ENVIRONMENTAL PROTECTION SERVICE
PACIFIC REGION

TRACE METALS IN HECATE STRAIT MARINE SEDIMENTS JUNE - SEPTEMBER 1979

[MANUSCRIPT REPORT SERIES 82-1]

Data Summary

By

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NOTICE

This report was prepared under contract to Environmental Protection Service. Environmental Protection Service assumes no responsibility for ommissions or errors. This information is being provided without interpretation for the benefit of those seeking such baseline data.

SUMMARY

Sediment samples were collected in Hecate Strait during June, July and September 1979 for the Pacific Geoscience Centre, Sidney, and by the Pacific Biological Research Station, Nanaimo. Aliquots of 59 of these samples were obtained and analysed for heavy metals by the Environmental Protection Service in February, 1980.

The 59 sample station locations are shown on the map in Figure 1. The stations have been grouped into six areas; (1) Two Peaks - Arogonaut Flats, (2) White Rocks, (3) Shell Ground, (4) Ole Spot, (5) Horseshoe and (6) Reef Island - Ramsay Island. Table 1 lists the coordinates of each station, the depth in meters and the sediment characteristics at each location.

The trace metal data for the 59 stations are compiled in Table 2. The concentrations are presented in mg/kg (ppm) dry weight of sediment.

The Inductively Coupled Argon Plasma (ICAP) method of analysis was used to determine all heavy metal concentrations except mercury, which was determined by the Graphite Furnace Atomic Absorption method. When sufficient sample was available, the graphite furnace method was also used to provide a lower level of detection for cadmium. The majority of the cadmium concentrations were determined by this method of analysis.

Except where noted, ICAP results are reported as an average of duplicate determinations (sample split in two portions, then analysed) for each sediment sample. Precision for the results is less than or equal to ± 10% standard deviation. Deviations greater than 10% are believed to be due to the non-homogeneity of certain duplicate sediment samples. In some instances there was not enough sample to run duplicate ICAP analysis, therefore the results are from one determination, not an average of two. Accuracy of analysis varies between metals. Reference should be made to the Department of Environment - Environmental Protection Service and Department of Fisheries and Oceans (Pacific Region) - Fisheries and Marine Service Laboratory Manual, Part 3. Metals for accuracy determination.

