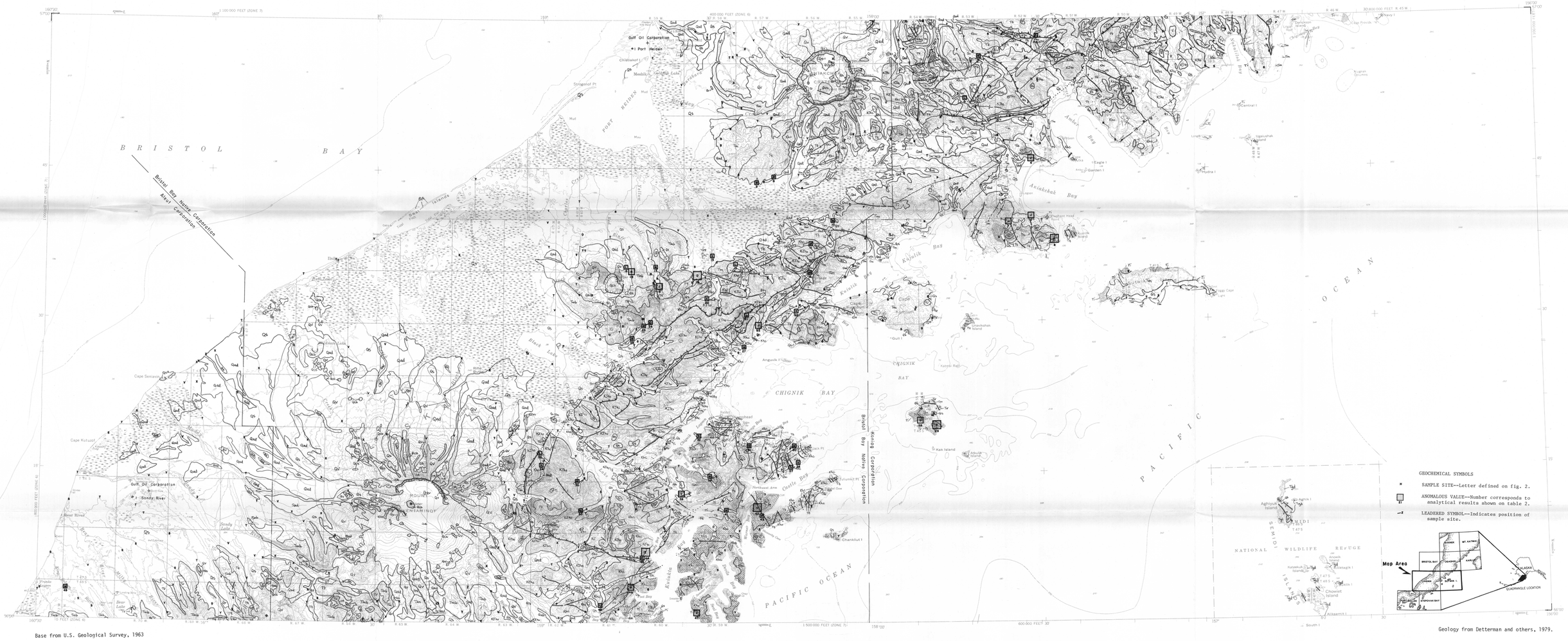
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

MISCELLANEOUS FIELD STUDIES
MAP MF-1053E

FOLIO OF THE CHIGNIK AND SUTWIK ISLAND QUADRANGLES, ALASKA

GEOCHEMICAL MAP, Zn

SHEET 2 OF 2



Base from U.S. Geological Survey, 1963

Geology from Detterman and others, 1979.

ZINC IN MINUS-80-MESH STREAM-SEDIMENT SAMPLES

SCALE 1:250 000

5 0 5 10 15 20 25 MILES

5 0 5 10 15 20 25 KILOMETERS

CORRELATION OF MAP UNITS

SURFICIAL DEPOSITS AND SEDIMENTARY ROCKS	VOLCANIC ROCKS	INTRUSIVE ROCKS		
Qs	Qad Qcs Qv		Holocene and Pleistocene	QUATERNARY
Tmb Unconformity	Tv	Tt	Pliocene and Miocene	TERTIARY
Tt Unconformity	Tm		Miocene or Oligocene	
		Tgd	Eocene and Paleocene	
Khc Unconformity KJhs			Paleocene	
			Upper Cretaceous	CRETACEOUS
			Lower Cretaceous to Middle Jurassic	CRETACEOUS AND JURASSIC

