Ocean Chemistry Data Report: Pb-210 and Metal Data for Sediment Cores and Sediment Trap Collections from Alice Arm and Observatory Inlet; Part 4, March 1982, June 1982, September/October 1982, July 1984

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1995

Canadian Data Report of Hydrography and Ocean Sciences 17 (Part 4)

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OCEAN CHEMISTRY DATA REPORT : Pb-210 AND METAL DATA FOR SEDIMENT CORES AND SEDIMENT TRAP COLLECTIONS FROM ALICE ARM AND OBSERVATORY INLET; PART 4, MARCH 1982, JUNE 1982, SEPTEMBER/OCTOBER 1982, JULY 1984

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Cat. No. Fs 97-16/17 ISSN 0711-6721

Correct citation for this publication :

Macdonald, R.W., M.C. O'Brien. 1995. Ocean Chemistry Data Report : Pb-210 and Metal Data for Sediment Cores and Sediment Trap Collections from Alice Arm and Observatory Inlet: Part 4, March 1982, June 1982, September/October 1982, July 1984.
Can. Data Rep. Hydrogr. Ocean Sci: 17 (part 4 of 4), 81 pp.

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ABSTRACT

O'Brien, M.C., R.W. Macdonald, 1994. Ocean Chemistry Data Report : Pb-210 and Metal Data for Sediment Cores and Sediment Trap Collections from Alice Arm and Observatory Inlet; Part 4, March 1982, June 1982, September/October 1982, July 1984. Can. Data Rep. Hydrogr. Ocean Sci. 17 (4), 81 pp.

Metal and Pb-210 data from cores and sediment trap material from Alice Arm and Observatory Inlet collected March 1982, June 1982, September/October 1982 and July 1984 are reported here.

Key Words : Alice Arm, core, data, metals, Observatory Inlet, oceanographic, Pb-210, sediment, sediment trap

RÉSUMÉ

O'Brien, M.C., R.W., Macdonald,1994. Ocean Chemistry Data Report : Pb-210 and Metal Data for Sediment cores and Sediment trap collections from Alice Arm and Observatory Inlet; Part 4, March 1982, June 1982, September/October 1982, July 1984. Can. Data Rep. Hydrogr. Ocean Sci. 17 (4), 81 pp.

Des données de métal et de Pb-210 recueillies à l'aide de carottage et de trappes à sédiment à Alice Arm et à Observatory Inlet en mars 1982, juin 1982, september/octobre 1982 et juillet 1984 son présentées ici.

Mots Clé : Alice Arm, carottage, données, métaux, Observatory Inlet, océanographique, Pb-210, sédiment, trappe de sédiment

ACKNOWLEDGMENTS

We thank Coastal Zone Oceanography for their generous assistance during the sampling program, and the officers and crew of the C.S.S. Vector for their assistance in the field, S. Thomson for her advice on style and format, A. Ages for his translation of the abstract and P. Kimber for her help in preparing the figures.

INTRODUCTION

Sediment cores and materials caught in sediment traps were obtained as part of an investigation of the transport and fate of mine tailings disposed into Alice Arm, a B.C. coastal fjord. The program consisted of two cruises organized by Ocean Chemistry (OC-82-IS-001 and OC-82-IS-003) and participation by Ocean Chemistry in four Coastal Zone Oceanography cruises (CZO 02, CZO 03, CZO 05, and CZO 08)as well as the most recent cruises (OC-84-IS-003 and OC-86-IS-003) where additional cores and surface grab samples were obtained. Reported here are the results of metal and Pb-210 analysis for :

- Six cores (designated ST-2, ST-3, ST-4, OB-5, HA-2, GB-1) taken during an Ocean Chemistry cruise to Alice Arm in September and October 1982 (OC-82-IS-003).

- Two cores (designated core#1 and core#2) taken on Ocean Chemistry cruise OC-84-IS-003 to Alice Arm in July 1984.

- Sediment trap material collected during three separate cruises to Alice Arm (OC-82-IS-003 in September/October 1982, CZO Alice Arm Cruise 05 in June 1982, and OC-82-IS-001 in March 1982).

Ancillary information on the samples taken, the sampling methods used and associated preliminary data is available in three previous data reports (*Macdonald et al, 1984, Parts 1,2 and 3).* This report includes the following:

- Station locations for coring and sediment trap moorings.

- Description of sampling techniques.

- Description of metal analysis.

- Description of Pb-210 analysis.

- Quality control data for metal and Pb-210 analysis.

- Tables of results for metal and PB-210 analysis.

- Graphs of metal and Pb-210 profiles in sediment cores.

Station Locations

The locations of the sediment cores are listed in Table 1 and depicted in Figure 1. The sediment trap moorings are listed in Tables 2a-2c with the arrangement of sediment traps in longitudinal section shown in Figure 2.

SAMPLING TECHNIQUE

Gravity cores

All the cores were collected with a Benthos gravity corer (118 kg) which was used without a barrel, the plastic tube being connected directly to the fin-weight assembly with a plastic adapter and stainless steel hose clamps. A one-way Benthos valve was attached to the top of the tube to help retain sediments in the core during recovery. A minimally disturbed core was obtained by eliminating the core cutter and catcher. The corer was allowed to hit bottom at a descent rate of 0.5 m/sec. Upon retrieval cores were capped immediately, labelled and wrapped in tin foil. The cores from cruise OC-82-IS-003 (ST-2, ST-3, ST-4, OB-5, HA-2 and GB-1) were stored upright on deck until returned to IOS where they were kept upright in a dark cooler at 4 °C. X-rays of the these cores were obtained to assist in choosing appropriate sub-samples for analysis. Cores were extruded and cut using an extruder (*Kemp et al,1971*). Stainless steel cutting tools were used to section the core and the outer edge of each section was removed to eliminate the effects of smearing. The core sections were stored frozen in Whirl-pac bags until analysis. The cores from Observatory Inlet (CORE#1 and CORE#3) obtained in July 1984, were sectioned and frozen in Whirl-pac bags on the ship. The cores were cut in 1 cm intervals for the top 10 cm and then at two cm intervals to the bottom with the exceptions that the GB-1 core was cut in 5 cm intervals below 20 cm and CORE#1 and CORE#3 from Observatory Inlet were cut in 3 cm intervals in the 30 to 45 cm range and then at 5 cm intervals to the bottom.

Sediment Trap Collection

The design characteristics and method of deployment are fully described in *Macdonald et al, 1984, Part 1.* Figure 2 illustrates the sediment trap mooring and Table 2 gives the station positions. The subsampling routine has also been fully outlined previously (*Macdonald et al, 1984*). The flow charts outlining the subsampling procedures used are included here (see Figures 3a-3d) to serve as an overview of the treatment of these samples. There was also a sediment trap deployment in January of 1983 but due to analytical problems, this data will not be reported here.

ANALYTICAL METHODS

Metal Analysis

In preparation for digestion, the sectioned core sediments were thawed and homogenized within the Whirl-pac bags and then transferred to crucibles where they were dried at 110 °C for 24 hours and then ground to a fine powder using an agate mortar and pestle. The sediment trap samples were dried on the filters at 40 °C overnight, finely ground and then stored in Whirl-pac bags. The sediments were then digested in teflon bombs (*Loring et al, 1977* and methods described in an ICES intercalibration exercise coordinated by D.H. Loring in 1984) using HF and aqua regia as follows; a 0.5 gram sample of dried, ground sediment was weighed accurately to the nearest 0.0001 gm and transferred to an acid cleaned teflon bomb. For the sediment trap material, a sample of 0.1 to 0.3 gm was used for the digest. The sediment was then wetted with 750 µl HCl followed by 250 µl of HNO_3 (aqua regia 1:3 HNO_3/HCl v/v). Using a fixed volume pipette (polypropylene tip), 6 ml of concentrated HF were added slowly to avoid frothing, and the cover was screwed on tightly. The bomb was placed in a water bath of greater than 90 °C for one hour. After cooling to room temperature (one hour in a freezer), the contents of the bomb were transferred by washing into 100 ml polypropylene volumetric flasks containing 5.6 gm of boric acid and approximately 20 ml of milli-Q water. The flasks were shaken to complete the dissolution (a black carbon residue and a small amount of undissolved H_3BO_4 sometimes remained at the end of the digest). The solutions were brought to volume and the resulting solutions were transferred to acid cleaned 100 ml or 60 ml acid cleaned polypropylene bottles, allowed to settle and stored for analysis. The solutions were analyzed for Zn, Cu, Mn, Fe, and Al using flame atomic absorption spectrophotometry (Varian AA - 1475 series with programmable sampler Varian Model 55) and for Cd, Pb, and some Cu (sediment trap materials that were too close to the detection limit for FAAS) using a graphite furnace AAS technique (Perkin Elmer Model 503).

A small number of samples were run for Ba using FAAS. The digests from cores St-2, St-3 and St-4 (cruise OC-82-IS-003) were analyzed for Ba using a flame atomic absorption technique. The samples were first run without dilution with a KCl solution to determine approximate Ba levels. It was not possible to get an acceptable standard curve without the addition of KCl to suppress ionization. Consequently, the samples and standards were all diluted by 1/3 with KCl to give a final K concentration of 2107 µg/ml. For barium, the samples were run in two different batches and included 8 blind

replicates, 11 reference sediments and 8 blanks. Also, 10 of the digests were rerun to determine instrumental variability. Blanks were corrected by subtracting 0.04 μg/ml from the μg/ml values for the samples and reference materials. The test for linearity was applied to the calibration data and the hypothesis of linearity was accepted.

Quality Control Data for Metal Analysis

Blanks, reference materials, blind replicates and replicate samples were run along with the core and sediment trap samples in order to establish the quality of the data set. The samples were analyzed in two batches, each consisting of several digest sets. Tables 3a-3h and Tables 4a-4c list the sample weights, the sample ID numbers, blind replicate designation and the digest set number of each sample along with the analyzed metal contents. Each batch consists of the following :

BATCH #1 :

Samples # 1-155
Digest sets # 1-8
62 core samples (St-2, St-3, St-4, OB-5, HA-2, GB-1)
18 sediment trap samples
Reference sediments (BCSS-1, MESS-1)
Blind reference sediments mixtures (14/02/85-1, 14/02/85-2, 14/02/85-3)
Reference sediments from ICES intercalibration exercises (intercal A,B,C)
Blanks (12 run with set)
Blind replicate from cores (MM-1 to MM-15)
Blind replicates from sediment trap material (5)
Other replicates (4)

BATCH #2 :

Samples # 156-380 (total of 225 samples)
Digest sets # 1*-13*
Core samples (cores #1 and #3 from Observatory Inlet)
Sediment trap samples (69 samples)
Reference sediment mixtures (A to E)
Blanks (26 run with set)
Blind replicates from core samples (A-1 to A-21)
Blind replicates from sediment trap samples.

The samples from batch #1 were analyzed for Cu, Zn, Mn Fe, Al, Pb, Cd and some Ba. Batch #2 samples were analyzed for only Cu, Zn, Cd, and Pb.

Tables 5h and 5i list the pooled standard deviation calculated for different concentration ranges for the various metals. The pooled standard deviation is worked out separately for concentration ranges for the core sediments, the sediment trap collections and the reference materials. Table 5a shows the accepted values for the reference materials and Table 5f shows the % recovery values for the reference sediments.

Pb-210 Analysis

The water contents of the core subsamples were determined by weighing before and after drying at 110 °C for 24 hours and this is used, together with the salinity of the pore water (bottom water) to calculate the sediment porosity. A brief outline of the chemical procedure for Pb-210 is as follows : The dry sediment was ground using an agate mortar and pestle and 3 to 6 gm of sediment were refluxed for 2 hours in 20 ml of Baker Instra analyzed concentrated HNO_3. A lead carrier solution was then added (4 ml of a 10 mg Pb^{++} per ml in 3 N HNO_3). After dilution with 60 ml of Milli-Q, the solids were removed by filtration. The Pb was then purified and separated by electrodeposition onto a platinum screen as hydrated lead dioxide. The lead oxide was removed from the screen by rinsing with a solution containing a few drops of hydrogen peroxide in 8 ml of 3 N HNO_3. The PH was then adjusted to 2 - 2.5 with NH_4OH solution and saturated solution of Na_2SO_4 was added to precipitate $PbSO_4$ which was then filtered off, dried, transferred to a planchette and fixed in place for counting by spreading evenly with an agar solution. The samples were stored for at least 30 days prior counting to allow for ingrowth of the Bi-210 daughter.

Pb-210 was then determined by counting the beta decay of the daughter Bi-210 using the Tennelec Model LB 1000 Low Level beta counter using 10% methane in Argon (P-10) as the carrier gas. The methods employed for the determination of Pb-210, density and porosity have been thoroughly described by *Macdonald et al, 1982.*

Quality Control Data for the Pb-210 Analysis

The counting efficiency of each sample was calculated from the PbSO4 recovery using the calibration curve determined for the period December 1985 to March 1986 :

% efficiency = (-0.0666) x (weight in mg of $PbSO_4$) + 31.108

The data set includes blanks and blind replicates along with the samples. A high activity sample and a lower activity sample were run at regular intervals and a control chart was maintained to establish the reliability of the counting. The precision of the method was estimated by analysing 9 blind replicates and is expressed as the pooled standard deviation (s_p =0.060 dpm/g). Pooled standard deviation, s_p, is calculated as

$$s_p = \sqrt{\frac{\sum \nu_i s_i^2}{\sum \nu_i}}$$

and where $\nu_i = n_i - 1$ degrees of freedom, and the n_i and s_i, refer to the number of replicates and their standard deviation for the individual components used in the pooled standard deviation calculation.

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Rantala, R.T.T. and D.H. Loring, 1975. Multi-element Analysis of Silicate Rocks and Marine Sediments by Atomic Absorption Spectrophotometry. At. Absorp. Newsletter 14 : 117-120.

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FIGURES

note :

Where um and ug are used in the tables, they refer to micrometers (μm) and micrograms (μg) respectively.

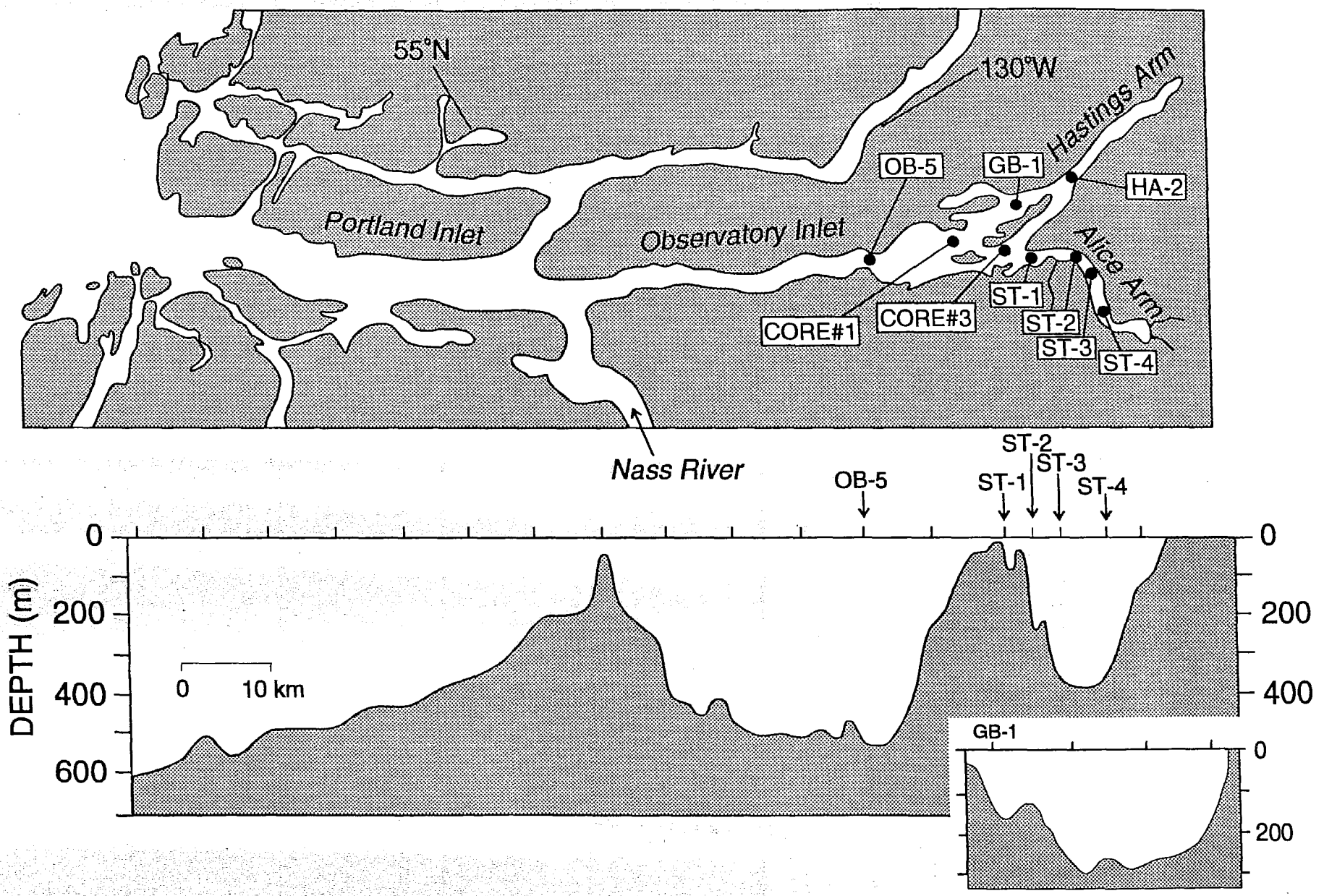


Figure 1. Coring station locations.

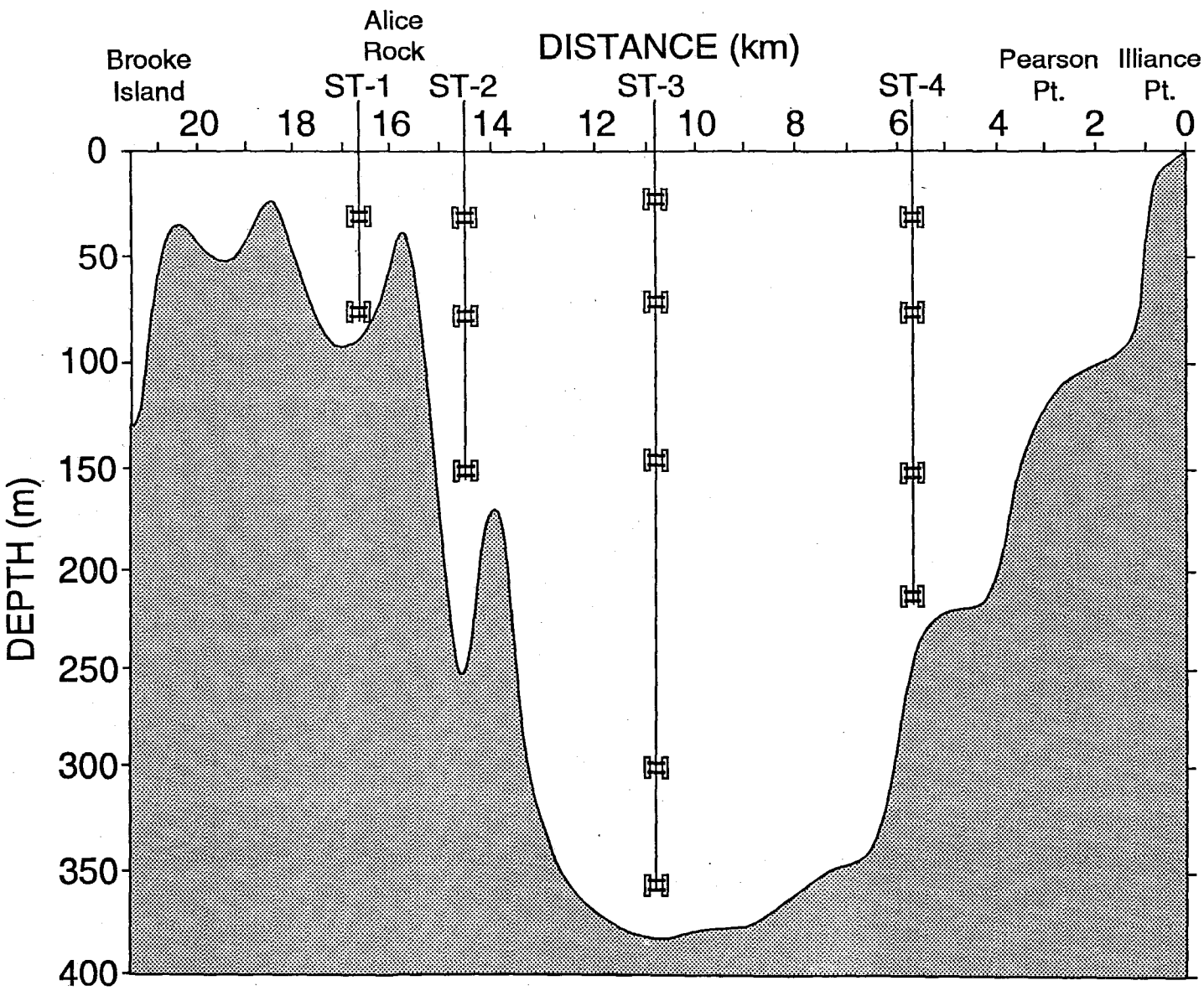


Figure 2. Sediment trap deployment locations.

FIGURE 3a : SEDIMENT TRAP SUBSAMPLING SCHEME CRUISE OC-82-IS-001 (MARCH 1982)

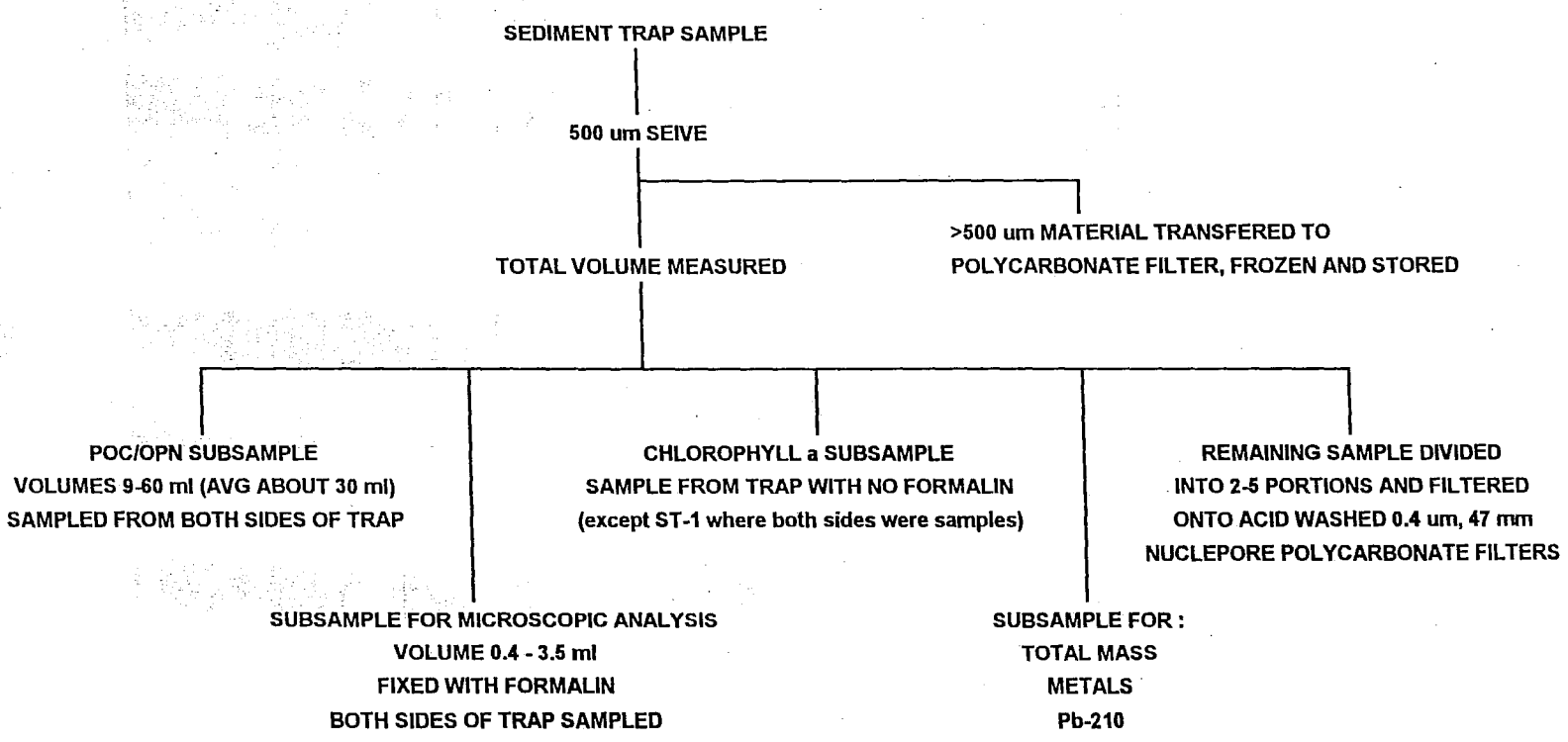
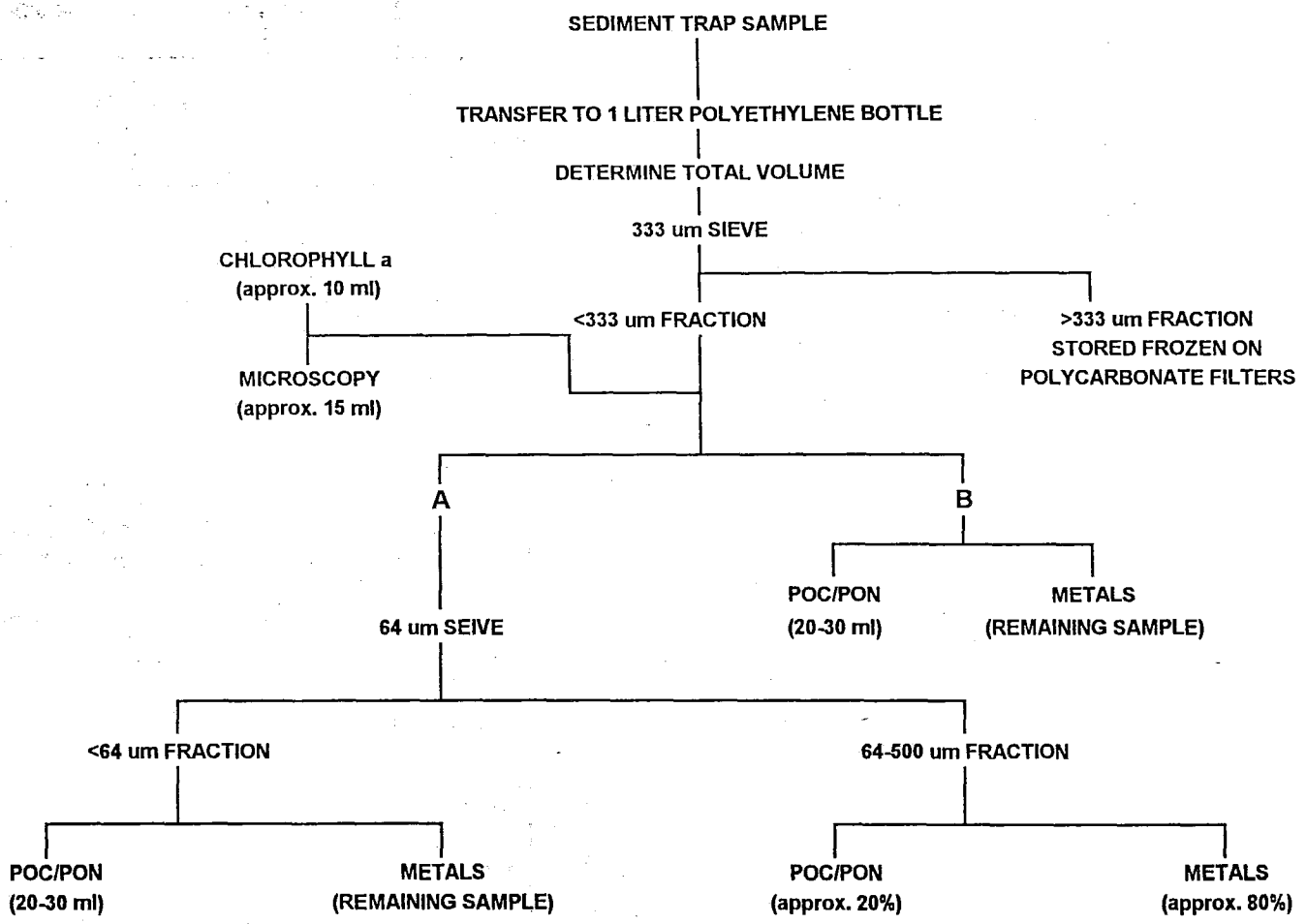


FIGURE 3b : SEDIMENT TRAP SUBSAMPLING SCHEME CRUISE CZO 05 (JUNE 1982)



NOTE : The a-side of the trap which was treated with sodium azide was subsampled according to branch A and the b-side which did not have any preservative added was subsampled according to branch B.

