NOAA Data Report OMPA-1

SUSPENDED PARTICULATE MATTER, TEMPERATURE AND SALINITY DATA, NEW YORK BIGHT, 1979

Robert G. Mann

Boulder, Colorado
October 1980

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ABSTRACT. Suspended particulate matter, temperature and salinity data are presented from seven monthly sampling cruises in the New York Bight. The purpose of the sampling was to examine the temporal and spatial distribution of particulates discharged from the Hudson-Raritan estuary. The data was collected using water bottles and probes at 41 stations along six transects from mid-March through early September 1979.

INTRODUCTION

The Marine Geology and Geophysics Laboratory of the Atlantic Oceanographic and Meteorological Laboratories has been studying the sediment dynamics of the New York Bight as part of the MESA-INSTEP Project (Marine Ecosystems Analysis--Inner Shelf Sediment Transport Experiment). During 1979, the inner shelf of Long Island and New Jersey was sampled using water bottles and sensors with the purpose of examining the temporal and spatial distribution of particulates discharged from the Hudson-Raritan estuary. Seven monthly cruises took place aboard the NOAA Ship KELEZ during the period from mid-March through early September. The suspended particulate matter (SPM), temperature and salinity data from each cruise are presented in this report in Tables 4-10.

The working area (Fig. 1) was divided into six transects with a total of 41 stations. Thirteen of the stations were occupied by current meter arrays deployed by the ship over the duration of the experiment. Due to weather conditions or equipment malfunctions, not all SPM stations were occupied on

every cruise. Sampling took place on a 24-hour basis in order to minimize the temporal variance of the data. All operations were completed within 48 hours after commencing.

METHODS

The suspended particulate matter data were obtained from 10-liter Niskin top-drop bottles attached to a rosette sampler frame. The frame was lowered over the side to a known depth, usually 2 meters below the surface and 1 meter above the bottom. By electronically triggering the bottle from the surface console, a sample of water was obtained from that depth. After all samples from each station were obtained, a subsample of up to 1 liter from each bottle was filtered through preweighed 0.4 Nuclepore filters, washed with 40 ml of filtered distilled water, and the volume of the water recorded. After drying, the filters were weighed again and the concentrations of SPM recorded in milligrams per liter (mg/l).

In order to minimize the possibility of errors in the measurements, the following procedures were used. On lowering the rosette frame, it was not allowed to touch and stir the bottom. This would have resulted in a sample that was not representative of the water column at that depth. The 10-liter Niskin bottle, 1-liter subsample bottle, and all filtering apparatus were clean and free of foreign particles prior to and during sampling. The filters themselves were protected from contaminants and the same calibrated balance was used to weigh them before and after sampling. Drying was at a uniform temperature.

In most samples near the bottom, the concentrations were very high and consequently less than one filtered liter of water was able to be conveniently filled. This made it necessary to normalize the concentration to one liter.

The salinity and temperature measurements were made at the same time as the SPM measurements. An Interocean CSTD probe, model 513-D, was attached to the rosette frame and the rosette frame lowered at a rate of approximately 0.5 meters per second. The temperature sensor ranged from -5°C to +45°C with an accuracy of ±0.02°, while the salinity sensor ranged from 0 to 40 °/oo and was accurate to ±0.05 °/oo. The pressure sensor recorded depths from 0 to 300 meters with an accuracy of ±0.5 m. These range and accuracy values were obtained from the manufacturer's specifications. A continuous record of depth, temperature, salinity, percent transmission, and dissolved oxygen was recorded on magnetic tape.

Included on the rosette frame was a Monitek turbidimeter, model 350/136. This made a continuous profile of the turbidity of each station on an x-y plotter. Calibrations were made with a known turbid solution and the accuracy of the output was ±2 percent of the full scale. These data are being analyzed and will be presented at a later date.

The profiles generally showed a high turbidity or concentration of SPM near the surface and also near the bottom, presumably a nepheloid layer. Also, where the thermocline was present, the profiles often revealed a marked increase in the turbidity of that layer. This was naturally more apparent in the profiles of the summer months than those of the well-mixed water in winter. This is in accordance with the findings of Drake (1974) and Nelsen (1979) in the New York Bight apex.

A series of current meters was deployed at 13 of the SPM stations. "Spar" heights denote a measurement level 3 meters below the surface. The measurements made by these meters are to be reported elsewhere.

Table 1 gives a listing of the cruise dates during which sampling took place, the number of SPM stations occupied, and the total number of water samples taken during each cruise. On cruise 7, 13 of the SPM stations were sampled twice--before and after a major storm on September 6, 1979.

The locations and depths of the SPM stations are given in Table 2, and of the current meters in Table 3. The sample depth was generally at 2 meters and from 1-5 meters above the bottom. Excellent repeatability in positioning for all cruises was obtained using Raydist positioning and LORAN-C navigation. All depths recorded at the station locations were obtained from a Ross Laboratories model 5000 fineline recorder with the output in feet. These depths were converted to meters to be consistent with the output from the CSTD probe.

Tables 4-10 are listings of the date, local standard time of commencement of sample period, station number, sample depth, SPM concentration, temperature, and salinity for each cruise. On cruise 4 (Table 7) no temperature or salinity readings were obtained due to electronic difficulties with the CSTD sensors.

Figure 1 shows the locations of the SPM transects, SPM stations, and current meter moorings.

TABLES AND FIGURE

Table 1. Statistics of cruises.

Table 2. SPM station locations and depths.

Table 3. Current meter station locations and depths.

Table 4. SPM, temperature and salinity data, cruise 1, 13-15 March 1979.

Table 5. SPM, temperature and salinity data, cruise 2, 4-5 April 1979.

Table 6. SPM, temperature and salinity data, cruise 4, 21-23 May 1979.

Table 7. SPM, data, cruise 5, 10-11 June 1979.