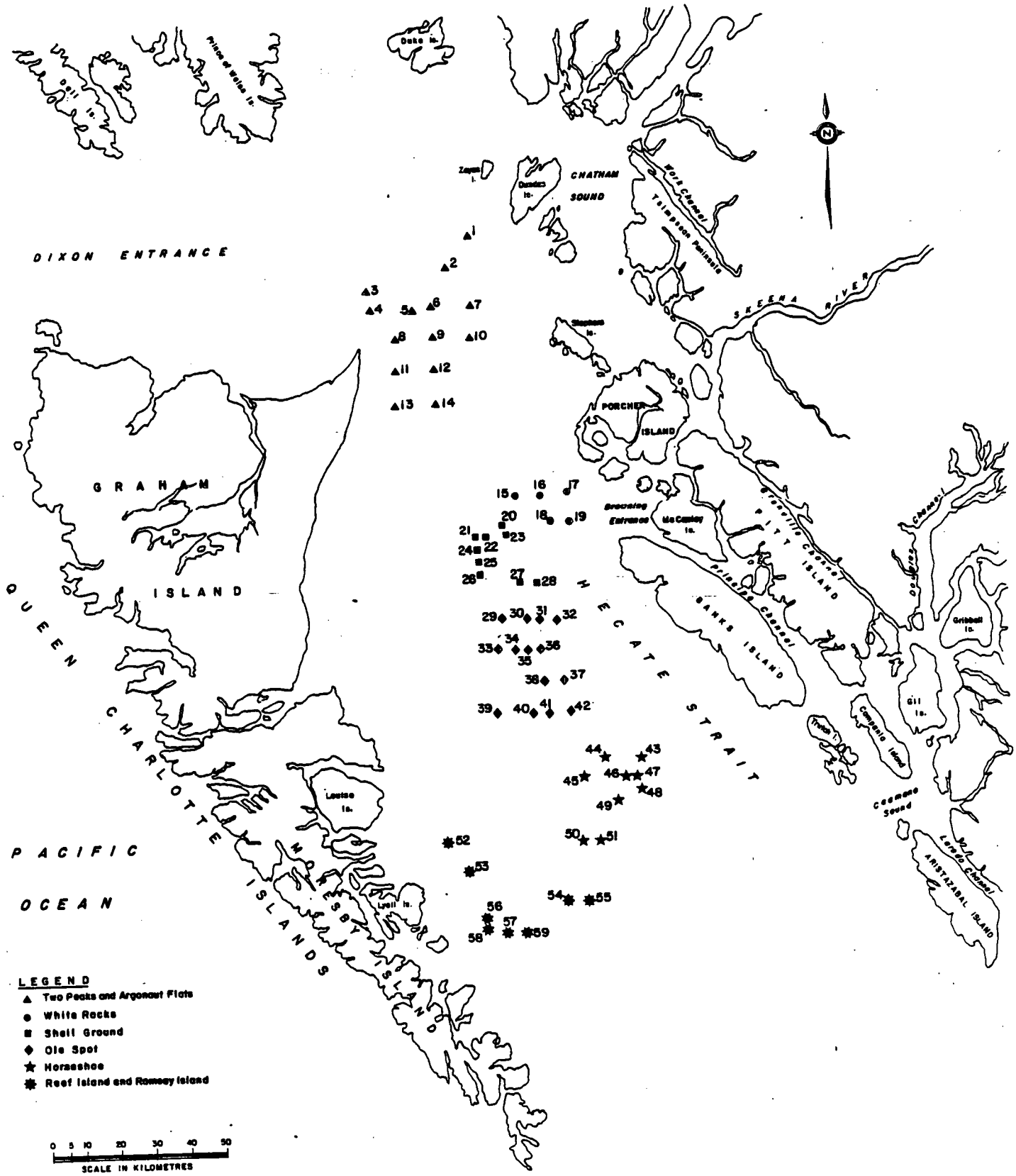

FIGURE 1 HECATE STRAIT SEDIMENT SAMPLE STATIONS

Statistical analyses (mean, standard deviation and range) were performed by area on each of the eighteen heavy metals analysed. The number of items in a sample (n) were limited, ranging from 4 to 14. Where data was predominantly less than detection limit (eg. Cd, Mo, Ni, Pb and Sn), only the ranges of concentrations were given. To calculate mean values, concentrations reported as less than the detection limit were assigned values of the given limit minus 0.001 ppm, (eg. for Cd L0.50-0.001 = 0.499). Standard deviations were not reported where less than detection values were involved in mean calculations.

TABLE 1 HECATE STRAIT MARINE SEDIMENTS

AREA	STATION	LATITUDE (degrees-minutes)		LONGITUDE (degrees-minutes)		DEPTH (meters)	SEDIMENT CHARACTERISTICS
Two Peaks	1	54°	25.5' N	131°	10.0' W	120	
	2	54°	21.0' N	131°	16.6' W	110	Sand; Cobble
	3	54°	17.4' N	131°	36.5' W	146	Sand
	4	54°	14.6' N	131°	35.2' W	59	Sand
	5	54°	14.5' N	131°	24.4' W	29	Sand; Shells
Argonaut Flats	6	54°	15.0' N	131°	20.0' W	28	Sand; Shells
	7	54°	15.0' N	131°	10.0' W	22	Gravelly Sand; Shells
	8	54°	10.0' N	151°	30.0' W	18	Gravelly Sand; Shells
	9	54°	10.0' N	131°	20.0' W	24	Sand
	10	54°	10.0' N	131°	10.0' W	33	Sand; Shells
	11	54°	05.0' N	131°	30.0' W	18	Sand; Shells
	12	54°	05.0' N	131°	20.0' W	26	Sand
	13	54°	00.0' N	131°	30.0' W	18	Fine Sand
	14	54°	00.0' N	131°	20.0' W	26	Sand
White Rocks	15	53°	45.0' N	131°	00.0' W	47	Shells
	16	53°	45.0' N	130°	52.6' W	64	Sand
	17	53°	45.0' N	130°	45.3' W	137	Sandy Mud
	18	53°	40.0' N	130°	50.0' W	49	Sand
	19	53°	40.0' N	130°	44.5' W	137	Sandy Mud
Shell Ground	21	53°	38.0' N	131°	10.0' W	44	Sand; Shells
	22	53°	38.0' N	131°	07.2' W	60	Sand; Shells

Continued...