FIGURE 3c : SEDIMENT TRAP SUBSAMPLING SCHEME CRUISE OC-82-IS-003 (SEPT-OCT 1982)

(for all traps except 16a and 16b - see figure 3d)

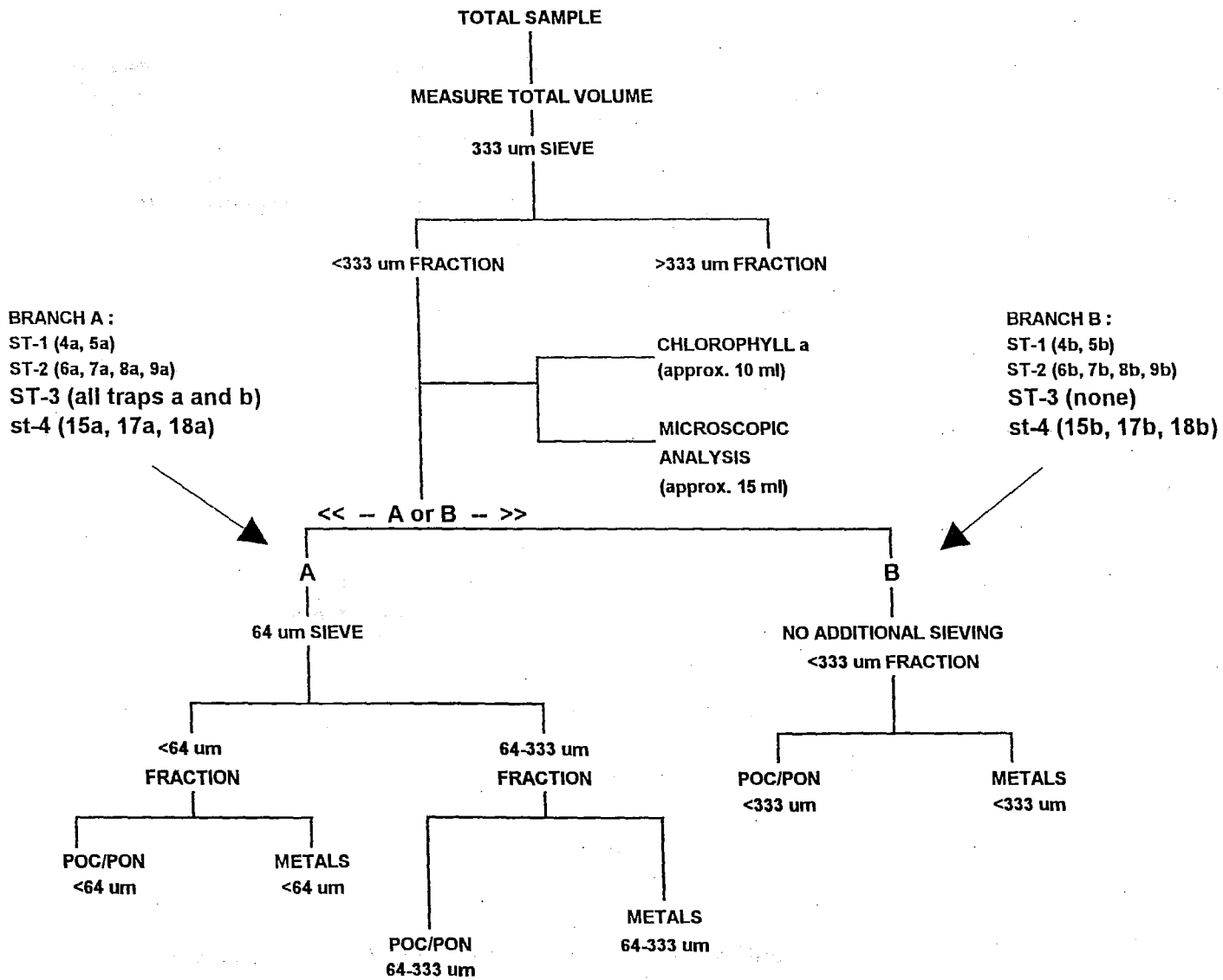
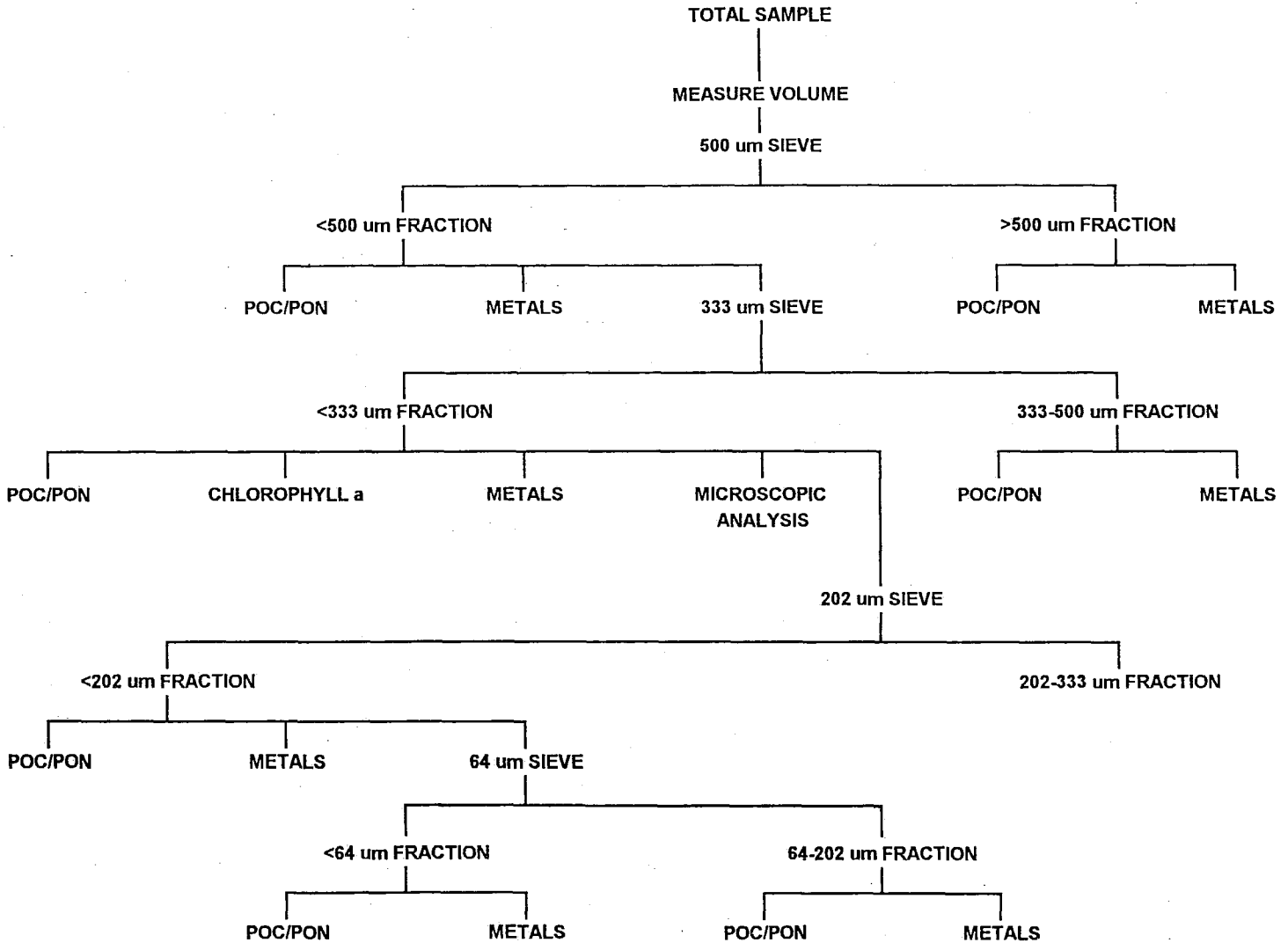


FIGURE 3d : SEDIMENT TRAP SUBSAMPLING SCHEME CRUISE OC-82-IS-003 (SEPT-OCT 1982)
(traps 16a and 16b only)



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APPENDIX 1 : TABLES

note :

Where um and ug are used in the tables, they refer to micrometers (μm) and micrograms (μg) respectively.

TABLE 1 : SEDIMENT CORING LOCATIONS

STATION	DATE	CORING LOCATION	CORE LENGTH (mm)	WATER DEPTH (m)	COMMENTS
ST-3	29-Sep-82	one cable E of station ST-3 (55 27.17 N 129 36.92 W)	1300	389	Yellow near bottom of core.
	29-Sep-82	"	1230	403	
ST-2	29-Sep-82	one cable S of station ST-2 (55 25.92 N 129 40.16 W)	1230	277	
	29-Sep-82	"	860	270	
HA-2	29-Sep-82	55 28.3 N 129 44.6 W	700	317	Lowered corer twice.
	29-Sep-82		1030	320	Good surface.
OB-5	29-Sep-82	55 17.6 N 129 47.8 W	1380	556	Grey mud.
	29-Sep-82		1910	597	
GB-1	29-Sep-82	55 25.4 N 129 46.2 W	600	119	
	29-Sep-82		600	118	
ST-4	30-Sep-82	one cable W of station ST-4 (55 26.75 N 129 31.55 W)	1300	271	Top 630 mm were grey tailings shading to and intermediate color and dark at the bottom.
	30-Sep-82	"	960	271	0-260 mm dark; 260-600 mm greenish; 600-960 mm grey tailings.
CORE #1	6-Jul-84	55 21.70 N 129 45.80 W	?	220	Observatory Inlet, green / grey mud.
CORE#3	9-Jul-84	55 23.72 N 129 42,88 W	1060	168	East of Larcom Island

TABLE 2a : ALICE ARM - SEDIMENT TRAP LOCATIONS - MARCH 1982

STATION	BOTTOM DEPTH (m)	LATITUDE	LONGITUDE	TRAP DEPTH (m)	DEPLOYED 24-Mar-82 TIME	RECOVERED 3-Apr-82 TIME	DEPLOYMENT INTERVAL (days)
ST-1	97	55 24.57 N	129 41.11 W	30	23:28	11:40	9.5
				67	23:32	11:35	9.5
ST-2	256	55 25.92 N	129 40.16 W	30	22:47	11:10	9.5
				70	22:52	11:05	9.5
				150	22:55	11:00	9.51
				226	22:59	13:12	9.52
ST-3	387	55 27.17 N	129 36.92 W	30	20:46	10:10	9.53
				70	20:49	10:05	9.54
				150	20:56	9:55	9.54
				300	21:00	9:50	9.55
				353	21:03	9:45	8.56
ST-4	245	55 26.75 N	129 31.55 W	30	21:43	8:55	9.44
				70	21:46	8:50	9.45
				150	21:50	8:40	9.46
				208	21:53	8:30	9.47

TABLE 2b : ALICE ARM - SEDIMENT TRAP LOCATIONS - JUNE 1982

STATION	BOTTOM DEPTH (m)	LATITUDE	LONGITUDE	TRAP DEPTH (m)	DEPLOYED 12-Jun-82 TIME	RECOVERED 21-Jun-82 TIME	DEPLOYMENT INTERVAL (days)
ST-1	95	55 24.56 N	129 41.12 W	30	8:20	16:45	9.34
				67	8:20	16:50	9.35
ST-2	252	55 26.20 N	129 40.10 W	30	9:29	16:05	9.28
				70	9:26	16:06	9.28
				150	9:23	16:08	9.28
				226	9:20	16:10	9.28
ST-3	387	55 27.13 N	129 37.75 W	30	10:00	15:05	9.21
				70	9:53	15:09	9.22
				150	9:47	15:13	9.23
				300	9:40	15:16	9.23
				353	9:34	15:20	9.24
ST-4	245	55 26.67 N	129 31.50 W	30	10:45	14:00	9.15
				70	10:40	14:05	9.15
				150	10:35	14:10	9.16
				208	10:30	14:15	9.16

TABLE 2c : ALICE ARM - SEDIMENT TRAP LOCATIONS - SEPTEMBER / OCTOBER 1982

STATION	BOTTOM DEPTH (m)	LATITUDE	LONGITUDE	TRAP DEPTH (m)	DEPLOYED 24-Sep-82 TIME	RECOVERED 1-Oct-82 TIME	DEPLOYMENT INTERVAL (days)
ST-1	109	55 24.54 N	129 41.12 W	30	15:27	8:09	6.7
				67	15:22	8:12	6.7
ST-2	259	55 26.00 N	129 40.10 W	30	16:13	8:35	6.68
				70	16:10	8:37	6.69
				150	16:08	8:39	6.69
				226	16:05	8:41	6.69
ST-3	378	55 27.16 N	129 36.75 W	30	17:00	9:11	6.68
				70	16:55	9:08	6.68
				150	16:52	9:05	6.68
				300	16:48	9:03	6.67
				353	16:45	9:01	6.67
ST-4	234	55 26.72 N	129 31.62 W	30	17:35	9:48	6.68
				70	17:40	9:46	6.67
				150	17:43	9:44	6.67
				208	17:46	9:42	6.66

TABLE 3a : METAL DATA CORE ST-2

DEPTH IN CORE cm	SAMPLE WEIGHT g	UNKNOWN I.D.	I.D.#	SET#	Cu ug/g	Zn ug/g	Mn ug/g	Fe %	Al %	Pb ug/g	Cd ug/g	Ba ug/g
0-1	0.5125		51	4	35.3	110	959	4.04	7.04	20.0	0.26	944
1-2	0.5021		52	4	28.5	97	768	3.74	7.16	16.6	0.14	892
7-8	0.496		45	3	27.0	106	757	3.87	6.42	17.6	0.14	1046
14-16	0.504		46	3	33.5	109	848	3.72	6.55	22.2	0.25	1522
	0.504		46									1592
20-22	0.496		242	6*	24.9	113				31.7	0.39	
24-26	0.4958		243	6*	24.9	119				34.1	0.38	
	0.4976	A-4	204	3*	30.2	123				31.6	0.50	
30-32	0.4989		47	3	36.3	135	910	3.91	6.50	34.0	0.45	2840
	0.4986		47									3262
	0.6029	MM-11	82	5	36.3	141	938	4.13	6.61	36.5	0.55	3842
36-38	0.5024		244	6*	28.6	108				30.5	0.28	
	0.4925	A-21	222	4*	30.6	107				29.6	0.36	
44-46	0.4999		245	6*	36.1	112				16.3	0.25	
50-52	0.5208		48	3	45.5	99	679	3.84	6.36	12.7	0.15	656
	0.5208		48									800
	0.5011		112	6	44.7	111	813	3.67	7.17	14.0	0.20	1060
	0.5363	MM-12	83	5	42.1	102	800	3.77	7.08	13.6	0.11	979
80-82	0.5147		49	3	37.7	86	706	3.38	6.05	11.3	0.12	727
100-102	0.566		53	4	15.4	60	552			11.0	0.04	718
104-106	0.4991		246	6*	13.9	68				11.2	0.09	
110-112	0.5197		50	3	26.4	87	648	3.29	6.44	13.1	0.20	657
	0.5197		50									719

TABLE 3b : METAL DATA CORE ST-3

DEPTH IN CORE cm	SAMPLE WEIGHT g	UNKNOWN I.D.	I.D.#	SET#	Cu ug/g	Zn ug/g	Mn ug/g	Fe %	Al %	Pb ug/g	Cd ug/g	Ba ug/g
0-1	0.4999		21	2	48.4	341	799	2.42	6.09	102	8.7	1342
	0.6341	MM-6	77	5	47.6	357	687	2.39	5.88	132	12.6	1829
2-3	0.5158		22	2	76.0	326	968	3.05	6.41	136	7.1	970
5-6	0.4923		15	1	86.3	369	1190	3.73	5.98	136	8.2	1085
	0.6866	MM-5	76	5	89.1	368	1077	3.46	6.54	181	12.0	1367
10-12	0.5014		16	1	91.7	537	1185	3.53	6.97	166	11.0	1066
	0.5014											1420
14-16	0.4998		214	4*	70.1	445				165	10.0	
20-22	0.4996		23	2	65.9	233	2286	4.52	7.54	76	2.6	1890
	0.4996											2221
	0.5018		111	6	70.9	253	2639	4.76	7.28	70	2.5	2155
20-22	0.4959		215	4*	60.2	229				73	2.5	
30-32	0.4971		216	4*	54.2	239				84	3.1	
40-42	0.4937		24	2	69.3	232	3077	4.69	7.60	77	2.4	2051
50-52	0.4943		223	5*	54.5	227				49	1.6	
	0.4971	A-13	258	6*	51.4	234				71	1.3	
60-62	0.4993		25	2	60.9	460	3271	4.78	6.48	132	4.2	1253
	0.4993		25									1435
70-72	0.497		224	5*	57.0	203				51	1.0	
	0.4958	A-20	274	7*	59.8	197				70	1.2	
80-82	0.4939		225	5*	60.4	189				42	0.7	
	0.4939	A-9	187	7*	59.2	196				54	0.7	
90-92	0.4944		26	2	75.1	173	2968	5.09	7.74	22	0.5	1289
	0.4882	MM-8	79	5	83.6	183	1956	5.91	8.07	26	0.5	1778
110-112	0.5044		27	2	82.5	161	2795	4.89	7.92	20	0.3	1053
120-122	0.499		28	2	52.3	137	2515	4.66	7.33	17	0.4	922
	0.499											1030

TABLE 3c : METAL DATA CORE ST-4

DEPTH IN CORE cm	SAMPLE WEIGHT g	UNKNOWN I.D.	I.D.#	SET#	Cu ug/g	Zn ug/g	Mn ug/g	Fe %	Al %	Pb ug/g	Cd ug/g	Ba ug/g
0-1	0.5057		36	3	47	287	601	2.32	6.81	125	6.9	1480
	0.5057		36									1546
1-2	0.5027		37	3	56	352	703	2.42	6.84	147	8.5	1423
	0.5225	MM-9	80	5	56	347	692	2.56	6.73	159	13.9	1559
5-6	0.5057		38	3	116	411	1104	3.58	7.13	184	11.2	1022
	0.5057		38									1133
	0.5049		110	6	124	413	1224	3.40	7.15	222	11.4	1286
10-12	0.5009		39	3	101	324	1721	4.59	7.12	140	7.8	504
14-16	0.497		226	5*	114	342				260	7.2	
20-22	0.5399		40	3	95	361	821	3.27	7.44	130	7.2	957
	0.4924	MM-10	81	5	101	333	935	3.43	7.31	122	9.3	1078
30-32	0.4996		227	5*	75	534				208	12.6	
40-42	0.4975		41	3	95	392	987	3.39	6.93	175	18.2	1105
50-52	0.4961		228	5*	71	288				112	2.9	
	0.4985	A-15	205	3*	74	289					4.2	
60-62	0.4925		229	5*	73	229				138	1.5	
69-71	0.5025		42	3	88	348	1547	4.58	7.85	95	4.2	1555
79-81	0.4958		230	6*	64	345				138	2.3	
	0.4976	A-18	221	4*	67	360				109	2.4	
89-91	0.4969		231	5*	61	321				143	1.7	
	0.4961	A-6	267	7*	64	332				148	2.1	
95-97	0.4947		232	5*	71	186				36.8	0.4	
99-101	0.4994		43	3	84	199	869	5.92	8.16	23.4	0.4	1565
109-111	0.5072		20	2	87	177	1548	5.31	7.22	23.1	0.5	1019
119-121	0.502		44	3	91	194	1780	5.82	8.03	21.2	0.03	1030

TABLE 3d : METAL DATA CORE OB-5

DEPTH IN CORE cm	SAMPLE WEIGHT g	UNKNOWN I.D.	I.D.#	SET#	Cu ug/g	Zn ug/g	Mn ug/g	Fe %	Al %	Pb ug/g	Cd ug/g
0-1	0.4633		1	2	55.9	156	10287	4.66	6.90	14.2	0.28
2-3	0.514		2	2	56.4	164	2410	4.96	6.92	15.6	0.16
8-9	0.503		3	2	60.0	166	2860	4.95	7.53	17.6	0.19
14-16	0.5011		4	2	61.5	171	2430	4.97	6.84	20.1	0.23
20-22	0.5154		5	1	63.4	172	3457	4.94	7.60	25.1	0.28
24-26	0.497		249	6*	55.8	153				25.2	0.26
34-36	0.4954		250	6*	59.0	144				19.6	0.22
	0.4984	A-5	257	6	57.1	144				19.5	0.25
40-42	0.4943		6	2	72.4	162	2496	4.66	7.66	16.6	0.26
50-52	0.4946		251	6*	84.6	155				19.6	0.33
60-62	0.4934		252	6*	56.2	141				15.8	0.24
70-72	0.5011	MM-1	72	5	127.0	195	4341	5.15	7.30	18.8	0.25
	0.4961		7	2	137.0	185	2407	4.99	7.54	18.4	0.16
	0.606		113	6	138.0	191	5012	4.69	6.98	18.8	0.30
78-80	0.4977		259	7*	60.4	138				17.7	0.35
90-92	0.4959		260	7*	39.0	140				15.7	0.36
	0.499	A-14	188	2*	40.8	145				15.3	0.31
96-98	0.5039		261	7*	41.4	140				16.1	0.36
	0.4939	A-12	271	7*	42.2	147				15.2	0.38
100-102	0.492		8	2	42.5	148	2559	4.92	7.47	24.2	0.36
130-132	0.5037		9	1	42.9	147	2779	4.73	7.69	14.7	0.19
	0.6687	MM-2	73	5	44.0	153	3027	5.05	7.35	13.1	0.21
160-162	0.5032		10	1	41.5	150	2520	4.78	7.96	14.3	0.19
170-172	0.5006		11	1	43.1	147	2830	4.93	7.90	13.4	0.20
180-182	0.5066		12	1	46.2	153	2719	4.89	7.19	14.2	0.19
186-188	0.4996		13	1	41.8	151	2287	4.89	7.08	15.0	0.23
	0.4783	MM-3	74	5	44.1	190	2381	5.01	7.41	13.9	0.22

TABLE 3e : METAL DATA CORE HA-2

DEPTH IN CORE cm	SAMPLE WEIGHT g	UNKNOWN I.D.	I.D.#	SET#	Cu ug/g	Zn ug/g	Mn ug/g	Fe %	Al %	Pb ug/g	Cd ug/g
0-1	0.5038		95	6	70.1	184	2146	4.75	7.06	24.7	0.46
3-4	0.5002		96	6	72.2	186	1656	4.88	7.17	25.3	0.78
7-8	0.5		54	4	76.2	166	2014	4.73	7.19	26.6	0.30
14-16	0.505		97	6	80.2	190	2126	4.97	7.41	29.2	0.77
20-22	0.5872		55	4	87.4	169	2038	4.57	7.03	26.6	0.30
40-42	0.5019		98	6	71.9	147	1013	4.41	7.37	18.7	0.28
50-52	0.4968		239	5*	36.9	127				16.4	0.31
60-62	0.4997		56	4	41.2	140	1578	4.59	7.50	16.7	0.28
	0.5163	MM-4	75	5	40.9	147	1653			14.8	0.24
	0.5001		240	6*	35.3	131				15.0	0.26
70-72	0.4989		241	6*	30.8	123				15.7	0.27
80-82	0.5043		99	6	42.2	145	1571	4.79	7.76	17.3	0.40
90-92	0.496		57	4	47.8	147	1752	4.64	7.67	18.0	0.32
	0.4986		58	4	48.9	154	1648	4.87	7.62	18.3	0.38
	0.5278	MM-15	86	5	47.2	156	1635	5.02	7.60	17.1	0.34
94-96	0.5036		100	6	42.3	146	1687	4.73	7.57	16.5	0.48
98-102	0.5151		59	4	44.5	149	2030	4.94	7.19	17.6	0.29

