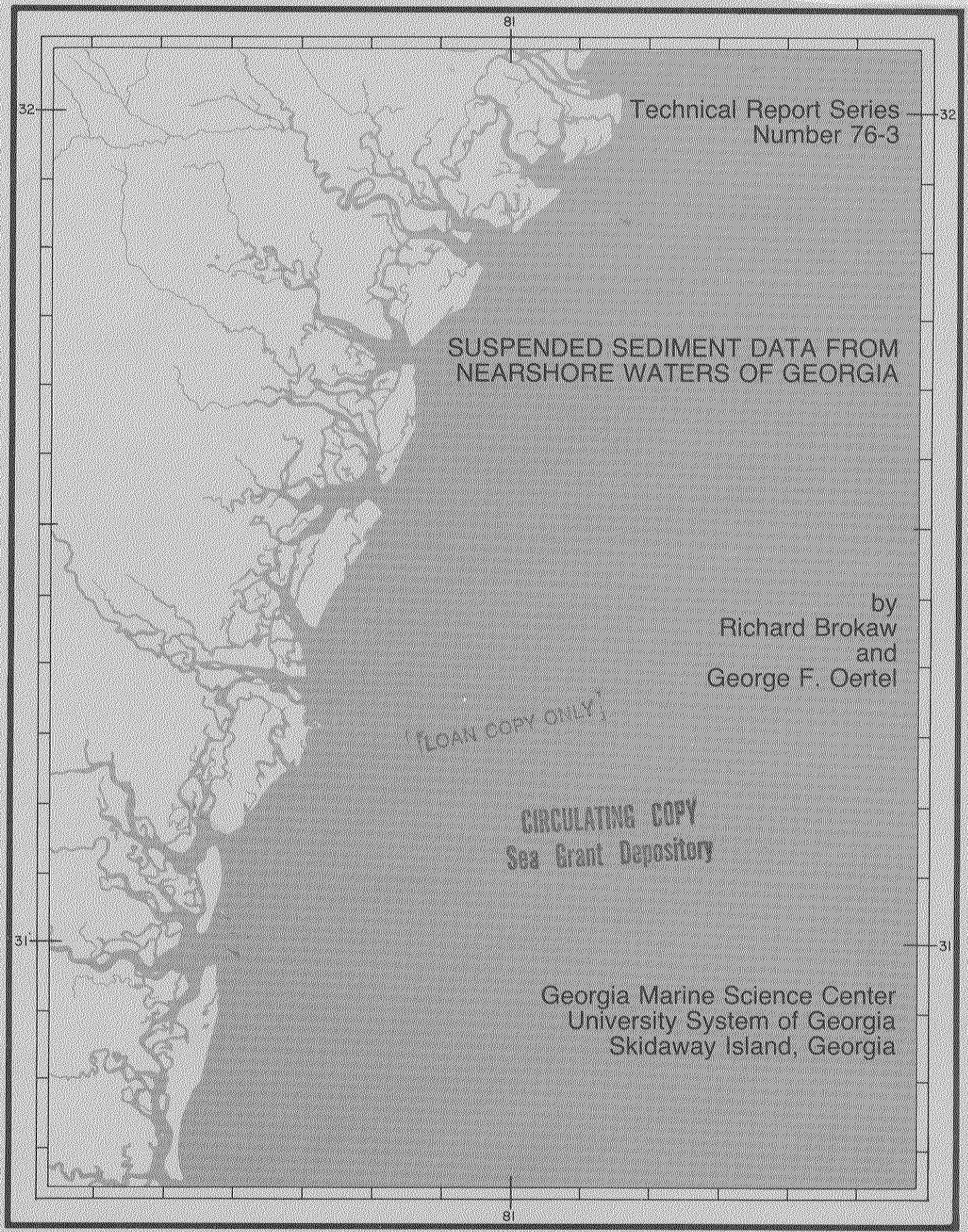


Technical Report Series
Number 76-3

SUSPENDED SEDIMENT DATA FROM NEARSHORE WATERS OF GEORGIA

by
Richard Brokaw
and
George F. Oertel

Georgia Marine Science Center
University System of Georgia
Skidaway Island, Georgia

OCEAN ATLAS SERIES

"SUSPENDED SEDIMENT DATA FROM NEARSHORE WATERS OF GEORGIA"

Richard Brokaw

and

George F. Oertel

Skidaway Institute of Oceanography
P.O. Box 13687
Savannah, Georgia 31406

The Technical Report Series of the Georgia Marine Science Center is issued by the Georgia Sea Grant Program and the Marine Extension Service of the University of Georgia on Skidaway Island (P.O. Box 13687, Savannah, Georgia 31406). It was established to provide dissemination of technical information and progress reports resulting from marine studies and investigations mainly by staff and faculty of the University System of Georgia. In addition, it is intended for the presentation of techniques and methods, reduced data and general information of interest to industry, local, regional, and state governments and the public. Information contained in these reports is in the public domain. If this prepublication copy is cited, it should be cited as an unpublished manuscript.

INTRODUCTION

The nearshore water of the Georgia Bight is very turbid relative to other areas of the east coast (Manheim, Meade and Bond, 1970, Oertel, 1976). The turbidity of the waters is documented through a variety of different oceanographic projects, some of which were oriented toward biologic, physical, chemical or geologic investigations. Because of this variety some of the data are not always comparable. Characterization of clays from the coastal plain is discussed by Bigham, 1972, Heron, Johnson, Wilson and Michael, 1964, Meade 1969, Manheim, Meade and Bond, 1970, Neiheisel and Weaver, 1967, and Oertel, 1976. This technical report is a summary of recent suspended sediment data collected from nearshore waters of Georgia. No attempt is made to interpret the mechanics of suspended sediment transport or the processes controlling its distribution.

Data that was collected from various sources are presented in atlas form. The study area extended from Cape Romain, South Carolina to Jacksonville, Florida. Data recovery within this area was restricted to projects that were predominantly located within the nearshore zone (0-40 km offshore). Several samples that were not included were part of estuarine sampling programs or shelf and gulf water sampling programs. A more complete description of these data may be found in the literature of the bibliography.

FIGURE 1

Satellite photography of the Georgia Bight illustrates the large loads of suspended sediment in nearshore water between Jacksonville, Florida and Cape Romain, South Carolina. Plumes from numerous coastal inlets appear to merge in the nearshore zone and form a turbid band.

