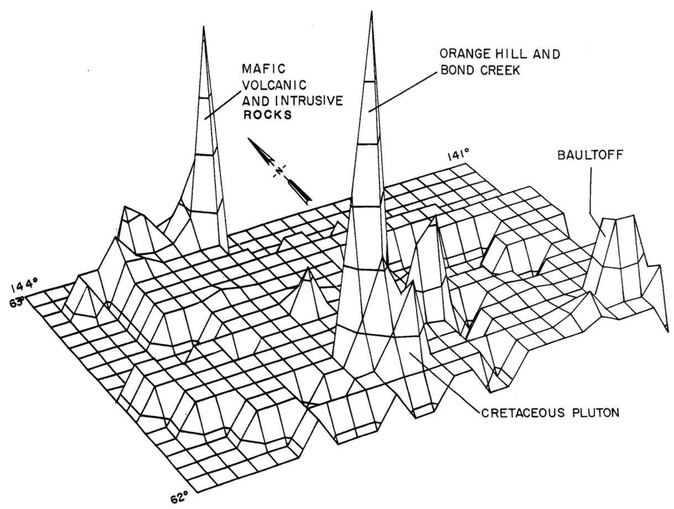
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY



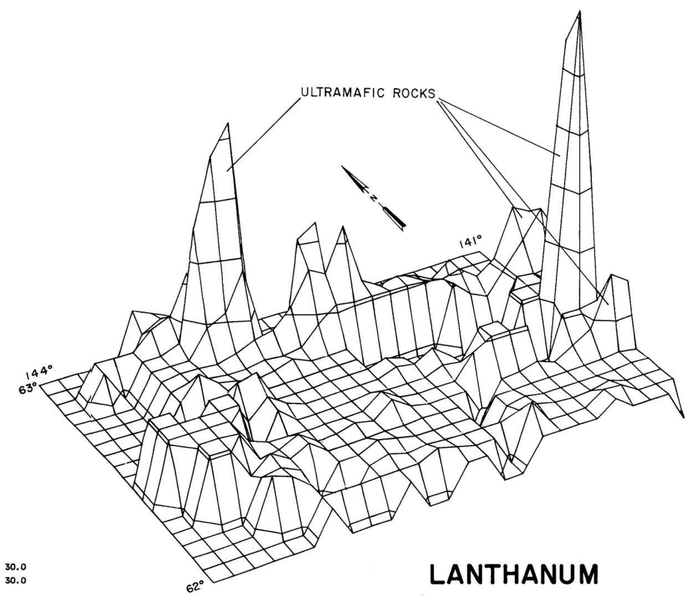
MISCELLANEOUS FIELD STUDIES MAP MF-655G
FOLIO OF THE NABESNA QUADRANGLE, ALASKA




V.A.= 30.0
H.A.= 30.0

## SILVER

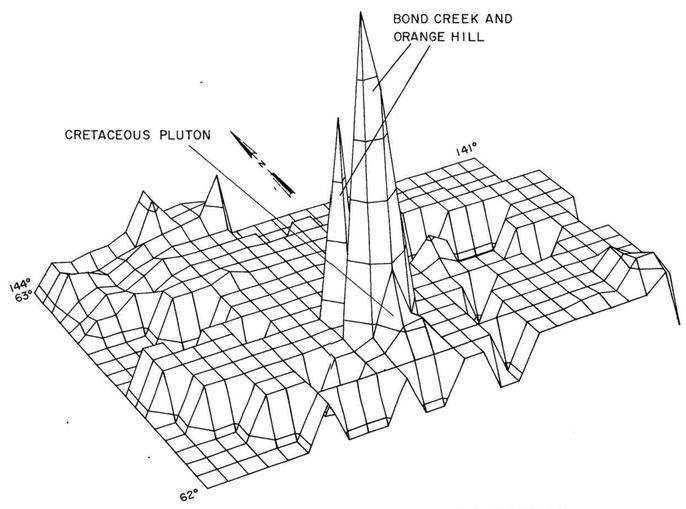
RANGE: 0.8000 — 1.8146




V.A.= 30.0
H.A.= 30.0

## LANTHANUM

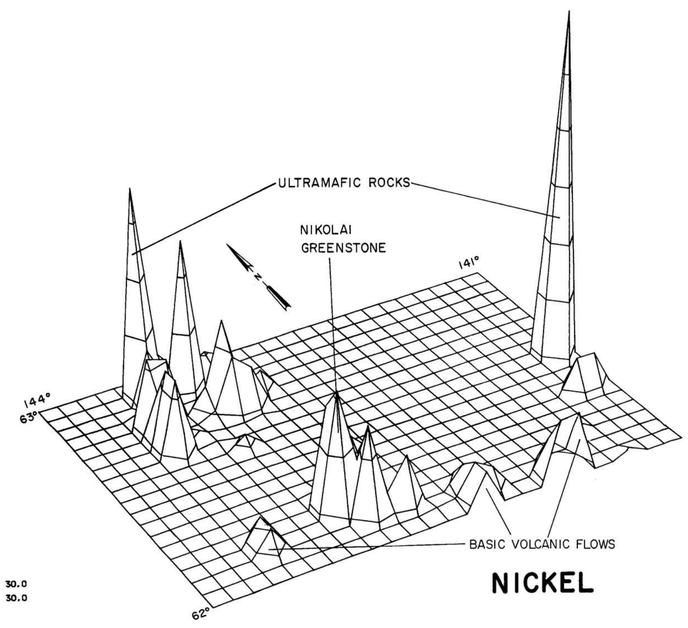
RANGE: 20.0000 — 113.2041




V.A.= 30.0
H.A.= 30.0

## MOLYBDENUM

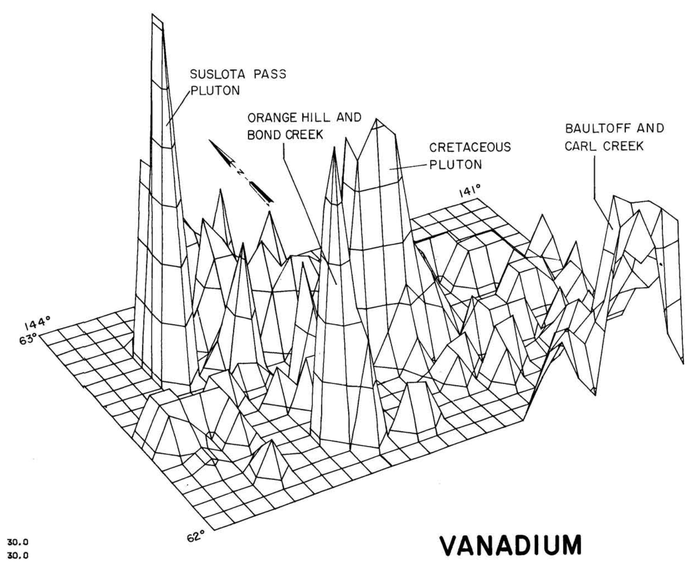
RANGE: 1.3398 — 40.3073




V.A.= 30.0
H.A.= 30.0

## NICKEL

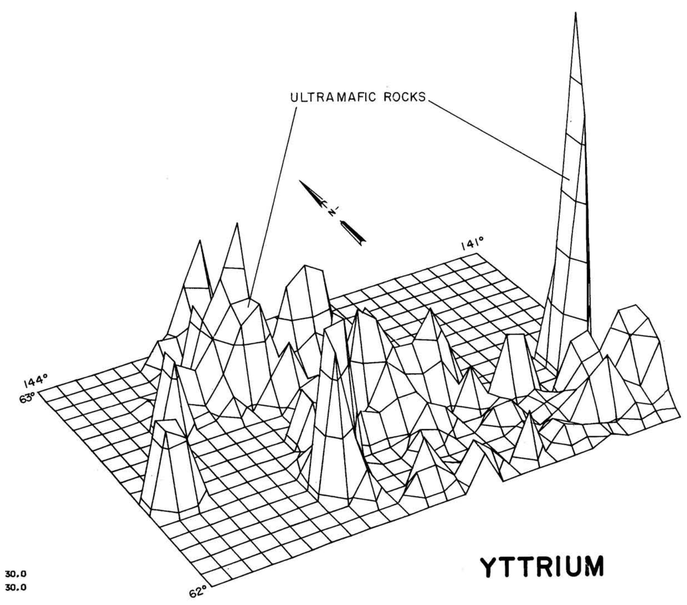
RANGE: 100.0000 — 318.8492




V.A.= 30.0
H.A.= 30.0

## VANADIUM

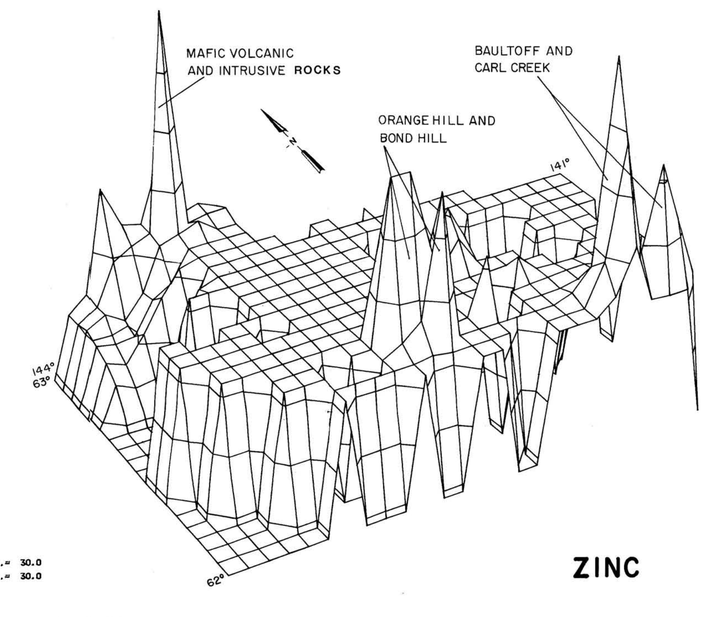
RANGE: 250.0000 — 700.0000




V.A.= 30.0
H.A.= 30.0

## YTTRIUM

RANGE: 20.0000 — 64.6228




V.A.= 30.0
H.A.= 30.0

## ZINC

RANGE: 54.6861 — 5121.7823