TABLE 3f: METAL DATA CORE GB-1

DEPTH IN CORE cm	SAMPLE WEIGHT g	UNKNOWN I.D.	I.D.#	SET#	Cu ug/g	Zn ug/g	Mn ug/g	Fe %	Al %	Pb ug/g	Cd ug/g
0-1	0.5015		60	4	437	449	831	7.60	6.44	26.3	0.73
2-3	0.5088		61	4	454	464	848	7.59	6.70	25.4	0.69
	0.5017		62	4	441	463	888	7.73	6.74	26.9	0.67
7-8	0.4989		63	4	525	582	849	8.21	6.41	25.5	1.04
14-16	0.5079		64	4	641	753	904	8.56	6.74	20.6	1.31
	0.481	MM-14	85	5	646	764	891	8.77	6.84	22.5	1.55
20-22	0.4997		247	6*	214	280				18.8	0.55
30-35	0.5034		65	4	49.9	150	778	4.79	7.02	15.0	0.17
40-45	0.503		248	6*	40.5	143				12.4	0.31
50-55	0.5002		66	4	44.4	152	901	4.69	6.70	15.1	0.28
	0.5037		67	4	44.1	147	933	4.55	6.96	15.0	0.26

TABLE 3g : METAL DATA CORE #1

DEPTH IN CORE cm	SAMPLE WEIGHT g	UNKNOWN I.D.	I.D.#	SET#	Cu ug/g	Zn ug/g	Pb ug/g	Cd ug/g
0-1	0.4953		156	1*	87.3	242	22.6	1.09
1-2	0.4947		157	1*	90.3	175	21.0	0.53
	0.4897	A-7	268	1*	92.4	177	24.9	0.61
3-4	0.4947		158	1*	96.3	171	22.8	0.37
6-7	0.4945		159	1*	101.0	170	23.5	0.35
8-9	0.4997		160	1*	101.0	179	23.0	0.33
12-14	0.4809		161	1*	116.0	183	26.0	0.38
16-18	0.4998		162	1*	131.0	191	25.8	0.38
	0.5025	A-2	171	1*	136.0	184	27.7	0.39
20-22	0.4916		163	1*	148.0	199	28.7	0.41
24-26	0.488		164	1*	158.0	197	27.0	0.40
	0.4951	A-1	170	1*	156.0	201	26.3	0.39
30-33	0.4879		165	1*	189.0	203	22.8	0.56
33-36	0.4974		172	2*	198.0	193	22.5	0.37
	0.4886	A-3	266	7*	199.0	208	22.5	0.43
39-42	0.4891		173	2*	99.3	155	18.0	0.36
45-50	0.5014		174	2*	45.0	136	16.0	0.32
55-60	0.5022		175	2*	38.7	131	14.8	0.26
60-65	0.5002		176	2*	46.5	149	14.8	0.28
70-75	0.4949		177	2*	40.9	134	14.8	0.28
	0.4952	A-17	273	7*	39.1	142	13.9	0.35
75-80	0.4978		178	2*	40.7	132	14.7	0.27
80-85	0.4991		179	2*	37.4	131	15.1	0.25
85-90	0.5054		180	2*	40.1	127	15.1	0.26
	0.4959	A-11	237	5*	32.6	131	17.0	0.22
90-95	0.5006		181	2*	40.5	129	16.0	0.23
95-99	0.5022		182	2*	38.7	128	15.3	0.23

TABLE 3h : METAL DATA CORE #3

DEPTH IN CORE cm	SAMPLE WEIGHT g	UNKNOWN I.D.	I.D.#	SET#	Cu ug/g	Zn ug/g	Pb ug/g	Cd ug/g
0-1	0.4964		189	3*	60.5	158	25.2	0.33
1-2	0.4919		190	3*	65.6	164	24.8	0.38
3-4	0.5007		191	3*	76.4	168	29.2	0.47
6-7	0.495		192	3*	89.2	176	25.1	0.40
8-9	0.4979		193	3*	99.1	179	24.7	0.44
10-12	0.4857		194	3*	98.5	174	26.8	0.40
14-16	0.4909		195	3*	117.0	178	23.4	0.42
	0.4883	A-19	238	5*	110.0	171	21.1	0.34
20-22	0.4984		196	3*	111.0	166	21.9	0.43
	0.493	A-8	269	7*	112.0	162	24.1	0.53
24-26	0.4924		197	3*	61.0	152	17.4	0.40
28-30	0.496		198	3*	48.5	146	17.3	0.36
	0.4926	A-16	272	7*	51.7	141	17.1	0.44
33-36	0.4882		199	3*	43.1	140	14.7	0.34
39-42	0.4879		206	4*	40.3	122	12.6	0.29
42-45	0.4927		207	4*	32.0	112	12.7	0.28
50-55	0.5008		213	4*	36.2	127	12.5	0.31
60-65	0.5012		209	4*	36.2	131	12.7	0.34
	0.4931	A-10	270	7*	37.6	134	13.9	0.35
70-75	0.5045		210	4*	36.0	125	12.2	0.30
80-85	0.5033		211	4*	37.5	129	12.0	0.32
90-95	0.4985		212	4*	37.8	133	13.0	0.32
95-100	0.4984		208	4*	44.0	134	13.0	0.34

TABLE 4a : METAL DATA SEDIMENT TRAP COLLECTION MARCH 1982
(table on 2 pages)

SEDIMENT TRAP SAMPLE	WEIGHT g	DEPTH m	UNKNOWN I.D.	I.D.#	SET#	FAAS Cu ug/g	Zn ug/g	Mn ug/g	Fe %	AL %	Pb ug/g	Cd ug/g	GFAAS Cu ug/g
ST-1(16A)	0.1273	30		285	8*	22.8	130				25.0	0.8	47.9
ST-1(9A)	0.1993	30		283	8*	14.6	113				18.9	0.5	32.1
ST-1(9A)	0.1286	30	B-9	362	12*	43.5	145				19.1	0.4	125.2
ST-1(13B)	0.1036	67		146	8	39.6	152	668	3.39	5.48	27.4	1.3	
ST-1(13B)	0.1035	67		114	7	53.1	163	661	3.47	5.82	33.2	0.9	
ST-1(13B)	0.2025	67		286	8*	28.6	138				32.0	0.9	46.9
ST-1(17A)	0.215	67		284	8*	27.0	158				30.9	0.5	45.1
ST-2(5A)	0.1019	30		115	7	33.4	158	612	2.93	5.25	31.7	0.8	
ST-2(5A)	0.0997	30		281	8*	19.1	126				11.6	0.3	44.1
ST-2(10B)	0.1658	30		277	8*	29.0	217				41.8	0.3	41.6
ST-2(11A)	0.2367	70		279	8*	32.5	234				56.1	0.8	46.5
ST-2(8B)	0.163	70		275	8*	35.6	167				54.8	0.9	52.8
ST-2(6B)	0.1999	150		278	8*	48.5	190				1.4	2.1	61.0
ST-2(5B)	0.2158	150		276	8*	53.8	561				97.5	2.0	62.1
ST-2(14A)	0.1074	226		116	7	70.8	268	2324	4.18	7.74	98.0	2.8	
ST-2(14A)	0.2379	226		282	8*	60.9	235				110.1	2.4	70.6
ST-2(14A)	0.1311	226	B-4	310	9*	51.9	236				125.4	2.7	68.6
ST-2(6A)	0.2326	226		280	8*	54.2	249				110.9	2.5	63.6
ST-3(13A)	0.2906	300		293	9*	56.8	301				175.6	4.8	72.3
ST-3(12B)	0.1988	300		294	9*	48.8	398				156.6	5.0	66.9
ST-3(12A)	0.1654	353		117	7	71.3	374	1635	4.27	7.86	127.0	2.4	
ST-3(12A)	0.2949	353		296	9*	72.6	347				140.4	5.4	84.8
ST-3(9B)	0.2449	353		295	9*	75.5	294				147.2	4.8	79.6
ST-4(14B)	0.1046	70		119	7	72.7	397	1033	3.05	7.22	157.0	9.6	
ST-4(14B)	0.2788	70		300	9*	66.4	357				155.3	8.0	76.8
ST-4(15A)	0.2461	70		297	9*	67.0	333				170.3	7.2	77.2

TABLE 4a : METAL DATA SEDIMENT TRAP COLLECTION MARCH 1982
(table on 2 pages)

SEDIMENT TRAP SAMPLE	WEIGHT g	DEPTH m	UNKNOWN I.D.	I.D.#	SET#	FAAS Cu ug/g	Zn ug/g	Mn ug/g	Fe %	AL %	Pb ug/g	Cd ug/g	GFAAS Cu ug/g
ST-4(15A)	0.1232	70	B-3	309	9*	47.1	344				217.6	7.1	69.8
ST-4(4A)	0.1055	150		120	7	65.4	380	845	2.65	7.38	-	-	
ST-4(4A)	0.1504	150		147	8	59.8	396	878	2.77	6.88	213.0	9.3	
ST-4(4A)	0.5651	150		139	8	70.1	381	928	2.65	7.57	299.0	11.8	
ST-4(4A)	0.2407	150		301	9*	64.8	366				179.9	9.0	76.9
ST-4(16B)	0.2693	150		298	9*	68.7	350				198.3	8.9	79.5
ST-4(18B)	0.4831	208		118	7	66.4	359	873	2.83	7.51	195.0	1.8	
ST-4(18B)	0.2685	208		302	9*	68.9	314				182.9	8.4	77.8
ST-4(18A)	0.2521	208		299	9*	61.9	323				185.2	8.6	75.4

TABLE 4b : METAL DATA SEDIMENT TRAP COLLECTION JUNE 1982
(table on 2 pages)

SEDIMENT TRAP SAMPLE	SIZE FRACT.	DEPTH m	WEIGHT g	UNKNOWN I.D.	I.D.#	SET#	FAAS Cu ug/g	Zn ug/g	Mn ug/g	Fe %	Al %	Pb ug/g	Cd ug/g	GFAAS Cu ug/g
ST-1(5A)	LT 64	30	0.2082		312	10*	46.6	155				27.7	0.58	56.7
ST-1(5A)	LT 64	30	0.1287	B-1	291	8*	29.5	152				22.5	0.45	60.6
ST-1(5B)	LT 333	30	0.1031		121	7	46.6	178	1672	4.62	8.14	16.4	-	
ST-1(5B)	LT 333	30	0.2531		303	9*	46.2	148				25.1	0.43	55.7
ST-1(4A)	LT 64	67	0.1010		122	7	54.5	188	2036	5.08	7.60	16.8	0.89	
ST-1(4A)	LT 64	67	0.2009		304	9*	53.3	166				31.6	0.54	64.2
ST-1(4B)	LT 333	67	0.2092		311	10*	46.4	186				35.2	0.58	59.3
ST-2(9A)	LT 64	30	0.2008		318	10*	47.8	194				28.7	0.60	64.7
ST-2(9B)	LT 333	30	0.2781		315	10*	41.4	148				25.9	0.35	61.5
ST-2(8A)	LT 64	70	0.0978		123	7	56.2	180	1996	4.83	8.40	17.4	0.72	
ST-2(8A)	LT 64	70	0.2529		313	10*	57.7	168				38.8	0.93	62.5
ST-2(8A)	LT 64	70	0.1303	B-2	292	8*	29.2	166				32.2	0.64	63.7
ST-2(8B)	LT 333	70	0.2373		317	10*	40.5	153				29.2	0.40	49.7
ST-2(7A)	LT 64	150	0.2019		316	10*	42.6	200				57.2	0.97	58.4
ST-2(7B)	LT 333	150	0.2334		319	10*	41.1	176				50.6	1.11	57.0
ST-2(6A)	LT 64	226	0.1950		320	10*	44.1	175				66.6	0.75	62.1
ST-2(6B)	LT 333	226	0.2148		314	10*	45.2	147				59.1	0.91	53.5
ST-3(14A)	LT 64	30	0.1940		332	11*	54.1	207				33.5	0.72	77.3
ST-3(14B)	LT 333	30	0.1323		124	7	68.0	212	1808	5.63	8.23	27.2	0.68	
ST-3(14B)	LT 333	30	0.1032		140	8	70.7	212	1903	5.41	8.43	29.1	0.87	
ST-3(14B)	LT 333	30	0.1835		322	10*	46.9	190				34.6	0.66	69.2
ST-3(14B)	LT 333	30	0.1337	B-6	328	10*	35.9	195				30.2	0.72	67.3
ST-3(13A)	LT 64	70	0.2108		330	11*	49.8	213				37.0	0.69	80.2
ST-3(13A)	LT 64	70	0.1314	B-5	327	10*	36.5	224				38.4	0.49	67.7
ST-3(13B)	LT 333	70	0.2268		331	11*	54.7	204				38.1	0.81	70.1
ST-3(12A)	LT 64	150	0.1131		125	7	54.8	155	2667	5.16	8.29	40.7	1.10	
ST-3(12A)	LT 64	150	0.1900		321	10*	50.5	219				66.8	0.70	64.2
ST-3(12B)	LT 333	150	0.2278		335	11*	60.6	214				67.1	1.08	71.1
ST-3(11A)	LT 64	300	0.2490		329	11*	53.8	178				78.8	1.35	65.1
ST-3(11B)	LT 333	300	0.2262		333	11*	46.4	207				84.1	1.59	71.2

TABLE 4b : METAL DATA SEDIMENT TRAP COLLECTION JUNE 1982
(table on 2 pages)

SEDIMENT TRAP SAMPLE	SIZE FRACT.	DEPTH m	WEIGHT g	UNKNOWN I.D.	I.D.#	SET#	FAAS Cu ug/g	Zn ug/g	Mn ug/g	Fe %	Al %	Pb ug/g	Cd ug/g	GFAAS Cu ug/g
ST-3(11B)	LT 333	300	0.1262	B-8	346	11*	44.4	198				86.8	1.55	65.9
ST-3(10B)	LT 64	353	0.1354	B-7	345	11*	34.0	250				200.0	4.22	62.8
ST-3(10B)	LT 64	353	0.2421		334	11*	39.7	188				101.0	2.11	71.0
ST-3(10A)	LT 333	353	0.2290		336	11*	47.2	174				96.9	2.12	57.6
ST-4(18A)	LT 64	30	0.1018		126	7	74.7	228	1654	5.91	8.25	34.4	1.28	
ST-4(18B)	LT 333	30	0.2104		349	12*	70.8	186				48.0	0.98	87.5
ST-4(17A)	LT 64	70	0.2523		340	11*	54.7	252				99.4	3.22	65.4
ST-4(17B)	LT 333	70	0.2934		347	12*	57.3	243				98.7	1.04	62.4
ST-4(16A)	LT 64	150	0.2736		338	11*	43.1	243				114.8	4.69	53.7
ST-4(16A)	LT 64	150	0.1318	B-12	379	13*	31.5	249				148.8	4.01	47.8
ST-4(16B)	LT 333	150	0.3020		339	11*	45.7	265				115.4	4.90	52.0
ST-4(16B)	LT 333	150	0.1251	B-11	378	13*	33.2	241				19.0	4.97	49.6
ST-4(15A)	LT 64	208	0.2502		337	11*	43.2	309				152.4	7.57	52.0
ST-4(15A)	64-333	208	0.2905		348	13*	19.3	232				79.9	4.15	31.0
ST-4(15B)	LT 333	208	0.2487		141	8	44.2	336	830	2.38	7.23	-	10.86	
ST-4(15B)	LT 333	208	0.5066		148	8	43.6	343	771	2.59	6.77	148.0	8.98	
ST-4(15B)	LT 333	208	0.1422		127	7	43.6	361	788	2.53	7.07	169.0	8.93	

TABLE 4c : METAL DATA SEDIMENT TRAP COLLECTION SEPTEMBER AND OCTOBER 19
(table on 2 pages)

SEDIMENT TRAP SAMPLE	SIZE FRACT.	DEPTH m	WEIGHT g	UNKNOWN I.D.	I.D.#	SET#	FAAS Cu ug/g	Zn ug/g	Mn ug/g	Fe %	Al %	Pb ug/g	Cd ug/g
ST-1(4B)	LT 333	67	0.1112		128	7	49.5	234	784	3.79	6.26	25.2	1.62
ST-2(9A)	LT 64	30	0.2629		351	12*	32.0	152				14.3	0.95
ST-2(9B)	LT 333	30	0.3975		356	12*	37.5	136				11.6	0.60
ST-2(8A)	LT 64	70	0.1760		130	7	41.5	145	1630	4.55	7.19	12.5	0.34
ST-2(8A)	LT 64	70	0.3058		357	12*	33.4	137				17.9	0.20
ST-2(8A)	LT 64	70	0.1307	B-13	380	13*	31.8	141				16.6	0.26
ST-2(8B)	LT 333	70	0.3356		354	12*	38.7	138				16.3	0.48
ST-2(7A)	LT 64	150	0.2129		352	12*	30.5	139				42.0	0.50
ST-2(7B)	LT 333	150	0.4478		355	12*	39.5	138				30.9	0.53
ST-2(6A)	LT 64	226	0.3756		353	12*	39.7	133				34.6	0.69
ST-2(6B)	LT 333	226	0.2936		142	8	42.2	154	1044	4.08	7.51	-	0.82
ST-2(6B)	LT 333	226	0.4971		129	7	44.3	154	1588	4.27	7.42	-	0.62
ST-2(6B)	LT 333	226	0.2310		364	13*	34.4	143				37.4	0.36
ST-3(11A)	LT 64	300	0.2322		365	13*	50.2	230				164	2.36
ST-3(11B)	LT 64	300	0.2578		366	13*	52.6	243				163	2.38
ST-3(10A)	LT 64	353	0.3196		367	13*	54.0	239				189	2.79
ST-3(10B)	LT 64	353	0.1289		131	7	62.1	258	2098	4.07	8.12	-	4.03
ST-3(10B)	LT 64	353	0.3621		368	13*	50.1	240				191	2.49
ST-3(10B)	LT 64	353	0.1354	B-7	345	11*	34.0	250				200	4.22
ST-4(16A)	LT 64	150	0.4984		137	8	89.7	504	1483	3.09	7.35	762	13.70
	LT 64	150	0.3041		143	8	86.8	477	1480	2.77	7.16	697	13.70
	LT 64	150	0.1288		144	8	80.0	507	1500	3.16	7.03	417	16.30
ST-4(16A)	LT 64	150	0.3784		370	13*	77.6	440				559	
ST-4(16B)	LT 64	150	0.5224		138	8	88.4	478	1429	3.07	7.25	693	15.30
ST-4(16B)	LT 64	150	0.3789		371	13*	77.5	419				589	
ST-4(15A)	LT 64	208	0.5033		135	8	88.8	474	1371	3.06	7.41	626	15.70

TABLE 4c : METAL DATA SEDIMENT TRAP COLLECTION SEPTEMBER AND OCTOBER 19
(table on 2 pages)

SEDIMENT TRAP SAMPLE	SIZE FRACT.	DEPTH m	WEIGHT g	UNKNOWN I.D.	I.D.#	SET#	FAAS Cu ug/g	Zn ug/g	Mn ug/g	Fe %	Al %	Pb ug/g	Cd ug/g
ST-4(15A)	LT 64	208	0.4282		372	13*	77.4	411				497	
	LT 64	208	0.1131		145	8	79.6	495	1224	3.18	6.92	416	12.03
ST-4(15A)	64-333	208	0.3828		369	13*	40.1	246				154	
ST-4(15B)	LT 333	208	0.5451		136	8	86.0	480	1317	3.19	7.13	657	13.21
ST-4(15B)	LT 333	208	0.4245		373	13*	82.3	426				508	

TABLE 5a : ACCEPTED VALUES FOR REFERENCE MATERIALS

REFERENCE SEDIMENT	BATCH #	Cu ug/g	Zn ug/g	Mn ug/g	Fe %	Al %	Pb ug/g	Cd ug/g
BCSS-1	1	18.5	119	229	3.29	6.26	22.7	0.25
MESS-1	1	25.1	191	513	3.08	5.84	34.0	0.59
14/02/85-1	1	18.3	128	299	3.32		25.3	0.30
14/02/85-2	1	21.9	168	452	3.18		31.3	0.49
14/02/85-3	1	41.6	491	566	4.66		167.0	2.48
INTERCAL A	1	31.4	85	720	2.83		34.5	0.71
INTERCAL B	1	54.0	130	360	3.70		115	0.98
INTERCAL C	1	129	314	380	2.81		211	2.00
A	2	18.5	119				22.7	0.25
B	2	101	1568				646	9.24
C	2	23.6	210				62.0	0.82
D	2	18.3	128				25.2	0.30
E	2	22.0	160				28.8	0.43

TABLE 5b : METAL ANALYSIS FOR REFERENCE SEDIMENTS RUN ALONG WITH BATCH #1 (SAMPLES 1-155)

REFERENCE SEDIMENT	I.D .#	SET #	SAMPLE WEIGHT g		Cu ug/g	Zn ug/g	Mn ug/g	Fe %	Al %	Pb ug/g	Cd ug/g
BCSS-1	30	2	0.4966		16.1	99	202	3.26	5.94	19.4	0.13
	33	3	0.4946		16.0	111	197	3.39	5.74	18.4	0.13
	71	4	0.5006		14.8	103	165	3.10	5.91	17.7	0.21
	90	5	0.5054		16.0	110	234	3.15	5.96	22.1	0.21
	107	6	0.5086		18.3	104	220	3.05	5.82	18.8	0.24
	132	7	0.1042		21.1	102	213	3.18	6.19	19.2	0.48
	153	8	0.4906		15.5	107	237	3.35	6.02	16.7	0.34
				x	16.8	105	210	3.25	5.94	18.9	0.25
				s	2.2	4	25	0.16	0.14	1.7	0.13
				n	7	7	7	7	7	7	7
MESS-1	17	1	0.5003		22.4	174	433	2.80	5.64	30.7	0.49
	31	2	0.502		21.9	183	524	3.05	5.71	25.0	0.52
	32	3	0.5001		19.4	189	546	3.13	5.37	24.3	0.55
	70	4	0.491		24.0	176	379	3.00	5.77	29.9	0.53
	108	6	0.4987		23.3	185	488	2.96	5.42	26.6	0.58
	133	7	0.1077		20.4	171	475	3.14	5.75	31.6	0.74
	154	8	0.1482		22.9	184	551	2.94	5.50	26.3	1.08
				x	22.0	180	485	3.00	5.59	27.8	0.64
				s	1.6	7	63	0.12	0.16	2.9	0.21
				n	7	7	7	7	7	7	7

TABLE 5c : METAL ANALYSIS FOR REFERENCE SEDIMENTS RUN ALONG WITH BATCH #1 (SAMPLES 1-155)

REFERENCE SEDIMENT	I.D .#	SET #	SAMPLE WEIGHT g		Cu ug/g	Zn ug/g	Mn ug/g	Fe %	Al %	Pb ug/g	Cd ug/g
14/02/85-1	87	5	0.4891		13.9	110	290	3.23	5.9	18.5	0.27
	93	6	0.4941		14.8	127	303	3.31	5.91	20.2	0.22
				x	14.4	119	296	3.27	5.91	19.4	0.25
				s	0.6	12	9	0.06	0.10	1.2	0.04
				n	2	2	2	2	2	2	2
14/02/85-2	88	5	0.4955		19.2	153	436	3.09	5.78	25.8	0.55
	94	6	0.5068		18.7	157	438	3.17	5.73	25.8	0.59
				x	19.0	155	437	3.13	5.76	24.8	0.55
				s	0.4	3	1	0.06	0.04	1.4	0.59
				n	2	2	2	2	2	2	2
14/02/85-3	89	5	0.4661		39.5	479	579	4.81	4.95	141	2.25
INTERCAL A	101	6	0.4987		25.1	82.4	637	2.96	5.40	31.3	0.68
	102	6	0.4981		26.4	80.9	1036	2.92	5.59	25.3	0.64
				x	25.8	81.7	836	2.94	5.50	28.3	0.66
				s	0.9	1.0	282	0.03	0.13	4.2	0.03
				n	2	2	2	2	2	2	2
INTERCAL B	103	6	0.4990		52.7	125	445	3.85	6.01	78.2	0.4
	104	6	0.4961		53.0	127	447	3.87	6.11	83.0	0.4
				x	52.7	126	446	3.86	6.06	80.6	0.4
				s	0.2	1	1.4	0.01	0.07	3.4	0
				n	2	2	2	2	2	2	2

TABLE 5c CONT. : METAL ANALYSIS FOR REFERENCE SEDIMENTS RUN ALONG WITH BATCH #1 (SAMPLES 1-155)

REFERENCE SEDIMENT	I.D .#	SET #	SAMPLE WEIGHT g		Cu ug/g	Zn ug/g	Mn ug/g	Fe %	Al %	Pb ug/g	Cd ug/g
INTERCAL C	105	6	0.5037		128	304	491	2.96	5.09	161	1.45
	106	6	0.4971		131	315	488	2.84	5.04	173	1.45
				x	130	310	490	2.90	5.07	167	1.45
				s	2	8	2.1	0.08	0.04	8	0.00
				n	2	2	2	2	2	2	2

TABLE 5d : METAL ANALYSIS FOR REFERENCE SEDIMENTS RUN ALONG WITH BATCH #1

REFERENCE SEDIMENT	RANGE SAMPLE WEIGHTS g		FAAS Cu ug/g	GFAAS Cu ug/g	Zn ug/g	Pb ug/g	Cd ug/g
STD A	0.5	x	15.7		99.5	20.1	0.28
		s	2.6		3.4	2.8	0.03
		n	5		5	5	5
	0.1 - 0.3	x	13.4	15.9	99.1	21.7	0.13
		s	0.4	0.9	0.5	0.3	0.04
		n	3	3	3	3	3
STD B	0.5	x	89.9		1423	66.4	7.34
		s	4.1		35	4.7	2.50
		n	3		3	3	2
	0.1 - 0.3	x	87.9	94.3	1371	670.0	7.10
		s	3.5	3.0	21	57.0	0.20
		n	2	2	2	2	2
STD C	0.5	x	21.1		186	56.9	0.30
		s	1.6		1	1.1	0.24
		n	2		2	2	2
	0.1 - 0.3	x	11.1	24.5	179	64.7	0.64
		s	4.9	0.7	2	1.7	0.01
		n	2	2	2	2	2
STD D	0.5	x	13.3		121	23.7	0.32
		s	3.3		9	0.4	0.01
		n	2		2	2	2
	0.1 - 0.3	x	10.2	16.3	122	24.6	0.10
		s	3.7	0.6	7	3.8	0.05
		n	3	3	3	3	3
STD E	0.5	x	16.9		137	27.6	0.44
		s	3.6		1	2.4	0.02
		n	2		2	2	3
	0.1 - 1.3	x	11.3	22.2	129	22.2	0.25
		s	5.7	3.5	1	2.0	0.13
		n	2	2	2	2	2