Table 8. SPM, temperature and salinity data, cruise 6, 29-30 June 1979.

Table 9. SPM, temperature and salinity data, cruise 7, 1-2 August 1979.

Table 10. SPM, temperature and salinity data, cruise 8, 5-7 September 1979.

Figure 1. Locations of SPM stations and current meter moorings.

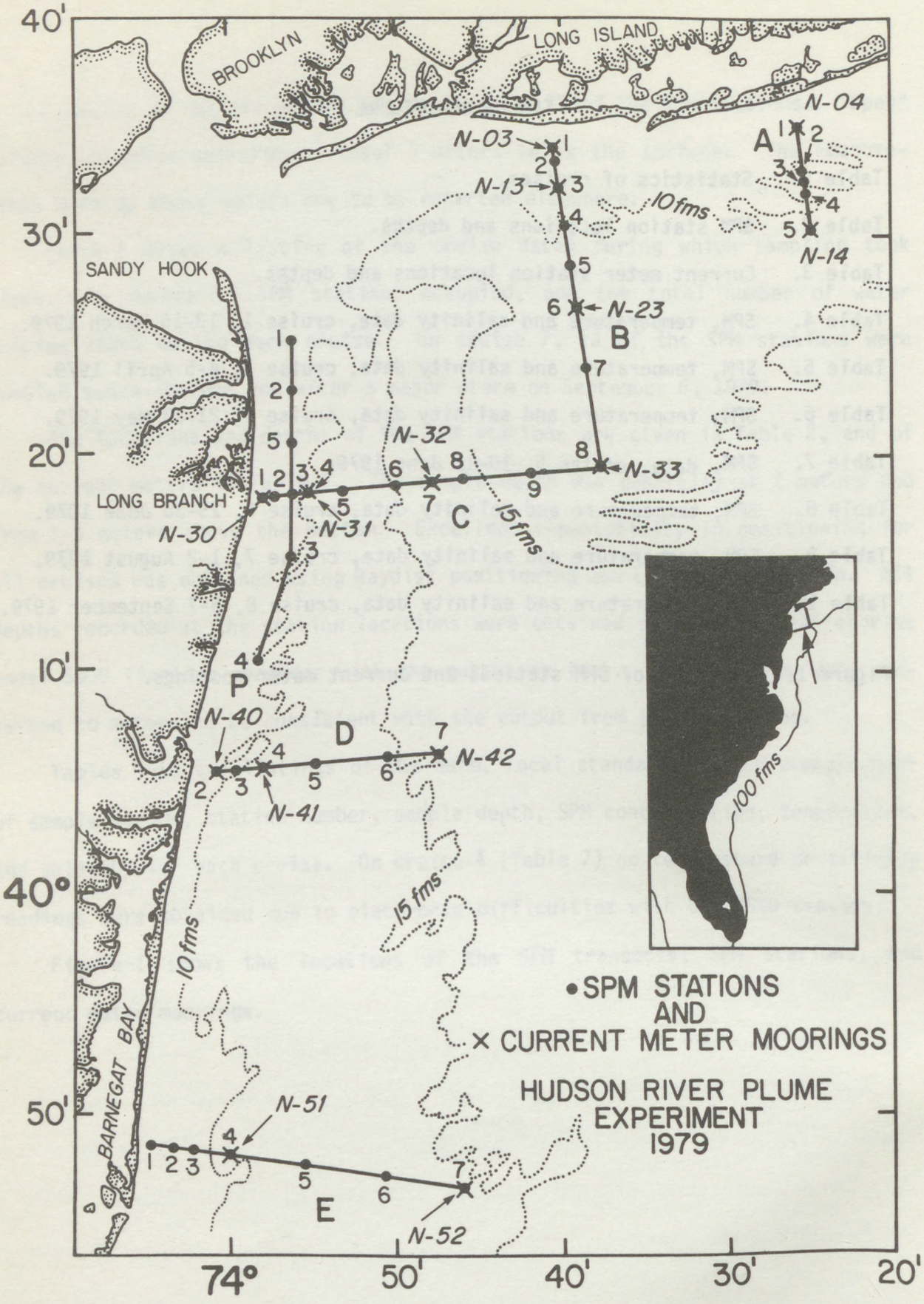

Figure 1. Locations of SPM stations and current meter moorings.

TABLE 1. STATISTICS OF CRUISES

Cruise Number	Dates of Cruise	No. Stations Occupied	No. Water Samples Taken
1	13-15 March	32	62
2	04-05 April	34	65
4	21-23 May	33	97
5	10-11 June	34	102
6	29-30 June	37	74
7	01-02 August	37	72
8	05-07 September	39*	90

*13 of the stations were occupied twice during the cruise - before and after a major storm.

TABLE 2. SPM STATIONS

Transect	Station	Latitude	Longitude	Depth (m)
A	A1	40°35.0'N	73°24.85'W	13
	A2	40°34.85'	73°24.8'	16
	A3	40°33.15'	73°24.7'	20
	A4	40°32.6'	73°24.6'	18
	A5	40°31.9'	73°24.55'	20
	A6	40°30.1'	73°24.5'	23
B	B1	40°33.9'	73°40.35'	13
	B2	40°33.25'	73°40.2'	14
	B3	40°32.0'	73°40.0'	17
	B4	40°30.2'	73°39.65'	20
	B5	40°28.4	73°39.35'	22
	B6	40°26.55'	73°39.0'	22
	B7	40°23.6'	73°38.4'	23
	B8	40°19.3'	73°37.5'	26
C	C1	40°18.15'	73°57.7'	13
	C2	40°18.1'	73°57.1'	17
	C3	40°18.05'	73°55.9'	21
	C4	40°18.0'	73°55.0'	21
	C5	40°18.1'	73°52.9'	23
	C6	40°18.3'	73°49.7'	31
	C7	40°18.55'	73°47.4'	56
	C8	40°18.65'	73°45.85'	30
	C9	40°19.0	73°41.6'	24

