

EXPLANATION

FORMATIONS	OUTCROPS (Lithologic symbols)
Duluth gabbro (Middle Keweenaw)	Basalt
Lava flows (Middle Keweenaw)	Gabbro
Precambrian Viscous slate, possibly includes older slates (Annikite)	Indefinite contact

The stratigraphic classification and nomenclature of this report follow the usage of the Minnesota Geological Survey.

INDEX MAP OF MINNESOTA

Magnetic contours with flight traverse; dashed contours indicate incomplete or doubtful data; hachured contour encloses area of lower magnetic intensity; 'x' and number denote location and value of measured maximum or minimum intensity within closed contour.

An aeromagnetic survey covering an area of approximately 30,000 square miles in north-central Minnesota was made during May and August 1947, May 1948, and September and October 1949 by the U. S. Geological Survey in cooperation with the Minnesota Geological Survey. The purpose of the survey was to delineate the major magnetic trends associated with known iron ore deposits and to indicate areas that may be favorable for additional exploration.

North-south traverses were flown at 1-mile intervals. This spacing was selected to cover as large an area as possible with a minimum of flying. The aeromagnetic information is presented in two forms: as an aeromagnetic map, contoured to a common arbitrary datum, and as magnetic profiles that accompany the map.

The measurements were made with an AN/ASQ-3A airborne magnetometer installed in a Beechcraft AT-11 airplane for the 1947 and 1948 flights and in a Douglas DC-3 for the 1949 flights; the detecting element of the magnetometer was towed about 75 feet below the plane. The elevation of the plane, ranging between 900 and 1,100 feet above the ground, was recorded with a continuous-recording radio altimeter. Aerial photographs were used for pilot guidance during the flights, and the flight path was recorded by a gyro-stabilized continuous-strip camera. Positional accuracy of all the surveys after 1947 was increased by use of a gyro-stabilized vertical sight.

The geologic information presented on this map has been provided by G. M. Schwartz, Director of the Minnesota Geological Survey.

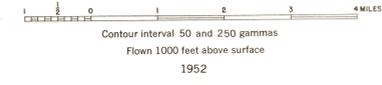
This area lies south of the Mesabi district in a region which, for the most part, is covered with thick glacial deposits (Pleistocene).

By inference from rock exposures to the north and the south, and from previous surveys with the ground magnetometer, it is believed that the area of low magnetic relief extending over the western part of this area is underlain by slate. The remaining area with varied magnetic pattern is underlain by the Duluth gabbro and extensive bodies of Keweenaw age. This is verified by a few outcrops in T. 54 N., R. 13 W., and T. 55 N., R. 12 W. The contact between the Duluth gabbro and the Keweenaw lava flows extends diagonally across T. 54 N., R. 12 W. A few outcrops of the lava flows occur in the southeastern part of the area.

Note

Aeromagnetic data are obtained and compiled along a continuous line, whereas ground magnetic surveys are made at separate points. Errors within the normal limits of any magnetic measurement may cause slight discrepancies between flight lines in an aeromagnetic map, which would be more obvious than similar discrepancies between points in a ground magnetic map. For this reason as much care should be exercised in evaluating magnetic features that appear as elongations along a single aeromagnetic traverse as in interpreting an anomaly indicated by a single ground station.

TOTAL INTENSITY AEROMAGNETIC AND GEOLOGIC MAP OF PART OF SOUTHEASTERN ST. LOUIS COUNTY, MINNESOTA
RELATIVE TO ARBITRARY DATUM



SHEET 1 OF 2

INTERIOR GEOLOGICAL SURVEY, WASHINGTON, D. C.
Aeromagnetic survey 1949 J. R. Henderson and J. L. Meuschke
Compilation directed by J. L. Meuschke

For sale by U. S. Geological Survey
PRICE 70 CENTS



Minnesota (St. Louis Co., southeastern), aeromagnetic

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M(200) GP 1091 Sheet 1 of 2