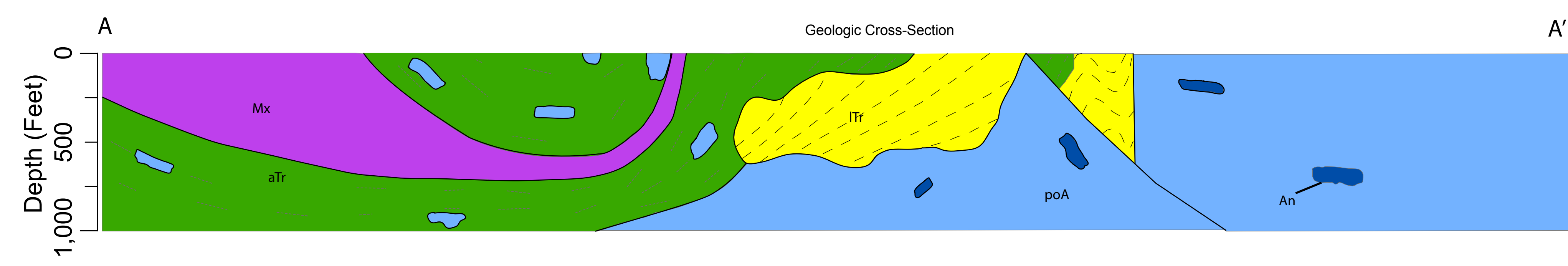
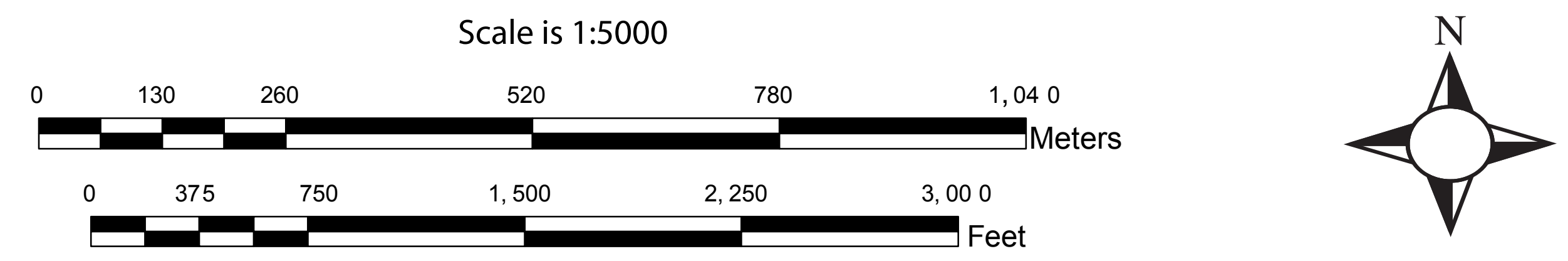
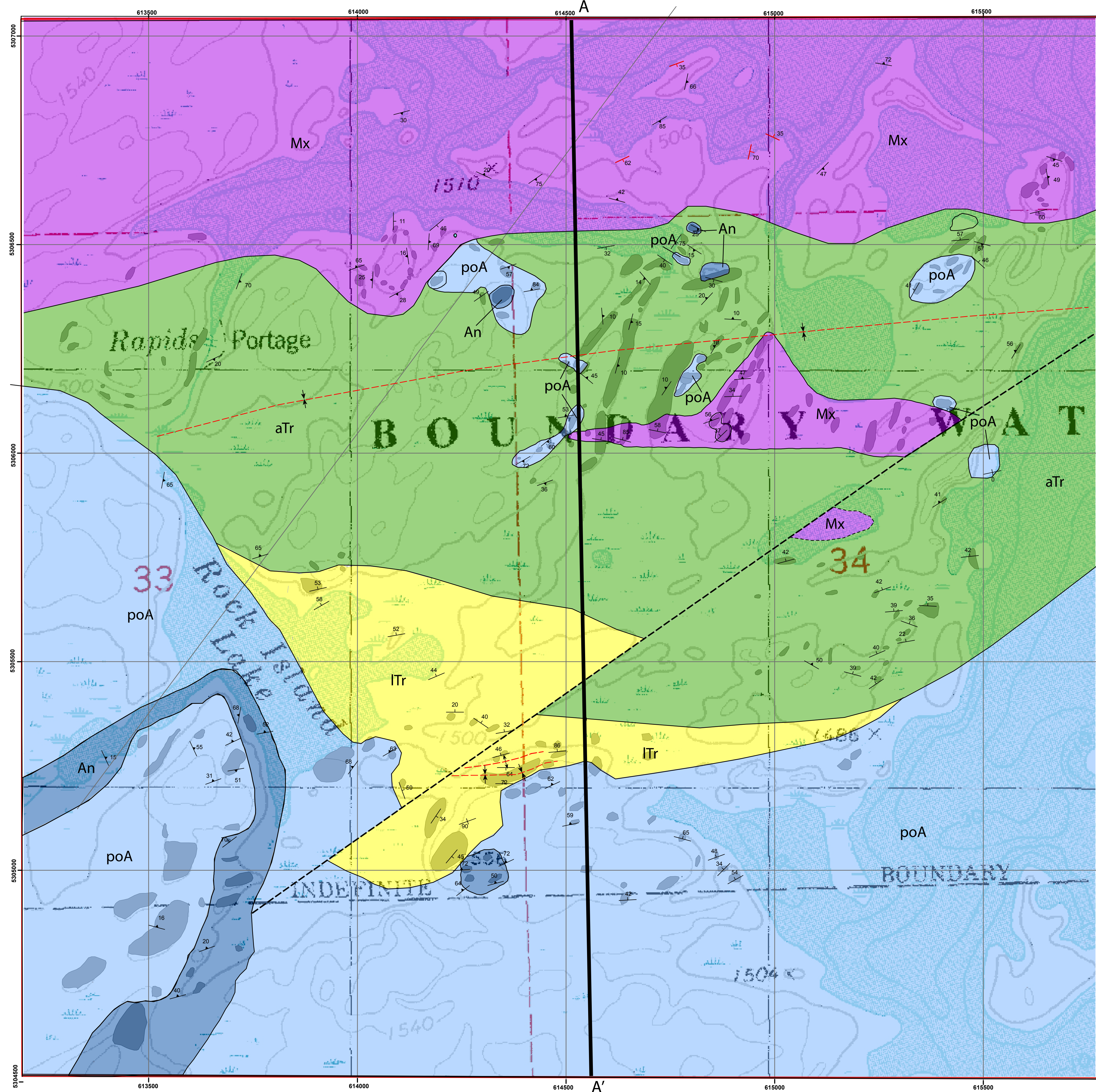