SPM STATIONS cont'd

Transect	Station	Latitude	Longitude	Depth (m)
D	D2	40°05.35'	74.01.0'	21
	D3	40°05.4'	73°59.6'	23
	D4	40°05.5'	73°57.9'	22
	D5	40°05.6'	73°54.7'	23
	D6	40°05.9'	73°50.5'	28
	D7	40°06.0'	73°47.0'	30
E	E1	39°48.4'	74°04.2'	12
	E2	39°48.35'	74°03.45'	13
	E3	39°48.25'	74°02.15'	17
	E4	39°48.0'	74°00.0'	20
	E5	39°47.6'	73°56.5'	23
	E6	39°47.0'	73°50.5'	27
	E7	39°46.5'	73°46.0'	26
P	P1	40°25.35'	73°56.4'	13
	P2	40°22.7'	73°57.2'	17
	P3	40°15.2'	73°58.8'	18
	P4	40°10.25'	74°00.35'	19
	P5	40°20.5'N	73°54.6'W	17

TABLE 3. CURRENT METER STATIONS

Station	Latitude	Longitude	Depth (m)	Height from Bottom (m)
N-13	40°32.0'N	73°40.0'W	16	5, Spar*
N-14	40°30.05'	73°24.5'	22	5, Spar
N-23	40°26.5'	73°39.0'	22	5, Spar
N-31	40°18.0'	73°55.0'	18	5, Spar
N-32	40°18.5'	73°47.4'	56	5, 25, Spar
N-33	40°19.3'	73°37.5'	23	5, Spar
N-41	40°05.5'	73°58.0'	20	5, Spar
N-42	40°06.0'	73°47.0'	28	5, Spar
N-51	39°48.0'	74°00.0'	20	5, Spar
N-52	39°46.5'	73°46.0'	25	5, Spar
N-04	40°35.0'	73°25.5'	12	1
N-03	40°34.0'	73°40.3'	11	1
N-30	40°18.1'	73°57.7'	12	1
N-40	40°05.35'	74°01.0'	18	1

*See text for definition of "spar" height.

TABLE 4. SPM, TEMPERATURE AND SALINITY DATA, CRUISE 1, 13-15 MARCH 1979

DATE	TIME (EST)	STATION	DEPTH (m)	CONCENTRATION (mg/l)	TEMP. (°C)	SALINITY (°/oo)
3/13/79	2054	E1	2	3.36	2.40	31.47
		E1	9	3.34	2.92	31.65
3/14/79	0640	E3	2	1.87	2.76	31.83
		E3	15	6.36	2.78	32.28
	0712	E4	2	1.15	2.88	31.87
		E4	20	2.71	3.08	32.80
	0832	E5	2	1.44	2.91	31.98
		E5	22	2.78	3.29	33.14
	0902	E6	2	0.90	3.30	31.76
		E6	26	1.38	3.93	33.33
	0950	E7	2	0.83	3.55	31.85
		E7	24	2.08	3.80	33.23
	1216	D2	2	2.54	2.59	32.77
		D2	17	4.32	2.49	33.10
	1258	D3	2	1.18	2.57	32.78
		D3	20	2.46	2.74	33.10
	1328	D4	2	1.42	2.61	32.60
		D4	20	3.80	2.81	33.12
	1423	D5	2	1.56	2.90	31.33
		D5	22	1.54	3.54	33.41
	1500	D6	2	1.48	3.12	31.32
		D6	27	0.86	3.54	33.36

SPM, TEMPERATURE AND SALINITY DATA, CRUISE 1, 13-15 MARCH 1979 (cont'd)

DATE	TIME (EST)	STATION	DEPTH (m)	CONCENTRATION (mg/l)	TEMP. (°C)	SALINITY (°/oo)
3/14/79	1533	D7	2	1.52	3.21	31.40
		D7	29	0.98	3.66	33.36
	1701	P4	2	1.84	2.68	32.73
		P4	17	6.84	--	--
	1750	P3	2	1.89	2.56	32.51
		P3	15	4.34	2.73	33.09
	1848	P2	2	3.70	3.12	26.46
		P2	16	6.80	3.24	33.30
	1926	P1	13	8.40	2.50	32.85
3/15/79	0857	C2	2	4.40	2.43	32.68
		C2	15	7.91	2.75	33.12
	0920	C3	2	1.24	2.52	31.11
		C3	20	3.00	2.94	33.39
	0940	C4	2	1.89	2.58	32.56
		C4	18	4.09	2.87	33.18
	1032	C5	2	1.50	2.76	31.43
		C5	22	1.22	3.71	33.38
	1120	C6	2	1.34	3.25	31.35
		C6	30	1.42	4.00	33.41
	1139	C7	2	1.14	3.42	31.40
		C7	55	0.94	4.63	33.29

SPM, TEMPERATURE AND SALINITY DATA, CRUISE 1, 13-15 MARCH 1979 (cont'd)

DATE	TIME (EST)	STATION	DEPTH (m)	CONCENTRATION (mg/l)	TEMP. (°C)	SALINITY (°/oo)
3/15/79	1211	C8	2	1.08	3.42	31.98
		C8	29	0.58	4.37	33.35
	1305	C9	2	0.94	3.05	31.78
		C9	23	0.70	4.36	33.46
	1330	B8	2	4.38	3.03	32.10
		B8	21	0.98	3.96	33.21
	1432	B7	2	1.86	--	--
		B7	21	5.36	3.56	33.24
	1457	B6	2	1.68	--	--
		B6	19	13.72	--	--
	1539	B5	2	4.06	--	--
		B5	20	4.52	--	--
	1603	B4	2	2.68	--	--
		B4	18	3.90	--	--
	1626	B3	2	2.70	--	--
		B3	16	3.28	--	--
	1640	B2	2	3.22	--	--
		B2	13	3.62	--	--
	1655	B1	12	4.80	--	--