TABLE 1 HECATE STRAIT MARINE SEDIMENTS

(Continued)

AREA	STATION	LATITUDE (degrees-minutes)	LONGITUDE (degrees-minutes)	DEPTH (meters)	SEDIMENT CHARACTERISTICS
Shell Ground	23	53° 38.0' N	131° 02.1' W	50	Sand; Shells
	24	53° 36.0' N	131° 10.0' W	40	Gravelly Sand; Shells
	25	53° 34.0' N	131° 10.0' W	55	Sand; Shells
	26	53° 32.0' N	131° 10.0' W	71	Sand; Shells
	27	53° 31.0' N	130° 59.3' W	59	Gravelly Sand; Shells
	28	53° 31.0' N	130° 54.0' W	90	Sand
Ole Spot	29	53° 25.0' N	131° 04.6' W	46	Sand; Shells
	30	53° 25.0' N	130° 57.8' W	98	Sand
	31	53° 25.0' N	130° 53.6' W	--	Gravelly Sand
	32	53° 25.0' N	130° 49.8' W	155	Mud
	33	53° 20.0' N	131° 05.6' W	--	Sand; Shells
	34	53° 20.0' N	131° 01.4' W	71	Sand
	35	53° 20.0' N	130° 57.6' W	88	Sand
	36	53° 20.0' N	130° 54.0' W	123	Gravelly Sand
	37	53° 15.0' N	130° 48.5' W	150	Mud
	38	53° 15.0' N	130° 53.7' W	112	Sand
	39	53° 10.0' N	131° 06.3' W	38	Sand; Shells
	40	53° 10.0' N	130° 56.5' W	82	Gravel; Sand; Mud; Shells
	41	53° 10.0' N	130° 53.0' W	106	Gravel; Sand; Mud
	42	53° 10.0' N	130° 47.8' W	124	Muddy Sand
Horseshoe	43	53° 02.9' N	130° 44.0' W	133	Sand

Continued...

TABLE 1 HECATE STRAIT MARINE SEDIMENTS

(Continued)

AREA	STATION	LATITUDE (degrees-minutes)		LONGITUDE (degrees-minutes)		DEPTH (meters)	SEDIMENT CHARACTERISTICS
Horseshoe	44	53°	03.0' N	130°	38.0' W	102	Fine Sand
	45	53°	00.0' N	130°	44.2' W	98	Sand
	46	53°	00.0' N	130°	33.1' W	93	Sand
	47	53°	00.0' N	130°	30.0' W	122	Fine Sand
	48	52°	58.0' N	130°	45.3' W	64	Sand; Shells
	49	52°	56.0' N	130°	35.0' W	102	Gravelly Sand
	50	52°	50.0' N	130°	44.6' W	73	Fine Sand
	51	52°	50.0' N	130°	40.0' W	93	Muddy Sand
Reef Island	52	52°	50.0' N	131°	20.0' W	88	Sandy Gravel
	53	52°	45.0 N	131°	15.0' W	126	Gravelly Sand; Shells
Ramsay Island	54	52°	40.0' N	130°	48.8' W	104	Sand
	55	52°	40.0' N	130°	43.8' W	130	Sand
	56	52°	37.5' N	131°	10.0' W	95	Sand
	57	52°	36.5' N	131°	10.0' W	126	Gravelly Sand
	58	52°	35.0' N	131°	05.0' W	100	Gravelly Sand
	59	52°	35.0' N	131°	00.1' W	110	Sand

TABLE 2 HECATE STRAIT MARINE SEDIMENTS - GRAB SAMPLES (mg/kg dry weight)