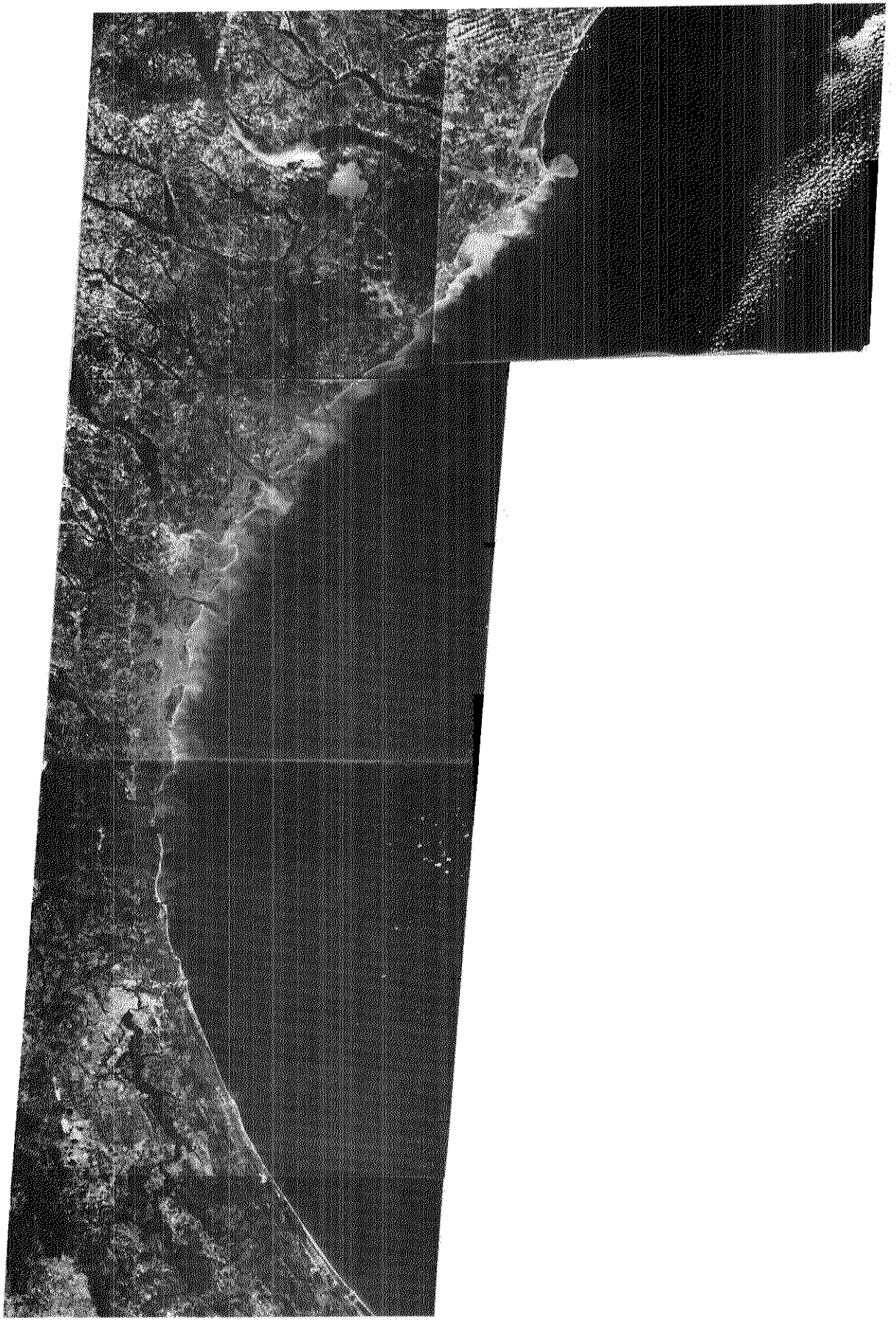


FIGURE 2

Satellite photography of the Georgia coast illustrates the distribution of various field sampling programs with respect to the apparent position of the turbid zone.

FIGURE 3

Map of station locations for six different sampling programs with principal investigators and sampling periods indicated.