TABLE 5. SPM, TEMPERATURE AND SALINITY DATA, CRUISE 2, 4-5 APRIL 1979

DATE	TIME (EST)	STATION	DEPTH (m)	CONCENTRATION (mg/l)	TEMP. (°C)	SALINITY (°/oo)
4/04/79	1410	A2	14	8.38	5.35	31.75
		A2	15	8.54	5.36	31.74
	1438	A3	17	3.04	5.74	31.79
	1500	A4	2	2.88	5.29	31.57
	1530	A5	2	2.48	5.08	31.61
		A5	17	4.08	5.06	31.61
	1555	A6	2	2.67	4.77	31.86
		A6	22	3.07	4.78	31.89
	1716	B2	2	7.50	5.72	31.29
		B2	14	11.03	5.71	31.30
	1759	B3	2	4.36	5.44	31.22
		B3	14	5.10	5.44	31.22
	1838	B4	2	1.74	5.10	31.28
		B4	18	2.10	5.05	31.34
	1917	B5	2	2.20	4.81	31.44
		B5	20	1.37	4.48	31.81
	1950	B6	2	1.33	4.56	31.79
		B6	21	1.87	4.26	32.05
	2056	B7	2	1.73	4.42	32.15
		B7	22	6.97	4.42	32.15
	2210	B8	2	3.37	3.97	32.30
		B8	22	3.53	3.98	32.30

SPM, TEMPERATURE AND SALINITY DATA, CRUISE 2, 4-5 APRIL 1979 (cont'd)

DATE	TIME (EST)	STATION	DEPTH (m)	CONCENTRATION (mg/l)	TEMP. (°C)	SALINITY (°/oo)
4/05/79	0201	E3	2	1.90	5.79	27.04
		E3	16	3.80	5.20	31.57
	0235	E4	2	2.23	5.08	31.82
		E4	18	2.80	5.09	31.86
	0311	E5	2	1.97	5.02	31.93
		E5	20	2.18	5.01	31.94
	0355	E6	2	0.80	5.22	32.08
		E6	23	3.40	3.81	32.51
	0428	E7	2	0.52	5.26	31.99
		E7	22	1.44	3.72	32.79
	0717	D2	2	4.20	5.64	27.55
		D2	20	2.00	5.03	31.47
	0742	D3	2	2.13	5.46	29.17
		D3	19	2.40	5.01	31.57
	0802	D4	2	0.40	5.06	31.46
		D4	18	2.17	5.02	31.64
	0827	D5	2	0.23	5.04	31.50
		D5	19	1.50	4.98	31.59
	0857	D6	2	0.97	5.00	31.66
		D6	24	1.77	4.51	32.14
	0932	D7	2	0.58	4.95	31.97
		D7	26	4.37	4.18	32.74

SPM, TEMPERATURE AND SALINITY DATA, CRUISE 2, 4-5 APRIL 1979 (cont'd)

DATE	TIME (EST)	STATION	DEPTH (m)	CONCENTRATION (mg/l)	TEMP. (°C)	SALINITY (°/oo)
4/05/79	1111	C9	2	1.40	4.26	32.33
		C9	23	3.03	4.35	32.50
	1146	C8	2	0.83	4.69	32.07
		C8	28	2.57	4.11	32.44
	1210	C7	2	0.97	4.63	32.33
		C7	42	0.90	4.12	32.59
	1240	C6	2	2.20	5.70	29.00
		C6	27	1.33	4.22	32.33
	1310	C5	2	2.70	5.32	29.91
		C5	21	2.53	4.51	32.19
	1335	C3	2	6.50	6.70	24.78
		C3	20	3.97	4.71	31.79
	1400	C2	2	4.83	5.73	30.19
		C2	15	5.27	5.29	30.81
	1425	P3	16	1.50	5.22	30.89
	1510	P4	2	3.53	5.77	29.59
		P4	14	2.20	5.17	31.07
	1640	P2	2	5.20	5.83	28.51
		P2	16	2.90	4.88	31.53
	1715	P1	2	5.27	5.33	31.46
		P1	11	2.43	5.38	31.03

TABLE 6. SPM, TEMPERATURE AND SALINITY DATA, CRUISE 4, 21-23 MAY 1979

DATE	TIME (EST)	STATION	DEPTH (m)	CONCENTRATION (mg/l)	TEMP. (°C)	SALINITY (°/oo)
5/21/79	1643	C1	2	2.16	13.79	27.36
		C1	6	2.93	12.75	29.68
		C1	12	6.36	12.22	30.49
	1713	C2	3	4.83	12.90	29.19
		C2	14	4.00	12.20	30.54
	1752	C3	2	1.13	13.10	28.76
		C3	8	4.16	12.24	30.51
		C3	18	3.57	12.00	30.60
	1845	C5	2	3.63	14.17	28.14
		C5	10	2.75	11.88	30.67
		C5	21	3.10	10.78	31.01
	1927	C6	2	0.62	13.21	30.54
		C6	13	1.22	11.67	31.10
		C6	27	2.08	10.87	31.10
	1952	C7	2	0.70	12.30	31.09
		C7	25	1.44	9.63	31.24
		C7	53	2.94	6.89	32.06
	2018	C8	2	0.40	12.78	30.94
		C8	13	1.46	11.45	30.99
		C8	28	7.86	7.91	31.66
	2049	C9	2	0.48	12.35	30.68
		C9	10	0.64	11.42	30.70

SPM, TEMPERATURE AND SALINITY DATA, CRUISE 4, 21-23 MAY 1979 (cont'd)

