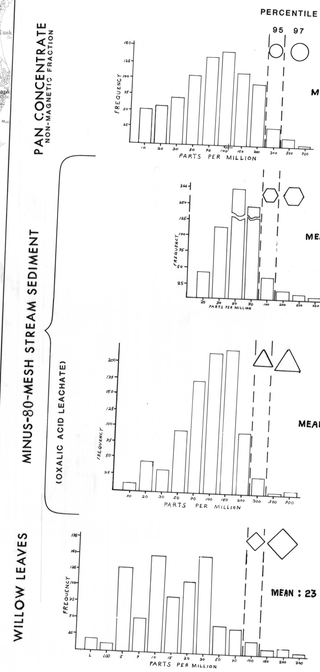
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

FOLIO OF THE
GOODNEWS AND HAGEMEISTER ISLAND QUADRANGLES REGION

OPEN FILE REPORT 78-9-L
HESSIN AND OTHERS - GEOCHEMICAL DISTRIBUTION OF NICKEL
SHEET 1 OF 2

HISTOGRAMS

THESE MANUALLY DERIVED HISTOGRAMS GRAPHICALLY ILLUSTRATE THE FREQUENCY AND ABUNDANCE OF NICKEL CONCENTRATION REPORTED IN TABLES OF GEOCHEMICAL ANALYSES (HESSIN AND OTHERS, 1978). COMPUTER-GENERATED HISTOGRAMS AND RELATED STATISTICS FROM THE SAME DATA ARE INCLUDED IN OTHER TABLES WITH THE GEOCHEMICAL ANALYSES.



GEOCHEMICAL AND GENERALIZED GEOLOGICAL MAP SHOWING DISTRIBUTION AND ABUNDANCE OF NICKEL IN THE GOODNEWS AND HAGEMEISTER ISLAND QUADRANGLES REGION, SOUTHWESTERN ALASKA

BY

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1978

CONCENTRATION DATA IN THE VICINITY OF PLATINUM AREA SHOWN ON SHEET 2
(AREA OF REPORT: CLARK, GRYBECK, GREENWOOD and others, 1978
CLARK, GRYBECK, HESSIN and others, 1978

(AREA OF REPORT: Barnes and others, 1978)

BASE MAP INDEX

Base compiled from U.S. Geological Survey 1:63,360 (A) and 1:250,000 (B) scale topographic series 1952-1957 and advance field completion material (C) 1976 by Menlo Park Base Map Section

SCALE 1:250,000

CONTOUR INTERVALS 50, 100, AND 200 FEET
DATUM IS MEAN SEA LEVEL

EXPLANATION

GEOLOGY GENERALIZED FROM HOARE AND COONRAD (1978)

CORRELATION OF MAP UNITS

SURFICIAL DEPOSITS

- Qu — QUATERNARY

VOLCANIC, SEDIMENTARY, AND METAMORPHIC ROCKS

- Qtb — Pleistocene — QUATERNARY
- QTs — Plio-Pleistocene — QUATERNARY or TERTIARY
- Tv — Early Tertiary — TERTIARY
- Kk — Late Cretaceous Maastrichtian ? — CRETACEOUS
- Ks — Upper and Lower Cretaceous — CRETACEOUS
- Kb Kcg Kts Kvg — Lower Cretaceous — CRETACEOUS
- KJvs — Lower Cretaceous to Middle Jurassic — CRETACEOUS AND JURASSIC
- Jk Jvs — Middle to Lower Upper Jurassic — JURASSIC
- Jtvs — Lower Jurassic — JURASSIC
- MzPz — Lower Cretaceous to Lower Ordovician ? — MESOZOIC AND PALEOZOIC
- Pzss — PALEOZOIC
- pEk — PRE-CAMBRIAN

INTRUSIVE ROCKS

- Tif Tim Tn — TERTIARY
- Tkg — TERTIARY AND CRETACEOUS
- Jg Jun Jt — JURASSIC AND JURASSIC ?
- Pzug — PALEOZOIC ?

