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MISCELLANEOUS FIELD STUDIES
MAP MF-765
CLARK-ANCHORAGE A-7, A-8 QUADS,
ALASKA
SHEET 2 OF 3

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STREAM-SEDIMENT AND ROCK SAMPLES

In the collection and preparation of samples, standard procedures were followed. Rock samples are grab samples from typical and atypical outcrops, chosen for analysis to provide data on background or because they contained visible sulfides, generally pyrite, or because they were limonite stained. Descriptions of analyzed rock specimens are given in Table 1.

Most stream-sediment samples of fine-grained material were collected from active stream channels; where this was not possible, samples were collected from bank or terrace deposits adjacent to the channel.

Rock samples were crushed and split, and one split was pulverized. Stream-sediment samples were dried and sieved. The pulverized split of the rock and the -80 mesh fraction of the stream-sediment samples were analyzed for 30 elements by the U.S. Geological Survey's standard six-step semiquantitative spectrographic method and for gold and mercury by atomic absorption (tables 2 and 3)[1]. The precision of a reported value is approximately plus 100 percent or minus 50 percent. Analyses for gold by the atomic absorption method are accurate to ± 100 percent. Semiquantitative spectrographic analyses were done by K. A. Curry, atomic absorption analyses by R. B. Tripp, H. D. Kleig, R. L. Miller, A. L. Meier, and D. G. Murray.

Locations of the rock and stream-sediment samples are shown on figures 3 and 4.

The results of the analyses of the stream-sediment and rock samples have been processed by means of a computer program known as GEOSUM and are presented in tables 2 and 3. The GEOSUM program is designed primarily for summarizing and tabulating geochemical data--in this case, data from semiquantitative spectrographic analyses (table 2) and quantitative spectrographic analyses) by the laboratories of the U.S. Geological Survey. The computer output consists of: (a) a tabulation of the data, (b) histograms and cumulative frequency distributions for all elements for which there is sufficient data, (c) a statistical summary which includes geometric means and geometric deviations[2].

EXPLANATION OF TABLES 2 AND 3

Analytical results from rock and stream-sediment samples are given in tables 2 and 3 as analytical values, 7.0000 ppm, 10.0000 percent, and so on, or as qualified values expressed as a letter: B = not detected, L = less than specified limits of detection, G = greater than value shown, B = no data. The terms N = interference and T = trace, but do not occur in these data. The rightmost zero digits for each analytical value may or may not be significant. The specified limits of detection are as follows:

Specified limits of detection

Fe PCT	Mg PCT	Ca PCT	Ti PCT	Mn PPM	Ag PPM	As PPM	Au PPM	B PPM	Ba PPM	Be PPM	Bi PPM
0.05000	0.00200	0.05000	0.00200	10.00000	0.5000	200.00	10.00000	10.00000	20.00000	1.00000	10.00000
Cd PPM	Co PPM	Cr PPM	Cu PPM	La PPM	Mo PPM	Nb PPM	Ni PPM	Pb PPM	Sb PPM	Sc PPM	Sn PPM
20.00000	5.00000	5.00000	5.00000	20.00000	5.00000	10.00000	5.00000	10.00000	100.00	5.00000	10.00000
Sr PPM	V PPM	W PPM	Y PPM	Zn PPM	Zr PPM	Au PPM[1]	Hg PPM[1]				
100.00000	10.00000	50.00000	10.00000	200.00000	10.00000	0.02000	0.01000				

Semiquantitative spectrographic analyses by the U. S. Geological Survey are reported in percentage (pct) or parts per million (ppm) as geometric midpoints (1.0, 0.7, 0.5, 0.3, 0.2, 0.15, 0.1, etc.) of geometric brackets having the boundaries (1.2, 0.83, 0.56, 0.38, 0.26, 0.18, 0.12, 0.83, and so on. The frequency distributions and histograms are on logarithmic scales and are computed using these brackets as class intervals, for example:

Reported value (ppm)	Limits
1.0	0.83 - 1.2
1.0	1.2 - 1.8
2.0	1.8 - 2.6
3.0	2.6 - 3.8
5.0	3.8 - 5.6
7.0	5.6 - 8.3
10.0	8.3 - 12.0

On the histogram, decimal numbers are shown as powers of 10, for example:

7.0E-01 means	7.0×10^{-1} or 0.7
7.0E 00	7.0×10^{0} or 7.0
7.0E 01	7.0×10^{1} or 70.0
7.0E 02	7.0×10^{2} or 700.0
7.0E 03	7.0×10^{3} or 7,000.0

The histograms are constructed of X's, each of which represents 1 percent of the total number of samples.

