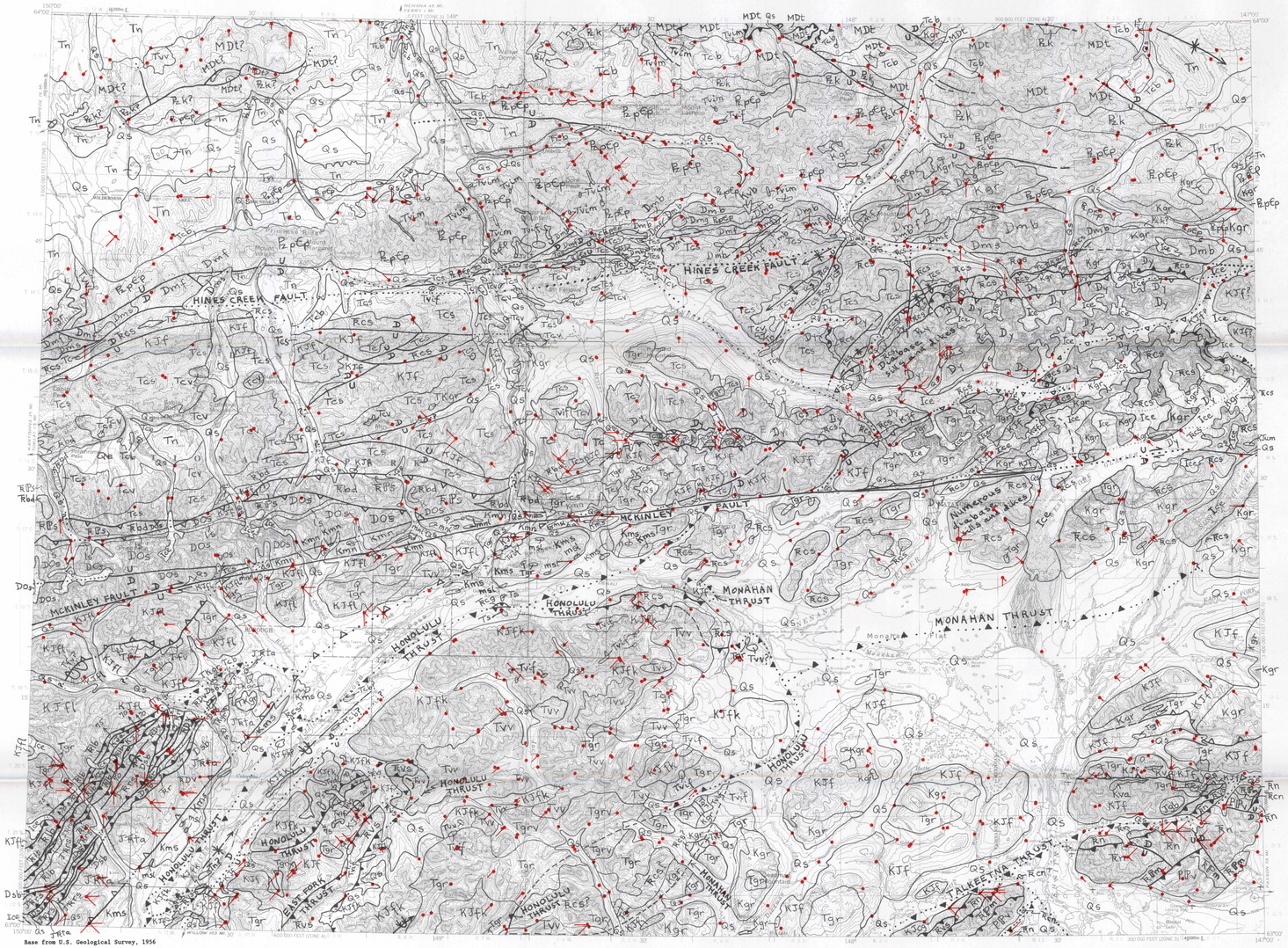

Base from U.S. Geological Survey, 1956

Geology modified from Csejtey and others, 1986

Manuscript approved for publication June 14, 1989

SCALE 1:250000

5 0 5 10 15 20 25 MILES

5 0 5 10 15 20 25 KILOMETERS

CONTOUR INTERVAL 200 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
1956 MAGNETIC DECLINATION AT SOUTH EDGE OF SHEET VARIES FROM 26°30' TO 28°30' EAST