DESCRIPTION OF MAP UNITS

SURFICIAL DEPOSITS

- Qu — UNCONSOLIDATED SEDIMENTARY DEPOSITS

SEDIMENTARY, VOLCANIC, AND METAMORPHIC ROCKS

- Qtb — TOGIAK BASALT
- QTs — SEMICONSOLIDATED MARINE BEACH SEDIMENTS
- Tv — VOLCANIC ROCKS AND VOLCANOGENIC SEDIMENTS - Chiefly andesitic flows and tuffs
- Tk — SUMMIT ISLAND FORMATION - Nonmarine conglomerate, sandstone, shale, and carbonaceous mudstone
- Kk — KUSKOKWIM GROUP - Conglomerate overlain by interbedded greywacke, siltstone, and shale; commonly volcanous; mostly marine
- Kb — BUCKIS RIDGE GREYWACKE - Chiefly interbedded calcareous greywacke, siltstone, and conglomerate with local coquinas of Aucella shells
- Kcg — LIMY GRIT AND LIMESTONE - Chiefly angular grit cemented by bioclastic limestone
- Kvs — TUFFS AND SEDIMENTARY ROCKS - Varied assemblage of andesitic tuffs, greywacke, siltstone, impure limestone, and tuffaceous chert; tuff and tuffaceous sediments commonly laumontitized
- Kvg — GRAYWACKE AND CONGLOMERATE - Marine greywacke, siltstone, and conglomerate; commonly calcareous
- KJvs — VOLCANIC AND SEDIMENTARY ROCKS - Interbedded intermediate to mafic flows, tuffs, tuffaceous sedimentary rocks, and argillites; intermediate composition tuffaceous rocks commonly laumontitized
- Jk — KULUKAK GREYWACKE - Chiefly very hard lithic greywacke and siltstone with local conglomerate
- Jtvs — VOLCANIC AND SEDIMENTARY ROCKS - Andesitic, trachytic, and basaltic flows and breccias interbedded with volcanogenic sedimentary rocks
- Jtvs — VOLCANIC AND SEDIMENTARY ROCKS - Mafic flows and breccias interbedded with volcanogenic sedimentary rocks; fractures commonly coated with laumontite
- MzPz — MESOZOIC AND PALEOZOIC ROCKS UNDIVIDED - Widespread marine unit including mafic to intermediate volcanic rocks, tuffaceous sedimentary rocks, chert, argillite, siltstone, greywacke, conglomerate, and limestone
- Trvs — VOLCANIC AND SEDIMENTARY ROCKS (Upper Triassic) - Locally differentiated marine unit of chert, tuffaceous cherty rocks, argillite, siltstone, wackes, conglomerate, limestone, and mafic flows and breccia
- Pv — VOLCANIC ROCKS (Permian) - Locally differentiated marine unit of pillow basalts, massive mafic flows, breccia, and tuff
- Pl — LIMESTONE (Permian) - Locally differentiated thin unit of marine limestone; generally tuffaceous, commonly has strong fetid odor
- DOl — LIMESTONE - Thin-bedded to massive limestone with minor interbedded tuff and mafic flows; locally recrystallized to marble with interbedded quartzite and quartz-chlorite schist
- Pzcs — CALCAREOUS SCHIST (Permian or older?)
- pEk — KANEKTOK METAMORPHIC COMPLEX - Gneiss, schist, amphibolite, and marble; upper greenschist to lower amphibolite facies
- pEl — MARBLEIZED LIMESTONE - Locally differentiated

INTRUSIVE ROCKS

- Tif — FELSIC INTRUSIVE ROCKS - Chiefly rhyolitic to dacitic dikes and sills; locally mapped
- Tim — MAFIC INTRUSIVE ROCKS - Diabase, basalt, dioritic, and gabbroic dikes and sills locally mapped
- Tn — HAGEMEISTER COMPLEX - Quartz-rich porphyritic felsite intrusive-extrusive complex of dikes, sills, tuff, and breccias
- TKg — GRANITIC ROCKS - Chiefly quartz monzonite, granodiorite, and quartz diorite stocks
- Jg — GABBROIC ROCKS - Commonly show compositional layering and generally associated with ultramafic rocks
- Jun — ULTRAMAFIC ROCKS - Serpentinite, dunite, and websterite
- Jt — TRONDHJEMITE - Associated with serpentinite and gabbro
- Pzug — METAGABBRO AND GREENSTONE - Probable dismembered ophiolite complex of mafic flows, dikes, volcaniclastic rocks, and gabbro altered by greenschist facies metamorphism and ocliton metamorphism

GEOLOGIC SYMBOLS

- Contact. Known, approximately located, gradational, and inferred. Most contacts between bedded rock units are probably faults
- Faults or fault zone. Dashed where approximately located, inferred, or concealed
- Thrust fault. Dashed where approximately located, inferred, or concealed. Sawteeth on upper plate
- Homefaits