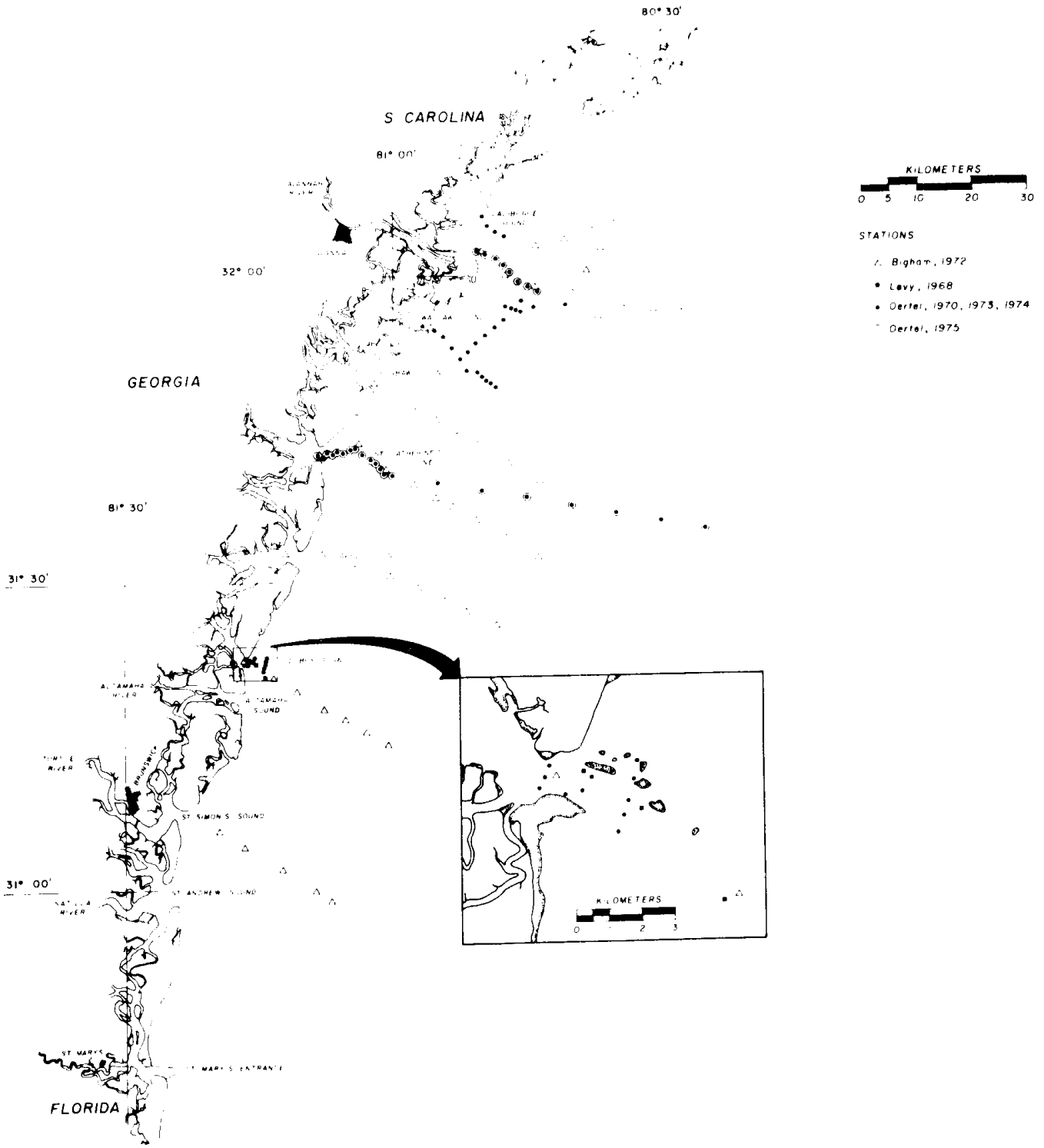
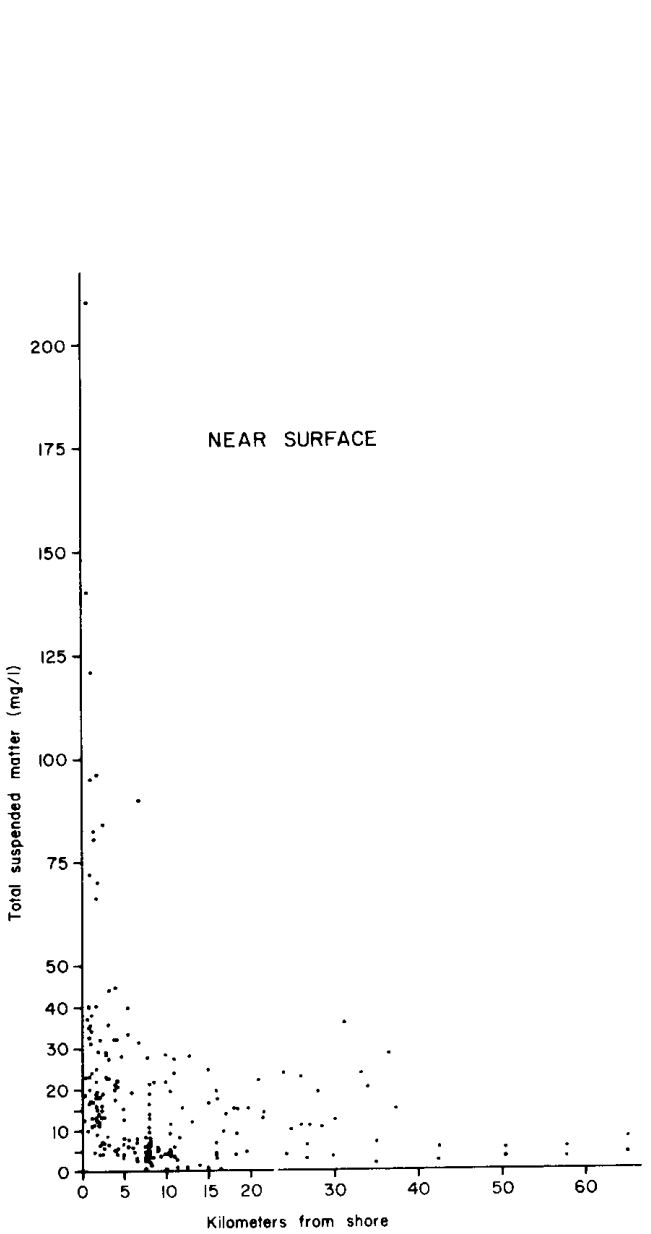

80° 30'
S CAROLINA
81° 00'
32° 00'
GEORGIA
81° 30'
31° 30'
31° 00'
FLORIDA
KILOMETERS
0 5 10 20 30
STATIONS
Bigham, 1972
Levy, 1968
Oertel, 1970, 1973, 1974
Oertel, 1975
KILOMETERS
0 2 3

FIGURE 4

Graphs showing the total concentrations of 490 samples relative to depth and distance from shore. The high concentrations were generally located very close to shore, whereas offshore stations generally had very low concentrations. The moderately highly concentrations in the mid distances (20-35 kilometers) are from the Bigham data.


NEAR SURFACE
Total suspended matter (mg/l)
200
175
150
125
100
75
50
40
30
20
10
0
0 5 10 15 20 30 40 50 60
Kilometers from shore

