UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Heavy Mineral Data from Lower Cook Inlet, Alaska

by Florence L. Wong[1]

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[1] Menlo Park, California

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METHODS

During environmental geology studies in 1976 aboard the U.S. Geological Survey research vessel Sea Sounder (cruise S2-76-WG), grab samples were collected from which subsamples were taken for this study. Bouma and Hampton (1976) detail sampling procedures and provide brief sample descriptions. Figure 1 presents the locations of all 33 samples analyzed for heavy mineral studies.

Heavy minerals were separated from the sand fraction (0.063 to 2.0 mm) in acetylene tetrabromide diluted to a specific gravity of 2.89. These heavy mineral separates were subsequently dry-sieved to collect the 0.063 to 0.25 mm size-fraction selected for this study. Except for nine samples, this specific size fraction embraces the greater volume of the heavy minerals that are coarser than 0.063 mm. Grains were permanently mounted in piccolyte (r.i. = 1.52). Except for one sample, at least 300 grains were counted for each sample along random traverses. The data are listed in Table 1.

An estimate of the modal grain size for the heavy mineral fraction was made by the following methods. For those samples that have greater volume of total grains in the 0.25 to 2.0 mm size-fraction and those that are approximately equal in volume above and below 0.25 mm, no further breakdown was made. A visual estimate of the modal grain size was made from the grain mounts for those samples with greater volume in the 0.063 to 0.25 mm size fraction. The modal heavy mineral grain size of most of the samples is 0.25 mm. The companion grain size analyses of bulk samples give the modal grain size as 0.25 to 0.5 mm (Bouma and others, 1978).

REFERENCES

Bouma, A.H., and Hampton, M.A., 1976, Preliminary report on the surface and shallow subsurface geology of the lower Cook Inlet and Kodiak Shelf, Alaska: U.S. Geological Survey Open-File Report 76-695, 36 p.

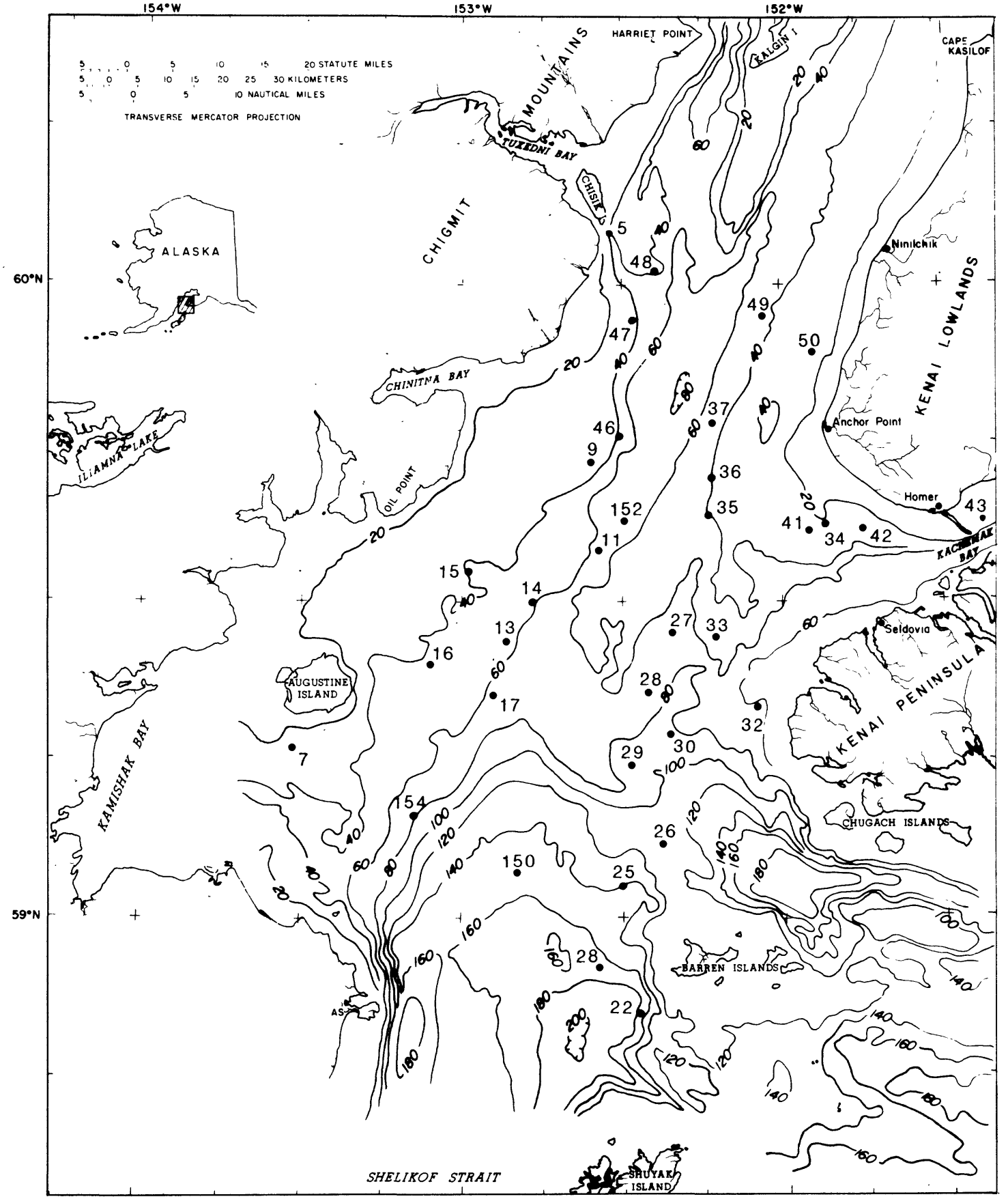
Bouma, A.H., Hampton, M.A., Frost, T.P., Torresan, M.E., Orlando, R.C., and Whitney, J.W., 1978, Bottom characteristics of lower Cook Inlet, Alaska: U.S. Geological Survey Open-File Report 78-236, 90 p.

