

MINNESOTA GEOLOGICAL SURVEY

Open-File Report: **OFR10_02**

PRELIMINARY* BEDROCK GEOLOGIC MAP OF MINNESOTA

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by

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** Note that the contents of this report have not been reviewed to conform to editorial standards of the Minnesota Geological Survey*

PROJECT SUMMARY

This mapping project was undertaken to create new state-wide geologic imagery that reflects the best possible interpretation, given modern techniques and available data sets. The geologic map is a new construct that incorporates existing geologic maps where prior mappers had ground control, and new interpretations based on drill hole, geophysical, and unpublished data where they did not. The interpretation differs locally from previous maps to accommodate scale and reflect new data.

The contents of this report include preliminary geologic maps, bedrock topographic and depth to bedrock maps, and maps of ancillary data as pdf files. Digital data files of the map elements, and those related to map compilation, are also included. The maps were compiled at varied scales ranging from 1:500,000 to 1:24, 000. They are printable at 1:500,000 scale; however, they are provided at 1:1,000,000 scale for this demonstration. Note that the geologic maps are labeled "Preliminary." This reflects the fact that they have been constructed, but require several months of review by workers in adjacent states and provinces and internal editing before final versions are released sometime in 2010 as MGS State Map Series S21.

The following maps are included in this report:

- 1) Preliminary Bedrock Geologic Map of Minnesota*
- 2) Preliminary Precambrian Geologic Map of Minnesota
- 3) Bedrock Topographic Map of Minnesota
- 4) Depth to Bedrock Map of Minnesota
- 5) Bedrock Outcrop Map of Minnesota
- 6) Location of Geochronologic Analyses in Minnesota

*Note that for this iteration of the Bedrock Geologic Map, Cretaceous bedrock is not portrayed. This is important because the Bedrock Topographic and Depth to Bedrock maps were compiled using the stratigraphic top of the Cretaceous in areas where it occurs.

GIS layers and digital files

projection: All ArcGis shapefiles are double precision and are in UTM zone 15 projection, NAD83.

Base layers:

Mn_counties -- Minnesota county outline polygon shapefile from DNR data deli.

Shapefiles (folder Shapefiles):

Kew_sed_cover -- polygon shapefile of Keweenawan clastic sediments covering crystalline rocks in Lake Superior

Pc_contacts_faults -- polyline shapefile of contacts and faults for the Precambrian geology map of Minnesota

Pc_gld_polys -- polygon shapefile of Precambrian bedrock geology of Minnesota

Pz_faults -- polyline shapefile of faults in the Paleozoic rocks of southeastern Minnesota

Pz_glg_polys -- polygon shapefile of Paleozoic geology of Minnesota. This separate shapefile is intended to be above the Precambrian geology in a GIS environment.

age_date_locs -- point shapefile of locations of age dates in Minnesota. This file does not include all age information available.

dikes -- polyline shapefile showing locations and trends of dikes in Minnesota. Many based on geophysics.

form_lns -- polyline shapefile showing types and locations of linear features in the Precambrian bedrock. Many based on geophysics.

oc_loc --point shapefile showing outcrop locations mapped as points.

oc_poly -- polygon shapefile showing outcrop locations mapped as polygons.

rp_samp_loc -- point shapefile showing outcrop locations where rock property data was obtained.

rp_site_loc -- point shapefile showing outcrop groups where rock property data was obtained.

Grids (folder grids):

Bedrock_topo --ESRI grid showing the elevation of the bedrock topographic surface in Minnesota. This surface includes the top of Cretaceous rocks. Units are feet above sea level.

Depth_to_bdrk -- ESRI grid showing the distance between the landsurface and the bedrock surface. Obtained by subtracting the bedrock_topo grid from the USGS NED land-surface elevation grid. Units are feet.

Compiled maps in Pdf format (folder Pdfs)

P11_Bedrock_Geology.pdf
P12_Precambrian_Geology.pdf
P13_Bedrock_Topography.pdf
P14_Depth_to_Bedrock.pdf
P15_Outcrop_Locations.pdf
P16_geochron.pdf

Legend files (folder Legends):

Age Date Locations.lyr

Pc_contacts_faults.lyr

Pc_glg_polys.lyr

Pz_glg_polys.lyr--empty polys are enclosed holes in the Paleozoic cover where Precambrian rocks are exposed.

form_Ins.lyr

Questions concerning the digital data may be directed to Rich Lively (lively@umn.edu).

Questions concerning the geologic information presented in the map should be directed to the principal author, Mark Jirsal (jirsa001@umn.edu).

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