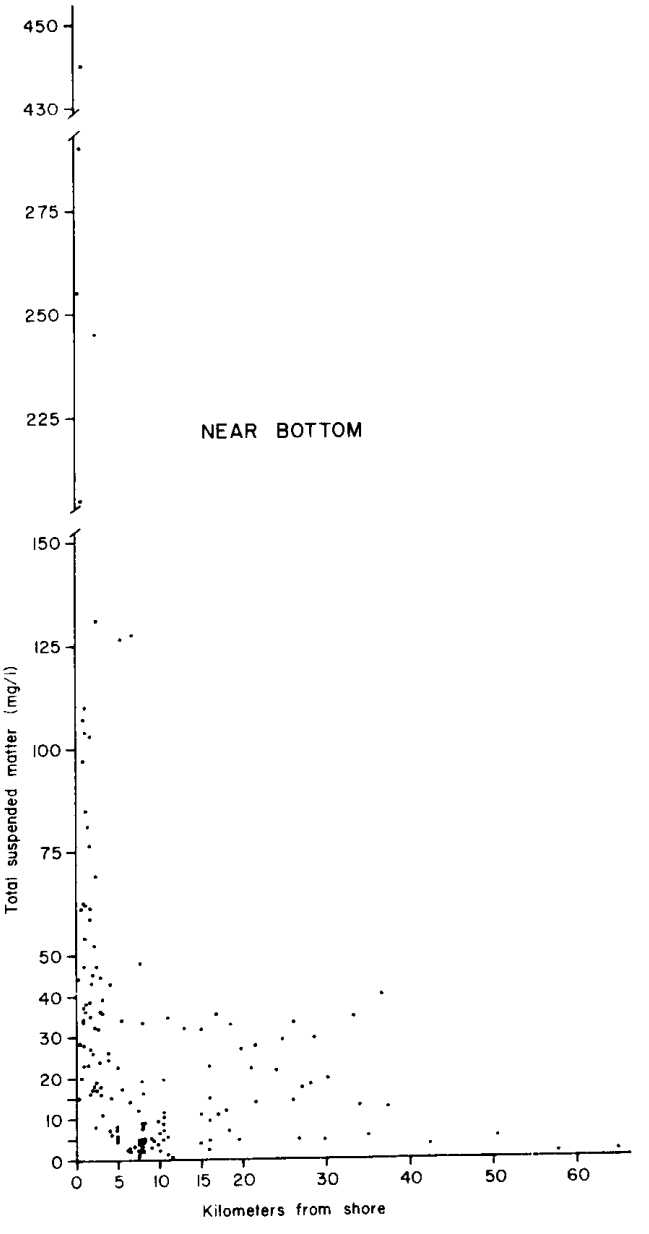

NEAR BOTTOM
Total suspended matter (mg/l)
450
430
275
250
225
150
125
100
75
50
40
30
20
10
0
0 5 10 15 20 30 40 50 60
Kilometers from shore

FIGURE 5

Histograms of the percent organic material collected during monthly sampling periods. These histograms illustrate the percentage of organics for actual samples, as well as the mean and standard deviation for the number taken in a given month. While data points are also affected by their relative distances from the shore, it appears that a higher percentage of organics was present in the summer months (June, July and September) than was present during the winter (November, December, February, March).

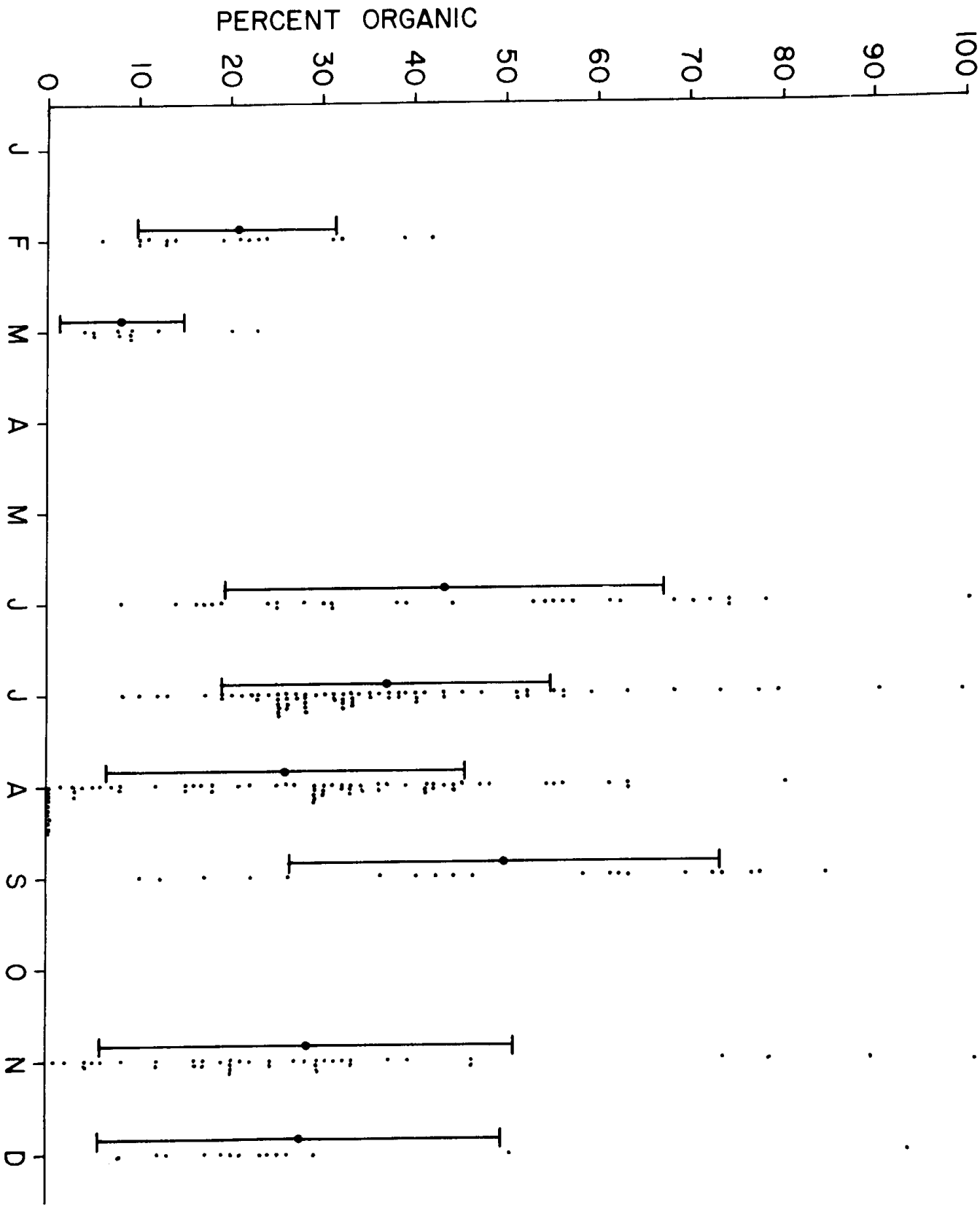

PERCENT ORGANIC
0
10
20
30
40
50
60
70
80
90
100
J
F
M
A
M
J
J
A
S
O
N
D

FIGURE 6

Transect extending seaward from St. Catherines inlet illustrating the surface concentrations of suspended sediment between the inlet and a point 80 km offshore. The distal shoals of the ebb delta are located approximately 10 km seaward of the inlet. Concentrations decrease rapidly and continuously between the inlet throat and the distal shoals. Seaward of the distal shoals, concentrations are low and relatively constant.

