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Physiography and superficial geology of the copper-nickel study region, northeastern Minnesota

Water-Resources Investigations Report 78-51

Prepared in cooperation with Minnesota Environmental Quality Board Copper-Nickel Study Staff

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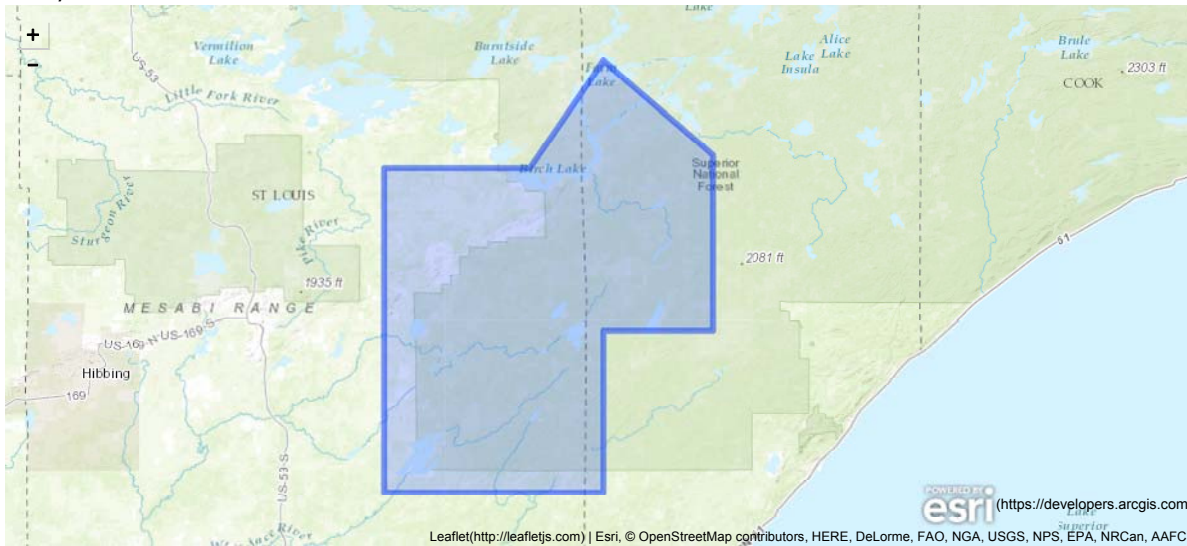
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Abstract

The Copper-Nickel study region lies in the Superior Upland physiographic province and is located approximately 60 miles north of Duluth and 100 miles southeast of International Falls, Minnesota. It straddles the Laurentian Divide, which separates Hudson Bay and Lake Superior drainage. The topography exhibits a southwesterly trending lineation that parallels the strike of southeastward-dipping bedrock units and the southwestward direction of ice movement during Pleistocene glaciation. For this study, the region has been divided into seven physiographic areas based on geomorphic features related to the bedrock surface, glacial deposits, and hydrogeologic significance.

The surficial geology is largely a result of two southwestward advances of the Rainy Lobe of the Laurentian ice sheet. The Toimi Drumlin Field, the oldest glacial deposit, covers much of the southern part of the region. It is bounded on the north by the Vermilion Moraine Complex, an east-west trending series of terminal and recessional moraines that mark the southerly extent of the second advance of the Rainy Lobe. Thin ground moraine and small outwash deposits occur both within and north of the Vermilion Moraine Complex except in the Embarrass and Dunka River basins where outwash deposits up to 200 feet in thickness fill a deep bedrock valley.

Study Area



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