Detailed Bedrock Mapping of Lake Two, Pagami Creek Burn Area Boundary Waters Canoe Area, MN

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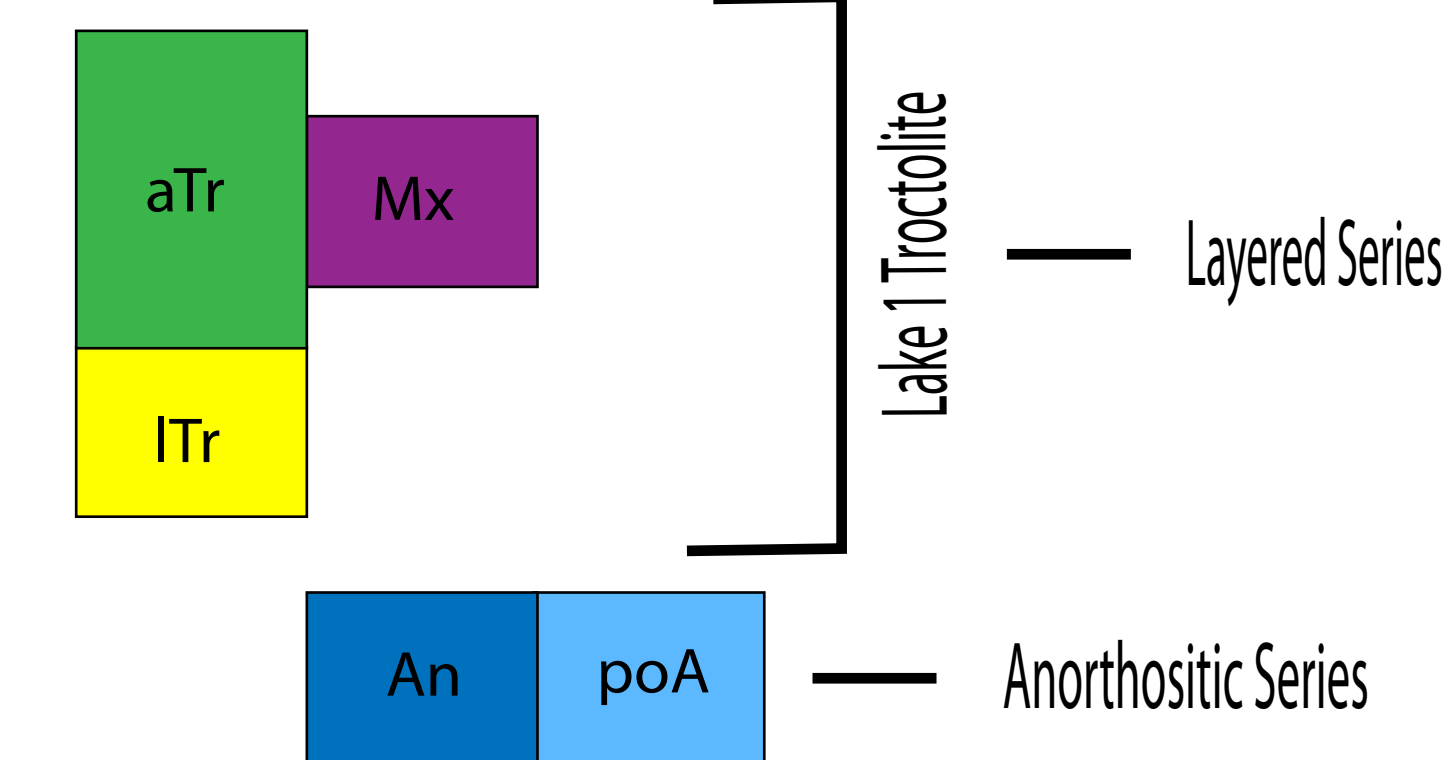
Objective

This map was made by four students from the Precambrian Research Center Field Camp under the supervision of Mark Severson and Jim Miller, and with assistance in the field from Alli Severson. The purpose of this map was to determine contact relationships between the troctolitic, anorthositic, and mixed rock units and refine the work started by Jim Miller in 1981. This map was produced by detailed field mapping from August 7th through August 10th, 2012. Canoeing allowed access to the best burn areas with good outcrop exposure as shoreline mapping was completed by Jim Miller in 1981. The map was produced at a 1:10,000 scale.

