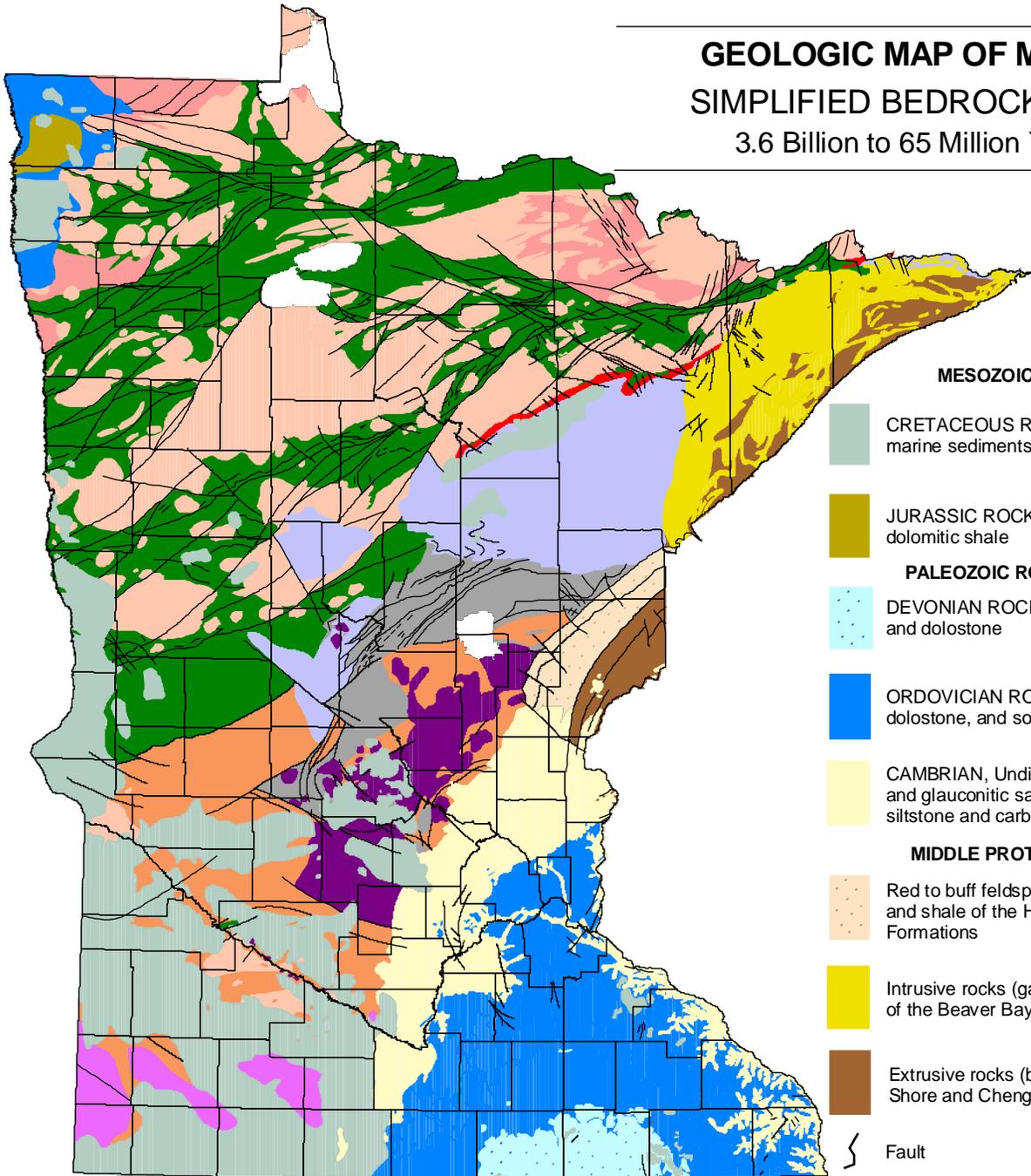


GEOLOGIC MAP OF MINNESOTA

SIMPLIFIED BEDROCK GEOLOGY

3.6 Billion to 65 Million Years Ago



DESCRIPTION OF MAP UNITS

(mya = million years ago, bya = billion years ago)

MESOZOIC ROCKS (225 to 65 mya)

- CRETACEOUS ROCKS, Undivided - Dominantly marine sediments; shale and sandstone
- JURASSIC ROCKS, Undivided - Reddish brown dolomitic shale

PALEOZOIC ROCKS (600 to 225 mya)

- DEVONIAN ROCKS, Undivided - Limestone and dolostone
- ORDOVICIAN ROCKS, Undivided - Limestone, dolostone, and some sandstone and shale
- CAMBRIAN, Undivided - Quartzose and glauconitic sandstone; lesser amounts of siltstone and carbonate

MIDDLE PROTEROZOIC (1.6 to 0.9 bya)

- Red to buff feldspathic to quartzose sandstone and shale of the Hinckley and Fond du Lac Formations
- Intrusive rocks (gabbro, granite and anorthosite) of the Beaver Bay and Duluth Complexes
- Extrusive rocks (basalt and rhyolite) of the North Shore and Chengwatana Volcanic Groups

} Fault

EARLY PROTEROZOIC ROCKS (2.5 to 1.6 bya)

- Sedimentary and Metamorphic rocks of the Sioux Quartzite formation
- Intrusive rocks (granite and granodiorite) of the Penokean orogeny
- Meta- and sedimentary rocks (argillite, slate, shale, graywacke) of the Virginia, Thomson and Rove Formations

- Iron-Formation (hematite and taconite) of the Biwabik and Gunflint Iron Formations

- Metasedimentary rocks (slate, quartzite and metagraywacke) intercalated with volcanic rocks and iron formations

LATE ARCHEAN ROCKS (3 to 2.5 bya)

- Intrusive rocks (granite, granodiorite and tonalite) of the Algomian Orogeny

- Meta-igneous rocks (granitic gneiss, schist and granite-rich migmatite) grading into granitic rock
- Meta-igneous extrusive rocks of mafic to felsic composition (greenstones/amphibolites) and metasedimentary rocks

MIDDLE ARCHEAN ROCKS (3.6 to 3 bya)

- Quartzofeldspathic gneiss, amphibolite, and other high-grade metamorphic rocks