TABLE 5e : METAL ANALYSIS FOR REFERENCE SEDIMENTS RUN ALONG WITH BATCH #2

REFERENCE SEDIMENT	SET #	SAMPLE WEIGHTS g	I.D. #	FAAS Cu ug/g	GFAAS Cu ug/g	Zn ug/g	Pb ug/g	Cd ug/g
STD A	1	0.4963	166	18.4		98.1	22.4	0.33
	4	0.4940	218	15.5		94.5	20.1	0.25
	5	0.4864	234	11.4		102	17.4	0.26
	1	0.4919	167	17.0		103	23.4	0.29
	7	0.4916	263	16.0		100	17.2	0.26
	9	0.2154	306	13.5	15.8	99.4	21.4	0.15
	12	0.2172	358	12.9	16.8	98.5	21.9	0.08
	13	0.1720	375	13.7	15.1	99.4	21.9	0.16
STD B	2	0.5028	184	92.0			648	4.51
	6	0.4997	253	85.2			716	8.49
	7	0.4980	262	95.5			627	9.03
	10	0.2247	323	85.4	92.1	1356	629	6.96
	12	0.2171	359	90.3	96.3	1386	710	7.24
STD C	2	0.4971	183	22.2		185	56.1	0.13
	4	0.4946	217	19.9		187	57.6	0.47
	8	0.2000	287	14.5	25.0	177	63.5	0.64
	10	0.2495	324	7.6	24.0	180	65.9	0.63
STD D	3	0.4907	200	15.6		127	23.4	0.33
	6	0.4984	254	10.9		114	23.9	0.31
	9	0.1351	305	6.7	17.0	118	23.5	0.05
	11	0.1958	341	9.7	15.8	130	21.4	0.09
	13	0.2309	374	14.1	16.0	117	28.8	0.15
STD E	3	0.4922	202	19.4		136	29.3	0.43
	5	0.4947	233	14.3		138	25.9	0.45
	8	0.1253	288	7.2	24.7	128	20.8	0.15
	11	0.1832	342	15.3	19.7	129	23.6	0.34

TABLE 5f : PERCENT RECOVERY OF REFERENCE MATERIALS

REFERENCE SEDIMENT	SET #	FAAS Cu ug/g	GFAAS Cu ug/g	Zn ug/g	Mn ug/g	Fe %	Al %	Pb ug/g	Cd ug/g
BCSS-1	SET #1	91		88	92	99	95	83	100
MESS-1	SET #2	88		94	95	97	96	82	90
14/02/85-1	SET #4	79		93	99	99	-	77	82
14/02/85-2	SET #5	87		92	97	98	-	79	116
14/02/85-3	SET #6	95		98	102	103	-	84	91
INTERCAL A	SET #8	82		97	-	104	-	82	93
INTERCAL B	SET #9	98		97	124	104	-	70	41
INTERCAL C	SET #10	101		99	129	103	-	79	73
A	SET #2 CORES	85		84				86	112
B	SET #2 CORES	89		91				103	94
C	SET #2 CORES	89		89				92	37
D	SET #2 CORES	73		95				94	107
E	SET #2 CORES	77		87				96	102
A	SET #2 SED TRAP	72	86	83				96	52
B	SET #2 SED TRAP	87	93	87				104	78
C	SET #2 SED TRAP	47	104	85				104	77
D	SET #2 SED TRAP	56	89	95				98	33
E	SET #2 SED TRAP	51	101	81				77	58

TABLE 5g : STANDARD POOLED DEVIATION FOR SET #1 (SAMPLES 1-155)

SAMPLE OR STANDARD	METAL	RANGE	POOLED STANDARD DEVIATION (Sp)
ALICE ARM CORES	Cu	10 - 140 ug/g	3.4 ug/g
	Zn	60 - 413 ug/g	10 ug/g
	Mn	600 - 2000 ug/g	63 ug/g
		2000 - 3000 ug/g	392 ug/g
		600 - 3000 ug/g	188 ug/g
	Fe	2.4 - 8.7 %	0.2 %
	Al	5.9 - 7.7 %	0.3%
	Pb	9 - 222 ug/g	10.8 ug/g
		117 - 222 ug/g	22 ug/g
		9 - 73 ug/g	1.6 ug/g
	Cd	0.1 - 14 ug/g	5.6 ug/g
		0.1 - 3 ug/g	0.07 ug/g
		7 - 14 ug/g	2.5 ug/g
SEDIMENT TRAP REPLICATES	Cu	43 - 86 ug/g	3.7 ug/g
	Zn	150 - 500 ug/g	11.5 ug/g
	Mn	796 - 1856 ug/g	141 ug/g
	Fe	2.5 - 5.5 %	0.14 %
	Al	7 - 8.4 %	0.23 ug/g
	Pb	25 - 35 ug/g	3 ug/g
		100 -300 ug/g	32 ug/g
	Cd	0 - 12 ug/g	0.88 ug/g
REFERENCE MATERIALS	Cu	13 - 130 ug/g	1.7 ug/g
	Zn	80 - 310 ug/g	6.1 ug/g
	Mn	200 - 600 ug/g	41 ug/g
		200 - 1050 ug/g	79 ug/g
	Fe	3.0 - 3.7 %	0.12 %
	Al	4.9 - 6.2 %	0.14 %
	Pb	16 - 175 ug/g	3.1 ug/g
	Cd	0.1 - 2.5 ug/g	0.61 ug/g

TABLE 5h : STANDARD POOLED DEVIATION FOR SET #2 (SAMPLES 156-380)

SAMPLE OR STANDARD	METAL	RANGE (ug/g)	POOLED STANDARD DEVIATION (ug/g)	# PAIRS
ALICE ARM CORES	Cu	24 - 200	3.4	21
	Zn	100 - 350	7	21
	Pb	12 - 145	8.5	20
		40 - 150	19	5
		12 - 75	5.7	17
		12 - 35	1.7	15
	Cd	0.2 - 2.1	0.31	21
SEDIMENT TRAP REPLICATES	Cu (FAAS)	30 - 70	14.3	12
	Cu (GFAAS)	45 - 80	6.7	12
	Zn	110 - 350	13	12
	Pb	15 - 40	4	6
		15 - 200	19	11
		80 - 200	27	5
	Cd	0.4 - 5.0	0.26	12
STANDARDS FOR CORE SAMPLES (approximately 0.5 g)	Cu	10 - 100	3.1	5
	Zn	95 - 200	4.3	4
	Pb	20 - 60	2.3	4
	Cd	0 - 10	0.17	5
STANDARDS FOR SEDIMENT TRAP SAMPLES (0.1 - 0.3 g)	Cu (FAAS)	10 - 100	3.7	5
	Cu (GFAAS)	10 - 100	1.9	5
	Zn	95 - 200	4.1	4
	Pb	20 - 60	2.4	4
	Cd	0 - 8	0.09	5

TABLE 5i : LIIMITS OF DETECTION AND QUANTIFICATION

METAL	ANALYTICAL METHOD	LOD (0.5 g)	LOQ (0.5 g)	LOD (0.1 - 0.2 g)	LOQ (0.1 - 0.2 g)
Cu (ug/g)	FAAS	4.6	15.6	23	78
Zn (ug/g)	FAAS	4.9	16.4	25	82
Fe (%)	FAAS	0.09	0.29	0.43	1.43
Mn (ug/g)	FAAS	5.5	18	28	92
Al (%)	FAAS	0.04	0.12	0.18	0.61

TABLE 6a : Pb-210 DATA - ALICE ARM CORES

CRUISE : OC-82-IS-003
STATION : ST-2
DATE CORE TAKEN : OCTOBER 1982

SALINITY : 31.4
SEDIMENT DENSITY : 2.7
TEMPERATURE : 5.5
SIGMA-T : 24.7

DEPTH IN CORE cm	MOISTURE CONTENT	WEIGHT SEDIMENT g	CORRECTED WEIGHT g	RECOVERY PbSO4 mg	RECOVERY PbSO4 %	COUNTING EFFICIENCY %	DPM BLANK	STD DEV BLANK	DPM S + B	STD DEV S + B	SALT-FREE DPM/G	STD DEV	BLIND REP I.D.
0 - 1	0.4832	5.1920	5.0346	36.33	62.04	28.688	0.787	0.024	3.499	0.039	3.027	0.051	
1 - 2	0.3739	6.0228	5.9062	28.97	49.48	29.178	0.752	0.020	2.908	0.031	2.528	0.043	
	0.3739	6.0200	5.9035	47.02	80.30	27.976	0.650	0.025	3.906	0.032	2.455	0.030	REP-8
7 - 8	0.3048	5.8961	5.8123	36.15	61.74	28.700	0.755	0.019	3.090	0.029	2.267	0.033	
14 - 16	0.3233	5.9249	5.8331	38.04	64.97	28.574	0.769	0.015	3.106	0.027	2.158	0.028	
30 - 32	0.3191	5.9435	5.8532	40.71	69.52	28.396	0.744	0.020	3.050	0.030	1.996	0.031	
	0.3191	6.0050	5.9238	51.70	88.07	27.664	0.635	0.010	3.261	0.029	1.823	0.021	REP-9
	0.3191	6.0016	5.9104	53.51	91.38	27.544	0.682	0.028	3.541	0.026	1.922	0.025	REP-10
50 - 52	0.2939	6.1206	6.0380	50.90	86.93	27.718	0.793	0.019	2.669	0.025	1.289	0.021	
80 - 82	0.2736	5.9674	5.8945	43.21	73.79	28.230	0.732	0.016	1.953	0.019	0.994	0.020	
100 - 102	0.2120	6.7646	6.7056	52.00	88.81	27.644	0.624	0.012	1.634	0.015	0.614	0.011	
110-112	0.2420	5.9739	5.9121	35.53	60.68	28.741	0.646	0.013	1.570	0.015	0.896	0.019	

TABLE 6b : Pb-210 DATA - ALICE ARM CORES

CRUISE : OC-82-IS-003
STATION : ST-3
DATE CORE TAKEN : OCTOBER 1982

SALINITY : 31.4
SEDIMENT DENSITY : 2.73
TEMPERATURE : 5.5
SIGMA-T : 24.7

DEPTH IN CORE cm	MOISTURE CONTENT	WEIGHT SEDIMENT g	CORRECTED WEIGHT g	RECOVERY PbSO4 mg	RECOVERY PbSO4 %	COUNTING EFFICIENCY %	DPM BLANK	STD DEV BLANK	DPM S + B	STD DEV S + B	SALT-FREE DPM/G	STD DEV	BLIND REP I.D.
0 - 1	0.3390	5.9877	5.8904	44.51	76.01	28.140	0.672	0.018	1.910	0.024	0.983	0.023	
2 - 3	0.3418	5.8632	5.7645	50.98	87.06	27.710	0.710	0.015	2.338	0.024	1.171	0.020	
5 - 6	0.3639	6.0886	5.9757	44.14	75.38	28.170	0.675	0.011	2.488	0.019	1.429	0.017	
10 - 12	0.3658	5.9737	5.8620	27.70	47.31	29.260	0.663	0.014	1.994	0.020	1.640	0.030	
20 - 22	0.4771	6.1167	5.9358	35.11	59.96	28.770	0.697	0.017	3.917	0.042	3.145	0.044	
40 - 42	0.4735	6.0967	5.9190	48.30	82.49	27.890	0.657	0.017	5.403	0.045	3.485	0.035	
60 - 62	0.4123	5.9878	5.8516	46.43	79.29	28.020	0.677	0.021	3.697	0.036	2.323	0.032	
	0.4123	6.0086	5.8719	56.19	95.96	27.370	0.615	0.019	4.329	0.022	2.408	0.018	REP-3
90 - 92	0.4284	6.0469	5.9000	49.31	84.21	27.820	0.686	0.016	3.833	0.037	2.277	0.029	
110 - 112	0.4310	5.9942	5.8470	30.10	51.41	29.100	0.727	0.018	2.213	0.021	1.699	0.031	
120 - 122	0.4280	6.1875	6.0374	53.13	90.74	27.570	0.722	0.028	3.165	0.029	1.617	0.026	

TABLE 6c : Pb-210 DATA - ALICE ARM CORES

CRUISE : OC-82-IS-003
STATION : ST-4
DATE CORE TAKEN : OCTOBER 1982

SALINITY : 31.4
SEDIMENT DENSITY : 2.7
TEMPERATURE : 5.5
SIGMA-T : 24.7

DEPTH IN CORE cm	MOISTURE CONTENT	WEIGHT SEDIMENT g	CORRECTED WEIGHT g	RECOVERY PbSO4 mg	RECOVERY PbSO4 %	COUNTING EFFICIENCY %	DPM BLANK	STD DEV BLANK	DPM S + B	STD DEV S + B	SALT-FREE DPM/G	STD DEV	BLIND REP I.D.
0 - 1	0.4360	0.4360	5.8002	50.04	85.46	27.775	0.685	0.013	2.554	0.020	1.358	0.017	
1 - 2	0.3945	0.3945	5.9145	56.48	96.46	27.346	0.731	0.016	2.861	0.027	1.365	0.02	
5 - 6	0.4044	0.4044	5.9148	56.95	97.26	27.315	0.709	0.020	3.074	0.025	1.505	0.02	
10 - 12	0.4153	0.4153	5.9247	40.81	69.70	28.390	0.731	0.014	2.646	0.021	1.633	0.021	
	0.4153	0.4153	5.8630	55.57	94.90	27.407	0.646	0.015	3.104	0.035	1.612	0.024	REP-2
20 - 22	0.3996	0.3996	5.9908	38.00	64.90	28.577	0.656	0.011	2.150	0.017	1.345	0.018	
40 - 42	0.3259	0.3259	5.9749	44.11	75.33	28.170	0.695	0.010	2.518	0.021	1.438	0.018	
69 - 71	0.4029	0.4029	5.8633	30.82	52.63	29.055	0.781	0.019	2.637	0.025	2.070	0.035	
99 - 101	0.3998	0.3998	6.0909	26.90	45.91	29.316	0.699	0.017	2.292	0.022	1.943	0.033	
109 - 111	0.4426	0.4426	5.8907	38.97	66.55	28.512	0.798	0.019	2.649	0.025	1.656	0.028	
119 - 121	0.4088	0.4088	5.9704	28.32	48.37	29.221	0.686	0.011	2.092	0.016	1.666	0.023	

TABLE 6d : Pb-210 DATA - ALICE ARM CORES

CRUISE : OC-82-IS-003
STATION : OB-5
DATE CORE TAKEN : OCTOBER 1982

SALINITY : 32.9
SEDIMENT DENSITY : 2.69
TEMPERATURE : 6.4
SIGMA-T : 25.9

DEPTH IN CORE cm	MOISTURE CONTENT	WEIGHT SEDIMENT g	CORRECTED WEIGHT g	RECOVERY PbSO4 mg	RECOVERY PbSO4 %	COUNTING EFFICIENCY %	DPM BLANK	STD DEV BLANK	DPM S + B	STD DEV S + B	SALT-FREE DPM/G	STD DEV	BLIND REP I.D.
0 - 1	0.7281	3.8458	3.4955	52.01	88.82	27.640	0.673	0.023	7.285	0.060	7.705	0.074	
2 - 3	0.6519	5.4839	5.1345	37.71	64.40	28.600	0.671	0.024	7.810	0.075	7.549	0.083	
8 - 9	0.6051	5.9693	5.6581	27.14	46.35	29.300	0.666	0.024	5.010	0.049	5.653	0.071	
	0.6051	3.4323	5.2534	40.88	69.82	28.390	0.642	0.017	4.253	0.040	5.599	0.067	REP-5
14 - 16	0.5686	6.0012	5.7321	51.66	88.23	27.670	0.614	0.022	7.523	0.057	4.937	0.043	
20 - 22	0.5713	5.9559	5.6859	41.52	70.91	28.340	0.676	0.027	5.792	0.053	4.477	0.052	
40 - 42	0.5062	5.9779	5.7694	50.41	86.09	27.750	0.676	0.016	4.714	0.038	2.930	0.029	
70 - 72	0.6044	6.1636	5.8432	51.23	87.49	27.700	0.690	0.023	5.177	0.054	3.169	0.041	
100 - 102	0.5203	5.9928	5.7717	47.18	80.57	27.970	0.681	0.020	3.271	0.031	1.991	0.028	
130 - 132	0.5565	6.0125	5.7558	43.77	74.75	28.190	0.625	0.016	2.860	0.024	1.843	0.023	
160 - 162	0.5473	5.9520	5.7072	41.55	70.96	28.340	0.664	0.016	2.523	0.022	1.620	0.023	
170 - 172	0.5373	5.9624	5.7269	51.73	88.34	27.660	0.698	0.016	3.023	0.026	1.661	0.021	
180 - 182	0.5433	5.9609	5.7197	39.16	66.88	28.500	0.735	0.015	2.562	0.023	1.676	0.025	
186 - 188	0.5376	5.9869	5.7501	45.90	78.39	28.050	0.753	0.018	2.976	0.027	1.758	0.025	

TABLE 6e : Pb-210 DATA - ALICE ARM CORES

CRUISE : OC-82-IS-003
STATION : HA-2
DATE CORE TAKEN : OCTOBER 1982

SALINITY : 32.2
SEDIMENT DENSITY : 2.65
TEMPERATURE : 6.6
SIGMA-T : 25.2

DEPTH IN CORE cm	MOISTURE CONTENT	WEIGHT SEDIMENT g	CORRECTED WEIGHT g	RECOVERY PbSO4 mg	RECOVERY PbSO4 %	COUNTING EFFICIENCY %	DPM BLANK	STD DEV BLANK	DPM S + B	STD DEV S + B	SALT-FREE DPM/G	STD DEV	BLIND REP I.D.
0 - 1	0.6684	5.5780	5.2039	55.98	95.60	27.380	0.713	0.024	9.965	0.072	6.792	0.055	
3 - 4	0.6088	5.5674	5.2791	44.65	76.25	28.130	0.665	0.029	8.507	0.084	6.926	0.078	
7 - 8	0.5390	6.1221	5.8839	53.54	91.44	27.540	0.832	0.029	9.500	0.082	5.850	0.058	
	0.5390	6.0106	5.7768	38.45	65.67	28.550	0.621	0.022	6.897	0.038	5.795	0.040	REP-6
14 - 16	0.5136	6.0067	5.7957	36.22	61.86	28.700	0.855	0.026	5.188	0.051	4.211	0.055	
	0.5136	6.0175	5.8061	49.74	84.95	27.800	0.644	0.016	6.403	0.042	4.200	0.032	REP-7
20 - 22	0.5013	6.1263	5.9214	31.08	53.08	29.040	0.651	0.016	4.239	0.039	3.931	0.046	
40 - 42	0.4916	6.0110	5.8176	50.23	85.78	27.760	0.761	0.017	4.109	0.033	2.417	0.026	
60 - 62	0.5186	6.0178	5.8021	30.71	52.45	29.060	0.819	0.017	2.498	0.023	1.899	0.032	
80 - 82	0.5110	6.1164	5.9037	43.35	74.03	28.220	0.724	0.018	3.105	0.030	1.931	0.028	
90 - 92	0.4733	6.4405	6.2479	52.60	89.83	27.600	0.692	0.020	3.514	0.033	1.822	0.024	
94 - 96	0.4845	6.0116	5.8236	53.28	90.99	27.560	0.791	0.015	3.381	0.029	1.774	0.022	
98 - 102	0.4694	5.9739	5.7981	52.59	89.81	27.610	0.752	0.015	3.333	0.027	1.795	0.021	

TABLE 6f : Pb-210 DATA - ALICE ARM CORES

CRUISE : OC-82-IS-003
STATION : GB-1
DATE CORE TAKEN : OCTOBER 1982

SALINITY : 32.5
SEDIMENT DENSITY : 2.67
TEMPERATURE : 6.4
SIGMA-T : 25.8

DEPTH IN CORE cm	MOISTURE CONTENT	WEIGHT SEDIMENT g	CORRECTED WEIGHT g	RECOVERY PbSO4 mg	RECOVERY PbSO4 %	COUNTING EFFICIENCY %	DPM BLANK	STD DEV BLANK	DPM S + B	STD DEV S + B	SALT-FREE DPM/G	STD DEV	BLIND REP I.D.
0 - 1	0.6521	5.5196	5.1721	44.53	76.05	28.14	0.803	0.021	7.168	0.067	5.751	0.063	
2 - 3	0.6102	5.9485	5.6357	44.93	76.73	28.12	0.735	0.018	7.130	0.039	5.259	0.035	
7 - 8	0.5846	6.0368	5.7514	39.87	68.09	28.45	0.756	0.019	5.490	0.043	4.249	0.042	
14 - 16	0.5473	6.0018	5.7581	36.69	62.66	28.66	0.715	0.021	3.708	0.039	2.894	0.042	
30 - 35	0.5914	5.9810	5.6902	39.31	67.13	28.49	0.742	0.025	2.744	0.023	1.840	0.031	
50 - 55	0.5819	5.9705	5.6914	42.74	72.99	28.26	0.753	0.025	2.678	0.026	1.640	0.030	

TABLE 6g : Pb-210 DATA - ALICE ARM CORES

CRUISE : OC-84-IS-003
STATION : CORE #1
DATE CORE TAKEN : JULY 1984

SALINITY : 33

DEPTH IN CORE cm	MOISTURE CONTENT	WEIGHT SEDIMENT g	CORRECTED WEIGHT g	RECOVERY PbSO4 mg	RECOVERY PbSO4 %	COUNTING EFFICIENCY %	DPM BLANK	STD DEV BLANK	DPM S + B	STD DEV S + B	SALT-FREE DPM/G	STD DEV	BLIND REP I.D.
0 - 1	0.7494	3.2445	2.9134	46.50	79.41	28.01	0.593	0.022	5.201	0.051	7.111	0.085	
1 - 2	0.6620	3.5745	3.3356	48.30	82.49	27.89	0.679	0.023	5.958	0.040	6.879	0.059	
3 - 4	0.6092	4.6630	4.4149	35.40	60.46	28.75	0.625	0.020	5.708	0.055	6.624	0.075	
30 - 33	0.4989	4.7744	4.6122	41.40	67.02	28.49	0.843	0.013	3.083	0.031	2.543	0.037	
33 - 36	0.5122	5.0774	4.8955	41.40	70.70	28.35	0.693	0.022	3.112	0.029	2.465	0.036	
45 - 50	0.5482	5.3062	5.0865	38.31	65.49	28.56	0.678	0.013	2.261	0.022	1.664	0.027	
75 - 80	0.5302	5.5109	5.2987	34.30	58.64	28.82	0.658	0.017	1.807	0.031	1.283	0.039	
85 - 90	0.5205	6.2210	5.9905	44.30	75.88	28.15	0.655	0.017	2.051	0.020	1.091	0.020	

TABLE 6h : Pb-210 DATA - ALICE ARM CORES

CRUISE : OC-84-IS-003 SALINITY : 33
STATION : CORE #3
DATE CORE TAKEN : JULY 1984

DEPTH IN CORE cm	MOISTURE CONTENT	WEIGHT SEDIMENT g	CORRECTED WEIGHT g	RECOVERY PbSO4 mg	RECOVERY PbSO4 %	COUNTING EFFICIENCY %	DPM BLANK	STD DEV BLANK	DPM S + B	STD DEV S + B	SALT-FREE DPM/G	STD DEV	BLIND REP I.D.
0 - 1	0.6566	1.5233	1.4239	52.71	89.89	25.12	0.638	0.010	3.121	0.035	7.723	0.114	
	0.6566	5.0045	4.6780	10.99	18.77	29.86	0.707	0.007	2.406	0.019	6.482	0.076	
1 - 2	0.6010	5.0496	4.7900	13.83	23.62	29.53	0.699	0.009	2.624	0.023	5.761	0.073	
3 - 4	0.5783	2.5659	2.4458	46.41	79.15	25.84	0.643	0.021	3.133	0.029	4.977	0.070	
20 - 22	0.4662	4.5377	4.4025	45.00	76.85	25.99	0.631	0.014	2.731	0.023	2.389	0.030	
28 - 30	0.4594	2.6806	2.6029	47.90	81.69	25.67	0.633	0.017	1.725	0.016	2.000	0.043	
33 - 36	0.4583	5.3644	5.2095	37.56	64.05	26.84	0.661	0.029	2.111	0.021	1.619	0.039	
39 - 42	0.4666	6.4703	6.2771	20.49	34.99	28.78	0.594	0.016	2.025	0.020	2.264	0.040	
42 - 45	0.4410	5.9979	5.8364	38.83	66.22	26.70	0.653	0.027	2.173	0.020	1.473	0.032	
50 - 55	0.4873	4.3820	4.2399	39.30	67.12	26.64	0.663	0.019	1.639	0.015	1.288	0.032	
95 - 100	0.4864	5.9549	5.7624	35.61	60.81	27.06	0.613	0.008	3.065	0.028	2.586	0.031	