AREA	STATION	Al	Ba	Cd	Cr	Cu	Fe	Hg	Mg	Mn	Mo	Ni	Pb	Si	Sn	Sr	Ti	V	Zn
Two Peaks	1	10900	38.20	L0.50	16.50	5.25	22200	0.37	4770	271.00	L18.30	L9.75	L9.75	2950	L24.40	119.00	1520	63.50	27.30
	2	18000	77.00	L0.50	25.90	11.20	22900	0.49	7850	361.00	L18.70	16.50	L9.95	1940	L24.90	152.00	2030	70.00	48.30
	3	10200	29.10	L0.50	13.90	3.80	16500	0.28	4220	225.00	L18.20	L9.65	L9.65	2100	L24.20	60.50	1460	51.50	22.30
	4	10500	33.10	L0.49	15.60	4.03	18100	0.27	4280	258.00	L18.60	10.30	L9.90	2040	L24.80	67.50	1650	57.00	23.40
	5	10300	32.50	L0.50	17.30	3.95	23000	0.31	4520	288.00	L18.50	L9.85	L9.85	2370	L24.70	84.50	2040	73.00	20.70
Argonaut Flats	6	8200	19.20	L1.19[a]	22.70	2.68	47000	0.10	3830	438.00	L17.90	L9.50	11.10	2810	L23.80	67.00	3210	142.00	23.00
	7[b]	8340	33.10	11.64[a]	24.10	6.91	49400	I.S.	3170	164.00	L24.70	L13.20	L13.20	7960	L32.90	248.00	821	48.20	40.30
	8[b]	9610	26.20	L1.23[a]	17.90	3.57	25600	0.13	3600	310.00	L18.50	L9.85	L9.85	2350	L24.60	91.00	2300	81.00	35.10
	9	8360	18.70	L0.49	14.00	2.77[c]	20800	0.16	3370	254.00	L18.50	L9.85	L9.85	2730	L24.70	63.50	1910[c]	72.50	14.00
	10	8600	28.80	L0.50	14.20	5.36	20500	0.58	5350	210.00	L18.10	L9.65	L10.60	2760	L24.20	115.00	1040	65.50	18.80
	11	5060	14.80	L0.50	48.60	5.70	118000	0.32	6000	650.00	L17.80	L9.50	18.60	2460	L23.80	69.00	5550	374.00	24.60
	12	8500	23.40	L0.50	19.40	4.57[c]	31900	0.19	3380	312.00	L18.50	L9.85	12.50[c]	2500	L24.70	79.00	2580	108.00	22.40
	13	7250	13.40	L0.47	51.00	5.50	121000	0.15	3050	670.00	L18.20	L9.70	21.60	2940	L24.30	56.50	5550	400.00	23.00
	14	8200	18.00	L0.49	14.20	3.23	22700	0.16	3150	267.00	L18.30	L9.75	L9.57	2510[c]	L24.40	67.50	2000[c]	78.50	13.20
White Rocks	15[b]	3210	40.40	L1.12[a]	21.10	14.50	11600	0.40	3910	193.00	L16.70	15.70	L8.93	4010	29.00	1890.00	369	40.70	45.00
	16	8150	14.10	L0.49	32.10	4.11	69000	0.26	3630	565.00	L18.40	L9.80	L9.80	3350	L24.50	63.00	4330	214.00	28.00
	17	9250	28.20	1.59[a]	14.50	5.50	12100	0.30	4010	194.00	L18.40	L10.20	L9.80	2050	L24.50	58.00	1420	33.80	30.30
	18	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	0.31	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
	19	9050	28.10	1.62[a]	15.10	5.55	12500	0.32	4050	188.00	L18.70	10.30	L9.95	2180	L24.90	60.00	1260	36.20	29.50
Shell Ground	20	7600	23.30	L0.50	17.10	5.45	30900	0.34	4020	247.00	L18.40	L9.80	L9.80	2690	L24.50	288.00	1610[c]	102.00	19.00
	21	8700	24.10	L0.49	18.00	4.13	32600	0.33	4090	341.00	L18.60	L9.90	L9.90	2120	L24.70	193.00	2600	101.00	22.70
	22	8250	24.60	L0.47	17.10	4.21	29400	0.30	4070	306.00	L18.60	L9.95	L12.40[c]	2150	L24.80	186.00	2370	93.50	19.80

TABLE 2 HECATE STRAIT MARINE SEDIMENTS - GRAB SAMPLES (mg/kg dry weight)

(Continued)