Description of Map Symbols

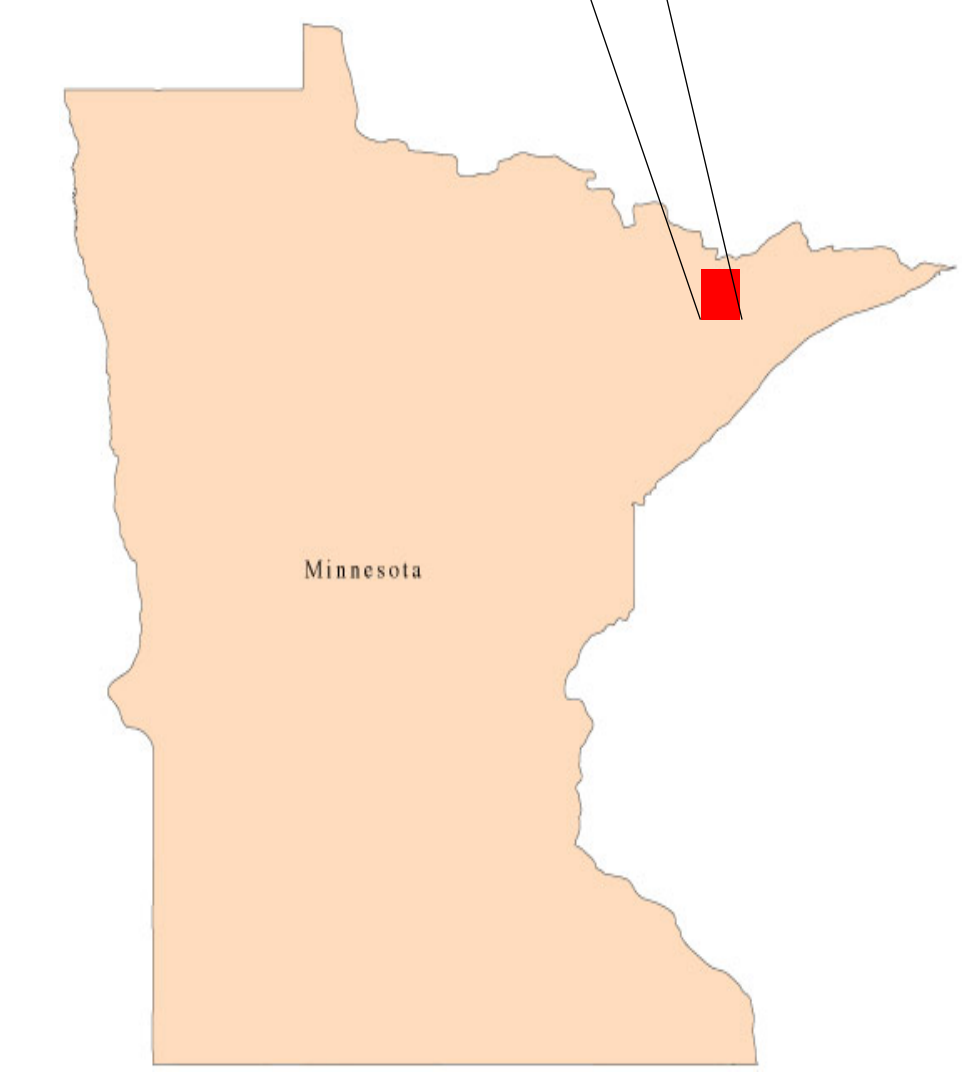
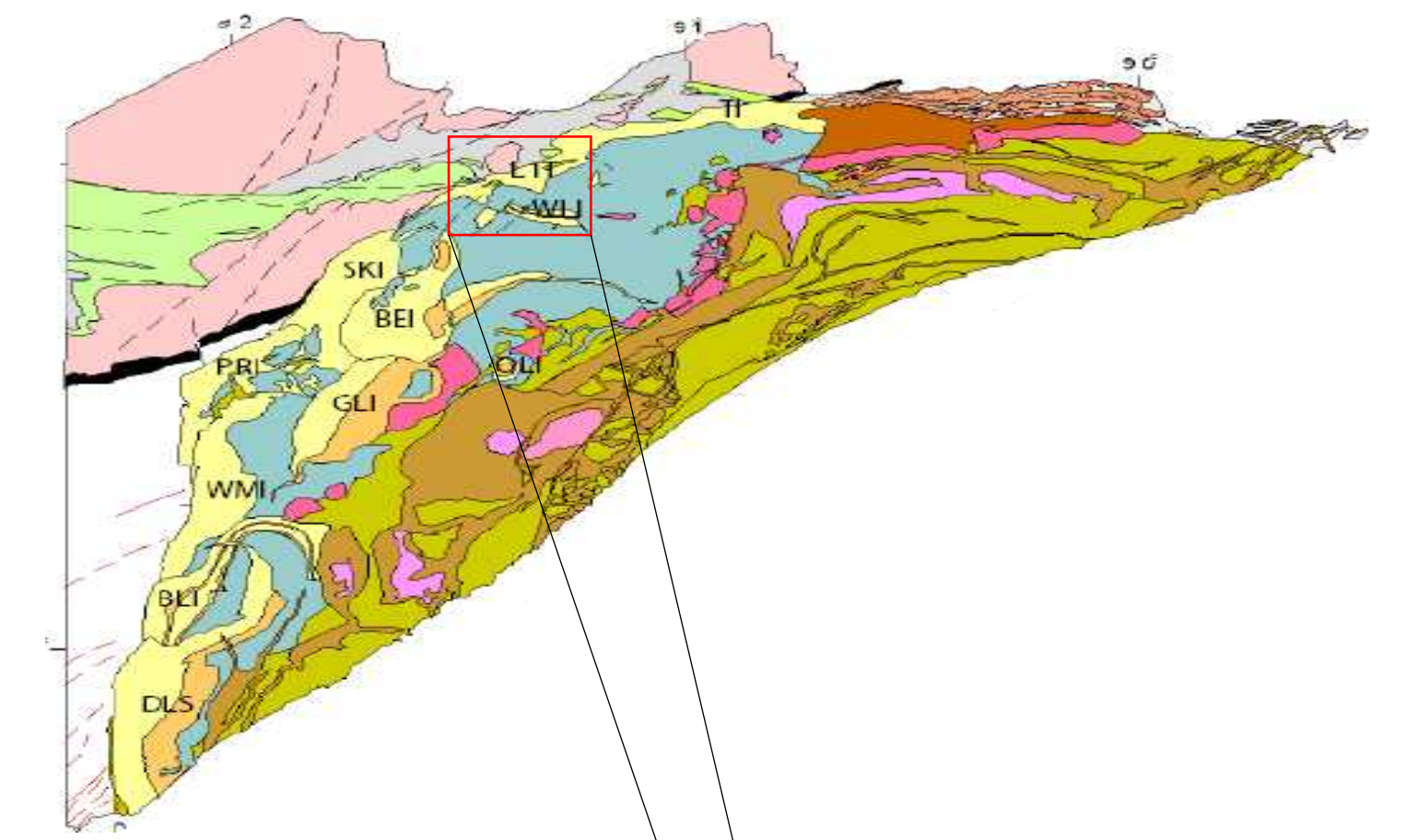
- Syncline Axis
- Anticline Axis
- Geologic Contact
- Inferred Geologic Contact
- Fault
- Outcrop
- Strike and Dip of Diabase Micro-dikes
- Strike and Dip of Inclined Bedding
- Strike of Vertical Bedding
- Strike and Dip of Inclined Foliation
- Strike of Vertical Foliation
- Cross-Section Line