TABLE 7 : Pb-210 DATA - SEDIMENT TRAP MATERIAL

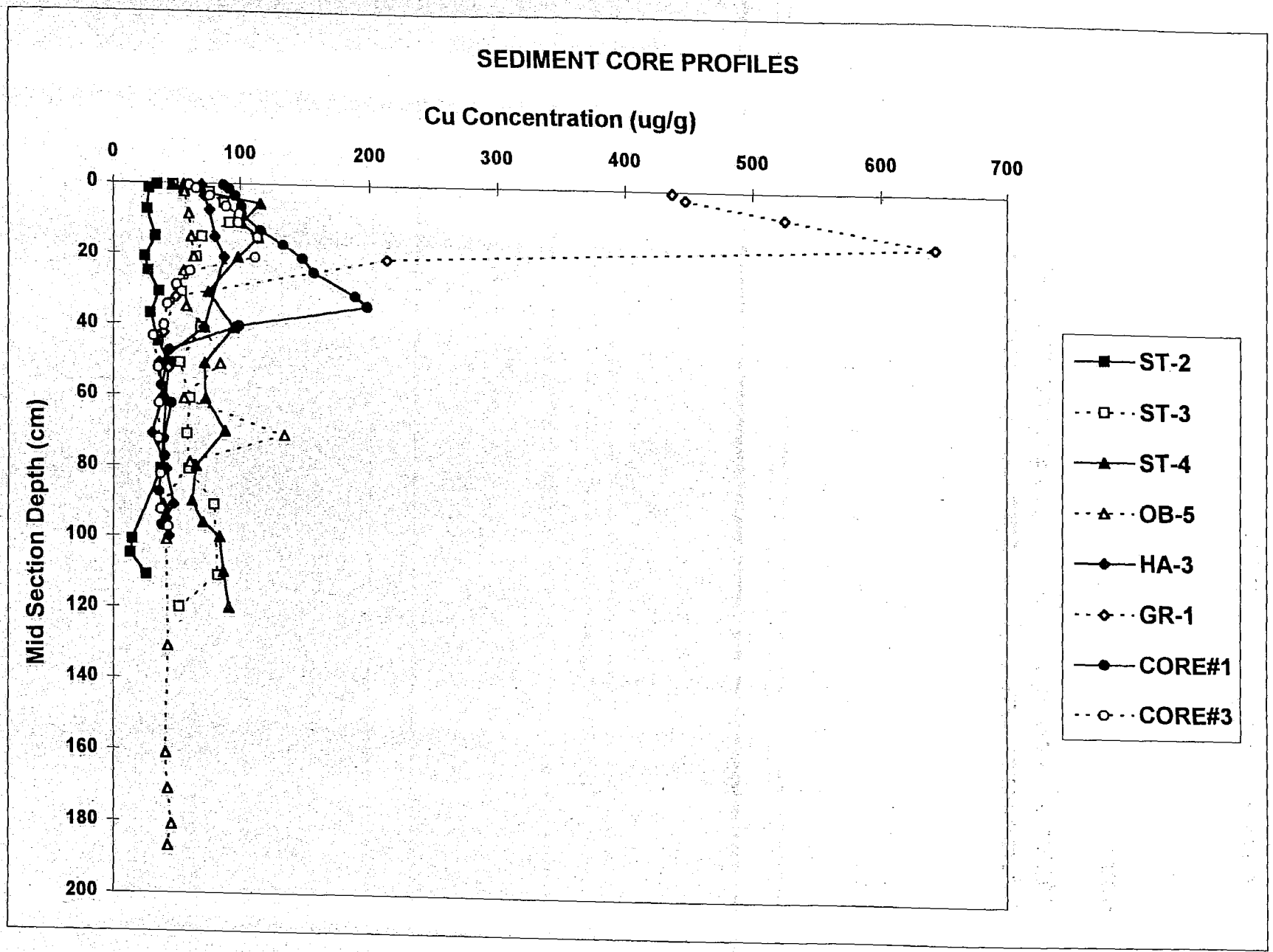
CRUISE ID	STN	TRAP ID	TRAP DEPTH m	SIZE FRACTION	WEIGHT SEDIMENT g	RECOV. PbSO4 mg	RECOV. PbSO4 %	COUNTING EFFICIENCY %	DPM BLANK	STD DEV BLANK	DPM S + B	STD DEV S + B	SALT-FREE DPM/G	STD DEV
OC-82-IS-001	ST-4	4a	150	total sample	6.1434	57.57	98.32	27.27	0.724	0.017	3.642	0.026	1.771	0.019
OC-82-IS-001	ST-4	16b	150	total sample	5.5708	57.62	98.40	27.27	0.671	0.020	3.286	0.026	1.749	0.022
OC-82-IS-001	ST-4	18a	208	total sample	5.6767	53.71	91.73	27.53	0.613	0.018	2.923	0.033	1.611	0.026
OC-82-IS-001	ST-4	18b	208	total sample	5.9926	56.25	96.06	27.36	0.741	0.024	3.225	0.025	1.577	0.022
CZO 05	ST-4	15a	208	<64	5.9502	32.12	54.85	28.97	0.676	0.013	2.101	0.021	1.507	0.026
CZO 05	ST-4	15b	208	<333	5.9974	53.62	91.57	27.54	0.651	0.013	2.988	0.020	1.546	0.016
OC-82-IS-003	ST-4	15a	208	<64	5.9689	55.77	95.24	27.39	0.674	0.025	3.181	0.029	1.610	0.025
OC-82-IS-003	ST-4	15b	208	<333	6.0505	56.50	96.49	27.35	0.746	0.029	3.306	0.030	1.604	0.026
OC-82-IS-003	ST-4	16a	150	<64	3.9983	58.22	99.43	27.23	0.678	0.018	2.901	0.018	2.053	0.024
OC-82-IS-003	ST-4	16b	150	<64	5.0213	53.10	90.68	27.57	0.684	0.028	2.940	0.021	1.797	0.028

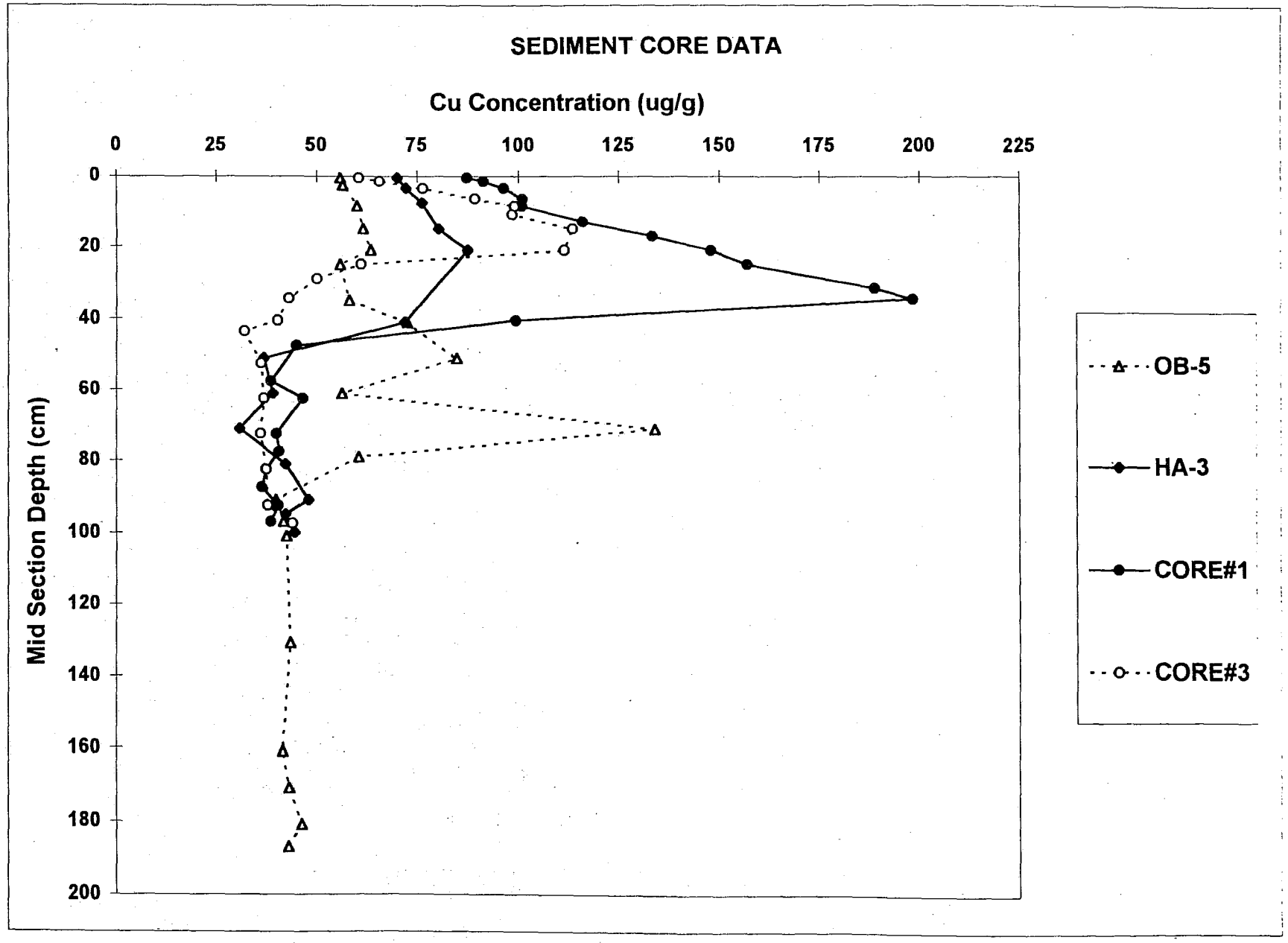
NOTE : No salt correction was needed as samples were rinsed to remove salt prior to drying.

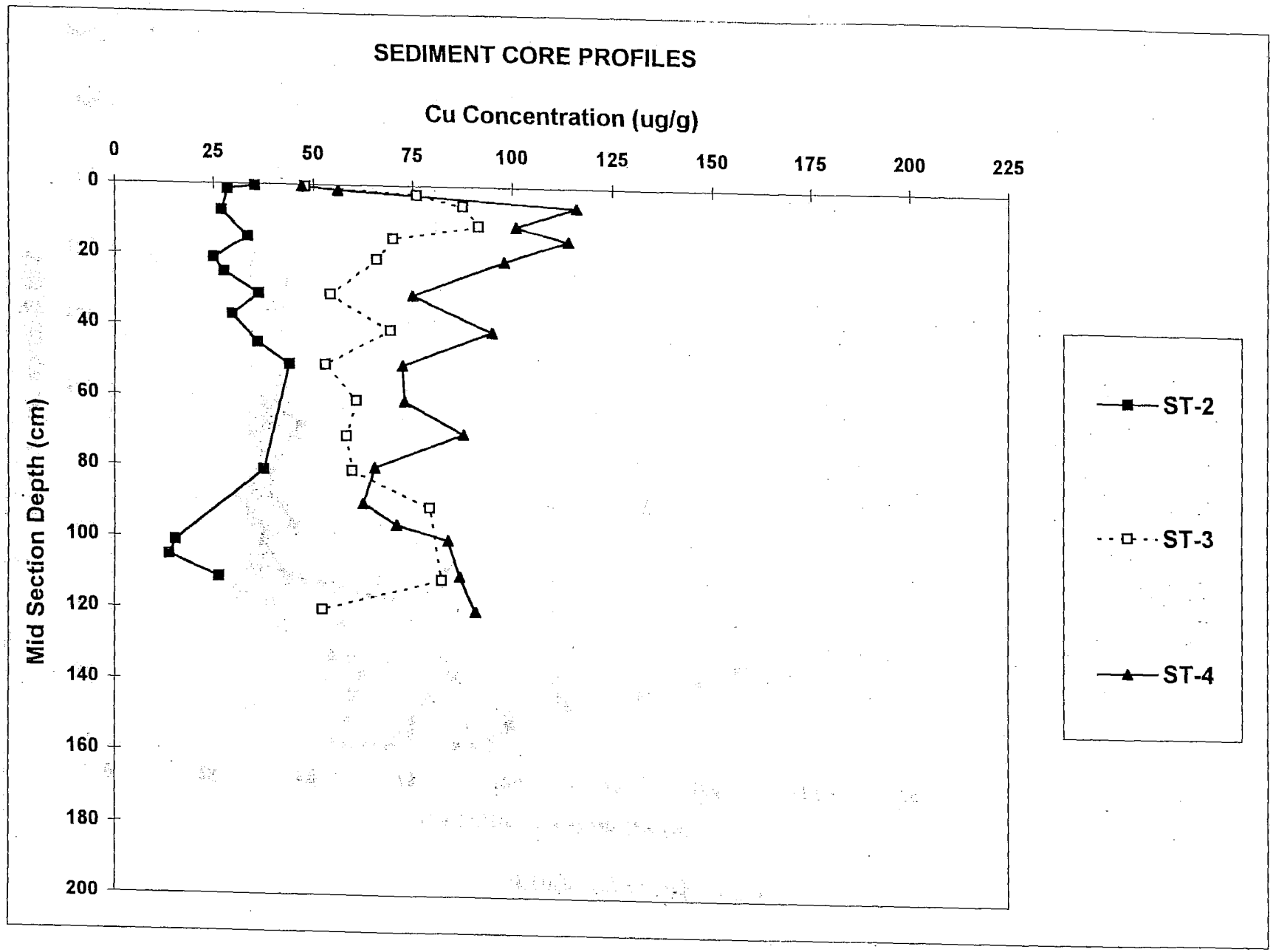
APPENDIX 2 : GRAPHS

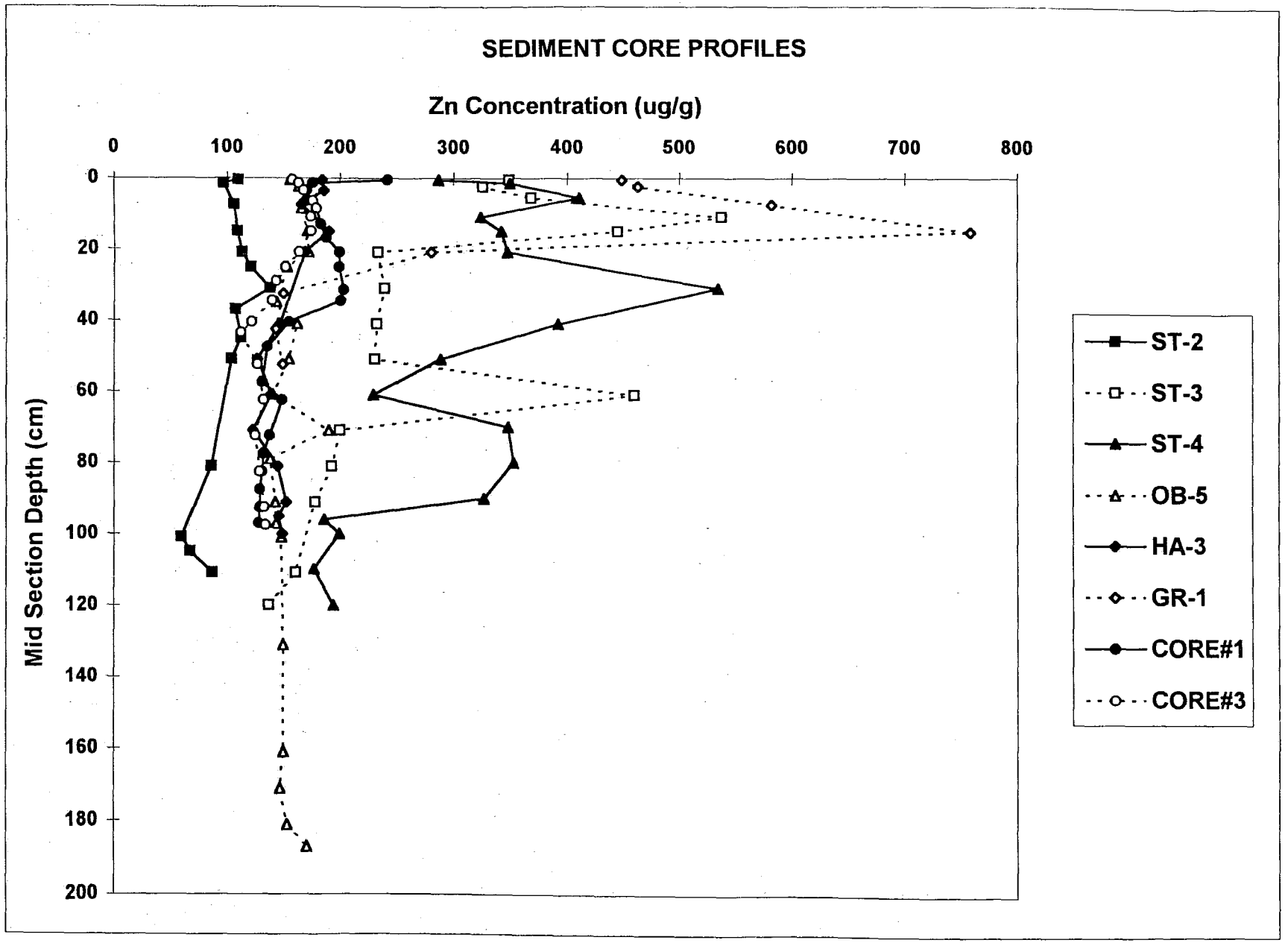
note :

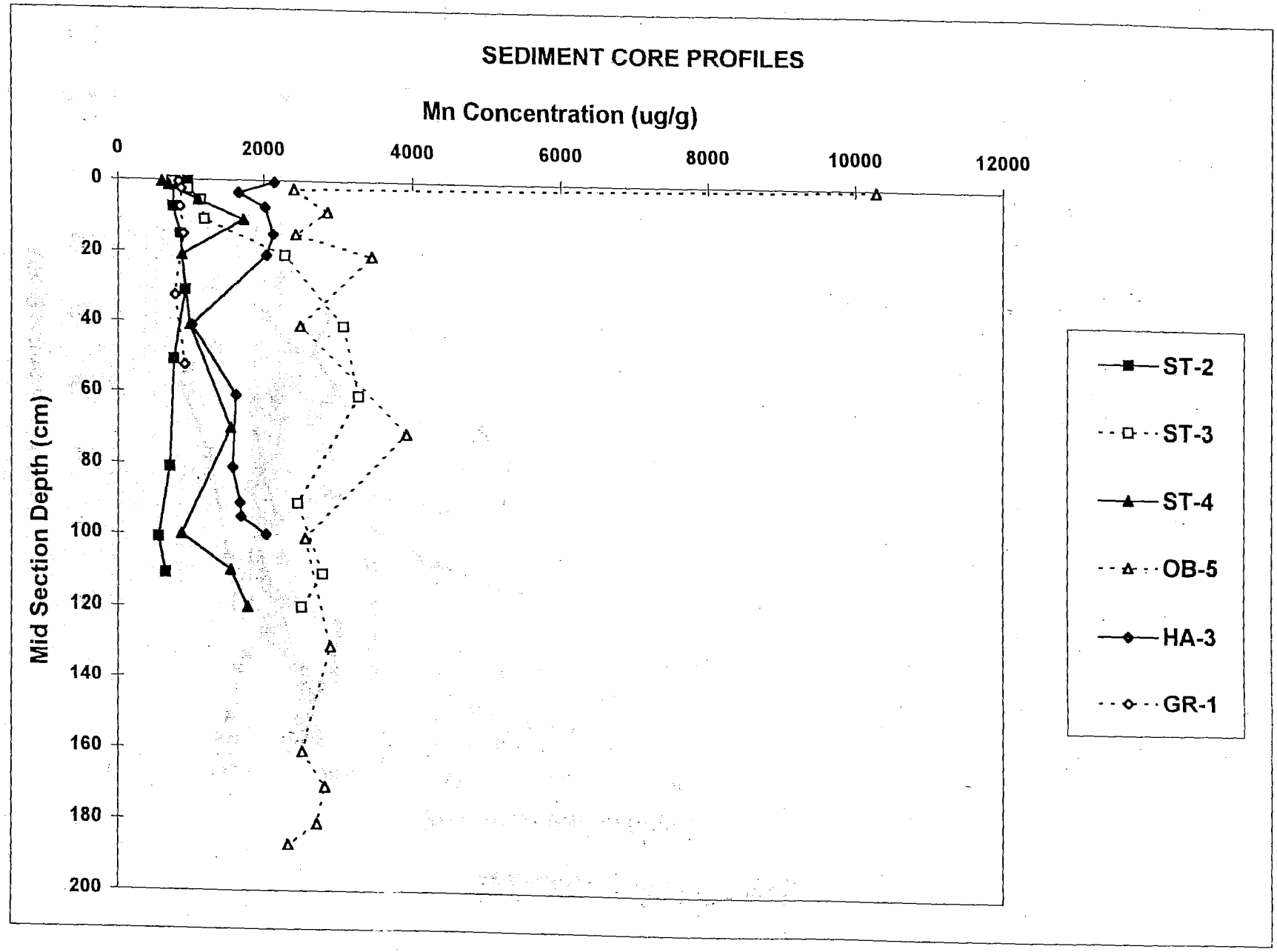
Where um and ug are used in the graphs, they refer to micrometers (μm) and micrograms (μg) respectively.

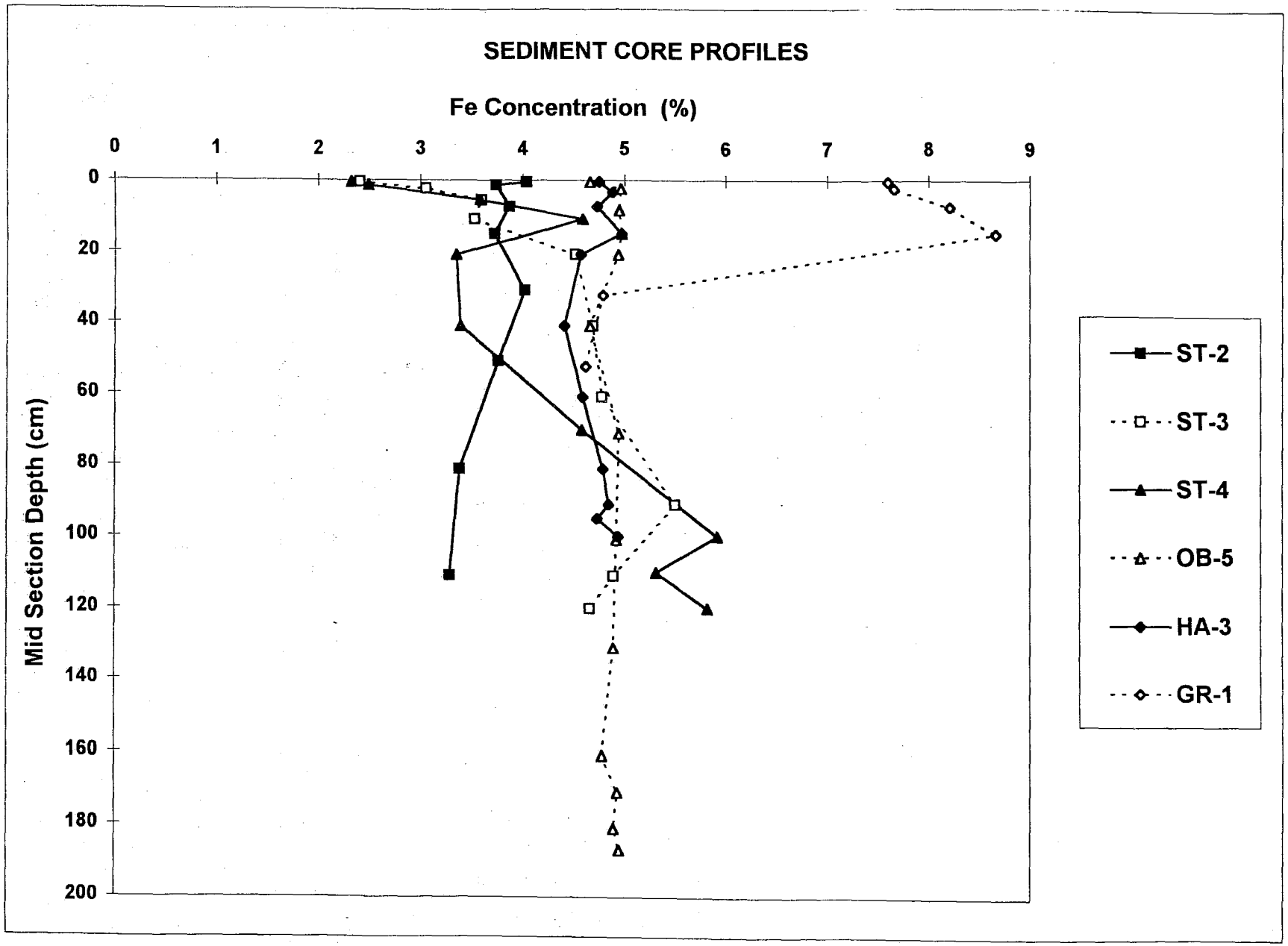

SEDIMENT CORE PROFILES
Cu Concentration (ug/g)
0
100
200
300
400
500
600
700
Mid Section Depth (cm)
0
20
40
60
80
100
120
140
160
180
200
ST-2
ST-3
ST-4
OB-5
HA-3
GR-1
CORE#1
CORE#3

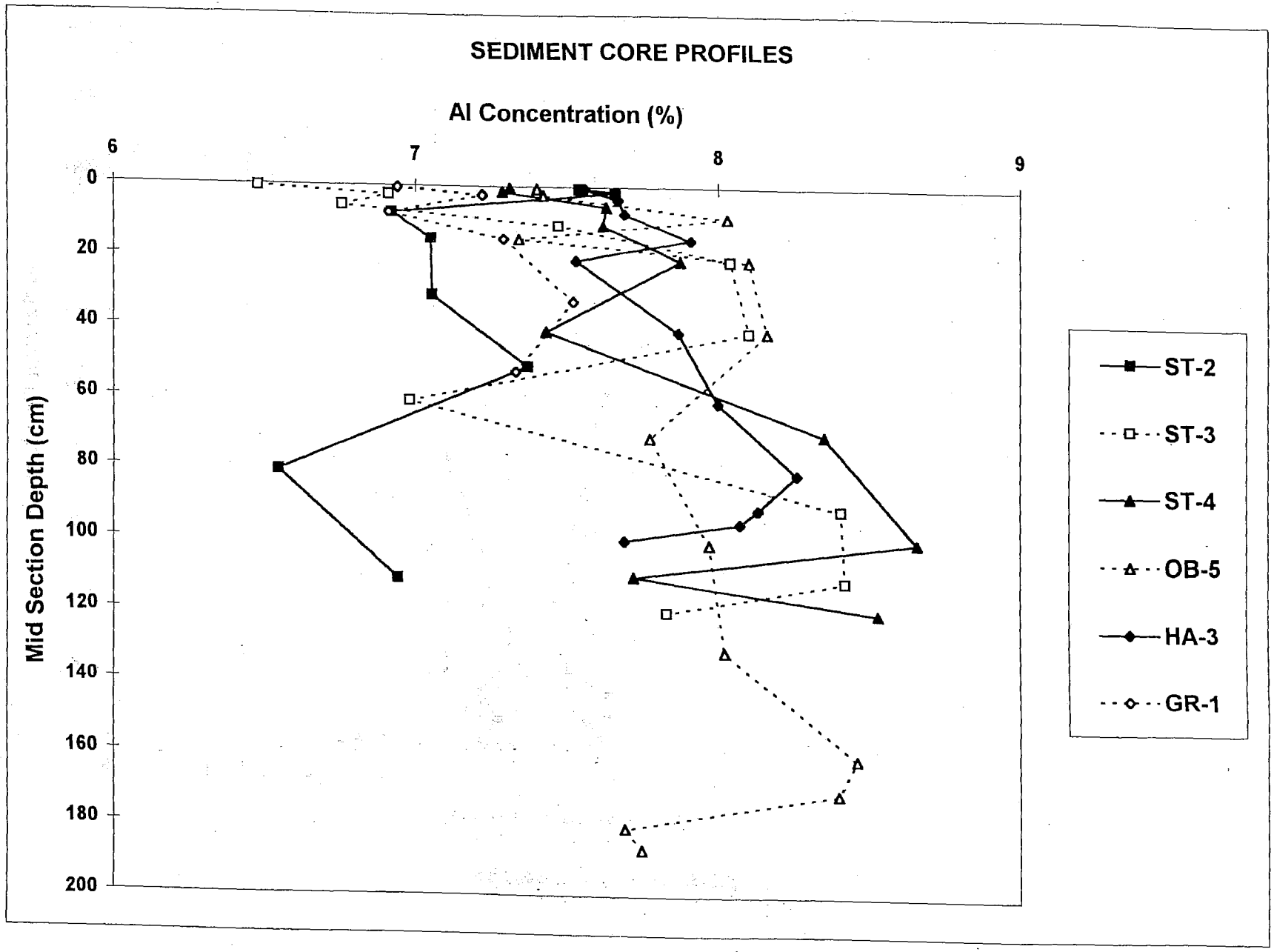

SEDIMENT CORE DATA
Cu Concentration (ug/g)
0
25
50
75
100
125
150
175
200
225
Mid Section Depth (cm)
0
20
40
60
80
100
120
140
160
180
200
OB-5
HA-3
CORE#1
CORE#3

