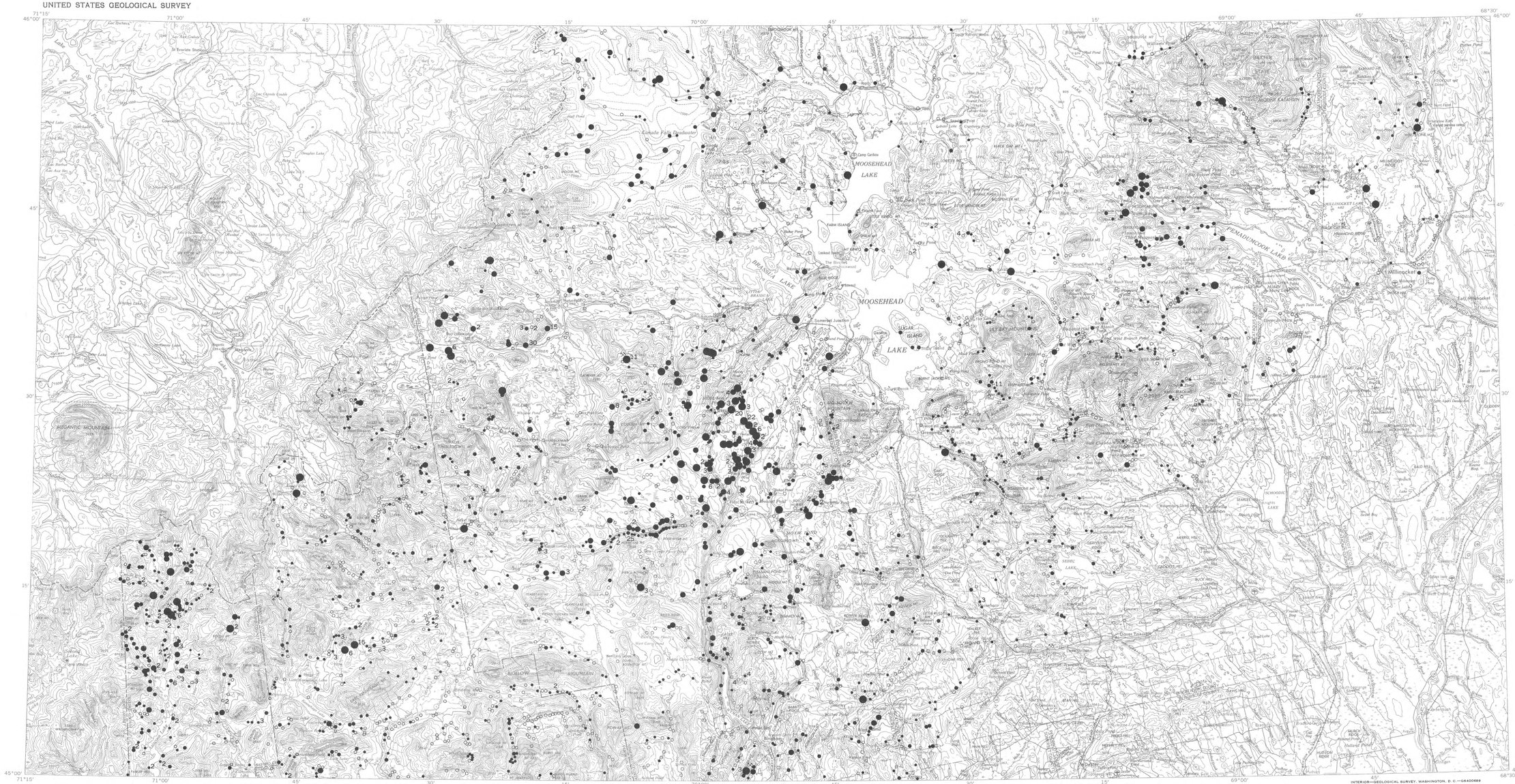
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

MINERAL INVESTIGATIONS
FIELD STUDIES MAP MF-278



EXPLANATION

Location and heavy-metal content of sample of active stream sediment

○ <8 ● 8 to 15 ● 16 to 30 ● 31 to 60 ● >60

Type and size of dot shows content of citrate-soluble heavy metals, expressed as parts per million as compared with standard samples containing known amounts of zinc

●^{2}

Numbers by dots show content of cold acid-extractable copper in parts per million where more than 1 part per million

⚒

Metal mine or prospect

DISCUSSION

This map presents the initial results of a geochemical reconnaissance of stream sediment in west-central Maine. The area covered by this map corresponds approximately to the area covered by sheets 2 and 4 of the geologic and aeromagnetic map of northern Maine (Boucot and others, 1960).

The data are based on the analysis of 2,766 samples of fine-grained sediment collected from the active channels of streams readily accessible by roads, trails, or waterways. The samples were collected principally during the field season of 1960, but about 20 percent were collected in the period 1956-60. An attempt was made to achieve a sample-site density of 1 sample per 2 square miles, but this was rarely achieved owing to variations in the drainage network and poor accessibility in many areas.

The samples were dried, screened through a 250-micron sieve, and the minus-250-micron portions were analyzed for cold citrate-soluble heavy metals (principally undifferentiated copper, lead, and zinc) and for cold acid-extractable copper by rapid semiquantitative field methods described by Ward, Lakin, Canney, and others (1963, p. 25-29).

A statistical study of the distribution of the citrate-soluble heavy metal values reveals that 5 percent exceed a value of 30 parts per million and may be considered anomalous. Previous experience and studies in this region on the distribution of cold acid-extractable copper suggest that values exceeding 2 parts per million are possibly anomalous and worthy of field checking. In general, this map shows only raw data; no systematic effort was made to investigate the possible significance of apparently anomalous values. However, a few areas where sulfide minerals have been mined or prospected are shown by an appropriate symbol.

Many of the heavy-metal anomalies are known to be associated with appreciable concentrations of manganese-iron oxides in the stream sediment. Such material is known to be an efficient scavenger of many metals, especially zinc.

The effect of this phenomenon on the interpretation of data of geochemical drainage surveys is still imperfectly understood. Therefore, these apparent heavy-metal anomalies should be interpreted cautiously and with full recognition that they may not be related to a mineral deposit but may only represent a natural enrichment of metal from unmineralized source rocks.

REFERENCES

Boucot, A. J., Griscom, Andrew, Allingham, J. W., and Dempsey, W. J., 1960, Geologic and aeromagnetic map of northern Maine: U.S. Geol. Survey open-file report.

Ward, F. N., Lakin, H. W., Canney, F. C., and others, 1963, Analytical methods used in geochemical exploration by the U.S. Geological Survey: U.S. Geol. Survey Bull. 1152, 100 p.

Base from parts of Army Map Service 1:250 000 series quadrangles: Jackman, 1943, and Millinocket, 1954

SCALE 1:250 000

5 0 5 10 15 20 MILES

5 0 5 10 15 20 KILOMETERS

CONTOUR INTERVAL 100 FEET
DATUM IS MEAN SEA LEVEL

AREA OF THIS REPORT

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.—G4400889

Fieldwork by E. V. Post, F. C. Canney, W. H. Dennen, J. B. Hite, G. H. VanSickle, G. A. Nowlan, J. R. Fisher, O. H. Espenshade, A. L. Albee, Andrew Griscom, E. L. Boudette, and D. S. Harwood, 1956-62
Analyses by G. A. Nowlan, J. B. Hite, G. H. VanSickle, M. J. Bright, and D. B. Hawkins

HEAVY METALS IN STREAM SEDIMENT, WEST-CENTRAL MAINE

By
Edwin V. Post and John B. Hite

1963

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