Correlation of Units



Duluth Complex
 Mesoproterozoic

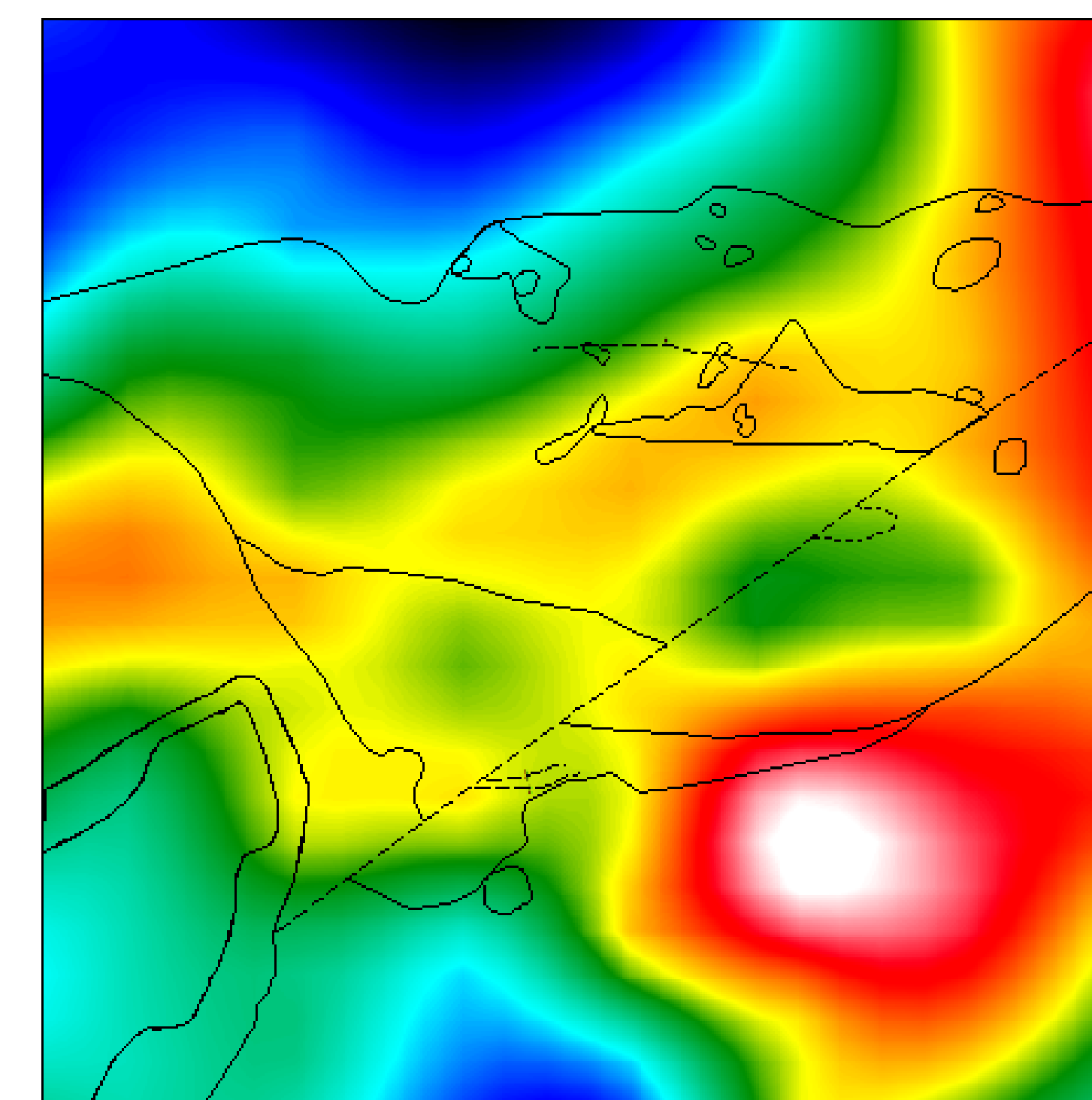
Map Location



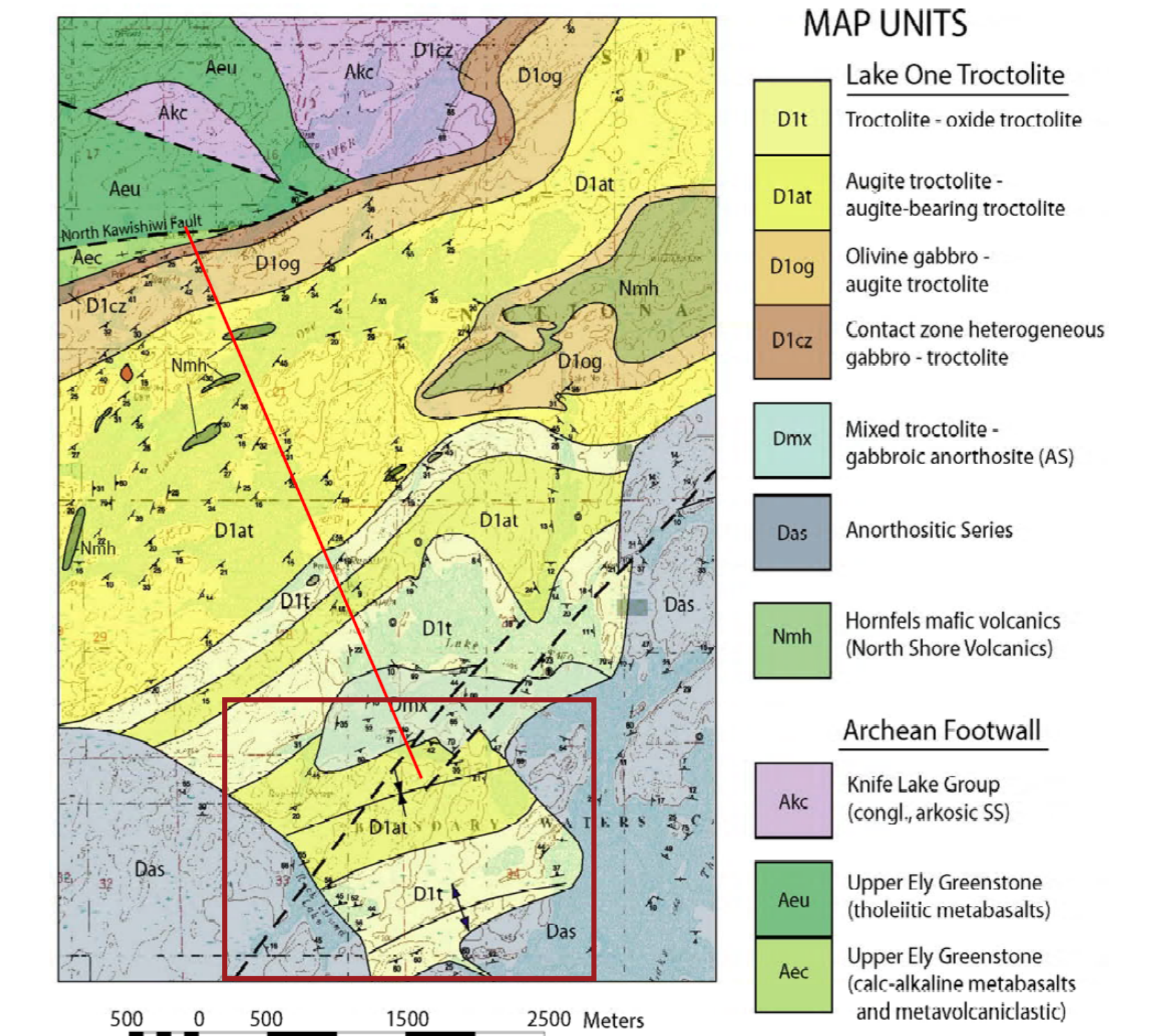
Description of Rock Units

- An**
 White to light grey medium grained anorthosite consisting of plagioclase with reddish brown olivine. In weathered surface, dark grey in fresh surface. Olivine is granular and can be layered locally. Contains minor augite and oxides. Often found interlayered with poikilitic anorthosite (poA).
- poA**
 White to light grey troctolitic anorthosite with brown poikilitic olivine oikocrysts. Plagioclase is white to light grey in weathered surface, dark grey in fresh, broken surface. Texture varies from medium to coarse grained, with weak to moderate plagioclase foliation, and olivine oikocrysts from 2 to >10 cm in diameter. May locally display olivine layering, and is often interlayered with the anorthosite (An).
- Mx**
 Mappable unit of highly heterogeneous (mixed) anorthosite series rocks in a troctolite matrix, with various xenolith inclusions such as mafic hornfels and pegmatitic gabbro. Inclusions range in size from several centimeters to over 10 meters. Contacts between units range from sharp to gradational over several centimeters. The southern limb of the unit contains a unique heterogeneous zone defined by the presence