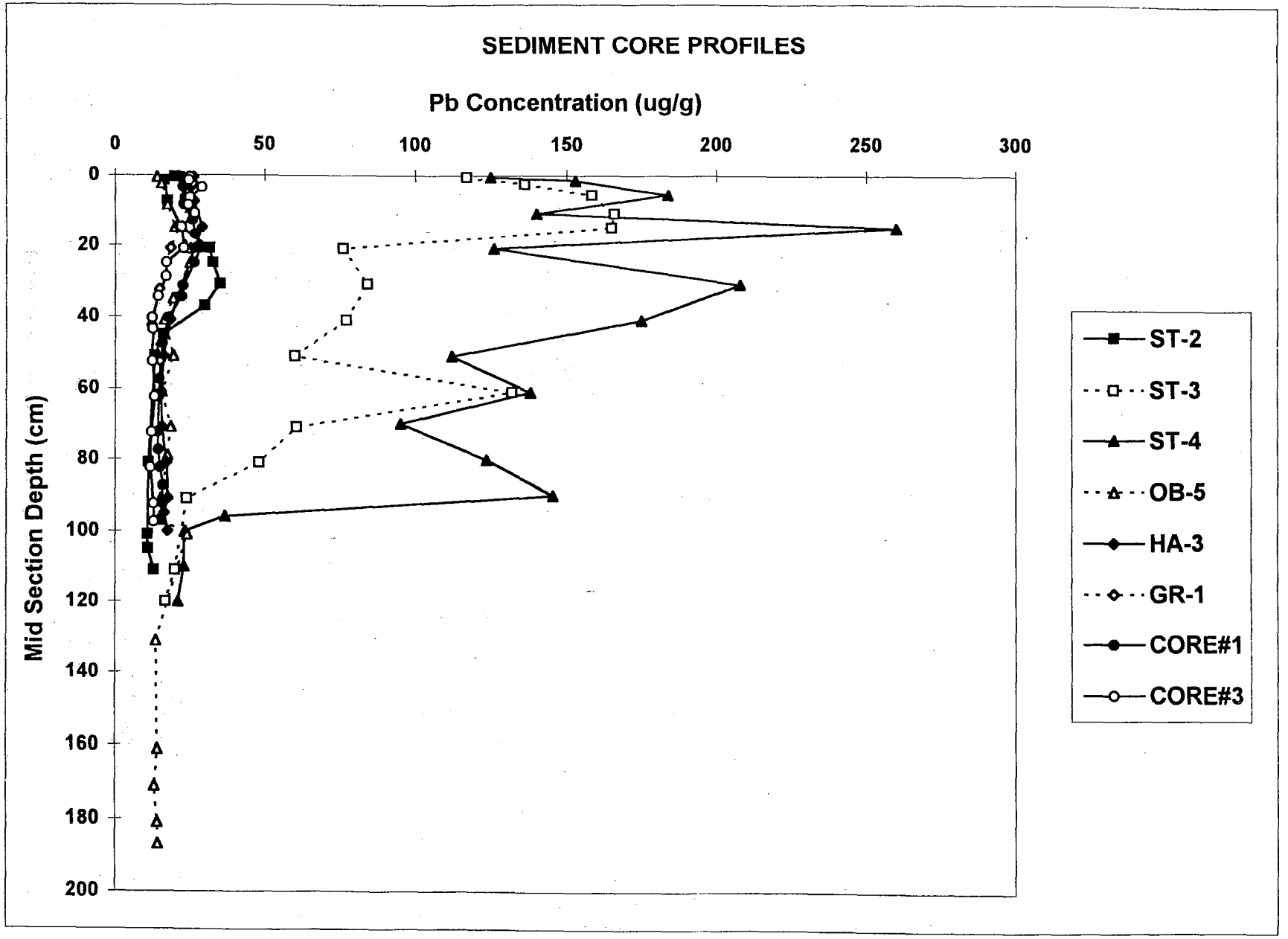

SEDIMENT CORE PROFILES
Cu Concentration (ug/g)
0
25
50
75
100
125
150
175
200
225
Mid Section Depth (cm)
0
20
40
60
80
100
120
140
160
180
200
ST-2
ST-3
ST-4

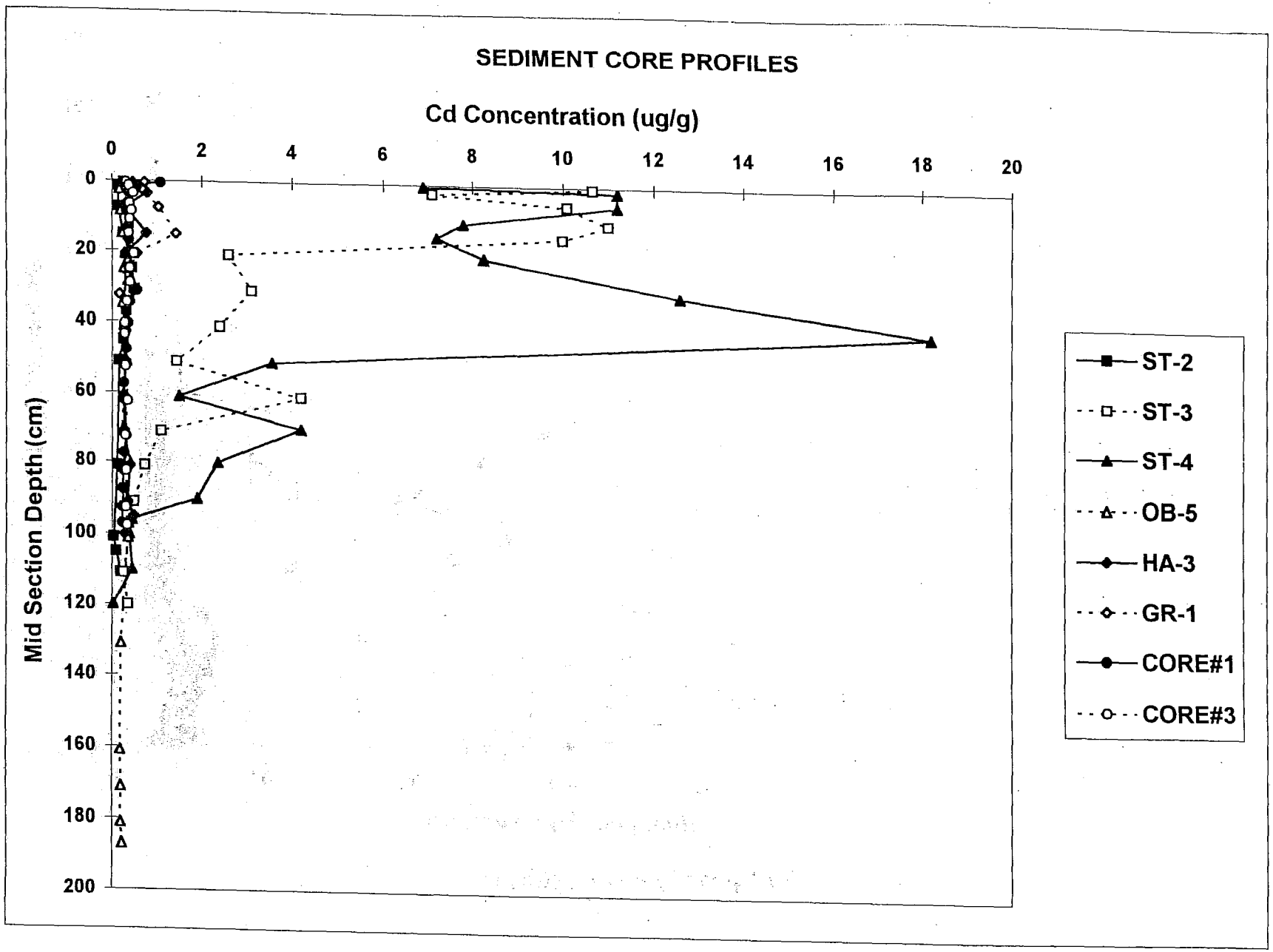

SEDIMENT CORE PROFILES
Zn Concentration (ug/g)
0
100
200
300
400
500
600
700
800
Mid Section Depth (cm)
0
20
40
60
80
100
120
140
160
180
200
ST-2
ST-3
ST-4
OB-5
HA-3
GR-1
CORE#1
CORE#3

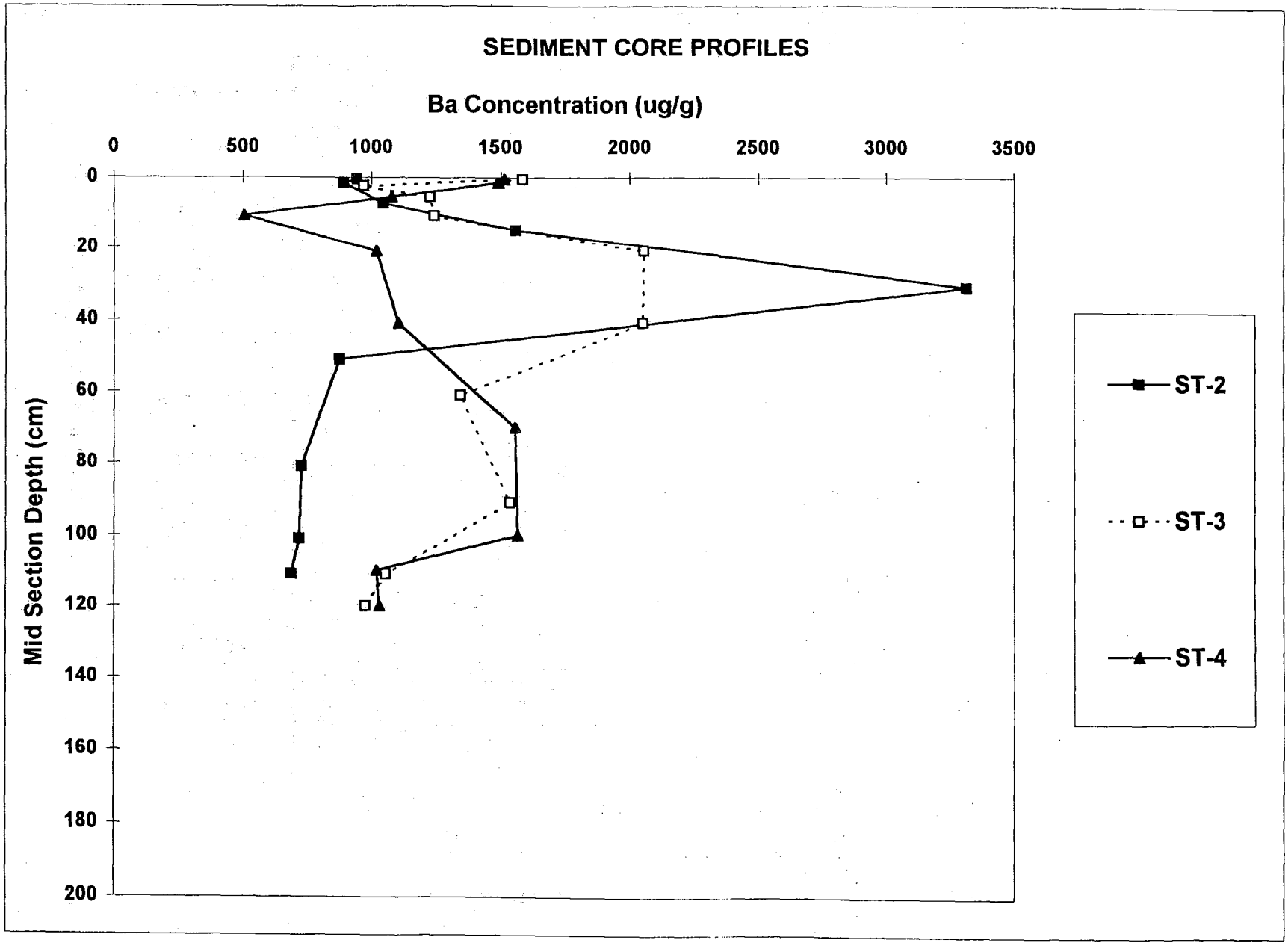

SEDIMENT CORE PROFILES
Mn Concentration (ug/g)
0
2000
4000
6000
8000
10000
12000
Mid Section Depth (cm)
0
20
40
60
80
100
120
140
160
180
200
ST-2
ST-3
ST-4
OB-5
HA-3
GR-1

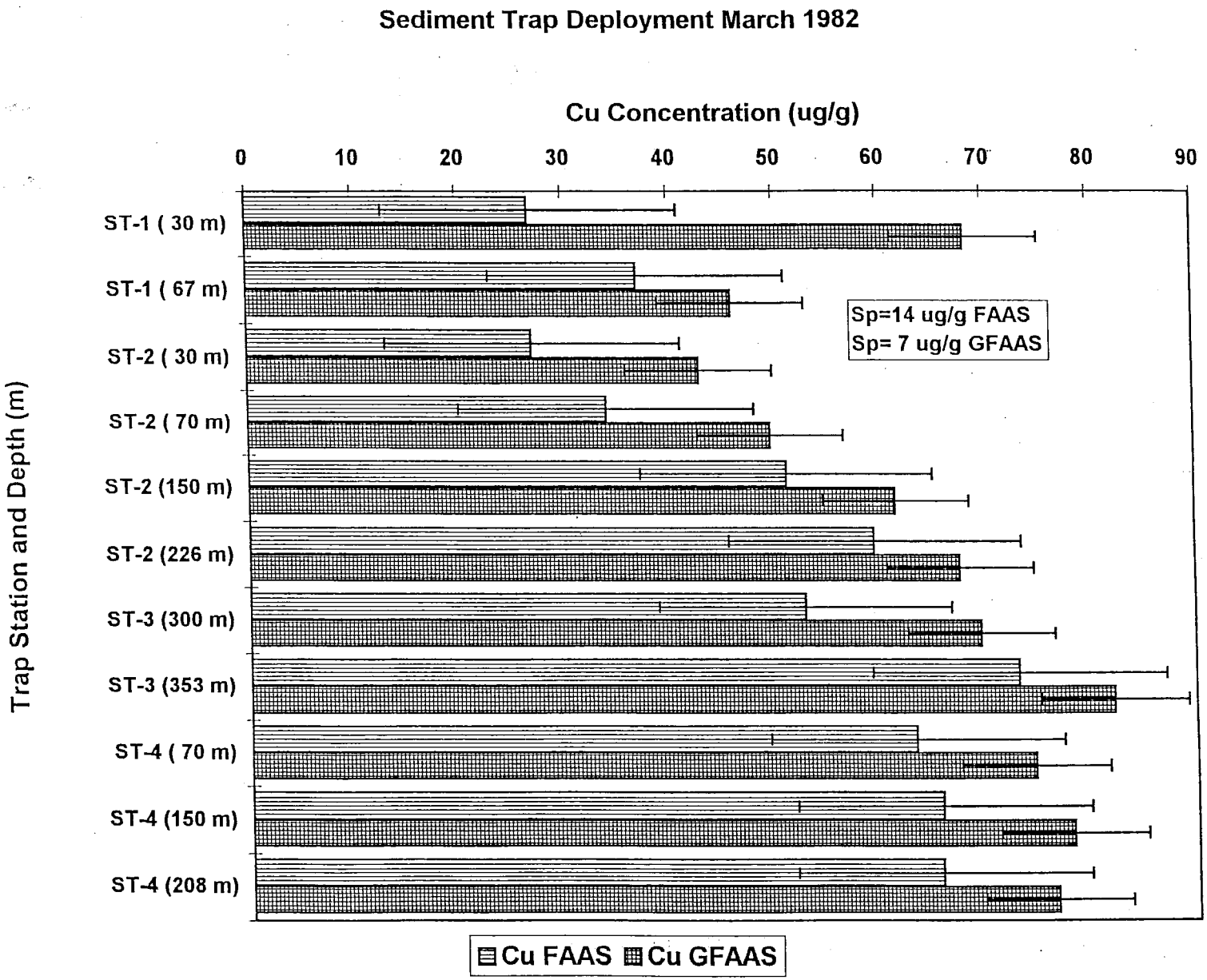

SEDIMENT CORE PROFILES
Fe Concentration (%)
0
1
2
3
4
5
6
7
8
9
Mid Section Depth (cm)
0
20
40
60
80
100
120
140
160
180
200
ST-2
ST-3
ST-4
OB-5
HA-3
GR-1

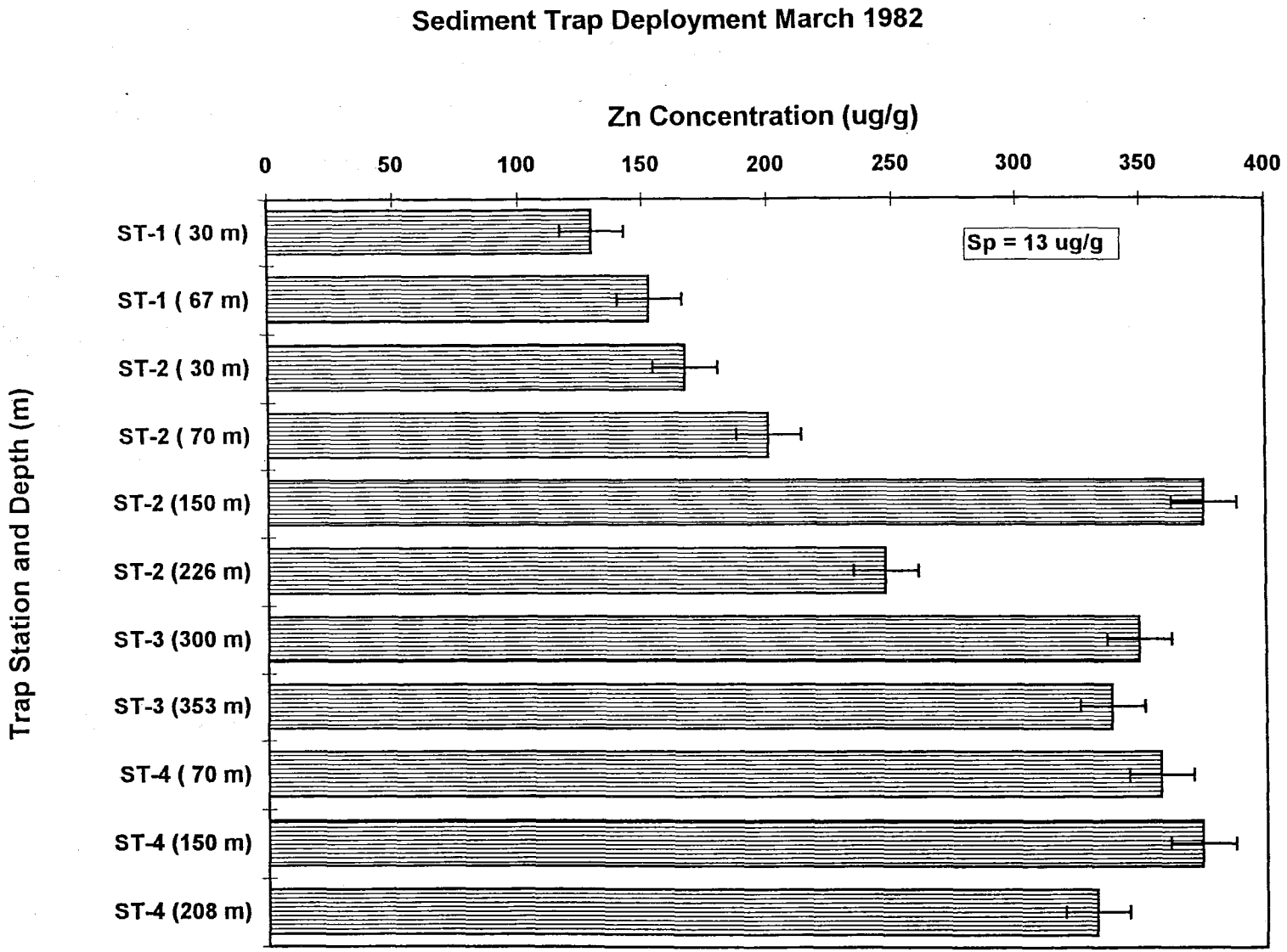

SEDIMENT CORE PROFILES
Al Concentration (%)
6
7
8
9
0
20
40
60
80
100
120
140
160
180
200
Mid Section Depth (cm)
ST-2
ST-3
ST-4
OB-5
HA-3
GR-1

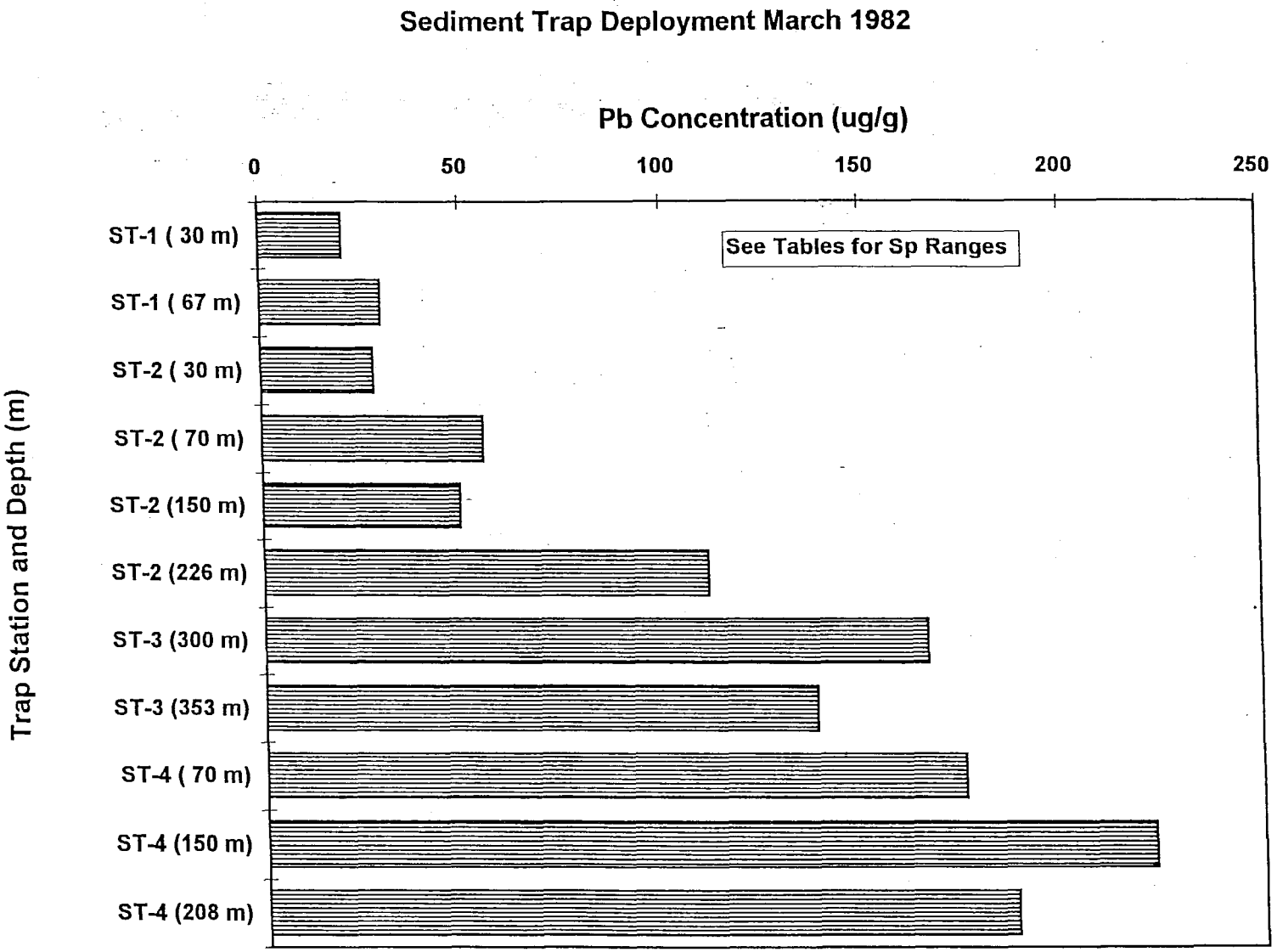

SEDIMENT CORE PROFILES
Pb Concentration (ug/g)
0
50
100
150
200
250
300
Mid Section Depth (cm)
0
20
40
60
80
100
120
140
160
180
200
ST-2
ST-3
ST-4
OB-5
HA-3
GR-1
CORE#1
CORE#3