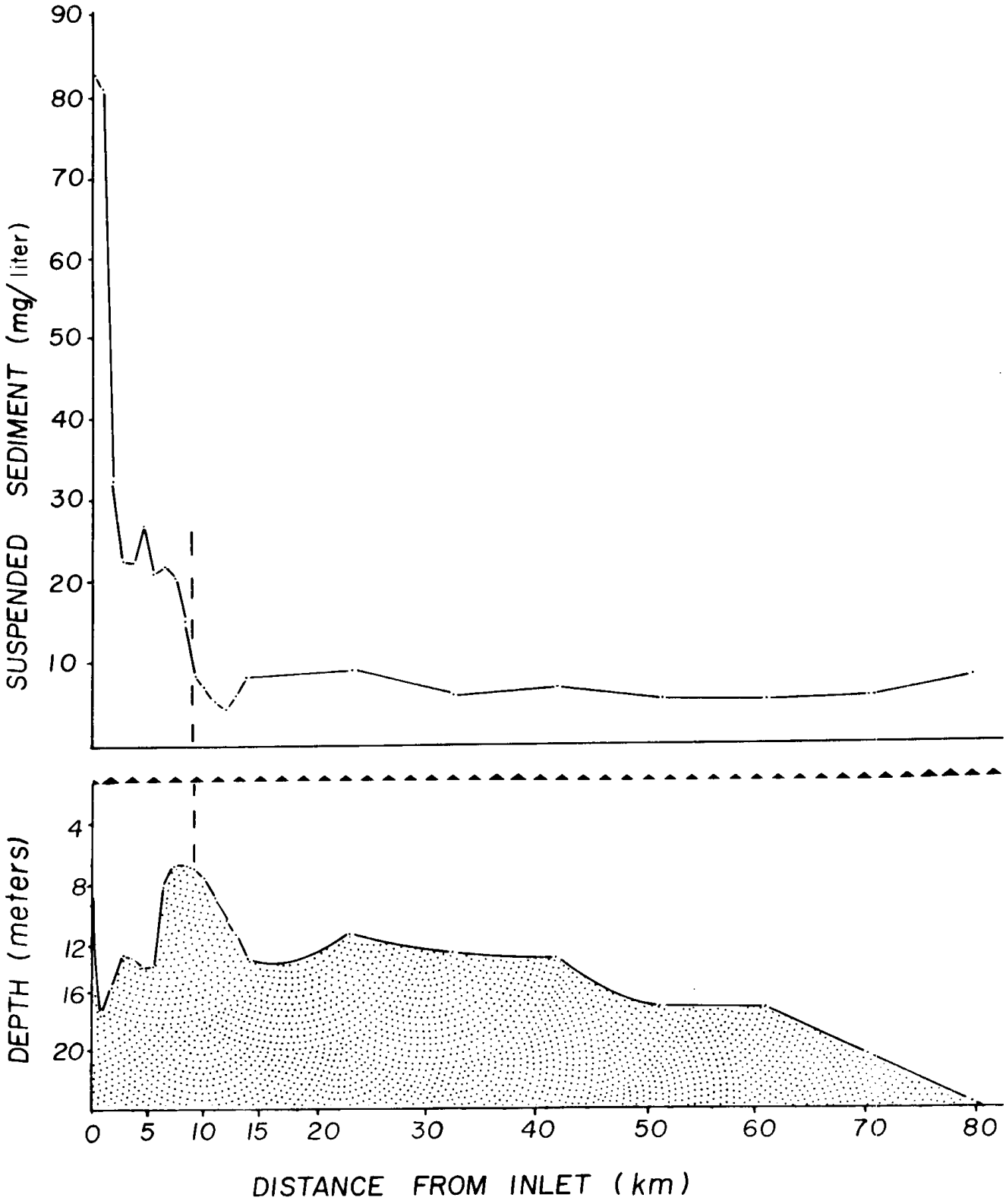

SUSPENDED SEDIMENT (mg/liter)
90
80
70
60
50
40
30
20
10
DEPTH (meters)
4
8
12
16
20
0
5
10
15
20
30
40
50
60
70
80
DISTANCE FROM INLET (km)

FIGURE 7

Transects extending seaward from St. Catherines inlet illustrating the relative organic and inorganic percentages of surface samples. The percentage of inorganic matter was greatest near the inlet throat, and decreased in a seaward direction. The percentages of organic and inorganic material were approximately equal above the distal shoals of the ebb delta. Seaward of the distal shoals the organic fraction increased slowly and continuously and comprised approximately 80 percent of the sample 80 km (43.2 miles) from the inlet.