### DISCUSSION

The seven perspective diagrams on this sheet show the distribution patterns of silver, lanthanum, molybdenum, nickel, vanadium, yttrium, and zinc in stream sediments in the Nabesna quadrangle. The diagrams portray the distribution and abundance of the elements and their relation to some of the geologic units (Richter, 1975) in easy-to-visualize, 3-dimensional perspective. The angle of perspective in each diagram is 30° from the horizontal (H.A. = 30.0) and 30° from the vertical (V.A. = 30.0). The vertical scale, depicted by contours, shows the abundance of the element in parts per million, with each contour interval equivalent to one-sixth of the range in values for that element. For example, the contour interval for molybdenum is approximately 6.5 ppm, based on a range in values of about 1 to 40 ppm. The range for each element is derived by computer and represents average values obtained by the method discussed below. Complete analytical data for geochemical samples collected by the U.S. Geological Survey in the Nabesna quadrangle are available on a computer tape (O'Leary, Van Trump, and others, 1975) that can be obtained from National Technical Information Service, Department of Commerce, Springfield, Va. 22151.

The perspective diagrams were generated on a DEC 10 computer at the U.S. Geological Survey Computer Center in Denver, Colorado. The diagrams were prepared in the following manner: The raw (analytical) data were plotted on a rectangular coordinate system with intersections (mesh points) 6.4 km (4 miles) apart. The original data points were transposed to the grid intersections by drawing 12.8 km (8 mile)-diameter circles centered on the intersections, and then shifting the coordinates of data points within each circle to the coordinates of the intersection. With the shift of coordinates, each point was weighted according to its distance from the mesh point; as a result, nearby data points influenced the final value at the mesh point more than outlying data points. After data were weighted and projected to a mesh point, the values at that point were averaged.