DATE	TIME (EST)	STATION	DEPTH (m)	CONCENTRATION (mg/l)	TEMP. (°C)	SALINITY (°/oo)
5/21/79		C9	22	3.28	11.34	30.89
	2230	D7	2	0.85	12.82	30.93
		D7	14	0.77	11.94	31.10
		D7	27	1.23	7.56	31.74
	2310	D6	2	0.47	12.98	30.62
		D6	12	0.45	12.10	30.89
		D6	24	1.76	9.20	31.36
	2354	D5	2	1.08	13.28	30.54
		D5	10	1.52	13.01	30.52
		D5	19	1.24	12.40	30.62
5/22/79	0028	D4	2	0.76	13.71	30.48
		D4	9	0.80	12.97	30.65
		D4	18	2.22	12.44	30.73
	0050	D3	2	2.86	13.40	29.99
		D3	9	5.66	12.88	30.75
		D3	19	4.26	12.46	30.77
	0109	D2	2	7.13	13.78	29.26
		D2	9	1.53	12.62	30.61
		D2	18	2.33	12.36	30.77
		D2	9	1.00	---	---
	2125	B1	2	1.64	114.41	30.15
	2139	B2	2	1.14	14.12	30.40

SPM, TEMPERATURE AND SALINITY DATA, CRUISE 4, 21-23 MAY 1979 (cont'd)

DATE	TIME (EST)	STATION	DEPTH (m)	CONCENTRATION (mg/l)	TEMP. (°C)	SALINITY (°/oo)
		B2	6	3.22	13.75	30.38
		B2	13	12.19	12.57	30.58
	2201	B3	2	1.14	13.58	30.44
		B3	7	13.78	13.59	30.43
		B3	15	1.56	12.28	30.51
	2245	B5	2	0.86	12.71	30.31
		B5	9	1.12	12.38	30.37
		B5	19	2.88	11.46	30.58
	2311	B6	2	0.92	12.44	30.26
		B6	10	1.20	12.10	30.43
		B6	20	13.86	11.53	30.57
	2349	B7	2	1.28	12.31	30.09
		B7	11	1.54	11.34	30.29
		B7	21	1.92	10.10	30.94
5/23/79	0025	B8	2	0.71	11.78	30.52
		B8	10	0.77	10.03	31.00
		B8	21	0.99	9.03	31.20
	0246	P4	2	2.48	14.43	28.57
		P4	8	1.60	12.81	30.15
	0348	P3	2	3.26	14.28	27.47
		P3	7	2.02	12.76	29.97
		P3	15	1.62	12.15	30.58

SPM, TEMPERATURE AND SALINITY DATA, CRUISE 4, 21-23 MAY 1979 (cont'd)

DATE	TIME (EST)	STATION	DEPTH (m)	CONCENTRATION (mg/l)	TEMP. (°C)	SALINITY (°/oo)
5/23/79		P4	17	4.78	12.31	30.49
	0431	C2	2	3.14	14.48	27.74
		C2	8	1.54	12.48	30.18
		C2	16	3.20	12.09	30.57
	0525	P5	2	2.15	14.16	28.19
		P5	6	1.94	12.58	29.96
		P5	15	2.52	11.28	30.78
	0600	P2	2	2.90	14.12	27.53
		P2	8	2.12	12.79	29.44
		P2	14	3.98	11.50	30.75
	0635	P1	2	3.74	14.65	26.59
		P1	5	4.06	13.26	28.43
		P1	11	8.56	11.94	30.41
	1516	A6	2	0.82	12.35	30.01
		A6	11	1.38	10.88	30.25
		A6	20	8.16	10.44	30.79
	1540	A5	2	2.34	12.79	29.95
		A5	7	1.26	12.75	29.96
		A5	15	4.86	10.92	30.18
	1610	A4	2	1.71	12.75	29.96
		A4	8	1.18	12.40	29.98
		A4	16	8.52	10.82	30.22

SPM, TEMPERATURE AND SALINITY DATA, CRUISE 4, 21-23 MAY 1979 (cont'd)

DATE	TIME (EST)	STATION	DEPTH (m)	CONCENTRATION (mg/l)	TEMP. (°C)	SALINITY (°/oo)
5/23/79	1625	A3	2	1.06	12.86	29.94
		A3	10	1.94	11.17	30.09
		A3	19	11.14	10.83	30.19
	1643	A2	2	1.18	---	---
		A2	7	2.20	---	---
		A2	13	3.93	---	---
	1658	A1	2	1.44	---	---
		A1	6	1.58	---	---
		A1	12	4.68	---	---

TABLE 7. SPM DATA, CRUISE 5, 10-11 JUNE 1979

DATE	TIME (EST)	STATION	DEPTH (m)	CONCENTRATION (mg/l)
6/10/79	2130	E2	2	1.12
		E2	6	1.36
		E2	11	1.50
	2154	E3	2	1.20
		E3	8	1.20
		E3	16	1.52
	2220	E4	2	0.94
		E4	9	1.18
		E4	18	1.04
	2243	E5	2	0.83
		E5	10	1.34
		E5	21	0.80
	2341	E7	2	0.58
		E7	12	0.80
		E7	24	0.76
6/11/79	0131	D7	2	0.74
		D7	13	0.80
		D7	27	1.48
	0228	D5	2	0.94
		D5	10	0.72
		D5	20	1.02
	0256	D4	2	1.00

SPM DATA, CRUISE 5, 10-11 JUNE 1979 (cont'd)

DATE	TIME (EST)	STATION	DEPTH (m)	CONCENTRATION (mg/l)
6/11/79		D4	10	1.06
		D4	19	0.88
	0314	D3	2	1.24
		D3	9	0.94
		D3	18	1.10
	0339	D2	2	1.80
		D2	7	1.80
		D2	15	4.26
	0422	P4	2	0.96
		P4	8	0.84
		P4	17	1.22
	0503	P3	2	1.16
		P3	8	1.82
		P3	16	1.34
	0553	P2	2	1.98
		P2	7	1.48
		P2	14	5.66
	0623	P1	2	2.20
		P1	5	1.72
		P1	10	2.40
	0725	C2	2	1.22
		C2	6	1.10

