DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE MINNESOTA GEOLOGICAL SURVEY AND THE GEOLOGICAL SURVEY OF CANADA

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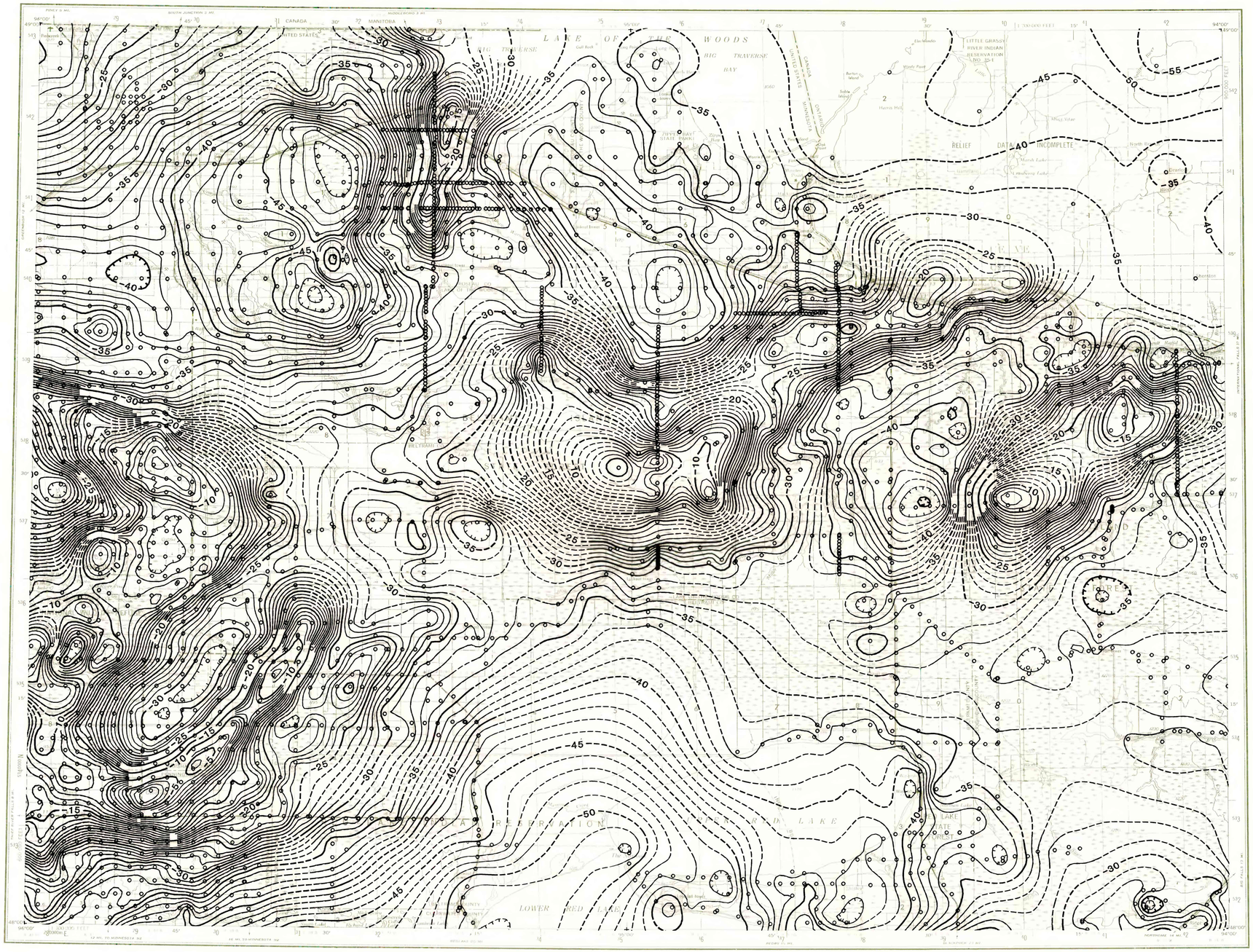