DESCRIPTION OF MAP UNITS

SURFICIAL DEPOSITS AND SEDIMENTARY ROCKS

Qs SURFICIAL DEPOSITS--Unconsolidated alluvium, colluvium, glacial, marine, swamp and eolian deposits; mainly sand, silt, gravel and pumice

Tmb MILKY RIVER FORMATION OF GALLOWAY (1974) AND BEAR LAKE FORMATION--Milky River Formation (Pliocene); mainly volcanogenic sandstone and conglomerate, non-marine. Bear Lake Formation (Miocene); sandstone, conglomerate, siltstone, shale, and coal; shallow marine to non-marine

Tt TOLSTOI FORMATION OF BURK (1965) (Paleocene and Eocene)--Sandstone, conglomerate, siltstone, dark shale, coal; high percent volcanic debris; mainly non-marine

Khc HOODOO AND CHIGNIK FORMATIONS--Hoodoo Formation (Upper Cretaceous); dark shale and siltstone; deep water deposit. Chignik Formation (Upper Cretaceous); sandstone, shale, conglomerate, siltstone, and coal; shallow water to non-marine

KJhs HERENDEEN LIMESTONE AND STANIUKOVICH, NAKNEK, AND SHELIKOF FORMATIONS--Herendeen Limestone (Lower Cretaceous); thin-bedded calcarenite composed of Inoceramus prisms and thin calcareous sandstone. Staniukovich Formation (Upper Jurassic and Lower Cretaceous); thin-bedded feldspathic and laumontitic sandstone. Naknek Formation (Upper Jurassic); dark siltstone and shale in upper part, light arkosic sandstone and conglomerate in lower part. Shelikof Formation (Middle Jurassic); dark siltstone and shale

VOLCANIC ROCKS

Qad ASH AND DEBRIS FLOW DEPOSITS--Volcanic ash, pumice, tuff, and breccia; includes air-fall, ash flow, and avalanche deposits; unsorted to well-sorted; poorly- to well-stratified; includes some lava flows

Qcs CINDER AND SPATTER CONES, AND DOMES--Cinders, scoria, and associated pyroclastic rock

Qv VOLCANIC ROCKS--Andesite and dacite flows, tuff, volcanic breccia, and lahars

Tv VOLCANIC ROCKS--Rhyolite, andesite, dacite, and basalt flows; tuff, volcanic rubble flows, and lahars; includes hypabyssal plugs and domes

Tm MESHIK FORMATION (Miocene or Oligocene)--Basalt flows, volcanic rubble flows, and lahars; minor volcanogenic sedimentary rock

INTRUSIVE ROCKS

Tt INTRUSIVE ROCKS--Quartz diorite, diorite, and gabbro; medium- to coarse-grained; mainly small plutons

Tgd GRANODIORITE--Semidi Islands pluton; medium- to coarse-grained; hornblende- and biotite-bearing

GEOLOGIC MAP SYMBOLS

- Contact--Dotted where concealed
- Fault--Dashed where approximately located, dotted where concealed, queried where probable; U, upthrown side; D, downthrown side. Arrows indicate relative lateral movement
- Thrust or high-angle reverse fault--Dotted where concealed; sawteeth on upper plate
- Folds--Showing trace of axial plane; dashed where approximately located; dotted where concealed. Arrow indicates direction of plunge
- Anticline
- Syncline
- Volcanic crater
- Volcanic vent or cinder cone
- Hornfels
- Alteration
- Dikes and sills
- Exploratory drill hole
- Hot spring
- Native Corporation boundary

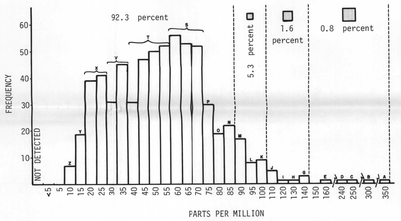


Figure 2.--Histogram for zinc in 637 minus-80-mesh stream-sediment samples, Chignik and Sutwik Island quadrangles, Alaska, showing: symbols denoting anomalous concentrations, percentage of total number of samples represented by each range, and letters corresponding to concentrations in parts per million. Statistics are based on all unqualified values (637) within the sample population; arithmetic mean, 5.7; standard deviation, 30.0; geometric mean, 48.2; and geometric deviation, 1.7.