SPM DATA, CRUISE 5, 10-11 JUNE 1979 (cont'd)

DATE	TIME (EST)	STATION	DEPTH (m)	CONCENTRATION (mg/l)
6/11/79		C2	13	1.76
	0747	C3	2	0.96
		C3	9	1.34
		C3	19	1.58
	0809	C5	2	1.04
		C5	10	0.84
		C5	21	1.08
	0837	C6	2	1.44
		C6	14	0.88
		C6	28	1.08
	0858	C7	2	0.94
		C7	26	1.44
		C7	54	2.26
	0924	C8	2	1.18
		C8	12	0.70
		C8	26	0.88
	0951	C9	2	1.02
		C9	11	0.74
		C9	23	0.78
	1019	B8	2	0.94
		B8	12	0.72
		B8	23	0.82

SPM DATA, CRUISE 5, 10-11 JUNE 1979 (cont'd)

DATE	TIME (EST)	STATION	DEPTH (m)	CONCENTRATION (mg/l)
6/11/79	1052	B7	2	1.84
		B7	10	0.66
		B7	21	1.48
	1118	B6	2	1.80
		B6	10	1.26
		B6	20	0.88
	1143	B5	2	1.02
		B5	10	1.32
		B5	19	1.60
	1200	B4	2	1.30
		B4	8	1.12
		B4	16	1.44
	1234	B3	2	1.34
		B3	8	1.62
		B3	16	1.72
	1250	B2	2	1.80
		B2	5	1.70
		B2	10	1.72
	1303	B1	2	2.16
		B1	4	1.04
		B1	8	2.12
		A6	2	1.06

SPM DATA, CRUISE 5, 10-11 JUNE 1979 (cont'd)

DATE	TIME (EST)	STATION	DEPTH (m)	CONCENTRATION (mg/l)
6/11/79	1423	A6	9	1.04
		A6	18	1.28
	1444	A5	2	0.70
		A5	8	0.78
		A5	16	1.64
	1455	A4	2	0.86
		A4	7	0.68
		A4	14	1.28
	1516	A3	2	0.76
		A3	8	0.96
		A3	17	3.66
	1531	A2	2	1.08
		A2	5	1.02
		A2	10	5.30

TABLE 8. SPM, TEMPERATURE AND SALINITY DATA, CRUISE 6, 29-30 JUNE 1979

DATE	TIME (EST)	STATION	DEPTH (m)	CONCENTRATION (mg/l)	TEMP. (°C)	SALINITY (°/oo)
6/29/79	0600	E2	2	2.22	18.64	30.36
		E2	10	6.44	11.30	31.40
	0634	E3	2	2.02	18.87	30.79
		E3	15	1.82	9.83	31.65
	0657	E4	2	1.53	19.06	30.74
		E4	18	2.44	8.51	31.88
	0722	E5	2	0.87	19.08	30.80
		E5	19	1.71	8.08	31.97
	0807	E6	2	0.60	19.17	30.78
		E6	24	1.22	7.70	32.16
	0836	E7	2	0.53	19.86	31.01
		E7	23	1.37	8.87	32.12
	1028	D7	2	0.67	19.31	30.46
		D7	28	0.87	7.65	32.42
	1103	D6	2	0.95	19.15	30.65
		D6	25	1.37	7.65	32.17
	1143	D5	2	0.84	19.24	30.16
		D5	19	1.10	8.08	32.02
	1222	D4	2	1.05	19.07	30.26
		D4	20	1.34	8.35	32.02
	1246	D3	2	1.39	18.73	30.40
		D3	20	1.25	8.67	31.86

SPM, TEMPERATURE AND SALINITY DATA, CRUISE 6, 29-30 JUNE 1979 (cont'd)

DATE	TIME (EST)	STATION	DEPTH (m)	CONCENTRATION (mg/l)	TEMP. (°C)	SALINITY (°/oo)
6/29/79	1310	D2	2	2.24	18.87	30.53
		D2	16	1.59	9.64	31.64
	1355	P4	2	1.30	18.05	30.43
		P4	13	2.17	10.14	31.59
	1436	P3	2	1.55	19.03	30.35
		P3	15	1.40	10.65	31.66
	1541	P2	2	1.79	17.87	29.94
		P2	13	2.22	12.77	31.41
	1605	P1	2	3.89	17.83	28.88
		P1	11	3.06	15.08	29.97
	1712	C2	2	2.00	17.90	29.79
		C2	11	1.64	12.35	31.27
	1734	C3	2	1.52	18.50	30.47
		C3	17	1.35	10.66	31.68
	1751	C4	2	1.14	18.84	30.48
		C4	18	1.20	10.31	31.77
	1809	C5	2	1.17	19.16	30.43
		C5	20	0.89	9.98	31.81
	1832	C6	2	1.04	18.99	30.19
		C6	25	1.62	8.32	32.34
	1900	C7	2	1.35	18.62	29.71
		C7	49	0.94	---	---

SPM, TEMPERATURE AND SALINITY DATA, CRUISE 6, 29-30 JUNE 1979 (cont'd)

DATE	TIME (EST)	STATION	DEPTH (m)	CONCENTRATION (mg/l)	TEMP. (°C)	SALINITY (°/oo)
6/29/79	1922	C8	2	1.45	18.75	29.63
		C8	27	2.14	8.82	32.42
	1956	C9	2	1.69	18.66	29.55
		C9	24	0.95	9.48	32.22
	2025	B8	2	1.75	18.12	30.03
		B8	24	5.06	9.75	31.88
	2057	B7	2	0.95	18.41	30.56
		B7	21	1.97	10.24	31.87
	2138	B6	2	1.04	17.90	31.16
		B6	21	1.90	11.04	31.83
	2159	B5	2	0.87	18.37	31.05
		B5	19	1.32	13.96	31.63
	2220	B4	2	1.87	18.42	31.22
		B4	17	0.77	13.92	31.63
	2244	B3	2	1.35	19.02	30.41
		B3	14	3.17	15.22	31.48
	2302	B2	2	1.37	19.57	30.46
		B2	10	7.01	17.64	31.32
6/30/79	0034	A1	2	2.51	18.72	31.27
		A1	12	8.66	15.92	31.37
	0055	A2	2	1.49	18.52	31.26
		A2	13	2.35	15.21	31.44