AREA	STATION	Al	Ba	Cd	Cr	Cu	Fe	Hg	Mg	Mn	Mo	Ni	Pb	Si	Sn	Sr	Ti	V	Zn
Shell Ground	23[b]	3250	41.40	L1.15[a]	17.50	12.40	10000	0.60	3920	139.00	L17.20	13.20	L9.17	4470	L22.90	2060	334	37.30	50.60
	24	8400	31.10	L0.50	18.10	6.65	31100	0.28	4400	274.00	L18.50	10.00	10.70	2530	L24.70	321.00	1630	96.00	26.30
	25	7450	21.70	L0.50	33.10	5.70	67000	0.22	3520	392.00	L18.30	L9.75	11.10	2030	L24.50	214.00	2730	201.00	23.20
	26	7900	26.10	L0.49	13.90	4.38	25100	0.36	5100	242.00	L18.50	L9.85	L9.85	2280	L24.70	275.00	1520	78.50	19.60
	27	4830	17.90	L0.47	20.10	7.20[c]	37700	0.26	4830	277.00	L18.40	L10.10	L10.50	2040[c]	L24.50	467.00	1030	122.00	18.50
	28	5800	13.40[c]	L0.49	16.00	3.83	27100	0.15	5050	219.00	L18.60	L9.90	L9.90	1900	L24.70	54.00	1620	90.00	14.40
Ole Spot	29	15500	61.00	L0.49	19.60	15.10	27700	0.38	8100	365.00	L18.30	12.70	9.90	3090	L24.40	109.00	2090	88.50	34.60
	30	8200	16.30	L0.48	14.40[c]	2.91	23100	0.12	3480	252.00[c]	L18.60	L9.90	L9.90	2370	L24.80	50.50	1940[c]	79.00[c]	14.10
	31	8100	28.20	L0.49	13.00	5.80	12700	0.30	7250	160.00	L18.10	L9.65	L9.65	2540	L24.10	80.00	820	36.80	17.60
	32	8000	23.40	L0.50	12.70	4.56	13300	0.16	3500	148.00	L18.50	L9.85	L9.85	2110	L24.70	49.60	875	38.00	13.80
	33[b]	5710	18.40	L1.20[a]	11.50	7.54	15200	0.26	5260	160.00	L17.90	L9.57	L9.57	5320	L23.90	122.00	734	48.70	10.20
	34	5650	12.90	L0.46	30.90	5.05	61500	L0.09	5700	862.00	L18.20	L9.70	L12.30[c]	2040	L24.30	63.50	2670	197.00	15.50
	35	8150	24.20	L0.48	19.70	6.95	25600	0.27	7250[c]	239.00	L18.30	10.20	L9.75	2690	L24.40	81.00	1570	84.00	25.90
	36	10300	33.10	L0.46	25.20	10.60	15600	0.38	6300	206.00	L17.70	18.80	L9.45	3420[c]	L23.60	100.00	1280	46.90	29.10
	37	10000	28.00	L0.49	13.30	5.05	13400	0.21	4030	188.00	L18.50	L10.20	L9.85	2290	L24.60	56.00	1370	40.30	18.90
	38	9600	23.00	L0.49	13.60	3.44	16600	0.14	4060	253.00	L18.40	L9.80	L9.80	2260	L24.60	55.00	2080	57.50	19.20
	39[b]	5140	27.10	L0.43	11.40	8.46	16100	0.37	G12300*	174.00	L18.40	13.10	L9.80	2860	L24.50	336.00	898	54.70	12.50
	40	10700	34.40	L0.48	18.00	6.90	24100	0.25	5300	283.00	L18.10	11.50	L9.65	2250	L24.10	111.00	1970	81.00	27.60
	41	9300	25.50	L0.46	15.90	5.10	18800	0.25	4540	241.00	L18.00	10.30	L9.55	2440	L23.90	66.00	1720	60.50	19.50
	42	10700	32.20	L0.49	14.10	5.40	15700	0.20	4540	208.00	L18.40	L9.95	L9.80	2850	L24.50	64.00	1480	48.10	21.20
Horseshoe	43	8550	21.70	L0.50	11.90	3.68[c]	12800	0.13	3330	167.00	L18.40	L9.80	L9.80	2660[c]	L24.60	55.00	1150	38.90	17.60
	44	8150	17.30[c]	L0.49	13.10	2.43	15800	0.11	3710	210.00	L18.60	L9.95	L9.95	2150	L24.90	52.50	1580	49.60	15.80

TABLE 2 HECATE STRAIT MARINE SEDIMENTS - GRAB SAMPLES (mg/kg dry weight)

(Continued)

