UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

MISHEGUK MOUNTAIN

ALASKA
TOPOGRAPHIC SERIES

U.S. GEOLOGICAL SURVEY
OPEN FILE REPORT
80-315

TOPOGRAPHY BY PHOTOGRAMMETRIC METHODS FROM AERIAL PHOTOGRAPHS TAKEN 1955–1956, AND FROM ARMY MAP SERVICE 1:50,000 SERIES MAPS, SURVEYED 1958. FIELD ANNOTATED 1956. MAP NOT FIELD CHECKED

UNIVERSAL TRANSVERSE MERCATOR PROJECTION, 1927 NORTH AMERICAN DATUM
100 000-FOOT GRID BASED ON ALASKA COORDINATE SYSTEM, ZONES 7 AND 6
10 000-METER UNIVERSAL TRANSVERSE MERCATOR GRID TICKS, ZONE 4, SHOWN IN BLUE

LAND LINES REPRESENT UNSURVEYED AND UNMARKED LOCATIONS PREDETERMINED BY THE BUREAU OF LAND MANAGEMENT
FOLIOS K-3, KATEEL RIVER MERIDAN AND U-8 AND U-9, UMIAT MERIDIAN

SWAMPS AS PORTRAYED, INDICATE ONLY THE WETTER AREAS, USUALLY OF LOW RELIEF, AS INTERPRETED FROM AERIAL PHOTOGRAPHS

SCALE 1:250000

CONTOUR INTERVAL 200 FEET
DATUM IS MEAN SEA LEVEL

1961 MAGNETIC DECLINATION AT SOUTH EDGE OF SHEET VARIES FROM 19°30' TO 22° EAST

ROAD CLASSIFICATION

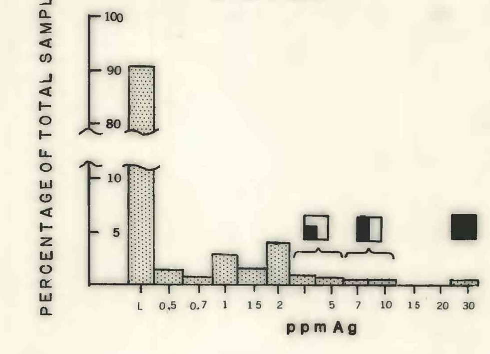
MISHEGUK MOUNTAIN, ALASKA
1956

MAP SHOWING SILVER, COPPER, LEAD, AND ZINC STREAM-SEDIMENT GEOCHEMICAL ANOMALIES IN MISHEGUK MOUNTAIN QUADRANGLE, ALASKA

BY S.M.CURTIS, I.F.ELLERSIECK, C.F.MAYFIELD, AND I.L.TAILLEUR

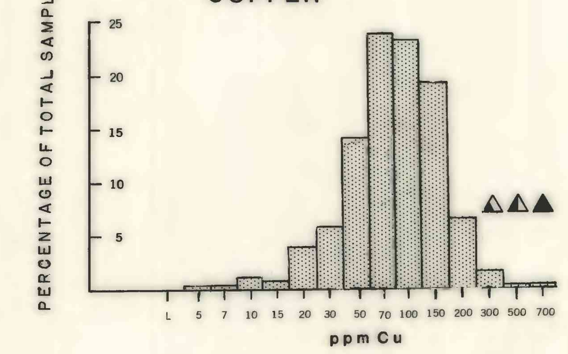
1980

SILVER



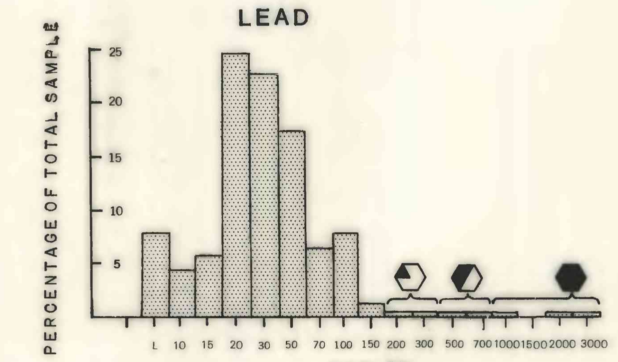
ANOMALY 3 ppm

COPPER



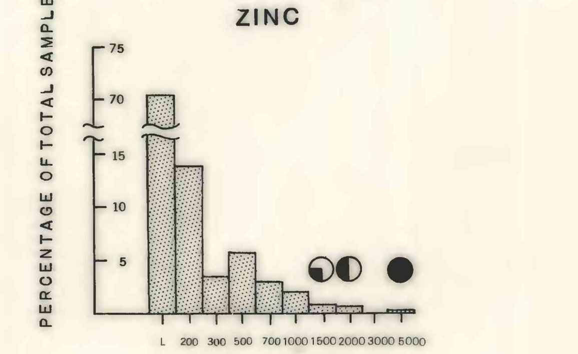
ARITHMETIC MEAN 98 ppm
STANDARD DEVIATION 64 ppm
ANOMALY 300 ppm

LEAD



ARITHMETIC MEAN 52 ppm
STANDARD DEVIATION 170 ppm
ANOMALY 200 ppm

ZINC



ANOMALY 1500 ppm

L LOWER LIMIT OF ANALYTICAL METHOD
• SAMPLE LOCATIONS
◐ LOCATION OF ANOMALOUS SAMPLE IS THE CENTER OF EACH SYMBOL

SILVER, COPPER, LEAD AND ZINC STREAM-SEDIMENT GEOCHEMICAL ANOMALIES IN MISHEGUK MOUNTAIN QUADRANGLE, ALASKA

Introduction

Stream-sediment samples from 595 locations in Misheguk Mountain quadrangle were used to compile this anomaly map. Three hundred and seven of these were sampled and reported by Theobald and Barton, 1978. Fifty-seven locations were sampled by the authors and reported in Mayfield and others, 1979. The remaining 231 locations were sampled by the authors and the data has not been previously released.