DESCRIPTION OF MAP UNITS

ALL AREAS OF HEALY QUADRANGLE

SEDIMENTARY AND VOLCANIC ROCKS

Qs — **Surficial deposits (Quaternary)**

Thd — **Hornblende dacite (Pliocene)**

Tn — **Nenana Gravel (Pliocene and Miocene)**--Poorly consolidated conglomerate and sandstone

Tcb — **Coal-bearing rocks (Miocene to Eocene)**--Mainly siltstone and shale with subbituminous coal and lignite

Ts — **Sedimentary rocks (Miocene? to Paleocene?)**--Mainly poorly consolidated shale, sandstone, siltstone, and conglomerate

Volcanic rocks (Oligocene to Paleocene)--

Tvv — **Flows, pyroclastic rocks, and subvolcanic intrusions**--Subaerial volcanic rocks and subordinate dikes ranging in composition from basalt to rhyolite

Tvim — **Felsic subvolcanic intrusive rocks**--Mainly dikes of rhyolite and dacite

Tvif — **Mafic subvolcanic intrusive rocks**--Mainly dikes of basalt and subordinate andesite

Tlv — **Flaviatile and volcanic rocks (Eocene?)**--Mainly conglomerate, sandstone, and siltstone and a few thin flows of basaltic andesite

Cantwell Formation (Paleocene)--

Tcv — **Volcanic rocks subunit**--Flows of andesite, basalt, rhyolite, and dacite and pyroclastic felsic rocks

Tcs — **Sedimentary rocks**--Mainly conglomerate, sandstone, and shale and a few thin coal beds and volcanic flows and tuffs

PLUTONIC ROCKS

Tgr — **Granitic rocks (Oligocene to Paleocene)**--Mainly granite and granodiorite

Tgrv — **Granitic and volcanic rocks, undivided (Oligocene to Paleocene)**--Border zone between granitic rocks and Tertiary volcanic rocks

TKgr — **Granitic and hypabyssal intrusive rocks (Paleocene? and Late Cretaceous)**--Mainly granodiorite

NORTHERN, EASTERN, AND SOUTH-CENTRAL AREAS OF QUADRANGLE

SEDIMENTARY AND VOLCANIC ROCKS

Yukon-Tanana terrane

Rocks north of Hines Creek fault

Kvb — **Basaltic subvolcanic rocks (Late Cretaceous)**--Mainly dike swarms

MDt — **Totatlanika Schist (Early Mississippian to Middle Devonian)**--Carbonaceous slate, phyllite, and schist; metachert, quartz-orthoclase-sericite schist and augen gneiss, metavolcanic rocks

Dmf — **Felsic metavolcanic rocks (Late Devonian)**--Metamorphosed rhyolite and quartz latite

Dmb — **Metabasalt and subordinate metasedimentary rocks (Late Devonian)**--Greenschist, metabasalt, and carbonaceous phyllite

Dms — **Metasedimentary rocks (Late Devonian)**--Sericite schist, black slate, and chert

Pzk — **Keerry Peak Formation (early Paleozoic)**--Mainly sericite schist, quartzite, arkosic schist, and black schist and phyllite

Rpzpcp — **Pelitic and quartzose schist sequence (early Paleozoic and Precambrian?)**--Quartz sericite (carbonate) schist, quartzite, and black phyllite

Rocks south of Hines Creek fault

Rcs — **Calcareous sedimentary rocks (Late Triassic; middle? Norian to late Karnian)**--Locally metamorphosed, carbonaceous, calcareous shale and sandstone and sandy to silty limestone. Includes sills and dikes of gabbro

Dy — **Yanert Fork sequence (Late Devonian)**--Carbonaceous siliceous mudstone, slate, phyllite, and schist; impure quartzite and metachert, metavolcanic rocks, and marble interbeds. Also dikes and sills of gabbro

Flysch and associated rocks

Kva — **Andesitic subvolcanic intrusive rocks (Late Cretaceous)**--Hornblende andesite

KJf — **Flysch sequence (Early Cretaceous and Late Jurassic)**--Graywacke turbidite, shale, siltstone, and conglomerate Metamorphosed in southeast part of area.