AREA	STATION	Al	Ba	Cd	Cr	Cu	Fe	Hg	Mg	Mn	Mo	Ni	Pb	Si	Sn	Sr	Ti	V	Zn
Horseshoe	45	6500	17.10	L0.50	8.70	2.74	11100	0.10	2840	136.00	L18.70	L9.95	L9.95	1780	L24.90	122.00	775	33.60	13.20
	46	9800	28.80	L0.50	14.20	6.35	15400	0.16	4190	185.00	L18.50	L9.85	L10.80	2580	L24.60	92.00	1110	47.20	24.00
	47	6700	14.80	L0.50	11.90	2.54	13300	0.11	2970	141.00	L18.70	L9.95	L9.95	2070c	L24.90	39.20	960	37.00	15.60
	48	5600	13.20	L0.49	13.50	3.34	25000	0.21	4330	202.00	L18.60	L9.90	L9.90	1730	L24.80	223.00	1380c	83.00	8.85
	49	8900	24.10	L0.50	11.70	4.32	15600	0.16	3720	196.00	L18.50	L9.85	L9.85	2890	L24.70	93.00	1380	50.50	19.20
	50	8250	14.30	L0.50	13.80	3.50c	21400	0.17	3610	244.00	L17.80	L9.45	L9.45	1930c	L23.70	49.30	1710	72.50	16.80
	51	7850	17.10	L0.49	13.20	2.65	19400	0.14	3460	206.00c	L18.10	L9.65	L9.65	2210	L24.10	51.5c	1600c	62.50	12.90c
Reef Island	52	12300	30.30	L0.50	16.20	6.50	17200	0.21	5150	234.00	L18.50	11.20c	L9.85	2270	L24.70	120.00	1590	56.00	28.10
	53	9400	23.40	L0.49	18.90	6.06	33600	0.30	5400	340.00	L18.20	L9.70	L9.70	2880	L24.30	256.00	2660c	124.00	21.30
Ramsay Island	54	9450	15.00c	L0.43	24.40	4.34c	47100	0.15	4760	424.00	L18.30	L9.80	L9.80	2340	L24.50	66.50	3500	168.00	20.70
	55	9200	18.60	L0.50	16.10c	3.99c	19400	L0.10	4160	219.00c	L18.70	L10.00	L10.00	2640	L24.90	50.50c	1740	61.50	19.20
	56	8050	11.00c	L0.49	48.60	7.15	89000	0.17	3840	458.00c	L18.40	L9.80	11.00	2700c	L24.50	46.20	3240c	302.00	26.30
	57	10800	24.10	L0.49	15.10	6.15	18700	0.19	4840	229.00	L18.60	L9.90	L9.90	2340c	L24.80	66.00	1400c	60.00	25.60
	58	10300	29.60c	L0.48	16.80	6.30	18900	0.20	5200	222.00	L18.50	9.95	L9.85	2150c	L24.70	57.00	1400c	60.50	27.80
	59	8450	19.80c	L0.50	15.70	4.71	22800	0.31	4180	235.00	L18.40	L9.80	L9.80	2150	L24.50	55.50	1380	77.00	18.90

a. ICAP results reported as there was insufficient sample for low level Cd analysis by graphite furnace method.

b. Only one ICAP determination per sample (not an average of duplicate sample analyses).

c. Less than 90% agreement between duplicate ICAP analyses. The laboratory reports the difference is due to non-homogenity of the split samples.

I.S. Insufficient sample for Hg analysis.

N.A. Not analysed.

TABLE 3 SUMMARY OF TRACE METALS IN HECATE STRAIT MARINE SEDIMENTS (mg/kg dry weight)

METAL	AREA	n	MEAN ($\bar{x}$)	STANDARD DEVIATION	RANGE
Al	Two Peaks - Argonaut Flats	14	9428.57	2895.67	5050.00 - 18000.00
	White Rocks	4	7415.00	2843.86	3210.00 - 9250.00
	Shell Ground	9	6908.89	1868.21	3250.00 - 8700.00
	Ole Spot	14	8932.14	2649.01	5140.00 - 15500.00
	Horseshoe	9	7811.11	1315.24	5600.00 - 9800.00
	Reef Island - Ramsay Island	8	9743.75	1362.88	8050.00 - 12300.00
Ba	Two Peaks - Argonaut Flats	14	28.96	15.79	14.80 - 77.00
	White Rocks	4	27.70	10.75	14.10 - 40.40
	Shell Ground	9	24.84	7.96	13.40 - 41.40
	Ole Spot	14	27.69	11.43	12.90 - 34.40
	Horseshoe	9	18.71	5.15	13.20 - 28.80
	Reef Island - Ramsay Island	8	21.78	6.73	11.00 - 30.30
Cd	Two Peaks - Argonaut Flats	14	-	-	L0.47 - L1.64
	White Rocks	4	1.20	-	L0.49 - 1.62
	Shell Ground	9	-	-	L0.47 - L1.15
	Ole Spot	14	-	-	L0.43 - L1.20
	Horseshoe	9	-	-	L0.49 - L0.50
	Reef Island - Ramsay Island	8	-	-	L0.43 - L0.50

Continued...

