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Faulting and fracturing in part of the Duluth complex, northeastern Minnesota

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ABSTRACT

In this paper

Extensive faulting and fracturing have been documented by detailed field studies of a 48 km^2 area in the upper Precambrian Duluth complex, northeastern Minnesota. Faults and fractures dip steeply, trend principally N35°E, N05°W, and N40°W, and were recognized by the displacement of plagioclase and plagioclase–olivine cumulate layers within the so-called South Kawishiwi intrusion. This work represents the first field documentation of extensive faulting in the Duluth complex and shows that fault offsets are an important complicating factor in understanding the geology of the complex. Further, faults of the type mapped are compatible with the structures predicted but not previously recognized by models that genetically link the Duluth complex to a major period of crustal rifting, and these faults have important economic implications, as offsets along them are certain to affect the continuity of important copper–nickel sulfides that occur along the basal part of the Duluth complex.

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