KJfk — **Overthrust flysch-like rocks (Early Cretaceous and Late Jurassic)**--Lithology identical to unit KJf

KJog — **Conglomerate, sandstone, siltstone, shale, and volcanic rocks (Early Cretaceous and Late Jurassic)**

Talkeetna superterrane
(includes Wrangellia terrane)

Rvs — **Metavolcanic, metavolcaniclastic, and subordinate metasedimentary rocks (Late Triassic; late Norian)**--Marine basalt, tuff, slate, and diabase sills.

Rch — **Chitistone and Nizina Limestones, undivided (Late Triassic; early Norian and late Karnian)**

Rn — **Nikolai Greenstone (Late and (or) Middle Triassic)**--Mainly subaerial flows of amygdaloidal basalt

RPm — **Metasedimentary rocks sequence (Middle Triassic to Late Pennsylvanian?)**--Black argillite, thin beds of volcanic breccia and sandstone, and limestone overlain by thin-bedded chert. Sills and dikes of gabbro

PPv — **Andesitic volcanic rocks (Early Permian? and Pennsylvanian)**--Volcanic flows and breccias, probably marine

PLUTONIC ROCKS

Kgr — **Granitic rocks (Late and (or) Early Cretaceous)**--Mainly tonalite, quartz diorite, and granodiorite, generally well foliated

Kgrt — **Tourmaline-bearing granite (Late or Early Cretaceous)**

KJum — **Ultramafic rocks (Early Cretaceous or Jurassic)**--Plagioclase-bearing peridotite

Jgb — **Alkali gabbro (Late Jurassic)**

Dmg — **Metagabbro (Late Devonian?)**

SOUTHWESTERN AND WEST-CENTRAL AREAS OF QUADRANGLE

SEDIMENTARY AND VOLCANIC ROCKS

Ohio Creek area (Chulitna district)

KJa — **Argillite, chert, sandstone, and limestone (Early Cretaceous and Late Jurassic)**

JTRrs — **Red and brown sedimentary rocks and basalt (Early Jurassic and Late Triassic)**--Red sandstone, siltstone, conglomerate, and basalt overlain by brown sandstone and siltstone

TRlb — **Limestone and basalt sequence (Late Triassic; Norian?)**

TRr — **Red beds (Late Triassic)**--Red sandstone, siltstone, and conglomerate

TRDv — **Volcanogenic and sedimentary rocks (Early Triassic to Late Devonian)**--Tuffaceous chert, mudstone, and basalt breccia; flysch-like graywacke and mudstone; limestone

Dsb — **Serpentinite, basalt, chert, and gabbro (Late Devonian)**

Flysch and associated rocks

KJfl — **Flysch sequence (Late Cretaceous to Late Jurassic)**

JTRta — **Crystal tuff, argillite, chert, graywacke, and limestone (Late Jurassic to Late Triassic?)**

Rocks of unknown terrane affinity

TRcg — **Conglomerate and volcanic sandstone (Late Triassic; late Norian)**

Nixon Fork terrane

DOs — **Sedimentary rocks sequence (Middle Devonian to Ordovician)**--Black argillite and siltstone, massive limestone (Ds), thinly bedded limestone, and chert

Flysch and rocks of unknown terrane affinity

KJf — **Flysch sequence (Early Cretaceous and Late Jurassic)**--Same rocks as unit KJf in eastern and southern parts of quadrangle

TRbd — **Basalt, diabase, and subordinate sedimentary rocks (Late Triassic; Karnian and Norian)**

TRPs — **Flysch-like sedimentary rocks (Late Triassic to Pennsylvanian)**--Impure sandstone, siltstone, and shale; minor limestone and chert

Tectonic melanges

Kms — **Melange south of McKinley fault (Late and (or) Early Cretaceous)**--Dark-gray flysch, cherty tuff, volcanic sandstone, and blocks of limestone (ms)

Kmn — **Melange north of McKinley fault (Late and (or)Early Cretaceous)**--Similar to unit Kms but contains recrystallized limestones (msl) and ophiolitic rocks (mso), mainly serpentinite, basalt, and chert