TABLE 3 SUMMARY OF TRACE METALS IN HECATE STRAIT MARINE SEDIMENTS
(mg/kg dry weight)

(Continued)

METAL	AREA	n	MEAN ($\bar{x}$)	STANDARD DEVIATION	RANGE
Cr	Two Peaks - Argonaut Flats	14	22.52	12.19	13.90 - 51.00
	White Rocks	4	20.70	8.16	14.10 - 32.10
	Shell Ground	9	18.99	5.55	13.90 - 33.10
	Ole Spot	14	16.66	5.63	11.40 - 30.90
	Horseshoe	9	12.44	1.67	8.70 - 14.20
	Reef Island - Ramsay Island	8	21.48	11.36	15.10 - 48.60
Cu	Two Peaks - Argonaut Flats	14	4.89	2.18	2.68 - 11.20
	White Rocks	4	7.42	4.77	4.11 - 14.50
	Shell Ground	9	5.99	2.68	3.83 - 12.40
	Ole Spot	14	6.63	3.16	2.91 - 15.10
	Horseshoe	9	3.51	1.24	2.43 - 6.35
	Reef Island - Ramsay Island	8	5.65	1.14	3.99 - 6.50
Fe	Two Peaks - Argonaut Flats	14	39971.43	35119.15	16500.00 - 121000.00
	White Rocks	4	26300.00	28469.05	11600.00 - 69000.00
	Shell Ground	9	32322.22	15088.55	10000.00 - 67000.00
	Ole Spot	14	21385.71	12536.95	12700.00 - 61500.00
	Horseshoe	9	16644.44	4473.28	11100.00 - 25000.00
	Reef Island - Ramsay Island	8	33337.50	24716.10	17200.00 - 89000.00

Continued...

TABLE 3 SUMMARY OF TRACE METALS IN HECATE STRAIT MARINE SEDIMENTS
(mg/kg dry weight)

(Continued)

METAL	AREA	n	MEAN ($\bar{x}$)	STANDARD DEVIATION	RANGE
Hg	Two Peaks - Argonaut Flats	14	0.27	0.15	0.10 - 0.58
	White Rocks	5	0.32	0.05	0.26 - 0.40
	Shell Ground	9	0.32	0.12	0.15 - 0.60
	Ole Spot	14	0.24	-	L0.09 - 0.38
	Horseshoe	9	0.14	0.04	0.10 - 0.21
	Reef Island - Ramsay Island	8	0.20	-	L0.10 - 0.31
Mg	Two Peaks - Argonaut Flats	14	4324.29	1324.99	3050.00 - 7850.00
	White Rocks	4	3900.00	189.38	3630.00 - 4050.00
	Shell Ground	9	4333.33	549.04	3520.00 - 5100.00
	Ole Spot	14	5829.29	2362.25	3480.00 - G12300*
	Horseshoe	9	3562.22	496.21	2840.00 - 4330.00
	Reef Island - Ramsay Island	8	295.13	98.57	219.00 - 458.00
Mn	Two Peaks - Argonaut Flats	14	334.14	152.99	164.00 - 670.00
	White Rocks	4	285.00	186.69	188.00 - 565.00
	Shell Ground	9	270.67	72.70	139.00 - 392.00
	Ole Spot	14	231.36	69.13	148.00 - 365.00
	Horseshoe	9	187.33	34.51	136.00 - 244.00
	Reef Island - Ramsay Island	8	295.13	98.57	219.00 - 458.00

*This number was given a value of 12300 in order to calculate the mean, S.D.

Continued...

