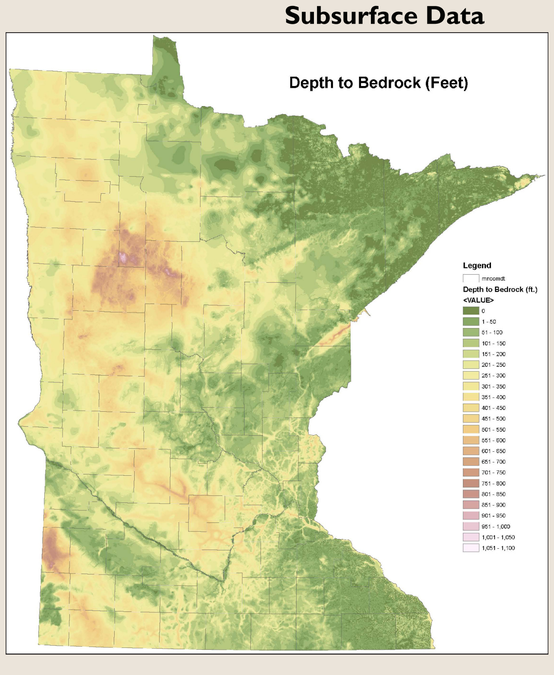




Geophysics



Subsurface Data



Re-examination of Core From the DNR Drill Core Library has Helped in the Discovery of Major Mineral Deposits in Minnesota.

> 3 million feet of core

> 8,000 drill holes

> 100,000 pages of data

Heated work areas with room to lay out 96 boxes of drill core.

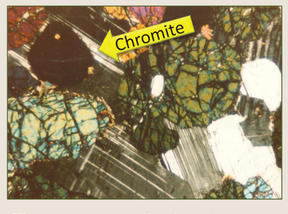
Shelves of boxed core in one of the Drill Core Library's four buildings in Hibbing

Drill Core Library

The Minnesota Department of Natural Resources (DNR) maintains an assessment file system that contains the historic data from exploration on State-owned lands, including more than 3 million feet of publically accessible drill core from more than 8,000 drill holes collected over a 100 year time period. The core is stored in a modern Drill Core Library that offers exploration geologists a first-hand look at core from areas with high mineral potential.

Birch Lake Deposit

In 1985, a DNR geologist used a hand lens to identify chromite grains in a section of core DU-15. Subsequent DNR assays revealed significant PGM content. Lehmann Exploration Management secured the state mineral rights in the vicinity of DU-15 with winning bids during a subsequent state lease sale…Their work started the exploration & delineation of what is today the Birch Lake deposit of CU + NI + PGM.



Thin-section view of a chromite grain in a pyroxenite from drill hole DU-15

The Drill Core Library has a heated work area where visitors can lay out and examine 960 feet of core at the same time.

Tamarack Deposit

In 1984, the Minnesota Geological Survey drilled a very short interval of a peridotite near Tamarack, MN. In about 1999, a Rio Tinto geologist reviewing the archived core recognized that this intrusion was related to the Mid-Continent Rift, and may have high mineral potential…His work led to the Rio Tinto discovery of high grade CU + NI + PGM at the Tamarack deposit, and the continuing exploration today.

Maturi Deposit

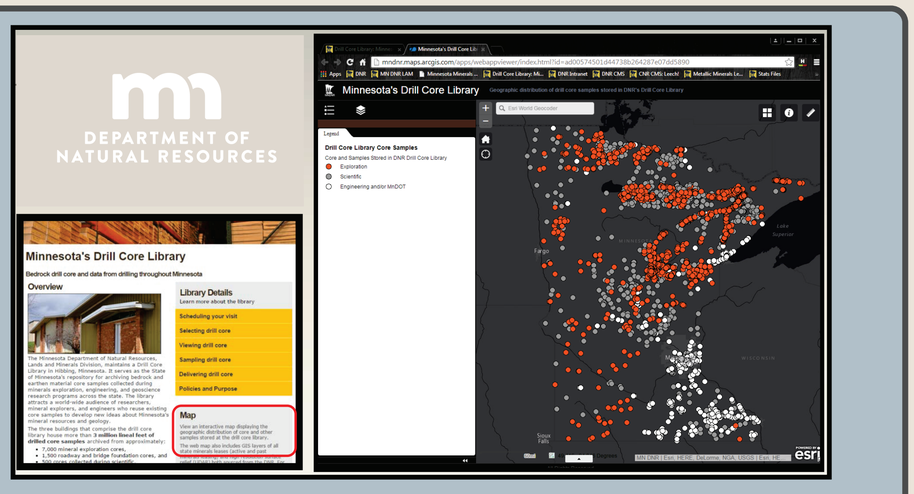
Duluth Metals (formerly Wallbridge America Ltd) geologists examined a series of widely spaced drill holes previously drilled by DUVAL, and recognized that a deep layer of CU + NI mineralization was a continuous sheet and that it may extend downdip. This work helped lead them to the Maturi deposit of CU+NI+PGM. Twin Metals Minnesota LLC is the company developing the project.

A box of core from the DNR's Drill Core Library. Visiting geologists can assay archived core.

Will the DNR Drill Core Library Be the Source for Your Company's Next Discovery?

http://www.dnr.state.mn.us/lands_minerals/dc_library.html

Drill Core Library Webpage and Web Map Application



This new DNR webpage greatly facilitates public access to the more than three million linear feet of drill core and other geologic materials archived within the Drill Core Library in Hibbing. The webpage outlines the Drill Core Library's mission and provides details for those interested in viewing, sampling, and/or submitting drill core materials.

An associated interactive web map displays more than 8,500 source locations for the material archived within the Drill Core Library, with links to drilling information. This user-driven map interface allows anyone with internet access to compare locations against overlays of geologic information and state mineral leases. This kind of interactive manipulation of drill hole and geologic data previously required ArcGIS software.

http://www.dnr.state.mn.us/lands_minerals/dc_library.html