Contact--Approximately located

Thrust fault--Showing direction of dip of overturned thrust fault. Dashed where inferred; dotted where concealed. Sawteeth on upper plate

High-angle reverse fault--Dashed where inferred; dotted where concealed. Sawteeth on upper plate

Fault--Dashed where inferred; dotted where concealed. Where displacement known, U, upthrown side, D, downthrown side; arrows indicate relative horizontal movement

Postulated position of fault prior to intrusion of plutonic and volcanic rocks

Anticline--Showing direction of plunge

Overturned anticline--Showing direction of dip of limbs and plunge

Syncline--Showing direction of plunge. Dashed where inferred

Overturned syncline--Showing direction of dip of limbs and plunge. Dashed where inferred

EXPLANATION FOR GEOCHEMICAL SYMBOLS SHOWN ON MAP B

Sample locality--Showing vector diagram for selected elements in stream-sediment samples. Small round dot is sample locality; vector length indicates concentration for selected elements as explained in figure 3 for element whose chemical symbol is shown at outer end of vector. Vector length also indicates approximate percentile range as discussed in text and actual percentile range as shown in figure 3. No vector for a particular element at a sample site indicates that element was below the cutoff shown in figure 3.

MAP B.- BARIUM, BORON, CHROMIUM, COBALT, IRON, NICKEL, TIN, AND TUNGSTEN

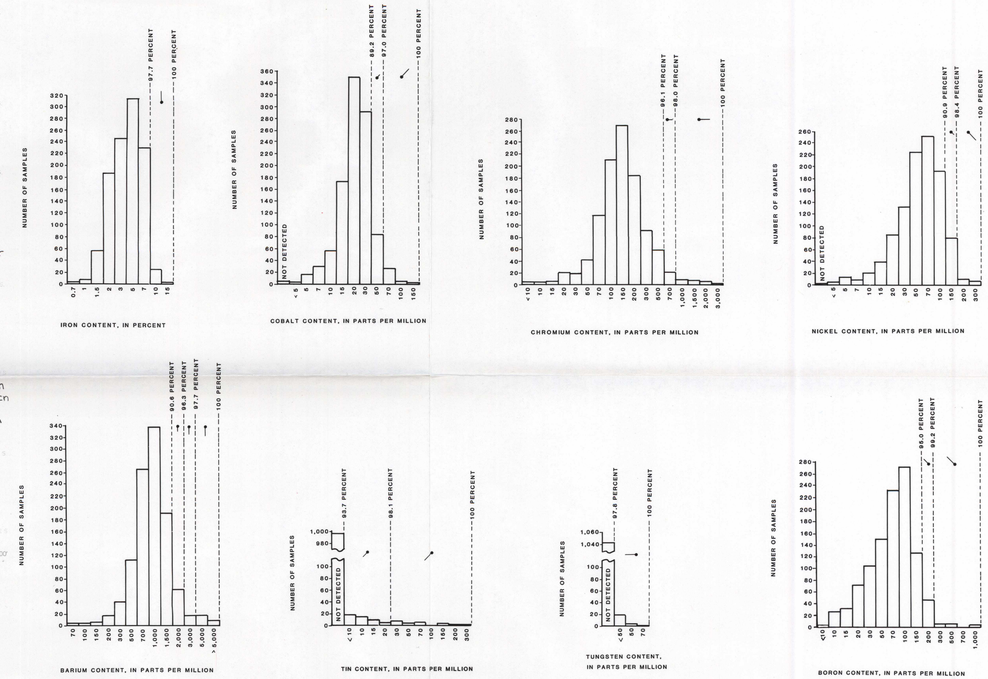

Figure 3.--Histograms showing concentrations of barium, boron, chromium, cobalt, iron, nickel, tin, and tungsten in 1,064 stream-sediment samples, Healy quadrangle. Vectors, which vary in length to denote concentrations or ranges of concentrations, correspond to symbols used on map B.

MAPS SHOWING DISTRIBUTION AND ABUNDANCE OF SELECTED ELEMENTS IN STREAM-SEDIMENT SAMPLES FROM A RECONNAISSANCE GEOCHEMICAL SURVEY OF THE HEALY QUADRANGLE, ALASKA

By
Harley D. King, Thomas D. Light, and Richard M. O'Leary

1989

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