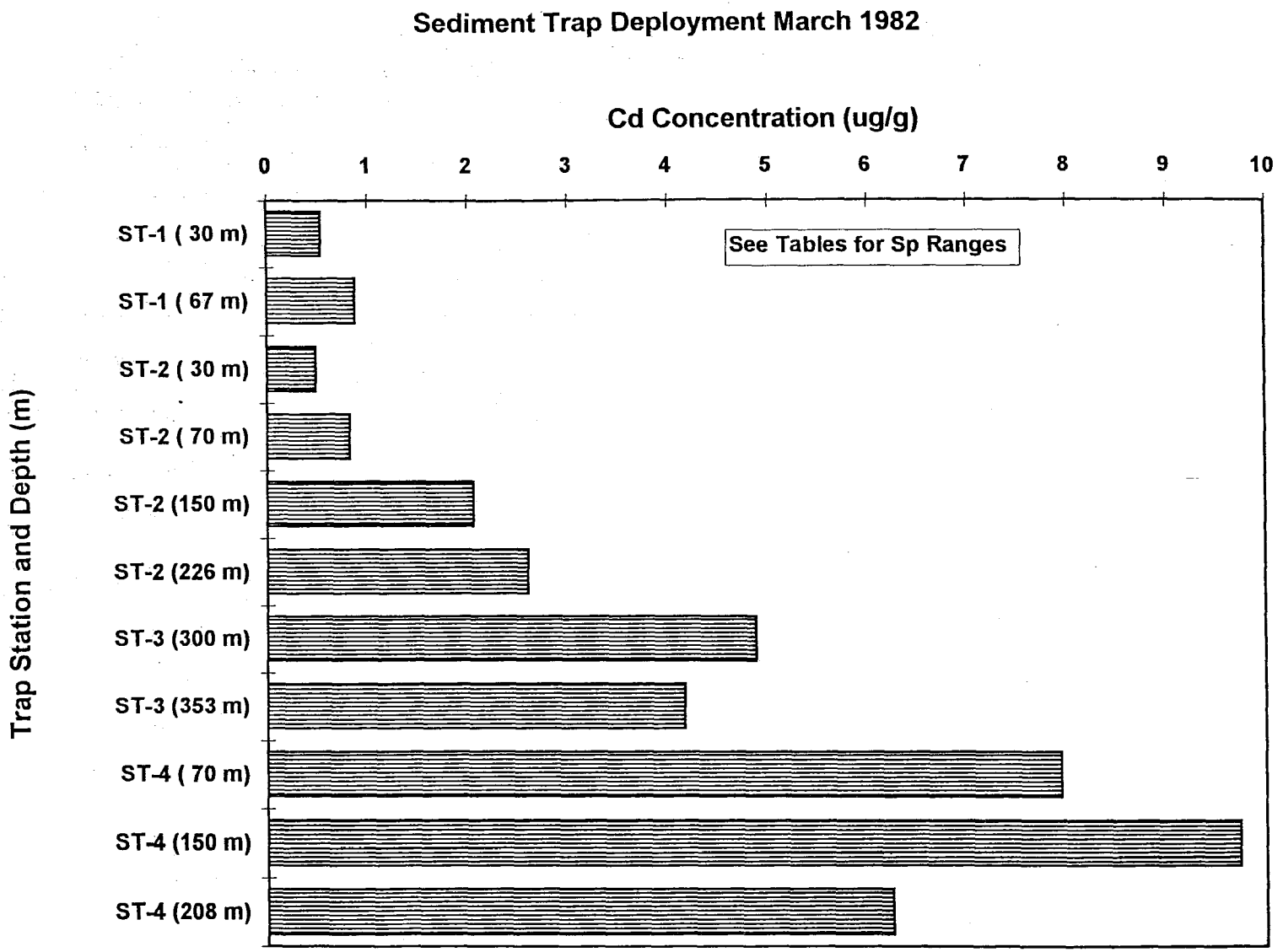

SEDIMENT CORE PROFILES
Cd Concentration (ug/g)
0
2
4
6
8
10
12
14
16
18
20
Mid Section Depth (cm)
0
20
40
60
80
100
120
140
160
180
200
ST-2
ST-3
ST-4
OB-5
HA-3
GR-1
CORE#1
CORE#3

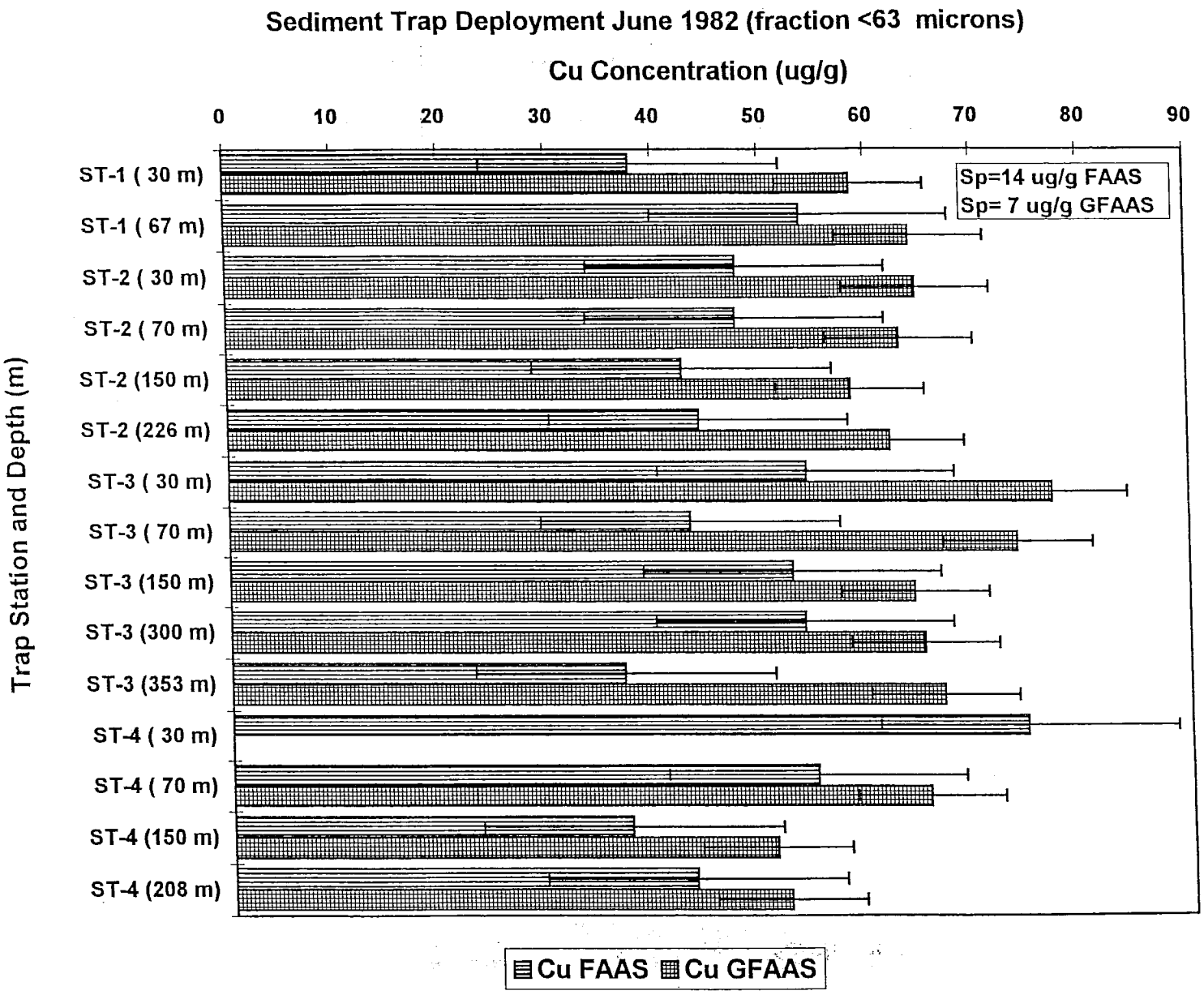

SEDIMENT CORE PROFILES
Ba Concentration (ug/g)
0
500
1000
1500
2000
2500
3000
3500
Mid Section Depth (cm)
0
20
40
60
80
100
120
140
160
180
200
ST-2
ST-3
ST-4

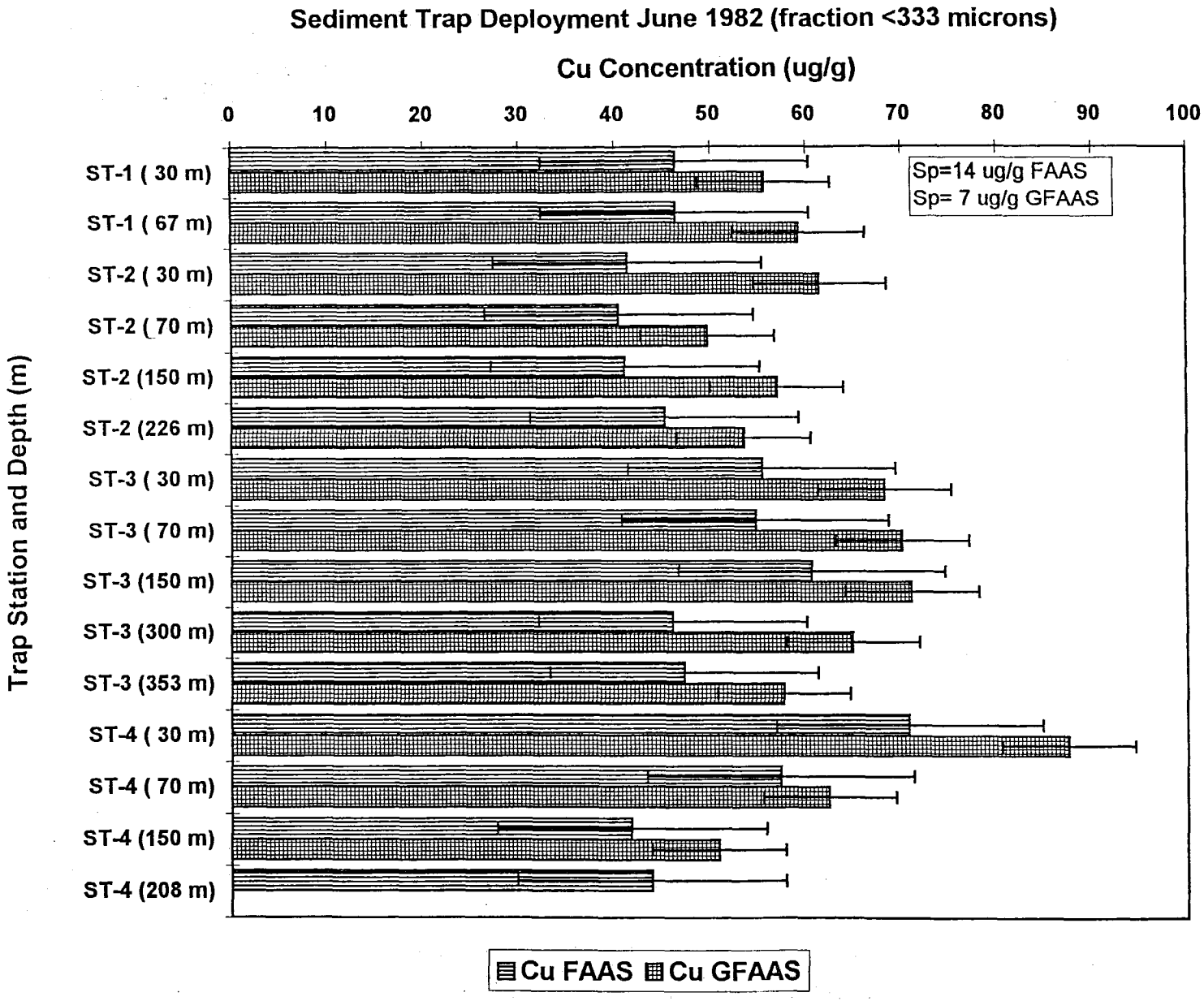

Sediment Trap Deployment March 1982
Cu Concentration (ug/g)
0
10
20
30
40
50
60
70
80
90
Trap Station and Depth (m)
ST-1 (30 m)
ST-1 (67 m)
ST-2 (30 m)
ST-2 (70 m)
ST-2 (150 m)
ST-2 (226 m)
ST-3 (300 m)
ST-3 (353 m)
ST-4 (70 m)
ST-4 (150 m)
ST-4 (208 m)
Sp=14 ug/g FAAS
Sp= 7 ug/g GFAAS
Cu FAAS
Cu GFAAS

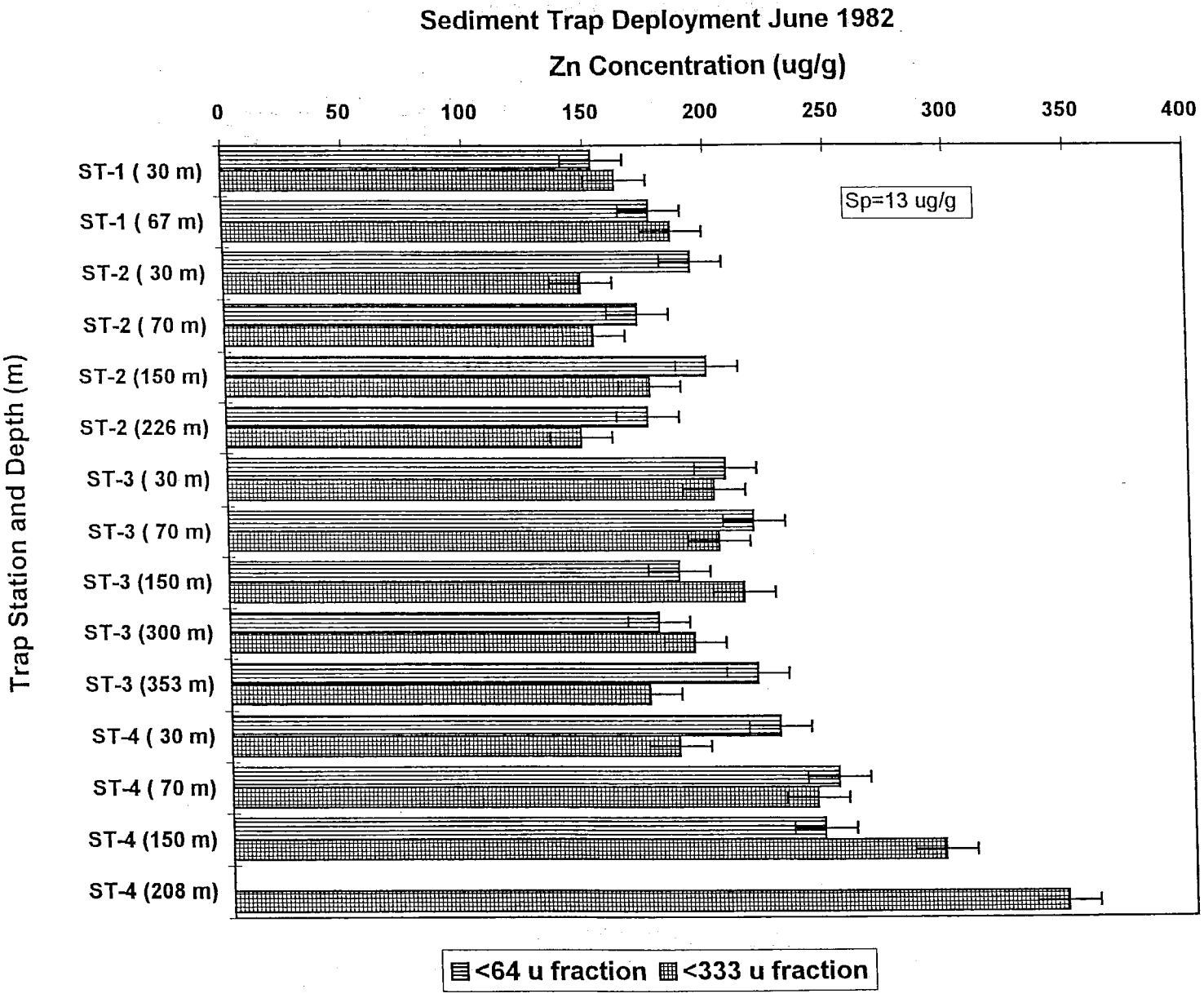

Sediment Trap Deployment March 1982
Zn Concentration (ug/g)
0
50
100
150
200
250
300
350
400
Trap Station and Depth (m)
ST-1 (30 m)
ST-1 (67 m)
ST-2 (30 m)
ST-2 (70 m)
ST-2 (150 m)
ST-2 (226 m)
ST-3 (300 m)
ST-3 (353 m)
ST-4 (70 m)
ST-4 (150 m)
ST-4 (208 m)
Sp = 13 ug/g

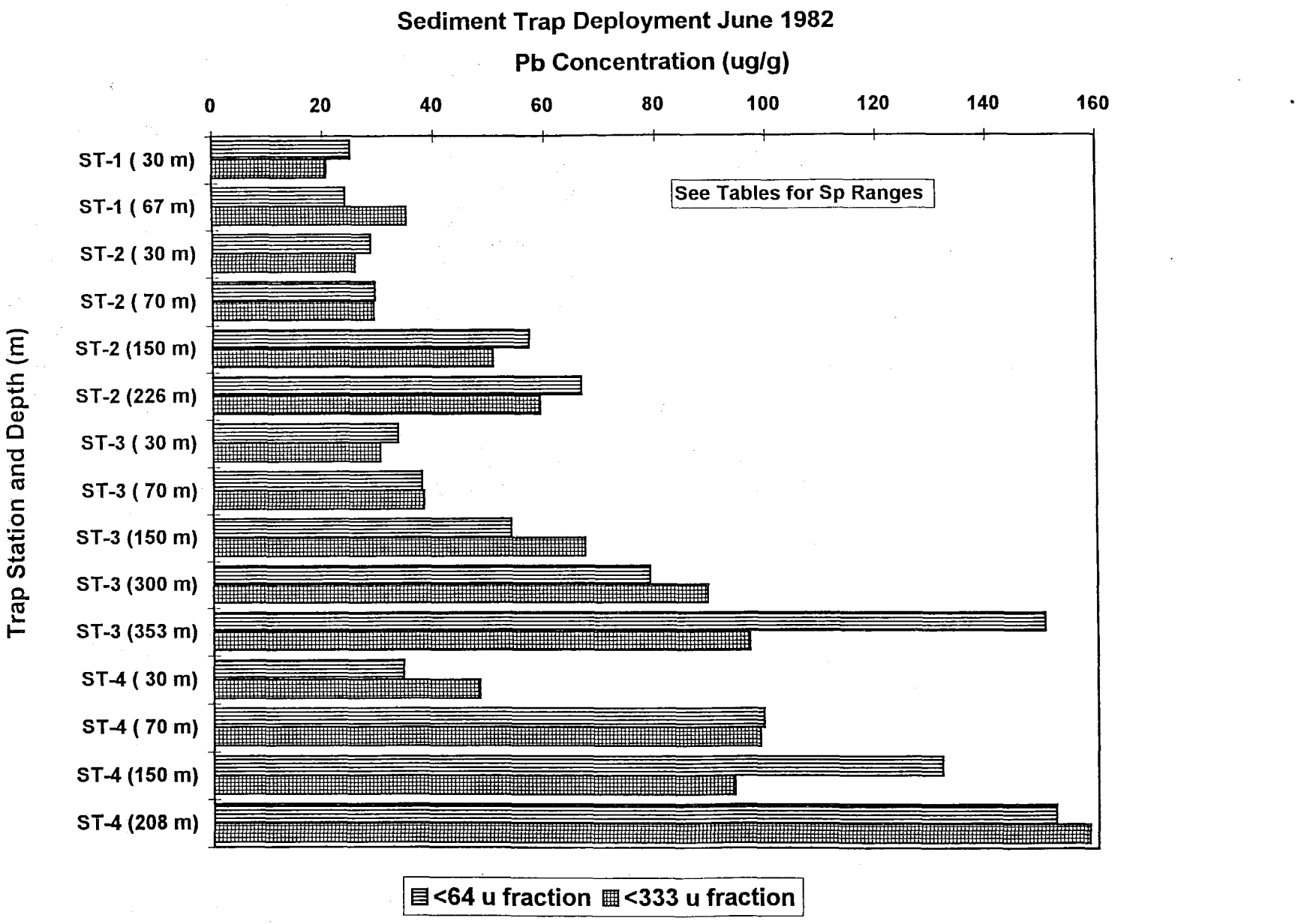

Sediment Trap Deployment March 1982
Pb Concentration (ug/g)
0
50
100
150
200
250
Trap Station and Depth (m)
ST-1 (30 m)
ST-1 (67 m)
ST-2 (30 m)
ST-2 (70 m)
ST-2 (150 m)
ST-2 (226 m)
ST-3 (300 m)
ST-3 (353 m)
ST-4 (70 m)
ST-4 (150 m)
ST-4 (208 m)
See Tables for Sp Ranges

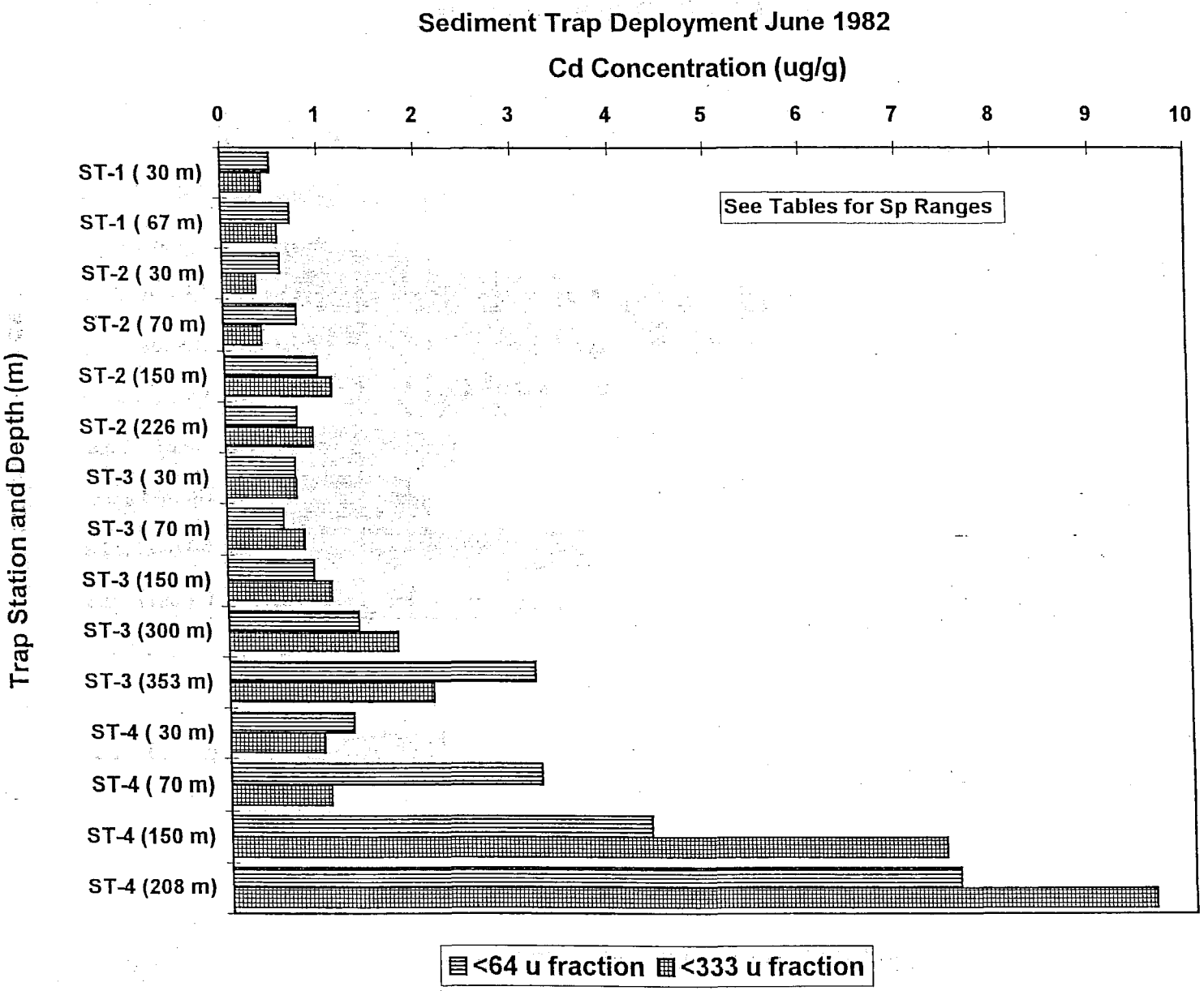

Sediment Trap Deployment March 1982
Cd Concentration (ug/g)
0
1
2
3
4
5
6
7
8
9
10
Trap Station and Depth (m)
ST-1 (30 m)
ST-1 (67 m)
ST-2 (30 m)
ST-2 (70 m)
ST-2 (150 m)
ST-2 (226 m)
ST-3 (300 m)
ST-3 (353 m)
ST-4 (70 m)
ST-4 (150 m)
ST-4 (208 m)
See Tables for Sp Ranges