The histograms and the statistics given below then are derived from data values within the ranges of analytical determination ("analytical values"). The histograms and statistics do not include data values qualified with G, L, or T. Data values qualified with B, L, G, T, or N codes are present. Statistical estimates that are unbiased in this report are given per end of tables 2 and 3. The geometric mean is the antilogarithm of the arithmetic means of the logs of the analyses and an estimate of geochemical abundance. The geometric deviation is the antilogarithm of the standard deviation that is approximately symmetrical on a log scale, and is therefore useful for characterizing many geochemical distributions. The geometric mean is not an estimate of geochemical abundance. The geometric deviation is the antilogarithm of the standard deviation of the logs of the analyses and is dimensionless. See Miesch (1967) for further discussion of geochemical abundance and Miesch (1963, p. 20-23) for further discussion and explanation of geometric deviation.

In the computations performed to produce the statistical summary at the end of tables 2 and 3, all elements are ignored where one or more of the unqualified data values is less than the analytical limit of detection specified on input or where any data values are qualified with the codes B, N, or T. Data values qualified with the codes G or L are used in the computations. Where some of the data values for an element are qualified, the mean and deviation should be the same as those given in the preceding section. Where data are qualified with the codes B, L, or T, the estimates of geometric mean and geometric deviation are biased and are not unbiased estimates of the combined distribution. The application of this method to geochemical problems is described in Miesch (1967). The estimates are unbiased in a strict sense only where the data are derived from a lognormal parent population, but experiments have shown that large departures from this requirement may not greatly invalidate the results. Acceptance and use of the estimates, however, is the responsibility of the individual.

ANOMALOUS SAMPLES

Normal background contents for rocks and stream-sediment samples were determined by inspection of histograms and tabulated data from the Anchorage A-6, A-7, and A-8 quadrangles (Clark and Bartsch, 1974; 1977 a, b; Clark and Yount, 1972). No metallic mineral deposits have been reported from the Anchorage A-7 and A-8 quadrangles. The sampling revealed a few weakly anomalous areas.

Titanium concentrations of 1 ppm or greater were found in six samples (117, 119, 122 through 125) from upper Bird Creek. Lead concentrations of 50 to 70 ppm and copper concentration of 150 ppm were found in some samples from the same area. A chromium concentration of 1,000 ppm was found in one sample (125) from upper Bird Creek. In samples from Indian Creek, titanium concentrations of 3 and 5 ppm were found in two samples (102 and 103) and a chromium concentration of 700 ppm was found in one sample (102).

Chromium concentrations of 700 to 5,000 ppm were found in several samples (2, 3, 6, 9, 13, 14, 16, and 27) collected near the range front in the vicinity of the Eklo fault. Chromium (5,000 ppm), nickel (1,500 ppm), cobalt (150 and 200 ppm), copper (150 ppm), and vanadium (1,500 ppm) are present in several samples collected from upper Eagle River drainages near the fault contact between the McHugh Complex and Valdez(?) Group. These samples were collected near the road and may have been contaminated.

Beryllium concentrations of 2 ppm were found in four samples from the headwaters of the North Fork of Ship Creek (samples 128 through 131) and in several other samples from the Ship Creek drainage (samples 78, 79, 81, 83, and 86).

Other anomalous concentrations of one or more elements were detected in single samples (tables 2 and 3) from several areas. No attempt has been made to locate the source of any of the anomalies.

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[1] Elements analyzed for but not detected by the spectrographic method are omitted: table 2, silver, arsenic, gold, bismuth, cadmium, antimony and tin; table 3, gold, bismuth, cadmium, antimony, tin, and tungsten.

[2] The frequency tables and histograms for gold and mercury have been omitted because the classes used in calculating these tables are those used in the semiquantitative spectrographic method, and gold and mercury were analyzed by the quantitative atomic absorption method. The frequency tables and histograms that contain no valid data points and those for which the minimum and maximum are the same have been omitted.

[3] Analyses by atomic absorption.

Table 1.--Description of bedrock samples from the Anchorage A-7 and A-8 quadrangles. Sample localities are shown by sample number plotted on figures 3 and 4.