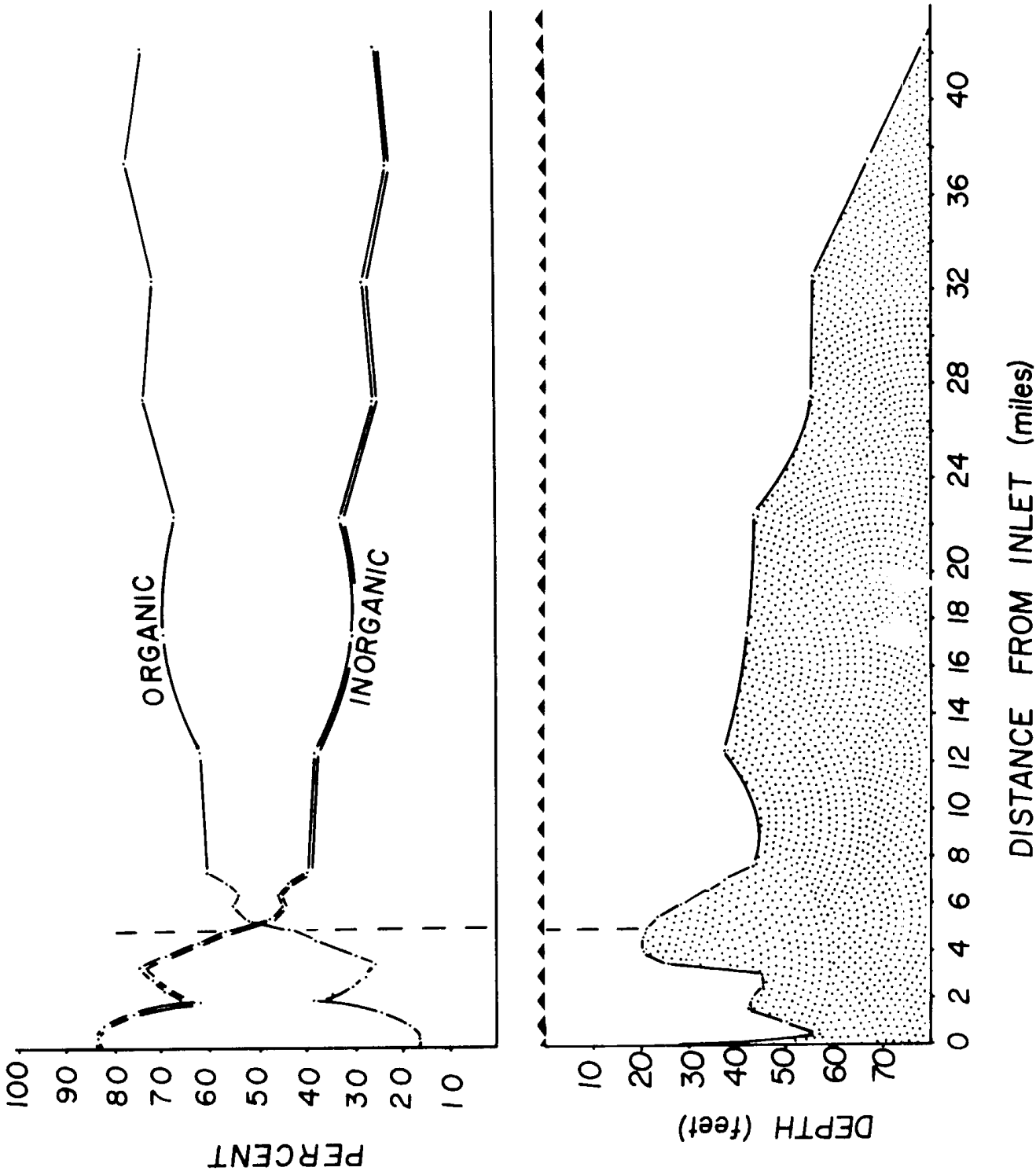
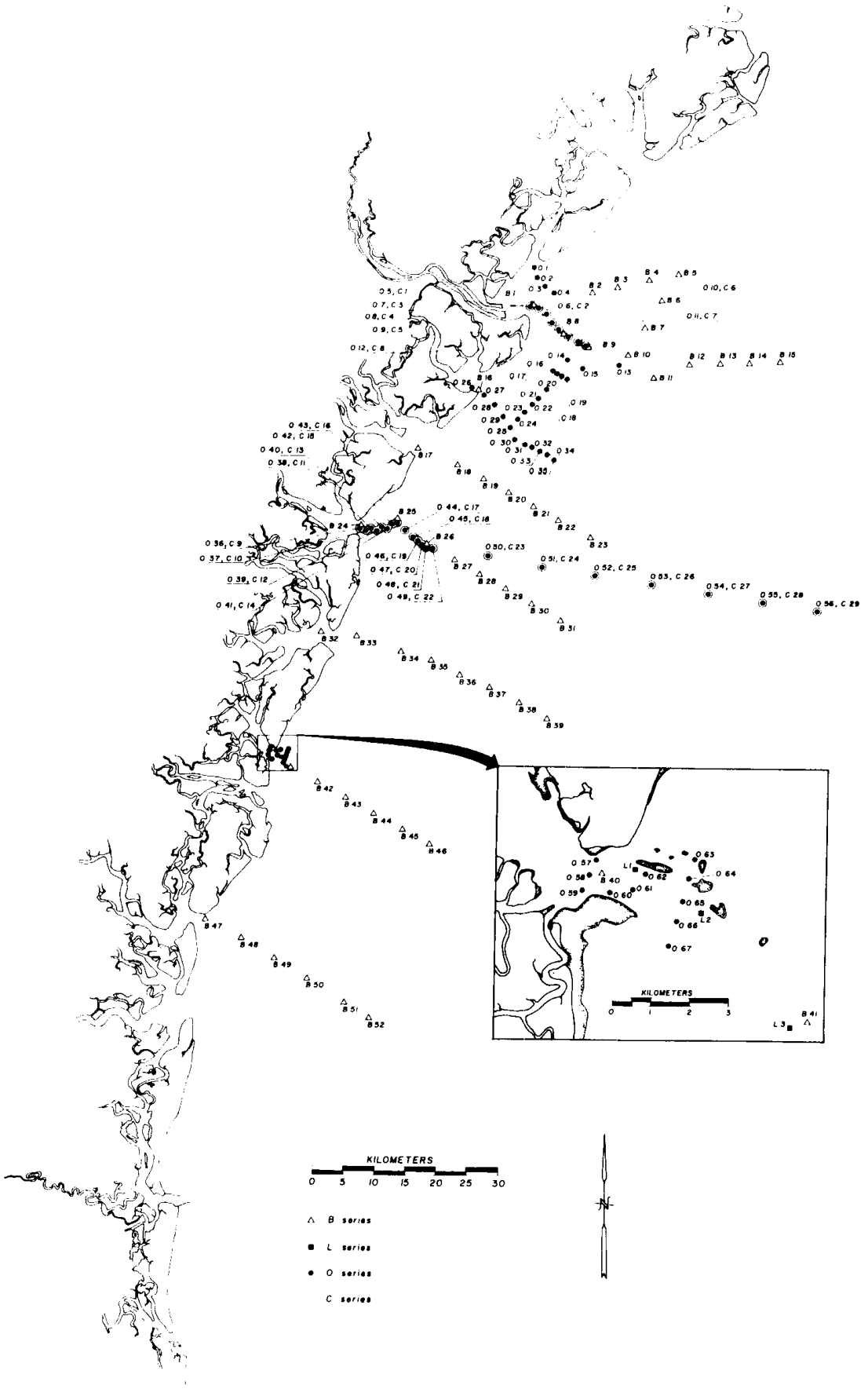

PERCENT
100
90
80
70
60
50
40
30
20
10
ORGANIC
INORGANIC
DEPTH (feet)
10
20
30
40
50
60
70
0 2 4 6 8 10 12 14 16 18 20 24 28 32 36 40
DISTANCE FROM INLET (miles)

FIGURE 8

Location map of all suspended sediment sample stations. Data for all of the stations are tabulated in the appendix.