GEOCHEMICAL SYMBOLS

- RM — RED MOUNTAIN ULTRAMAFIC BODY
- RMCZ — RED MOUNTAIN CONTACT ZONE

GEOCHEMICAL SAMPLE SITES

- ROCK (CLARK, GRYBECK, GREENWOOD, AND OTHERS, 1978; COONRAD, AND OTHERS, 1978)
- CONCENTRATE (OVERSTREET, AND OTHERS, 1973)
- OFFSHORE AND ONSHORE SEDIMENTS (BARNES, AND OTHERS, 1978)
- BEACH AND STREAM SEDIMENTS
- STREAM DRAINAGE SEDIMENT (HESSIN, AND OTHERS, 1978)
- STREAM DRAINAGE SEDIMENT (CLARK, GRYBECK, HESSIN, AND OTHERS, 1978)

ABUNDANCE

- ▼300 — NUMBER WITH SOLID ROCK SAMPLE-SITE SYMBOL REPRESENTS GEOCHEMICAL CONCENTRATION IN PARTS PER MILLION (PPM)
- ● — SOLID STREAM-DRAINAGE SAMPLE-SITE SYMBOL INDICATES GEOCHEMICAL ABUNDANCE OF 90TH PERCENTILE VALUE OR GREATER IN TWO OR MORE GEOCHEMICAL DETERMINATIONS AS SHOWN IN HISTOGRAMS (SHEET 1)
- ABUNDANCE SYMBOLS REPRESENTING 95TH PERCENTILE OR GREATER CONCENTRATIONS DETERMINED IN STREAM-DRAINAGE SITE SAMPLES ARE SHOWN WITH HISTOGRAMS (SHEET 1)

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DISCUSSION OF GEOCHEMISTRY

THE TWO SHEETS COMPRISING THIS REPORT SHOW THE DISTRIBUTION AND ABUNDANCE OF NICKEL AS GEOCHEMICALLY DETERMINED IN VARIOUS SAMPLE MEDIA COLLECTED FROM LOCATIONS THROUGHOUT THE GOODNEWS AND HAGEMEISTER ISLAND QUADRANGLES REGION. SHEET 1 COVERS THE ENTIRE REGION AND SHEET 2 COVERS THE AREA OF ABUNDANT SAMPLE DATA IN THE VICINITY OF PLATINUM. SAMPLE LOCATION AND CONCENTRATION SYMBOLS ARE SIMILAR ON BOTH SHEETS. DATA PRESENTED HAVE BEEN COMPILED FROM ANALYSES AND LOCATIONS REPORTED BY BARNES AND OTHERS (1978); CLARK, GRYBECK, GREENWOOD, AND OTHERS (1978); CLARK, GRYBECK, HESSIN, AND OTHERS (1978); COONRAD AND OTHERS (1976); HESSIN AND OTHERS (1978); AND OVERSTREET AND OTHERS (1973).

THE HISTOGRAMS ON SHEET 1 HAVE BEEN USED TO IDENTIFY CONCENTRATIONS OF NICKEL THAT MIGHT BE ANOMALOUS. ALTHOUGH THE HISTOGRAMS ARE BASED SOLELY ON THE ANALYSES REPORTED BY HESSIN AND OTHERS (1978), THE RESPECTIVE SAMPLE POPULATIONS (BETWEEN 600 AND 900 SAMPLES) APPEAR TO PROVIDE REPRESENTATIVE CONCENTRATION STATISTICS. MANY OF THE HIGHER VALUES OF CONCENTRATION OF NICKEL SHOWN ON THE MAPS ARE FROM SAMPLE SITES WHERE ULTRAMAFIC ROCK IS KNOWN TO CROP OUT WITHIN THE IMMEDIATE SOURCE AREA AND SUCH VALUES ARE NOT NECESSARILY ANOMALOUS (SEE HISTOGRAM OF ROCK ANALYSES DATA FROM RED MOUNTAIN ULTRAMAFIC BODY ON SHEET 2). THE GENERALIZED GEOLOGIC MAP DATA INCLUDED IN SHEET 1 AND THE MORE DETAILED GEOLOGIC MAP OF THE REGION (HOARE AND COONRAD, 1978) SHOULD BE UTILIZED IN CONSIDERING POSSIBLE SOURCE ROCKS FOR THE NICKEL THAT HAS BEEN DETECTED IN VARIOUS GEOCHEMICAL SAMPLES.

BACKGROUND INFORMATION RELATING TO THIS REPORT IS PUBLISHED AS U. S. GEOLOGICAL SURVEY OPEN-FILE REPORT 78-9 (AVAILABLE FROM THE SAME SOURCE AS THIS MAP)

This report is preliminary and has not been edited or reviewed for conformity with Geological Survey standards and nomenclature.