Map No.	Sample description
1r	Massive metasandstone
2r	Massive metasandstone
3r	Laumontitic cherty argillite
4r	Massive metasandstone
5r	Argillite
6r	Argillite
7r	Greenstone
8r	Greenstone
9r	Argillite
10r	Silica-carbonate veinlet
11r	Metasandstone
12r	Argillite
13r	Metasandstone
14r	Felsic igneous clast from metaconglomeratic sandstone
15r	Felsic igneous rock
16r	Felsic dike rock
17r	Limonite-stained metagraywacke about 3-6 m from dike
18r	Hornfelsed sandstone about 1 m from dike
19r	Massive metasandstone
20r	Metasiltstone
21r	Fine-grained siliceous rock
22r	Massive metasandstone
23r	Massive metasandstone
24r	Metasiltstone
25r	Felsic dike rock
26r	Metagraywacke
27r	Green metasandstone
28r	Conglomeratic metasandstone
29r	Metasandstone
30r	Chert lenses from argillite
31r	Metagraywacke
32r	Slaty argillite and metagraywacke

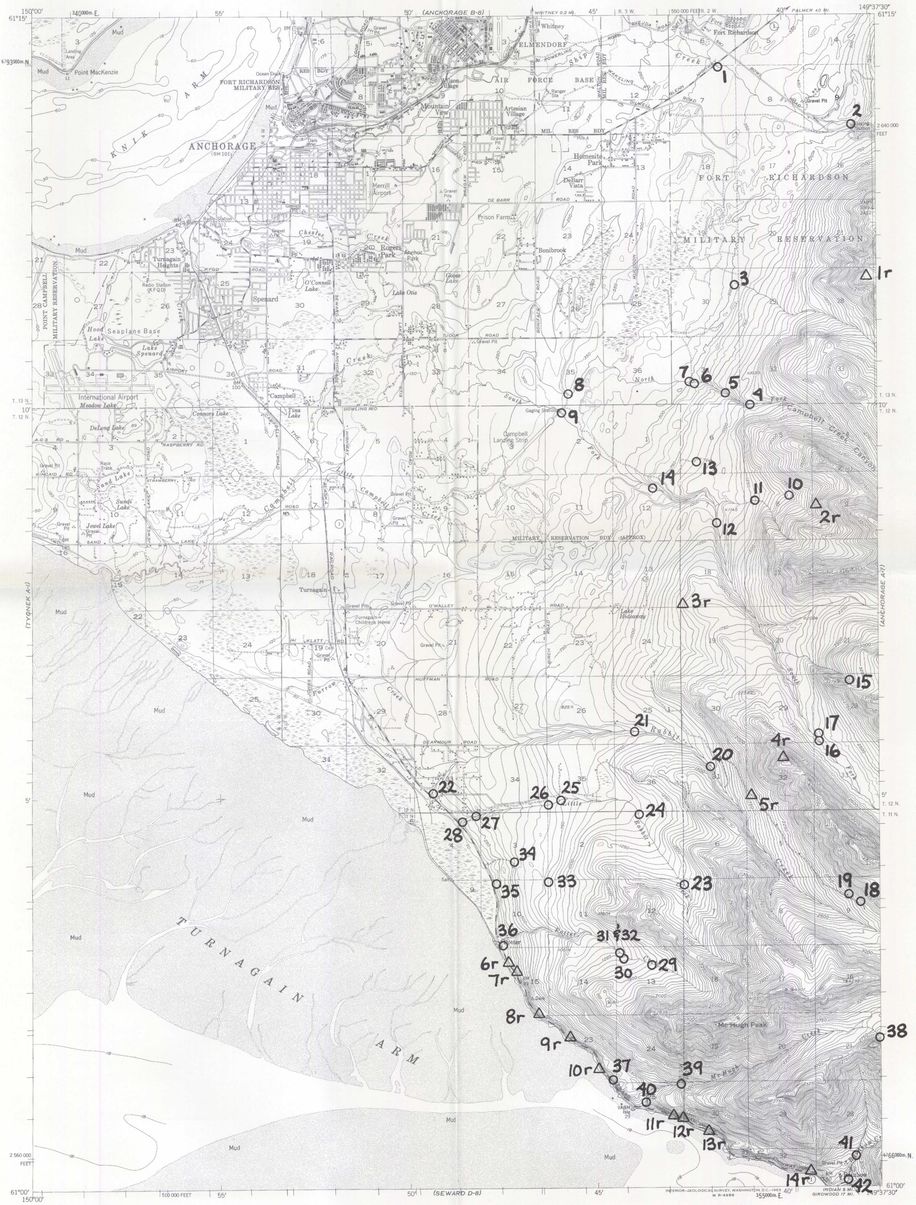

Figure 3. Location of stream-sediment and rock samples, Anchorage A-8 quadrangle.