SPM, TEMPERATURE AND SALINITY DATA, CRUISE 6, 29-30 JUNE 1979 (cont'd)

DATE	TIME (EST)	STATION	DEPTH (m)	CONCENTRATION (mg/l)	TEMP. (°C)	SALINITY (°/oo)
6/30/79	0121	A3	2	0.87	18.57	31.33
		A3	17	2.75	13.56	31.67
	0142	A4	2	1.51	18.44	31.28
		A4	17	1.22	14.42	31.59
	0203	A5	2	0.93	18.39	31.24
		A5	19	4.17	13.29	31.75
	0237	A6	2	0.62	18.23	31.15
		A6	21	2.71	12.54	31.89

TABLE 9. SPM, TEMPERATURE AND SALINITY DATA, CRUISE 7, 1-2 AUGUST 1979

DATE	TIME (EST)	STATION	DEPTH (m)	CONCENTRATION (mg/l)	TEMP. (°C)	SALINITY (°/oo)
8/01/79	1822	C9	2	0.08	25.66	30.81
		C9	23	1.03	13.40	31.75
	1910	C8	2	0.07	25.26	30.69
		C8	27	0.92	12.45	31.91
	1949	C7	2	0.17	25.07	30.50
		C7	54	0.50	---	---
	2035	C6	2	0.43	24.76	30.05
		C6	26	1.00	12.09	32.05
	2109	C5	2	0.32	24.94	29.41
		C5	22	2.15	12.67	31.98
	2137	C4	2	0.80	24.60	29.40
		C4	20	1.23	13.38	31.86
	2203	C3	2	0.41	24.19	29.45
		C3	19	1.93	13.74	31.79
	2238	C2	2	0.70	---	---
		C2	12	5.33	---	---
8/02/79	0030	D3	2	0.87	22.77	30.80
		D3	22	1.80	12.12	31.93
	0058	D4	2	0.70	24.60	30.55
		D4	21	1.43	12.26	32.01
	0126	D5	2	1.57	24.64	30.81
		D5	21	1.20	11.69	32.04

SPM, TEMPERATURE AND SALINITY DATA, CRUISE 7, 1-2 AUGUST 1979 (cont'd)

DATE	TIME (EST)	STATION	DEPTH (m)	CONCENTRATION (mg/l)	TEMP. (°C)	SALINITY (°/oo)
8/02/79	0204	D6	2	0.33	25.22	30.82
		D6	27	1.57	10.73	32.12
	0243	D7	2	0.18	23.08	31.24
		D7	28	1.28	10.44	32.37
	0455	E7	2	0.23	25.57	30.63
		E7	15	0.23	16.00	31.84
	0531	E6	25	0.50	25.58	30.65
	0617	E5	2	0.22	25.00	30.38
		E5	21	1.25	10.92	32.03
	0701	E4	2	0.48	24.93	30.58
		E4	19	0.97	11.58	31.93
	0730	E3	2	0.52	24.57	30.52
		E3	15	0.58	13.45	31.75
	0757	E2	2	0.66	22.68	30.70
		E2	12	1.66	14.56	31.50
	0813	E1	2	1.20	22.73	30.63
		E1	10	1.47	15.04	31.45
	1043	P4	2	0.32	24.87	30.01
		P4	18	0.68	14.29	31.83
	1144	P3	2	0.50	24.70	30.47
		P3	17	0.75	13.99	31.79
	1242	P2	2	0.43	23.22	29.74

SPM, TEMPERATURE AND SALINITY DATA, CRUISE 7, 1-2 AUGUST 1979 (cont'd)

DATE	TIME (EST)	STATION	DEPTH (m)	CONCENTRATION (mg/l)	TEMP. (°C)	SALINITY (°/oo)
8/02/79		P2	16	2.63	14.29	31.71
	1310	P1	2	2.59	22.76	28.46
		P1	12	3.28	16.19	31.22
	1509	B8	2	0.30	26.09	30.82
		B8	25	0.68	12.67	31.87
	1545	B7	2	0.48	25.33	30.32
		B7	21	0.78	13.28	31.78
	1620	B6	2	2.18	23.22	29.12
	1646	B5	2	0.93	24.40	29.66
		B5	21	0.43	14.36	31.60
	1707	B4	2	0.75	22.41	30.77
		B4	19	0.62	14.58	31.57
	1733	B3	2	0.70	25.09	29.98
		B3	16	2.40	15.89	31.41
	1751	B2	2	0.88	20.83	30.71
		B2	13	5.08	16.32	31.36
	1805	B1	2	0.72	21.63	30.60
		B1	11	4.55	16.59	31.33
	1938	A2	2	1.33	23.67	30.73
		A2	13	4.79	16.92	31.28
	2005	A3	2	0.43	22.06	30.75
		A3	19	2.36	15.39	31.42

SPM, TEMPERATURE AND SALINITY DATA, CRUISE 7, 1-2 AUGUST 1979 (cont'd)

DATE	TIME (EST)	STATION	DEPTH (m)	CONCENTRATION (mg/l)	TEMP. (°C)	SALINITY (°/oo)
8/02/79	2024	A4	2	1.37	23.10	30.78
		A4	15	1.40	15.28	31.43
	2044	A5	2	1.13	24.52	30.50
		A5	19	1.00	15.45	31.40
	2111	A6	2	0.43	24.07	30.67
		A6	21	0.25	14.80	31.62