TABLE 1: Mineral count data. (Note: Heavy minerals percentage data have been calculated as a proportion of the total points counted for each sample. Heading: id=sample no., cnt=no. of grains counted, grn hb=green hornblende, oth hb=other hornblende, trem=tremolite, hyp=hypersthene, oth opx=other orthopyroxene, cpx=clinopyroxene, epi=epidote, sph=sphene, zir=zircon, gar=garnet, oth=others, tot nopq=total nonopaques, opq=opaques, rf=rock fragments, unk=unknowns, dep=depth, grn sz=heavy fraction grain size.)

FIGURE 1: Location map for heavy mineral samples from cruise S2-76-WG, lower Cook Inlet, Alaska. Contour interval is 20 m.

Table 1

id	cnt	nonopaque minerals												opq	rf	unk	dep	grn
		grn hb	oth hb	trem	hyp	oth opx	cpx	epi	sph	zir	gar	oth	tot nopq				(m)	sz
5	429	12.1	6.7	0.9	15.9	0.2	13.1	2.6	1.2	0.7	0.0	0.0	53.4	32.4	14.2	0.0	47	1.9
7	363	41.3	5.5	3.9	13.8	0.3	11.6	7.7	1.1	0.8	0.6	1.1	87.7	6.6	5.0	0.8	32	3.0
9	351	22.2	5.2	1.4	22.8	1.7	17.4	3.7	1.4	0.3	1.1	2.0	79.2	14.2	5.4	1.1	35	1.9
11	436	18.6	7.8	1.6	9.2	0.7	8.7	1.8	1.1	1.4	0.9	0.2	52.0	39.0	8.0	0.9	75	2.3
13	347	20.7	4.9	2.3	16.7	1.7	13.0	2.0	0.3	1.2	1.4	0.6	64.8	23.9	9.2	2.0	63	2.3
14	347	11.2	6.4	0.3	22.8	0.0	23.1	0.6	0.3	1.2	0.0	0.0	65.9	13.0	19.6	1.7	65	1.5
15	344	18.0	7.6	1.2	18.6	0.0	14.9	2.1	0.6	0.0	0.9	0.6	64.5	18.6	16.0	1.2	45	1.9
16	376	18.1	6.6	2.1	19.4	0.3	12.7	6.9	1.6	0.3	0.8	1.1	69.9	18.1	12.0	0.0	48	2.5
17	345	20.9	11.2	2.0	14.5	1.2	13.9	3.2	2.9	2.3	2.0	0.6	74.7	14.5	10.4	0.3	74	2.5
22	417	12.9	2.4	0.7	14.4	0.0	7.4	0.9	1.7	0.2	0.2	0.7	41.5	17.3	40.6	0.5	170	1.5
23	389	13.4	7.8	0.0	20.6	0.0	14.1	1.8	0.5	0.0	0.3	0.0	58.5	9.0	32.1	0.5	147	2.0
25	457	8.3	5.5	0.2	17.1	0.2	13.1	0.6	0.4	0.2	0.4	0.0	46.0	17.9	35.2	0.7	133	2.0
26	363	12.4	5.1	1.9	22.0	0.6	14.6	0.6	0.3	0.3	0.6	0.0	57.8	15.4	26.7	0.3	119	2.0
27	233	3.9	2.6	0.9	12.4	0.0	8.6	0.4	0.0	0.9	0.0	0.0	29.7	19.7	50.7	0.0	74	1.5