All samples used in this compilation were grab samples of the finest stream sediment available at each location. The samples collected by Theobald and Barton were sieved to 30 mesh which retains discrete particles rather than the clay fraction. This mesh size was used rather than 80 mesh because Theobald and Barton believe the discrete particles probably contain more of the metals being sampled for than the clay fraction. For all other samples, the 80 mesh fraction was analyzed. Atomic absorption concentrations were not determined for samples collected by Theobald and Barton, but were available for all other samples in this compilation and seem to agree fairly well with the emission spectrographic values. For consistency, only emission spectrographic values are used in this compilation, but a complete compilation with all analyses is in preparation.

Silver

The majority of samples (90.1%) had concentrations of silver below the lower limit of detection for the analytical method (0.5 ppm). For this reason, no mean or standard deviation was computed for the distribution. The anomaly threshold was arbitrarily picked as 3 ppm or the top 1.8% of the population, which makes 10 samples anomalous.

Copper

The arithmetic mean copper concentration is 98.4 ppm and the standard deviation is 64.2 ppm. The anomaly threshold was chosen as 300 ppm or 2% of the population, which makes 12 samples anomalous.

Lead

The arithmetic mean value for lead is 52 ppm with a standard deviation of 170 ppm. The anomaly threshold was chosen as 200 ppm or 1.7% of the population, which makes 9 samples anomalous.

Zinc

Most of the samples (70.4%) have zinc concentrations below the lower analytical limit (200 ppm). No mean or standard deviation was therefore calculated for the population. The anomaly threshold was chosen as 1500 ppm or 1.7% of the population, which makes 9 samples anomalous.

Discussion

The majority of anomalous samples are concentrated in four small areas labeled 1 through 4. Area 1 contains the Ginny Creek zinc-lead-silver deposit. High stream-sediment concentrations of Pb and Zn originally led the authors to investigate and discover the deposit. The minerals mainly occur disseminated in the lower Mississippian Noatak sandstone which is mapped by the authors as part of the Brooks Range thrust sequence, or the lowest in a succession of several structural sequences or "thrust sheets" (Mayfield and others, 1979). Geochemical anomalies around Ginny Creek show high values of Zn and Ag as well as the only Pb anomalies in the quadrangle.