Table 2.--*Copper, lead, molybdenum, and silver associated with anomalous zinc values in minus-80-mesh stream-sediment samples, Chignik and Sutwik Island quadrangles, Alaska*

[Values reported in parts per million; Cu, Pb, Mo, and Ag determined by semiquantitative emission spectroscopy; Zn, by atomic absorption; N, not detected; L, detected but below value shown; lower limits of detection for Mo and Ag are 5 and 0.5 ppm, respectively; *, anomalous concentrations of Cu, Pb, Mo, or Ag.

Map no.	Field no.	Zn	Cu	Pb	Mo	Ag
1	SM049	100	70	20	N	N
2	153	90	30	30	N	N
3	137	95	30	20	N	N
4	064	110	100	30	N	N
5	090	110	70	50*	N	N
6	092	350	700*	200*	20*	1*
7	088	110	100	70*	N	N
8	CG321	90	30	20	N	N
9	323	90	50	20	N	N
10	096	90	70	20	N	N
11	010	90	50	20	N	N
12	013	90	50	10	N	N
13	355	95	30	10	N	N
14	502	100	20	50*	N	N
15	378	95	50	20	N	N
16	377	140	50	15	N	N
17	375	90	30	20	N	N
18	372	110	20	30	N	N
19	364	240	100	20	N	N
20	359	100	100	20	N	N
21	201	95	1,000*	15	20*	L(0.5)
22	156	100	100	20	N	N
23	402	110	1,000*	20	20*	N
24	413	95	150*	30	20*	N
25	254	90	70	15	N	N
26	415	90	150*	50*	15*	N
27	197	90	50	50*	N	N
28	SM125	140	200*	50*	N	N
29	131	300	70	50*	N	N
30	CG150	90	50	20	N	N
31	165	100	70	50*	N	N
32	169	100	70	30	N	N
33	243	95	70	20	N	N
34	242	100	70	30	N	N
35	248	90	30	10	N	N
36	171	90	100	50*	N	N
37	152	95	50	20	N	N
38	151	100	70	20	N	N
39	175	120	100	50*	N	N
40	178	90	70	50*	N	N
41	048	90	100	50*	N	N
42	139	250	100	50*	L(5)	N
43	138	90	70	30	N	N
44	040	160	70	30	N	N
45	039	100	50	20	N	N
46	036	140	150*	30	10*	L(0.5)
47	069	130	70	30	N	N
48	078	95	50	20	N	N
49	430	90	70	20	N	N

Table 3.--*Statistical summary of zinc results obtained from the analysis of representative rock samples collected from the generalized units listed in the geologic explanation, Chignik and Sutwik Island quadrangles, Alaska*

[The statistics are calculated using only the unqualified values (those not coded with an N, L, or G); leaders indicate insufficient data to calculate value; method analysis is atomic absorption]

Rock unit	Number of samples			Data based on the unqualified population					Percentile distribution based on n samples analyzed				
	Qualified		Unqualified	Geometric mean	Geometric deviation	Arithmetic mean	Standard deviation	Range of values	25th	50th	75th	90th	95th
	N	L	G										
Volcanic rocks, (Qv)----	1	0	0	1	--	--	90	--	90	--	--	--	--	--
Milky River and Bear Lake Formation, (Tmb)-	0	0	0	3	13.6	2.6	21.7	20.1	6- 50	--	--	--	--	--
Volcanic rocks, (Tv)----	0	1	0	16	51.4	2.8	83.7	90.1	15-400	--	--	91	132	--
Intrusive rocks, (Tt)---	0	0	0	31	42.4	1.8	50.2	31.4	20-130	--	39	69	98	113
Meshik Formation, (Tm)--	0	0	0	24	45.9	1.9	55.2	33.3	15-140	--	51	75	115	121
Tolstoi Formation, (Tt)-	0	0	0	9	58.8	1.9	69.4	38.2	20-130	--	69	102	--	--
Hoodoo and Chignik formations, (Khc)-----	0	0	0	20	62.2	1.7	72.0	43.3	20-220	--	68	86	111	119
Herendeen, Staniukovich, Naknek, and Shelikof Formations, (KJhs)----	0	0	0	7	35.8	2.6	50.0	36.4	10-100	--	46	75	--	--

DISTRIBUTION AND ABUNDANCE OF ZINC IN MINUS-80-MESH STREAM-SEDIMENT AND NONMAGNETIC HEAVY-MINERAL-CONCENTRATE SAMPLES, CHIGNIK AND SUTWIK ISLAND QUADRANGLES, ALASKA

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1980

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