KILOMETERS
0 5 10 15 20 25 30
B series
L series
O series
C series
KILOMETERS
0 1 2 3

CONCLUSIONS

1. Satellite photography illustrates that a band of turbid water exists between Cape Romain, South Carolina and Jacksonville, Florida.

2. The band is widest adjacent to the Savannah River entrance and attenuates towards the south near Jacksonville, Florida and towards the north near Cape Romain, South Carolina.

3. The concentration of suspended sediment in the band is areally

4. Concentrations of suspended sediment are highest adjacent to the shoreline and lowest offshore.

5. The concentration of organic matter suspended in the water column may be higher in the summer and early fall than it is during the remainder of the year.

6. The percentage of inorganic vs. organic material is higher landward of the tidal deltas than it is seaward of the tidal deltas.

ACKNOWLEDGMENTS

This project was sponsored (in part) by the Georgia Sea Grant Program, support by N.O.A.A., Office of Sea Grant, Department of Commerce, under grant no. 10-32-RR273-077. The U.S. Government is authorized to produce and distribute reprints for governmental purposes not withstanding any copyright notation that may appear hereon.

BIBLIOGRAPHY

Bigham, G.N. 1972. Clay mineral transport on the inner Continental Shelf of Georgia: Unpub. Masters Thesis, School of Geophysical Sciences, Georgia Institute of Technology, Atlanta, Ga. 49 p.

Bigham, G.N. 1973. Zone of influence - inner continental shelf Georgia. J. Sediment. Petrol. 43:207-214.

Heron, D.S., Johnson, H.S., Wilson, P.G., and Michael, G.E., 1964. Clay mineral assemblages in South Carolina Lake-River-Estuary Complex. Southeaster Geology, V.6, no. 1:1-10.

Levy, J.S. 1968. Suspended sediment distribution of Doboy Sound, Georgia. M.S. Thesis, Univ. Georgia, Athens, 102 p.

Manheim, F.T., Meade, R.H., and Bond, G.C., 1970. Suspended matter in surface waters of the Atlantic continental margin from Cape Cod to the Florida Keys. Science 167:371-376.

Meade, R.H., and Trimble, S.W., 1974. Changes in sediment loads in rivers of the Atlantic drainage of the United States since 1900: Internat. Assoc. Hydrol. Sci. Pub. 113:99-104.

Meade, R.H. 1969. Landward transport of bottom sediments in estuaries of the Atlantic coastal plain. J. Sediment. Petrol. 39:222-234.

Neiheisel, J., and Weaver, C.E., 1967. Transport and deposition of clay minerals in southeastern United States. J. Sediment. Petrol. 37:1084-1116.

Oertel, G.F. 1971. Sediment hydrodynamic interrelationships at the entrance to the Doboy Sound estuary, Georgia. Ph.D. Thesis, Univ. Iowa, Iowa City, 172 p.

Oertel, G.F. 1973a. Examination of textures and structures of mud in layered sediments at the entrance of a Georgia tidal inlet. J. Sediment. Petrol. 43(1):33-41.

Oertel, G.F. 1973b. A sedimentary framework of the substrate adjacent to Georgia tidal inlets, p.59-66. In The Neogene of the Georgia coast. Guidebook for the 8th Annual Field Trip of the Georgia Geological Society.

Oertel, G.F. 1974. Hydrography and suspended matter distribution patterns of Doboy Sound Estuary, Sapelo Island, Georgia. Georgia Marine Science Center, Tech. Rep. Series, No. 74-4.

APPENDIX

Partial data for suspended sediment stations including dates, times, water depths, sample depths, salinity, total suspended concentrations, and percent organics.

STATION NO.	TIME	DATE	WATER DEPTH (meters)	SAMPLE DEPTH (meters)	SALINITY (°/oo)	TOTAL SUSPENDED MATTER (mg/1)	PERCENT ORGANICS
B SERIES							
B-1	2045	7/13/70	12.5	6.1	31.3	29.2	31
B-2	1825	7/14/70	11.6	4.6	33.9	21.8	38
B-3	1746	7/14/70	12.1	4.6	34.0	22.0	51
B-4	1717	7/14/70	8.5	3.0	33.8	15.5	27
B-5	1625	7/14/70	15.8	3.0	34.1	16.6	33
				13.7	35.2	11.0	26
B-6	1523	7/14/70	14.6	3.0	33.6	19.5	13
				12.2	34.5	14.7	19
B-7	1434	7/14/70	14.6	1.8	33.3	15.2	35
				12.2	34.6	11.9	25
B-8	1038	7/14/70	4.6	2.1	32.6	19.2	25
B-9	1131	7/14/70	12.8	1.8	32.9	28.0	21
				11.0	34.4	6.3	28
B-10	1225	7/14/70	14.6	3.0	33.2	13.8	19
				11.6	35.0	11.0	52
B-11	1331	7/14/70	15.5	1.8	33.7	14.1	30
				12.2	35.3	13.8	22
B-12	1237	7/18/70	15.8	1.8	35.2	11.1	35
				13.7	35.1	17.2	40
B-13	1337	7/18/70	17.7	3.7	35.1	12.2	8
				13.7	35.4	19.4	41
B-14	1430	7/18/70	17.4	1.8	35.1	20.3	28
				15.8	35.6	12.8	17
B-15	1529	7/18/70	20.1	1.8	35.5	14.8	33
				16.8	35.5	12.4	29

STATION NO.	TIME	DATE	WATER DEPTH (meters)	SAMPLE DEPTH (meters)	SALINITY (°/oo)	TOTAL SUSPENDED MATTER (mg/1)	PERCENT ORGANICS
B-16	1624	7/24/70	9.8	7.6	32.6	69.4	28
B-17	1830	7/22/70	6.4	1.5	24.4	120.8	23
				4.6	25.0	201.4	19.7
B-18	1959	7/21/70	3.0	2.1	31.6	31.4	32.4
B-19	1903	7/21/70	13.1	3.0	34.4	27.4	37.4
				10.4	34.9	1.2	9.8
B-20	1826	7/25/70	14.6	3.0	35.2	6.6	67.7
				12.2	35.4	3.9	98.8
B-21	1744	7/21/70	13.7	3.0	35.4	4.6	72.7
				9.1	35.6	4.7	89.0
B-22	1656	7/21/70	15.8	3.0	35.7	3.9	56.4
				12.2	35.7	-	-
B-23	1535	7/21/70	16.2	1.5	35.9	3.4	76.7
				14.6	36.0	4.6	62.5
B-24	0923	7/29/70	9.1	4.6	19.8	35.3	27.4
B-25	0951	7/29/70	4.6	2.1	32.2	32.0	51.3
B-26	2022	7/27/70	11.3	1.5	33.5	19.5	30.7
				9.1	33.7	19.6	55.1
B-27	1949	7/27/70	12.8	3.0	33.6	24.7	26.5
				9.1	34.7	31.7	33.4
B-28	1905	7/27/70	15.2	1.8	34.6	15.2	51.8
				10.7	35.4	26.9	63.4
B-29	1822	7/27/70	18.3	3.0	35.7	23.7	26.1
				15.2	35.6	21.5	25.6
B-30	1733	7/27/70	18.6	1.8	35.6	19.2	45.0
				15.2	35.6	18.1	47.0