TABLE 10. SPM, TEMPERATURE AND SALINITY DATA, CRUISE 8, 5-7 SEPTEMBER 1979

DATE	TIME (EST)	STATION	DEPTH (m)	CONCENTRATION (mg/l)	TEMP. (°C)	SALINITY (°/oo)
9/05/79	1341	C1	2	10.17	23.02	29.19
		C1	4	2.67	22.10	29.39
		C1	9	1.49	20.52	30.37
	1411	C2	2	2.30	23.06	29.37
		C2	6	1.49	20.85	29.89
		C2	12	7.27	18.11	31.58
	1442	C3	2	1.69	20.99	29.86
		C3	9	0.76	19.46	31.61
		C3	18	1.72	16.38	32.16
	1553	C4	2	1.58	22.28	29.83
		C4	8	0.58	18.98	31.83
		C4	18	0.93	15.71	32.28
	1623	C5	2	0.55	22.98	29.56
		C5	9	0.10	19.42	32.00
		C5	19	0.85	15.73	32.24
	1701	C6	2	0.32	22.85	31.19
		C6	10	0.24	19.91	32.14
		C6	25	1.09	13.84	32.23
	1730	C7	2	0.25	23.03	31.46
		C7	18	0.23	18.09	32.92
		C7	47	0.58	---	---

SPM, TEMPERATURE AND SALINITY DATA, CRUISE 8, 5-7 SEPTEMBER 1979 (cont'd)

DATE	TIME (EST)	STATION	DEPTH (m)	CONCENTRATION (mg/l)	TEMP. (°C)	SALINITY (°/oo)
9/05/79	1806	C8	2	0.79	23.24	31.42
		C8	17	0.46	18.64	32.33
		C8	26	1.07	17.07	32.81
	1842	C9	2	0.56	23.55	31.37
		C9	12	0.30	20.92	31.66
		C9	24	1.67	18.09	32.67
	2041	D7	2	0.33	22.78	31.30
		D7	14	0.37	19.04	32.33
		D7	28	9.96	11.94	32.62
	2128	D6	2	0.36	22.55	31.34
		D6	12	0.36	19.59	32.19
		D6	25	5.46	13.18	32.61
	2206	D5	2	0.31	22.37	31.34
		D5	8	0.47	18.82	32.02
		D5	19	5.78	15.09	32.57
	2247	D4	2	0.34	22.12	31.27
		D4	10	0.73	18.23	31.90
		D4	19	6.98	15.91	32.59
	2314	D3	2	0.33	22.56	30.99
		D3	11	0.53	17.58	32.11
		D3	19	6.90	15.86	32.40
9/06/79	0140	E4	2	0.54	20.12	31.59

SPM, TEMPERATURE AND SALINITY DATA, CRUISE 8, 5-7 SEPTEMBER 1979 (cont'd)

DATE	TIME (EST)	STATION	DEPTH (m)	CONCENTRATION (mg/l)	TEMP. (°C)	SALINITY (°/oo)
9/06/79		E4	6	0.56	20.02	31.61
		E4	17	2.00	15.46	32.08
	1710	D7	2	3.38	18.82	32.16
		D7	28	12.83	11.22	32.59
	1804	D6	2	0.48	19.06	32.17
		D6	26	17.08	12.74	32.64
	1842	D5	2	0.78	19.05	32.21
		D5	19	7.84	14.66	32.63
	2015	D2	2	2.32	18.73	31.78
		D2	16	4.64	---	---
	2042	D3	2	1.30	19.07	31.72
		D3	21	7.72	16.99	32.27
	2108	D4	2	1.32	19.41	31.71
		D4	20	7.06	16.45	32.46
	2333	P2	2	2.50	21.41	29.99
		P2	12	6.08	17.65	31.92
9/07/79	0012	P1	2	3.35	21.03	30.11
		P1	10	5.24	19.18	31.07
	0102	C2	2	3.62	20.44	31.29
		C2	13	3.90	16.73	32.08
	0124	C3	2	2.24	21.08	30.86
		C3	13	3.20	17.27	32.01

SPM, TEMPERATURE AND SALINITY DATA, CRUISE 8, 5-7 SEPTEMBER 1979 (cont'd)

DATE	TIME (EST)	STATION	DEPTH (m)	CONCENTRATION (mg/l)	TEMP. (°C)	SALINITY (°/oo)
9/07/79	0142	C4	2	4.61	21.18	30.81
		C4	16	0.94	16.21	32.21
	0218	C5	2	1.60	21.15	30.35
		C5	19	9.62	16.62	31.95
	0247	C6	2	2.16	21.08	29.96
		C6	24	7.44	15.31	32.32
	0325	C7	2	2.02	20.26	30.88
		C7	20	2.20	17.96	32.08
	0358	C8	2	1.10	19.81	31.02
		C8	25	3.76	13.23	32.68
	0431	C9	2	0.72	19.45	31.55
		C9	22	10.63	14.73	32.59
	0629	A6	2	0.62	21.13	31.76
		A6	20	25.43	17.85	32.13
	0655	A5	2	9.20	21.00	31.75
		A5	18	2.58	19.69	31.90
	0713	A4	2	3.76	21.04	31.75
		A4	15	10.18	19.69	31.88
	0754	A2	2	5.72	21.82	31.46
		A2	12	4.68	21.08	31.75
	1058	B1	2	8.77	22.35	31.34
		B1	11	35.17	21.10	31.89

SPM, TEMPERATURE AND SALINITY DATA, CRUISE 8, 5-7 SEPTEMBER 1979 (cont'd)

DATE	TIME (EST)	STATION	DEPTH (m)	CONCENTRATION (mg/l)	TEMP. (°C)	SALINITY (°/oo)
9/07/79	1159	B4	18	10.20	20.01	31.99
	1227	B5	19	5.18	16.57	32.20
	1242	B6	19	12.10	17.64	32.19

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