Area 2 is a terrain of Triassic to Pennsylvanian chert and argillite and Upper Mississippian black carbonaceous shale and chert (Curtis and others, in prep). We suspect that the Mississippian rocks are the source of the anomalies.

Anomalies in area 3, located along the Upper Nimiuktuk River are also related to the Brooks Range sequence. Outcrops of the black Mississippian shale mentioned above are common and may be the source of these anomalies (Mayfield and others, in prep).

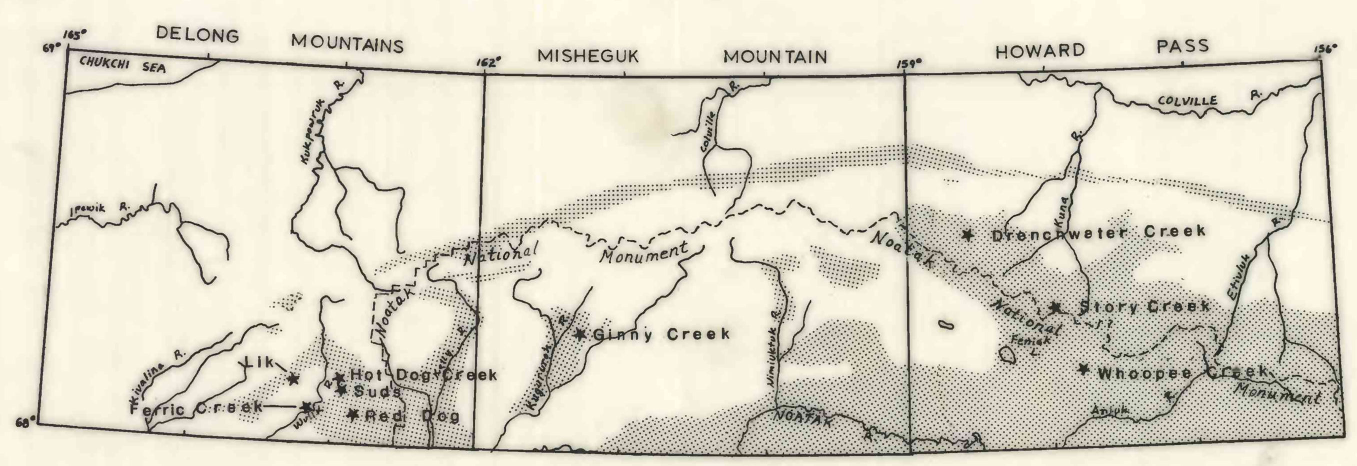
Area 4 also contains the black Mississippian shale, Permo-Triassic chert and argillite, and Cretaceous wacke of the Brooks Range sequence (Mayfield and others, in prep).

Five geochemical anomalies occur outside the four areas mentioned above. The silver anomaly in the Kingasivik Mountains is in a drainage containing Noatak Sandstone, Mississippian black shale, and Permo-Triassic chert of the Brooks Range thrust sequence. The zinc anomaly northeast of Misheguk Mountain is from a red-running creek near mafic intrusions into Mississippian shale and chert of the Ipnavik thrust sequence (Ellersieck and others, in prep). The two copper anomalies west of Mount Bastille are also close to a red-running creek in the Ipnavik thrust sequence (Curtis and others, in prep). No visible evidence of mineralization, other than red-running streams, was discovered during the course of geologic mapping in the vicinity of these anomalies.

Conclusion

Previous studies (Tailleur and others, 1977; Churkin and others, 1978; Mayfield and others, 1979) have noted that all known zinc-lead-silver deposits in the northwestern Brooks Range occur in the lowest structural sequence -- called the Brooks Range thrust sequence in this report. At this writing eight such deposits are known to the authors: Lik,[1] Suds, Hot Dog Creek[2] and Red Dog[3] in De Long Mountains quadrangle; Ginny Creek[4] in Misheguk Mountain quadrangle; and Drenchwater Creek,[5] Story Creek,[6] and Whoopee Creek,[7] in Howard Pass quadrangle. All occur in the Brooks Range sequence. The area of outcrop of Brooks Range sequence rocks and approximate locations of the deposits are shown below.