TABLE 3 SUMMARY OF TRACE METALS IN HECATE STRAIT MARINE SEDIMENTS
(mg/kg dry weight)

(Continued)

METAL	AREA	n	MEAN ($\bar{x}$)	STANDARD DEVIATION	RANGE
Mo	Two Peaks - Argonaut Flats	14	-	-	L17.80 - L24.70
	White Rocks	4	-	-	L16.70 - L18.70
	Shell Ground	9	-	-	L17.20 - L18.60
	Ole Spot	14	-	-	L17.70 - L18.60
	Horseshoe	9	-	-	L17.80 - L18.70
	Reef Island - Ramsay Island	8	-	-	L18.20 - L18.70
Ni	Two Peaks - Argonaut Flats	14	-	-	L9.50 - 16.50
	White Rocks	4	11.50	-	L9.80 - 15.70
	Shell Ground	9	10.27	-	L9.75 - 13.20
	Ole Spot	14	11.09	-	L9.57 - 18.80
	Horseshoe	9	-	-	L9.45 - L9.95
	Reef Island - Ramsay Island	8	-	-	L9.70 - 11.20
Pb	Two Peaks - Argonaut Flats	14	-	-	L9.57 - 21.60
	White Rocks	4	-	-	L8.93 - L9.95
	Shell Ground	9	-	-	L9.17 - L12.40
	Ole Spot	14	-	-	L9.45 - L12.30
	Horseshoe	9	-	-	L9.45 - L10.80
	Reef Island - Ramsay Island	8	-	-	L9.70 - 11.00

Continued...

TABLE 3 SUMMARY OF TRACE METALS IN HECATE STRAIT MARINE SEDIMENTS
(mg/kg dry weight)

(Continued)

METAL	AREA	n	MEAN ($\bar{x}$)	STANDARD DEVIATION	RANGE
Si	Two Peaks - Argonaut Flats	14	2887.14	1494.92	1940.00 - 7960.00
	White Rocks	4	2897.50	944.36	2050.00 - 4010.00
	Shell Ground	9	2467.78	791.86	1900.00 - 4470.00
	Ole Spot	14	2752.14	836.43	2040.00 - 5320.00
	Horseshoe	9	2222.22	405.79	1730.00 - 2890.00
	Reef Island - Ramsay Island	8	2433.75	272.03	2150.00 - 2880.00
Sn	Two Peaks - Argonaut Flats	14	-	-	L23.80 - L32.90
	White Rocks	4	25.72	-	L24.50 - 29.00
	Shell Ground	9	-	-	L22.90 - L24.80
	Ole Spot	14	-	-	L23.60 - L24.80
	Horseshoe	9	-	-	L24.10 - L24.90
	Reef Island - Ramsay Island	8	-	-	L24.30 - 24.90
Sr	Two Peaks - Argonaut Flats	14	95.64	51.68	55.50 - 248.00
	White Rocks	4	517.75	914.84	58.00 - 1890.00
	Shell Ground	9	450.78	613.87	54.00 - 2060.00
	Ole Spot	14	95.97	73.20	49.60 - 336.00
	Horseshoe	9	86.39	58.05	39.20 - 223.00
	Reef Island - Ramsay Island	8	89.71	71.05	46.20 - 256.00

Continued...

TABLE 3 SUMMARY OF TRACE METALS IN HECATE STRAIT MARINE SEDIMENTS
(mg/kg dry weight)

(Continued)

METAL	AREA	n	MEAN ($\bar{x}$)	STANDARD DEVIATION	RANGE
Ti	Two Peaks - Argonaut Flats	14	2404.36	1461.64	821.00 - 5550.00
	White Rocks	4	1842.25	1723.01	359.00 - 4330.00
	Shell Ground	9	1716.00	765.19	334.00 - 2730.00
	Ole Spot	14	1535.50	579.88	734.00 - 2670.00
	Horseshoe	9	1293.89	315.99	775.00 - 1710.00
	Reef Island - Ramsay Island	8	2113.75	883.16	1380.00 - 3500.00
V	Two Peaks - Argonaut Flats	14	120.34	115.60	48.20 - 400.00
	White Rocks	4	81.18	88.60	33.80 - 214.00
	Shell Ground	9	102.26	43.60	37.30 - 201.00
	Ole Spot	14	68.64	40.95	36.80 - 197.00
	Horseshoe	9	52.76	16.78	33.60 - 83.00
	Reef Island - Ramsay Island	8	113.63	85.88	56.00 - 302.00
Zn	Two Peaks - Argonaut Flats	14	25.96	9.70	13.20 - 48.30
	White Rocks	4	33.20	7.92	28.00 - 45.00
	Shell Ground	9	23.79	10.60	14.40 - 50.60
	Ole Spot	14	19.98	7.04	10.20 - 34.60
	Horseshoe	9	15.99	4.28	8.85 - 24.00
	Reef Island - Ramsay Island	8	23.49	3.86	18.90 - 28.10

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