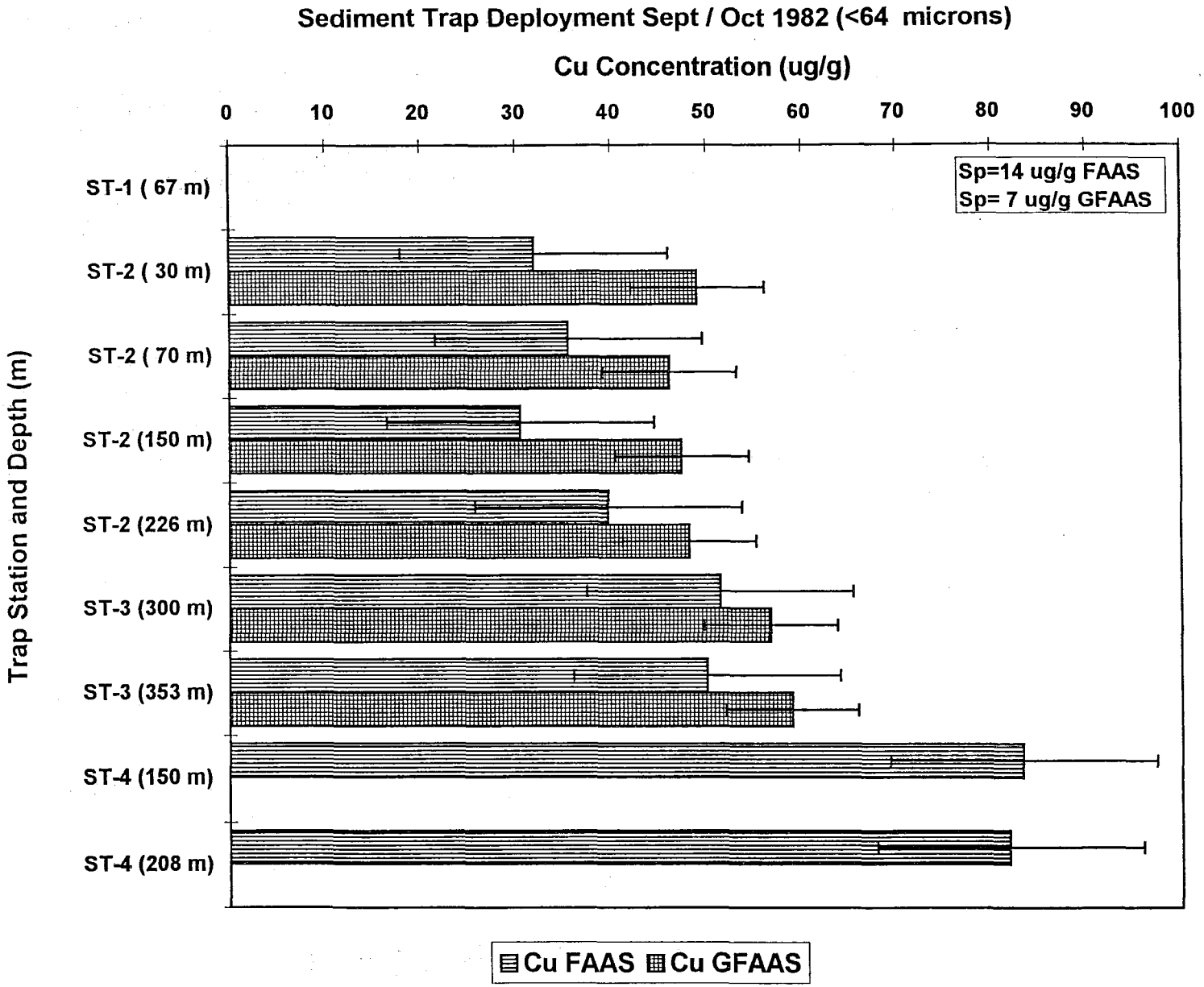

Sediment Trap Deployment June 1982 (fraction <63 microns)
Cu Concentration (ug/g)
0
10
20
30
40
50
60
70
80
90
Trap Station and Depth (m)
ST-1 (30 m)
ST-1 (67 m)
ST-2 (30 m)
ST-2 (70 m)
ST-2 (150 m)
ST-2 (226 m)
ST-3 (30 m)
ST-3 (70 m)
ST-3 (150 m)
ST-3 (300 m)
ST-3 (353 m)
ST-4 (30 m)
ST-4 (70 m)
ST-4 (150 m)
ST-4 (208 m)
Sp=14 ug/g FAAS
Sp= 7 ug/g GFAAS
Cu FAAS
Cu GFAAS

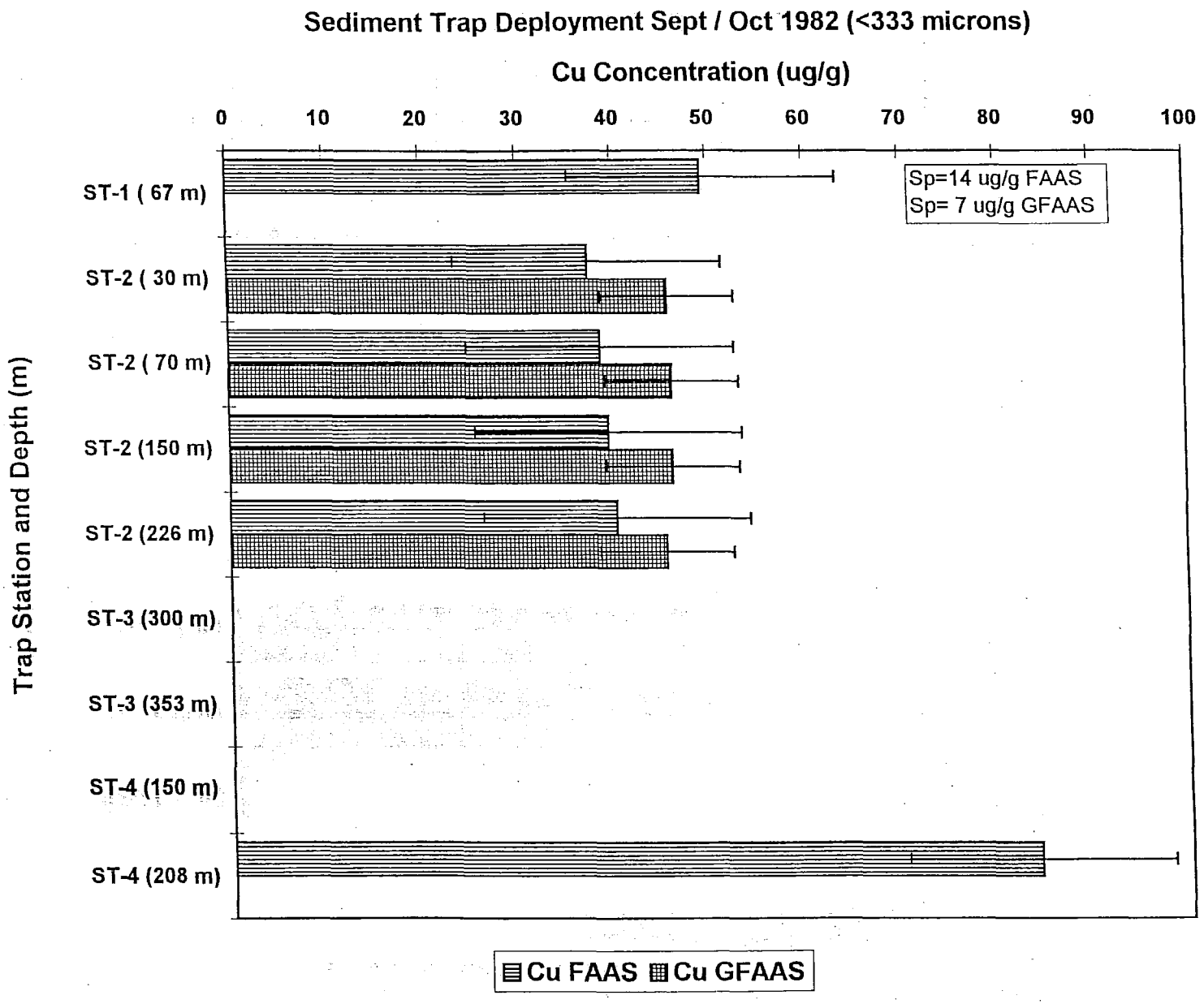

Sediment Trap Deployment June 1982 (fraction <333 microns)
Cu Concentration (ug/g)
0
10
20
30
40
50
60
70
80
90
100
Trap Station and Depth (m)
ST-1 (30 m)
ST-1 (67 m)
ST-2 (30 m)
ST-2 (70 m)
ST-2 (150 m)
ST-2 (226 m)
ST-3 (30 m)
ST-3 (70 m)
ST-3 (150 m)
ST-3 (300 m)
ST-3 (353 m)
ST-4 (30 m)
ST-4 (70 m)
ST-4 (150 m)
ST-4 (208 m)
Sp=14 ug/g FAAS
Sp= 7 ug/g GFAAS
Cu FAAS
Cu GFAAS

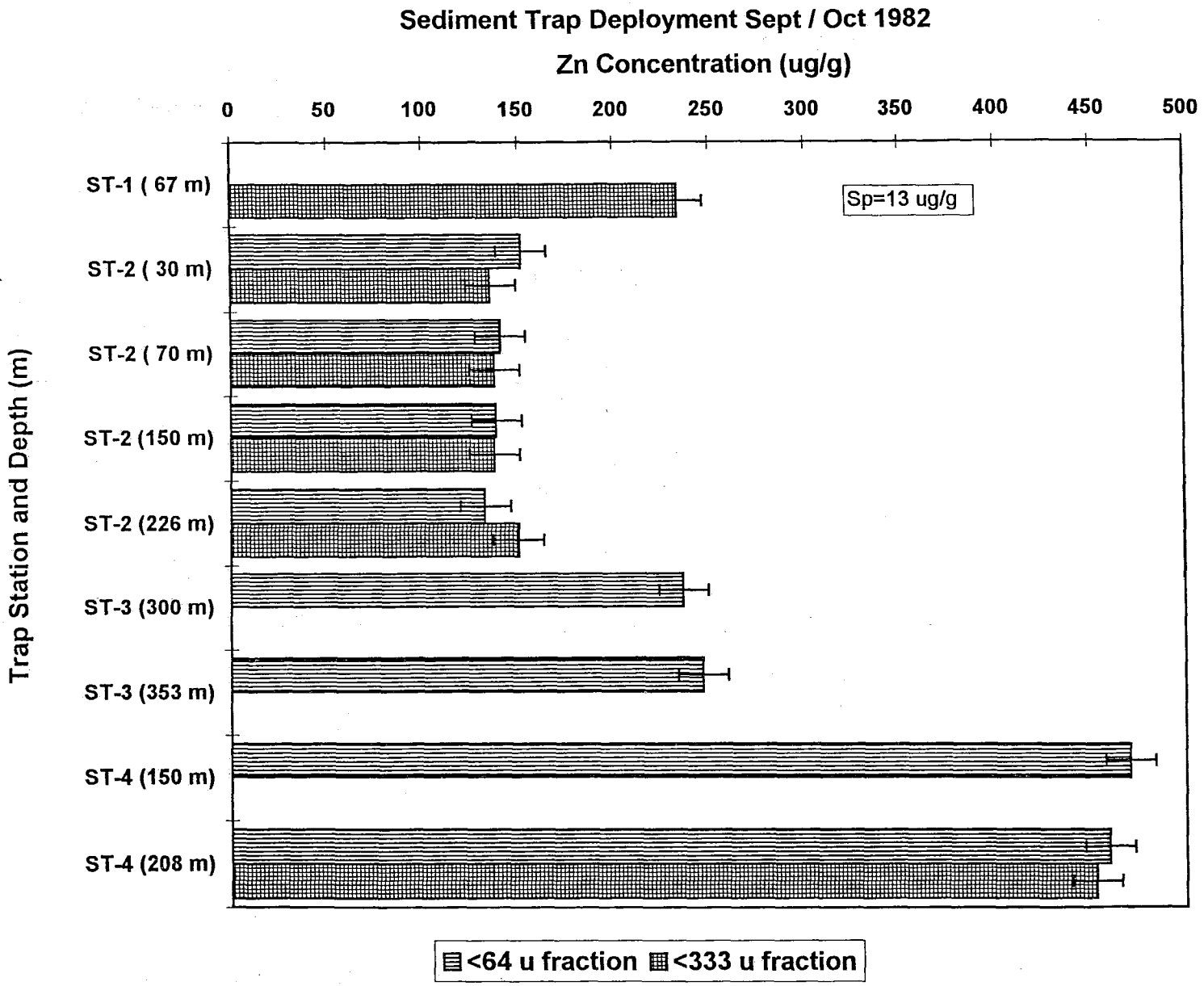

Sediment Trap Deployment June 1982
Zn Concentration (ug/g)
0
50
100
150
200
250
300
350
400
Trap Station and Depth (m)
ST-1 (30 m)
ST-1 (67 m)
ST-2 (30 m)
ST-2 (70 m)
ST-2 (150 m)
ST-2 (226 m)
ST-3 (30 m)
ST-3 (70 m)
ST-3 (150 m)
ST-3 (300 m)
ST-3 (353 m)
ST-4 (30 m)
ST-4 (70 m)
ST-4 (150 m)
ST-4 (208 m)
Sp=13 ug/g
<64 u fraction
<333 u fraction

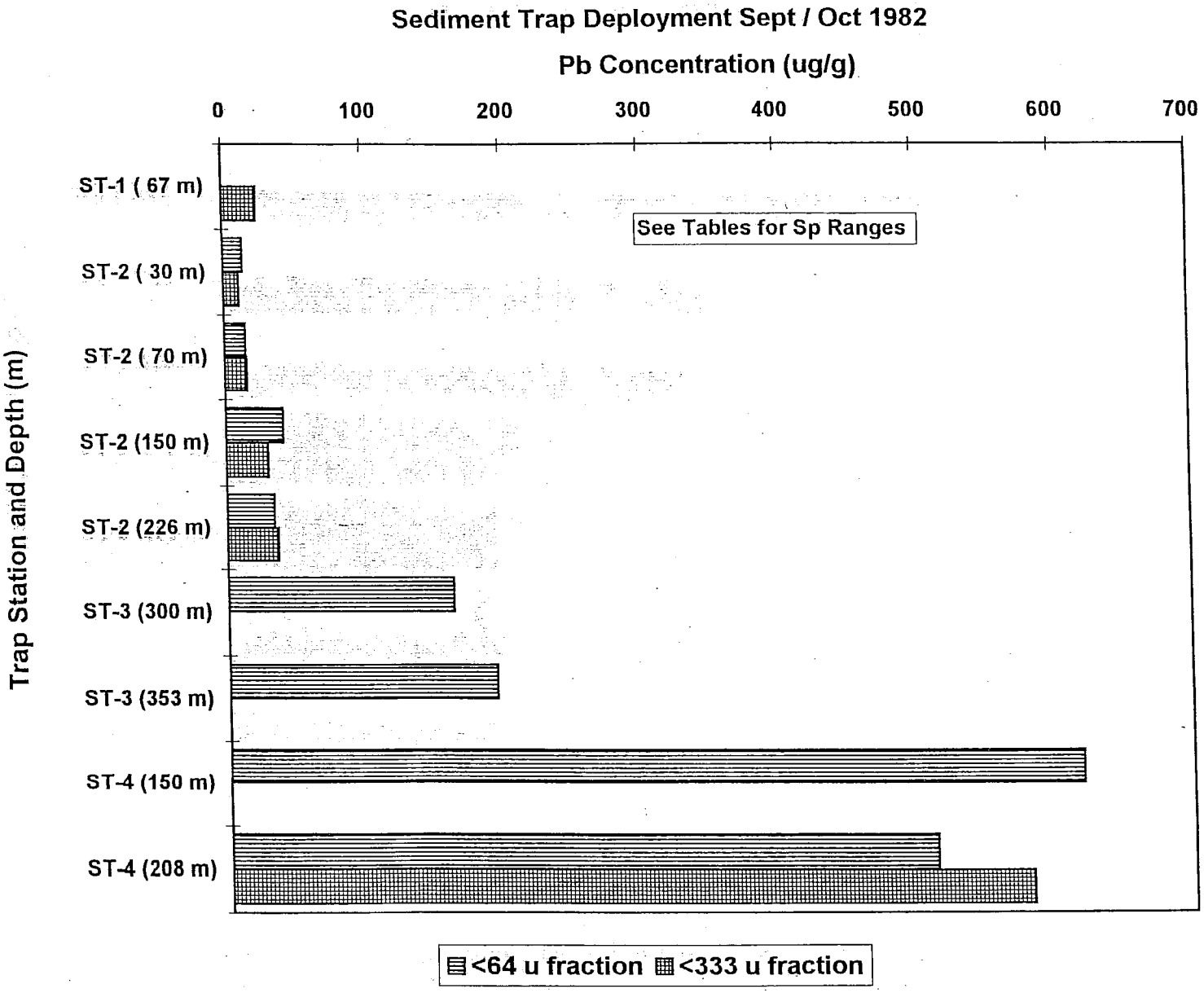

Sediment Trap Deployment June 1982
Pb Concentration (ug/g)
0
20
40
60
80
100
120
140
160
Trap Station and Depth (m)
ST-1 (30 m)
ST-1 (67 m)
ST-2 (30 m)
ST-2 (70 m)
ST-2 (150 m)
ST-2 (226 m)
ST-3 (30 m)
ST-3 (70 m)
ST-3 (150 m)
ST-3 (300 m)
ST-3 (353 m)
ST-4 (30 m)
ST-4 (70 m)
ST-4 (150 m)
ST-4 (208 m)
See Tables for Sp Ranges
<64 u fraction
<333 u fraction

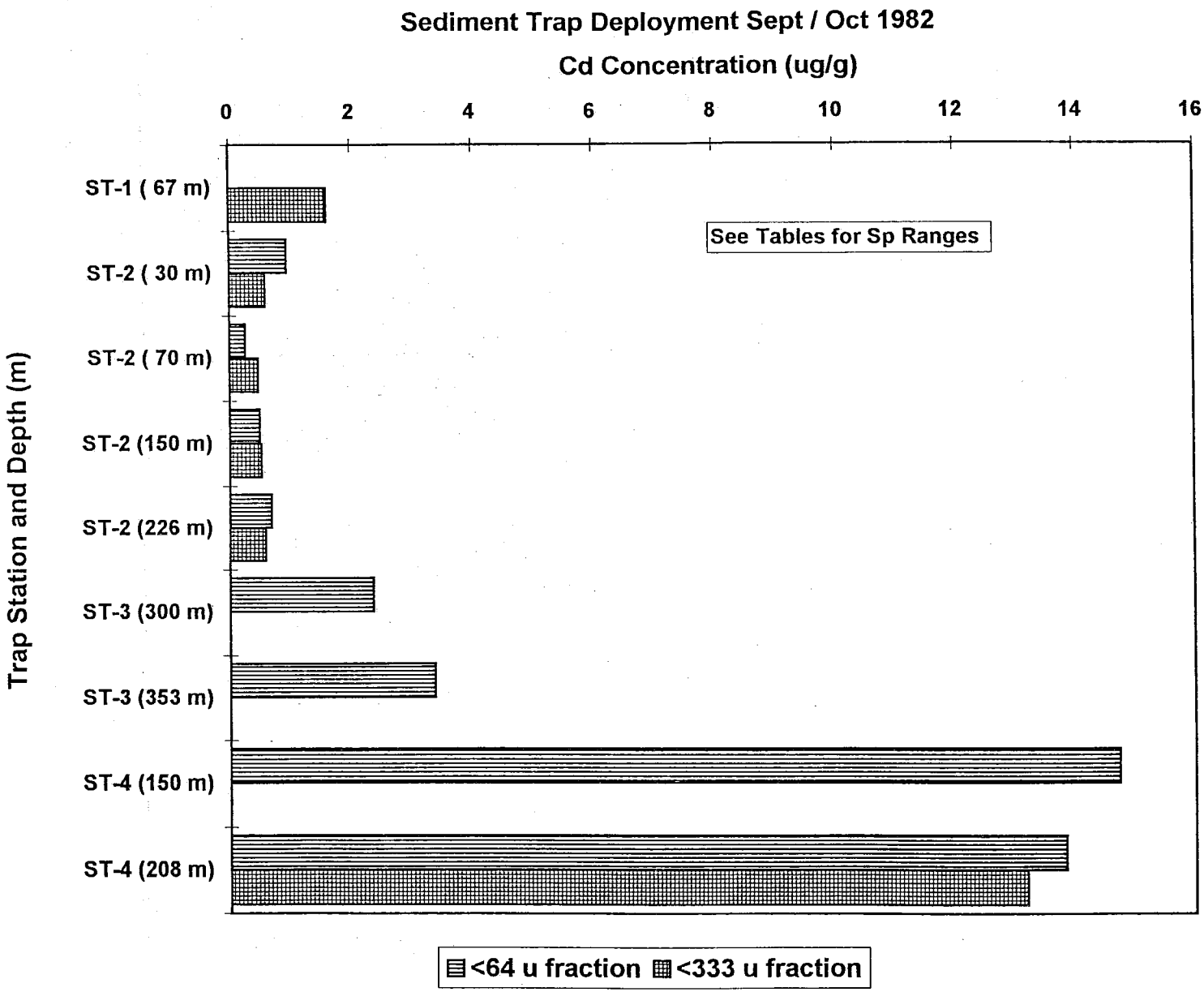

Sediment Trap Deployment June 1982
Cd Concentration (ug/g)
0
1
2
3
4
5
6
7
8
9
10
Trap Station and Depth (m)
ST-1 (30 m)
ST-1 (67 m)
ST-2 (30 m)
ST-2 (70 m)
ST-2 (150 m)
ST-2 (226 m)
ST-3 (30 m)
ST-3 (70 m)
ST-3 (150 m)
ST-3 (300 m)
ST-3 (353 m)
ST-4 (30 m)
ST-4 (70 m)
ST-4 (150 m)
ST-4 (208 m)
See Tables for Sp Ranges
<64 u fraction
<333 u fraction


Sediment Trap Deployment Sept / Oct 1982 (<64 microns)
Cu Concentration (ug/g)
0
10
20
30
40
50
60
70
80
90
100
Sp=14 ug/g FAAS
Sp= 7 ug/g GFAAS
ST-1 (67 m)
ST-2 (30 m)
ST-2 (70 m)
ST-2 (150 m)
ST-2 (226 m)
ST-3 (300 m)
ST-3 (353 m)
ST-4 (150 m)
ST-4 (208 m)
Trap Station and Depth (m)
Cu FAAS
Cu GFAAS

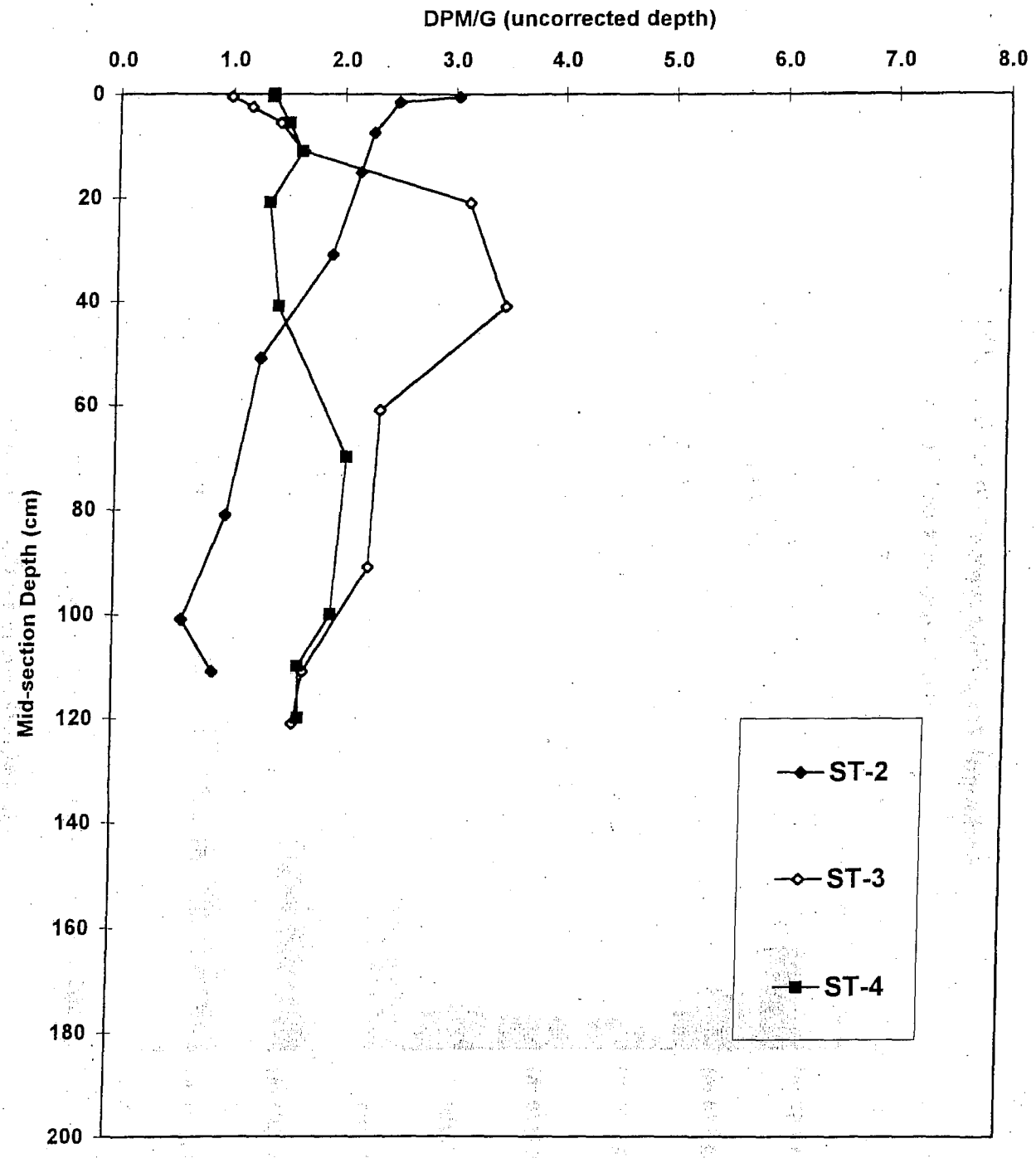

Sediment Trap Deployment Sept / Oct 1982 (<333 microns)
Cu Concentration (ug/g)
0
10
20
30
40
50
60
70
80
90
100
Sp=14 ug/g FAAS
Sp= 7 ug/g GFAAS
ST-1 (67 m)
ST-2 (30 m)
ST-2 (70 m)
ST-2 (150 m)
ST-2 (226 m)
ST-3 (300 m)
ST-3 (353 m)
ST-4 (150 m)
ST-4 (208 m)
Trap Station and Depth (m)
Cu FAAS
Cu GFAAS


Sediment Trap Deployment Sept / Oct 1982
Zn Concentration (ug/g)
0
50
100
150
200
250
300
350
400
450
500
Trap Station and Depth (m)
ST-1 (67 m)
ST-2 (30 m)
ST-2 (70 m)
ST-2 (150 m)
ST-2 (226 m)
ST-3 (300 m)
ST-3 (353 m)
ST-4 (150 m)
ST-4 (208 m)
Sp=13 ug/g
<64 u fraction
<333 u fraction


Sediment Trap Deployment Sept / Oct 1982
Pb Concentration (ug/g)
0
100
200
300
400
500
600
700
Trap Station and Depth (m)
ST-1 (67 m)
ST-2 (30 m)
ST-2 (70 m)
ST-2 (150 m)
ST-2 (226 m)
ST-3 (300 m)
ST-3 (353 m)
ST-4 (150 m)
ST-4 (208 m)
See Tables for Sp Ranges
<64 u fraction
<333 u fraction


Sediment Trap Deployment Sept / Oct 1982
Cd Concentration (ug/g)
0
2
4
6
8
10
12
14
16
Trap Station and Depth (m)
ST-1 (67 m)
ST-2 (30 m)
ST-2 (70 m)
ST-2 (150 m)
ST-2 (226 m)
ST-3 (300 m)
ST-3 (353 m)
ST-4 (150 m)
ST-4 (208 m)
See Tables for Sp Ranges
<64 u fraction
<333 u fraction

SEDIMENT CORE PROFILES - Pb-210 DATA



SEDIMENT CORE PROFILES - Pb-210 DATA