Based on the present compilation, there appears to be a similiar positive geographical correlation between geochemical anomalies and rocks of the Brooks Range sequence. It should be noted, however, that the sampling density is slightly higher in areas marked by conspicuous red-running streams and springs which are characteristic of the Brooks Range sequence. Together these facts argue that mineralization may have occurred in an extensive belt in the Brooks Range thrust sequence of the northwestern Brooks Range, and that geochemical anomalies in Misheguk Mountain quadrangle may reflect undiscovered mineral resources.



OUTCROP OF BROOKS RANGE SEQUENCE ROCKS

Footnotes

1 Reconnaissance field mapping by the authors in 1979. Also reported as the "Wulik deposit" in: Bundtzen, T. K., and Henning, M. W., 1978, Barite in Alaska: Alaskan Division of Geology and Geophysical Surveys, Mines and Geology Bulletin, v. 27, no. 4, p. 1-3.

2 Reconnaissance field mapping by the authors in 1979.

3 Plahuta, J. T., Lange, I. M., and Jansons, U., 1978, The nature of mineralization at the Red Dog prospect, western Brooks Range, Alaska, abs.: in Geological Society of America Abstracts with Programs, Cordilleran Section, 74th Annual Meeting, Tempe, Arizona, March 29-31, 1978, p. 142.

4 Mayfield, C. F., Curtis, S. M., Ellersieck, I. F., and Tailleur, I. L., 1979, Reconnaissance geology of the Ginny Creek zinc-lead-silver and Nimiuktuk Barite deposits, northwestern Brooks Range, Alaska: U. S. Geological Survey, Open-File Report 79-1092, 20 p.

5 Nokleberg, W. J., and Winkler, G. R., 1978, Geologic setting of the lead and zinc deposits, Drenchwater Creek area, Howard Pass quadrangle, western Brooks Range, Alaska: U. S. Geological Survey Open-File Report 78-70C, 16 p.

6 Oral communication with Uldis Jansons, U. S. Bureau of Mines, 1978. Also reconnaissance field mapping by the authors, 1979.

7 Written and oral communication with Uldis Jansons, U. S. Bureau of Mines, 1979.

References

Churkin, M., Jr., Mayfield, C. F., Theobald, P. K., Barton, H. N., Nokleberg, W. J., Winkler, G. R., and Huie, C., 1978, Geological and geochemical appraisal of metallic mineral resources, southern National Petroleum Reserve in Alaska: U. S. Geological Survey Open-File Report 78-70A, 82 p.

Curtis, S. M., Ellersieck, I. F., Mayfield, C. F., and Tailleur, I. L., in prep., Reconnaissance bedrock geologic map of south-central Misheguk Mountain quadrangle, 1:63,360, Alaska: U. S. Geological Survey, Miscellaneous File Map.

Ellersieck, I. F., Curtis, S. M., Mayfield, C. F., and Tailleur, I. L., in prep., Reconnaissance bedrock geologic map of south-central Misheguk Mountain quadrangle, 1:63,360, Alaska: U. S. Geological Survey, Miscellaneous File Map.

Mayfield, C. F., Curtis, S. M., Ellersieck, I. F., and Tailleur, I. L., 1979, Reconnaissance geology of the Ginny Creek zinc-lead-silver and Nimiuktuk barite deposits, northwestern Brooks Range, Alaska: U. S. Geological Survey, Open-File Report 79-1092, 20 p.

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Tailleur, I. L., Ellersieck, I. F., and Mayfield, C. F., 1977, Mineral resources of the western Brooks Range, in Blean, K. M., U. S. Geological Survey in Alaska: Accomplishments during 1976: U. S. Geological Survey Circular 751-B, p. 24-25.

Theobald, P. K., and Barton, H. N., 1978, Basic data for the geochemical evaluation of National Petroleum Reserve, Alaska: U. S. Geological Survey, Open-File Report 78-70D, 102 p.