28	378	14.8	7.4	1.1	13.8	1.1	10.0	0.3	0.5	0.3	0.0	1.6	50.9	16.4	32.8	0.0	78	1.5
29	375	23.5	10.2	1.9	9.6	0.0	13.3	4.0	1.1	0.5	0.3	1.3	65.7	16.3	17.9	0.3	89	2.0
30	334	15.6	8.7	2.1	21.6	1.5	11.7	0.9	0.0	0.0	0.9	0.6	63.6	10.5	25.5	0.6	91	1.5
32	327	26.6	11.3	1.5	16.5	0.9	15.0	5.2	1.8	0.6	0.3	0.0	79.7	12.2	7.9	0.0	69	3.0
33	336	12.2	4.8	2.7	28.3	1.2	16.4	0.0	1.2	0.6	0.3	0.3	68.0	15.5	15.5	1.2	50	2.0
34	390	24.6	9.5	1.8	19.7	1.3	11.0	4.1	1.5	0.0	0.5	0.6	74.6	14.4	11.1	0.0	28	2.0
35	387	18.9	9.6	4.9	10.1	1.8	9.8	1.3	0.8	0.3	1.3	0.0	58.8	26.9	13.7	0.8	50	2.3
36	344	21.5	6.7	2.6	15.4	2.0	13.9	0.6	0.6	1.2	1.2	0.0	65.7	20.3	13.1	0.9	46	1.9
37	322	10.2	6.5	1.6	18.0	0.6	10.5	4.0	1.2	0.9	0.9	0.0	54.4	31.4	13.1	0.9	56	2.0
41	355	16.3	6.5	0.6	29.3	0.8	15.5	1.1	0.8	0.0	0.8	0.3	72.0	11.5	15.8	0.6	30	2.0
42	355	36.1	10.5	2.8	7.9	0.0	11.6	5.3	1.7	0.0	0.0	0.0	75.9	9.6	13.5	1.1	30	3.5
43	328	13.4	4.6	1.8	24.4	0.0	20.7	3.7	1.5	1.2	1.2	0.0	72.5	14.9	12.5	0.0	52	2.5
46	391	6.9	2.6	0.5	26.6	0.0	18.4	0.8	0.3	0.3	0.5	0.5	57.4	30.7	11.7	0.3	71	1.5
47	364	9.9	2.4	0.3	22.5	0.0	21.2	0.5	0.0	0.3	0.5	0.5	58.1	34.3	6.5	0.8	25	1.5
48	347	16.4	7.5	1.4	18.7	0.3	15.9	2.3	1.2	0.0	0.9	0.3	64.9	16.4	17.3	1.4	45	2.0
49	320	11.9	8.4	2.5	20.3	0.3	18.4	2.8	0.6	0.0	0.6	0.3	66.1	22.2	11.3	0.3	47	1.5
50	349	12.0	4.0	0.6	26.9	0.0	12.6	3.2	0.6	0.6	1.1	0.3	61.9	20.1	17.2	0.9	32	1.9
150	338	25.7	8.3	2.4	13.6	1.5	20.2	2.1	0.3	0.6	0.3	0.0	75.0	14.5	10.3	0.3	147	3.0
152	366	12.8	15.9	1.6	23.0	1.6	13.4	2.5	1.4	0.3	2.2	0.6	75.3	13.1	11.7	0.0	70	1.5
154	315	34.3	10.8	1.0	7.3	0.6	14.3	2.5	0.0	0.3	0.3	0.0	71.4	11.7	16.9	0.0	75	3.3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TUXEDNI BAY
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Ninilchik
KENAI LOWLANDS
CHINITNA BAY
ILIAMNA LAKE
OIL POINT
Anchor Point
Homer
KACHEMAK BAY
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