High silver values in stream sediments are mainly associated with the middle-Cretaceous granitic plutons, especially the Nabesna and Klein Creek plutons (Richter, 1975), which host all of the known porphyry copper deposits in the quadrangle (Richter and others, 1975), and with a small unnamed Cretaceous pluton in the south-central part of the quadrangle. High values in the northwestern part of the quadrangle north of the Denali fault appear to be related to a low-grade metamorphic terrane that includes a number of mafic volcanic and intrusive rocks.

High lanthanum values in stream sediments are confined to the metamorphic terrane north of the Denali fault and are especially strong in areas of ultramafic rocks. Similarly, yttrium values are also high near some of the ultramafic bodies, but in contrast to lanthanum, are also high south of the Denali fault. The apparent enrichment of lanthanum and yttrium in the ultramafic rocks cannot be explained with the data available. Typically, ultramafic rocks are very low in these and associated elements.

Molybdenum values in general are low except near the Bond Creek and Orange Hill porphyry copper deposits in the middle-Cretaceous Nabesna pluton and around the small unnamed Cretaceous pluton in the southcentral part of the quadrangle. The raised plateau of values on the molybdenum perspective diagram represents the 5 ppm spectrographic lower limit of detection.

The distribution of nickel in the Nabesna quadrangle is similar to that of chromium (Marsh, 1975a). Highest nickel values occur north of the Denali fault in areas underlain by ultramafic rocks. South of the Denali fault high nickel values are associated with amygdaloidal basalt flows of the Triassic Nikolai Greenstone, with some of the smaller middle-Cretaceous diorite plutons, and with volcanic rocks in the Cretaceous Chisana Formation.

Vanadium is widespread but erratic in the stream sediments of the quadrangle. High values are associated with the middle-Cretaceous Suslota Pass, Nabesna, Antler Creek, and Klein Creek plutons south of the Denali fault.

High zinc values coincide mainly with areas of high copper (Marsh, 1975b) and lead (Marsh, 1975c) values associated with the middle Cretaceous Nabesna and Klein Creek plutons. In the metamorphic terrane in the northwestern part of the quadrangle high zinc values occur in an area also characterized by high silver values. The raised plateau of values on the zinc perspective diagram represents the 200 ppm spectrographic lower limit of detection.

### REFERENCES CITED

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_____, 1975b, Geochemical and generalized geologic map showing distribution and abundance of copper in the Nabesna quadrangle, Alaska: U.S. Geol. Survey Misc. Field Studies Map MF-655B, 1 sheet, scale 1:250,000.

_____, 1975c, Geochemical and generalized geologic map showing distribution and abundance of lead in the Nabesna quadrangle, Alaska: U.S. Geol. Survey Misc. Field Studies Map MF-655C, 1 sheet, scale 1:250,000.

O'Leary, R. M., Van Trump, George, and others, 1975, Spectrographic and chemical analyses of rock and stream-sediment samples from the Nabesna quadrangle, Alaska: Natl. Tech. Inf. Service (U.S. Dept. Commerce) Magnetic Tape No. PB240-488

Richter, D. H., 1975, Geologic map of the Nabesna quadrangle, Alaska: U.S. Geol. Survey Misc. Field Studies Map MF-655A, 1 sheet, scale 1:250,000.

Richter, D. H., Singer, D. A., and Cox, D. P., 1975, Mineral resources map of the Nabesna quadrangle, Alaska: U.S. Geol. Survey Misc. Field Studies Map MF-655K, 1 sheet, scale 1:250,000.


# PERSPECTIVE DIAGRAMS SHOWING GEOCHEMICAL ABUNDANCE OF SILVER, LANTHANUM, MOLYBDENUM, NICKEL, VANADIUM, YTTRIUM, AND ZINC IN THE NABESNA QUADRANGLE, ALASKA

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1975

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