Base from U.S. Geological Survey 1954

Scale 1:250,000

5 0 5 10 15 20 Statute Miles
5 0 5 10 15 20 25 30 Kilometres
5 0 5 10 15 Nautical Miles

Complete Bouguer gravity anomaly map of the Roseau 1° X 2° Quadrangle, Minnesota and Ontario

By

Robert J. Horton, U.S. Geological Survey and Val W. Chandler, Minnesota Geological Survey

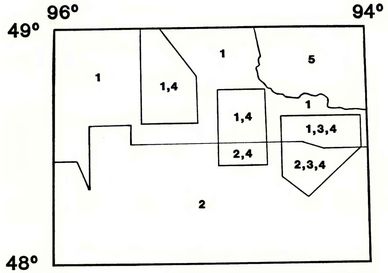
EXPLANATION

5 milligal contour interval, dashed where approximate.

1 milligal contour interval, dashed where approximate.

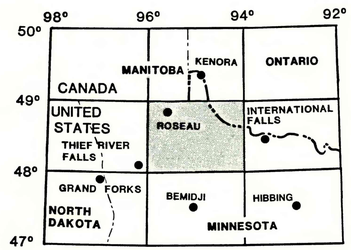
Contours are hachured when enclosing a gravity low.

Gravity station



INDEX TO AREAS OF FIELD RESPONSIBILITY AND INSTRUMENTATION

1. R. J. Ikola (Minnesota Geological Survey), LaCoste-Romberg G-142, 1969-1972.
2. George Durfee (Minnesota Geological Survey), LaCoste-Romberg G-127, Worden-Sel, and Worden-2, 1969-1972.
3. R. P. Kucks and R. J. Horton (U.S. Geological Survey), LaCoste-Romberg G-551, 1986.
4. R. J. Horton and V. L. Taylor (U.S. Geological Survey), LaCoste-Romberg G-551, 1986.
5. M. J. S. Innes (Geological Survey of Canada), North American NA-085, 1949-1950; R. K. McConnell (Geological Survey of Canada), Worden W-391, W-460, LaCoste-Romberg G-74, and G-75, 1965; J. F. Halpenny (Geological Survey of Canada), Worden W-807 and LaCoste-Romberg G-74, 1968.



LOCATION DIAGRAM

INTRODUCTION

This map was compiled by the U.S. Geological Survey in cooperation with the Minnesota Geological Survey as part of the Roseau CUSMAP (Conterminous United States Mineral Appraisal Program) Project. The data were collected primarily by the Minnesota Geological Survey and were supplemented with data obtained from the Geological Survey of Canada, the U.S. Department of Defense gravity data base, and the U.S. Geological Survey (Horton and Kucks, 1988). The complete Bouguer anomaly was calculated using a reduction density of 2.67 g/cm^3, the 1967 gravity formula (International Association of Geodesy, 1967), and observed gravity values relative to the IGSN-71 datum (Morelli and others, 1974). Terrain corrections, to a radial distance of 167 km around each station, were made using the method of Plouff (1977) in conjunction with U.S. Department of Defense digital terrain data. The previously published gravity map of this quadrangle is a simple Bouguer map reduced to the 1932 datum (McGinnis and others, 1973). For purposes of computer contouring, a data grid with a 1 km spacing was produced from 10,160 irregularly distributed gravity stations using a computer program by Webring (1981) based on a minimum curvature algorithm (Briggs, 1974). The original grid and data set extended a minimum of 15 minutes beyond the boundary of this map to ensure accuracy along the map edges. To enhance contour smoothness, the 1-km data were regridded to 0.5 km using a two dimensional spline function. The gridded data were contoured at a 1 milligal interval using a computer program by Godson and Webring (1982). Contours are dashed in small areas where field data are sparse. In large areas where field data are sparse (e.g., Canada), the contour interval is 5 milligals. Minor modifications of computer contours were done by hand.

References and Sources for Gravity Data

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