of layered troctolite with contorted, moderately dipping to sub-vertical bedding, medium grained augite bearing to augite troctolite, pegmatitic olivine gabbro, as well as numerous inclusions of anorthosite and poikilitic anorthosite.
- aTr**
 Light to dark grey, fine to very coarse grained augite troctolite with weak to moderate plagioclase foliation and granular olivine. Augite content ranges from barely present to well over 5%, and is observed in both granular and ophitic form, with ophites up to 2.5 cm in diameter and some pegmatitic zones. Augite distribution is inconsistent on the outcrop scale, with augite rich zones bordered by zones that contain very small amounts of augite. Also contains small amounts of oxide minerals, causing the rock to be strongly magnetic locally. Locally displays both plagioclase foliation and modal layering. Anorthosite inclusions are common and vary in size from 10 cm to over 20m.
- ITr**
 Modally layered, fine to medium grained pure troctolite containing white to light grey plagioclase and reddish brown olivine, in weathered surface, dark grey in fresh surface. Modal layering is very distinctive and alternates between olivine rich (OP) and olivine poor (PO) layers. Augite and oxides are present locally, but characteristically nearly absent (<<1%) throughout the unit.

Aeromagnetic Survey Data of Map Area



Previous Map



DISCLAIMER
 Every reasonable attempt has been made to ensure the accuracy of the factual data on which this map interpretation is based. However, the Precambrian Research Center and the University of Minnesota do not warrant or guarantee that there are no errors. Users may wish to verify critical information. Sources include both the references listed here and information on file at the Precambrian Research Center. In addition, effort has been made to ensure that the interpretation conforms to sound geologic and cartographic principles. No claim is made that the interpretation shown is rigorously correct, however, and it should not be used to guide engineering-scale decisions without site specific verifications. The University of Minnesota is an equal opportunity employer. The views and conclusions in this document are those of the authors and should not be interpreted as necessarily representing the official policies, either expressed or implied, of the U.S. Government. This map is submitted for publication with the understanding that the U.S. Government is authorized to reproduce and distribute reprints for governmental use. The field mapping was conducted at a 1:10,000 scale. For visual purposes, the map is represented here in a 1:5,000 scale.