BASE BY U.S. GEOLOGICAL SURVEY, 1952.

SAMPLES COLLECTED 1969-1972.

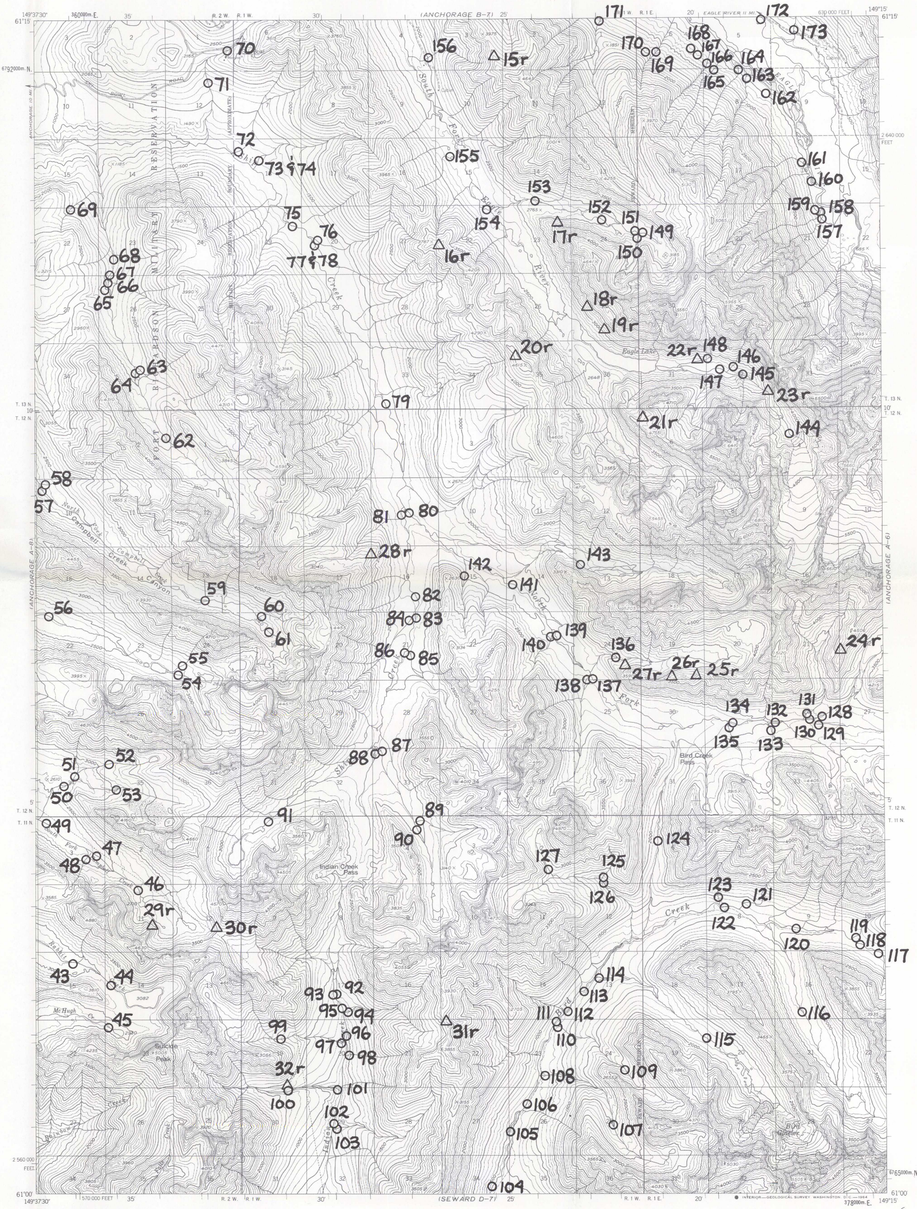

Figure 4. Location of stream-sediment and rock samples, Anchorage A-7 quadrangle.

BASE BY U.S. GEOLOGICAL SURVEY, 1960.

SAMPLES COLLECTED 1969-1972.

Explanation

○160 Location and map number of stream-sediment sample; analyses given in Table 2

△16r Location and map number of rock sample; analyses given in Table 3

RECONNAISSANCE GEOLOGIC MAP AND GEOCHEMICAL ANALYSES OF STREAM-SEDIMENT AND ROCK SAMPLES OF THE ANCHORAGE A-7 AND A-8 QUADRANGLES, ALASKA

by
Sandra H.B. Clark, Martha E. Yount, and Susan R. Bartsch

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