STATION NO.	TIME	DATE	WATER DEPTH (meters)	SAMPLE DEPTH (meters)	SALINITY (°/oo)	TOTAL SUSPENDED MATTER (mg/1)	PERCENT ORGANICS
B-31	1646	7/27/70	18.6	1.8	35.8	23.5	25.3
				16.8	35.8	34.5	25.2
B-32	1736	7/28/70	9.4	3.0	32.1	40.1	24.6
				6.1	32.8	76.6	22.6
B-33	1106	7/28/70	6.7	1.5	31.5	44.0	40.4
				5.5	31.6	35.7	25.3
B-34	1147	7/28/70	8.8	2.1	34.1	23.9	33.9
				6.7	34.0	34.3	32.0
B-35	1220	7/28/70	11.6	3.0	34.2	17.6	37.0
				10.7	35.0	22.4	40.1
B-36	1248	7/28/70	13.1	1.5	34.6	22.1	78.7
				9.1	35.4	21.6	32.1
B-37	1336	7/28/70	14.6	3.0	35.6	22.9	26.0
				9.1	35.7	14.0	36.5
B-38	1417	7/28/70	20.1	3.0	35.7	36.1	55.7
				16.8	35.7	15.5	42.8
B-39	1503	7/28/70	21.3	3.0	35.9	28.4	38.5
				19.8	35.9	39.9	24.3
B-40	1640	8/23/70	11.6	4.6	34.0	43.4	25.6
B-41	1717	8/23/70	5.2	2.4	34.7	44.6	56.0
B-42	1740	8/23/70	10.1	2.4	24.4	21.5	41.0
				7.6	35.6	33.2	36.3
B-43	1909	9/17/70	12.2	1.5	34.3	12.0	69.0
				10.7	34.6	31.8	40.3
B-44	1822	9/17/70	13.4	1.5	35.0	9.6	76.8
				12.2	35.2	35.2	60.6

STATION NO.	TIME	DATE	WATER DEPTH (meters)	SAMPLE DEPTH (meters)	SALINITY (°/oo)	TOTAL SUSPENDED MATTER (mg/1)	PERCENT ORGANICS
B-45	1733	9/17/70	14.6	1.5	35.6	12.8	84.8
				12.2	-	27.6	73.3
B-46	1643	9/17/70	18.3	1.5	35.9	11.1	71.8
				16.8	35.7	33.1	61.5
B-47	1102	9/15/70	11.3	1.5	31.8	32.5	12.1
				9.8	32.2	62.4	41.7
B-48	1013	9/17/70	11.6	1.5	32.1	89.7	36.0
				10.7	33.2	127.5	25.7
B-49	1101	9/17/70	12.5	1.5	33.8	28.1	9.6
				10.7	34.3	47.2	22.3
B-50	1206	9/17/70	15.2	1.5	35.0	15.0	76.4
				13.7	35.4	32.8	45.7
B-51	1312	9/17/70	15.8	1.5	35.4	9.9	61.9
				13.7	35.5	29.0	58.1
B-52	1307	9/17/70	15.2	1.5	35.7	10.6	44.4
				13.7	35.7	29.3	17.3
L SERIES							
L-1	0818	6/30/67	11.9	0.6	21.1	12.6	-
	1424	6/30/67		0.6	25.6	18.5	-
	0818	6/30/67		5.2	23.7	23.6	-
	1424	6/30/67		5.5	27.4	8.0	-
	0818	6/30/67		10.7	24.2	15.0	-
	1424	6/30/67		11.6	29.1	44.1	-
L-2	0823	6/30/67	8.5	0.6	23.0	13.2	-
	1427	6/30/67		0.6	25.9	5.5	-

STATION NO.	TIME	DATE	WATER DEPTH (meters)	SAMPLE DEPTH (meters)	SALINITY (°/oo)	TOTAL SUSPENDED MATTER (mg/1)	PERCENT ORGANICS
L-2	0823	6/30/67	8.5	3.7	24.8	28.0	-
	1427	6/30/67	8.5	4.3	29.1	10.5	-
	0823	"		7.0	25.3	31.8	-
	1427	"		8.2	29.0	17.7	-
L-3	0830	6/30/67	7.0	0.6	26.0	7.7	-
	1432	"		0.6	23.6	6.0	-
	0830	"		3.0	27.0	10.5	-
	1432	"		3.7	29.8	11.5	-
	0830	"		5.8	29.4	33.9	-
	1432	"		6.7	29.9	17.2	-
O SERIES							
O-1	1130	11/12/74	9.1	0.3	19.5	19.3	1.6
		"		8.1	18.5	61.0	-
O-2	1240	"	8.5	0.3	20.0	28.3	10.6
		"		7.5	20.0	44.3	9.0
O-3	1252	"	7.3	0.3	22.0	32.0	0.9
		"		6.3	20.2	42.7	17.1
O-4	1305	"	2.1	0.3	22.0	33.3	15.9
O-5	1000	"	11.9	0.3	19.5	96.0	19.5
		"		10.9	22.0	58.7	22.2
		8/23/73	11.7	0.3	27.0	12.2	8.2
		"		10.7	26.5	103.2	-
O-6	1005	11/12/74	11.7	0.3	22.0	28.0	31.1
		"		10.7	22.8	52.3	24.3
O-7	1010	"	10.2	0.3	22.0	28.3	29.3

STATION NO.	TIME	DATE	WATER DEPTH (meters)	SAMPLE DEPTH (meters)	SALINITY (°/oo)	TOTAL SUSPENDED MATTER (mg/1)	PERCENT ORGANICS
		11/12/74		9.2	20.9	36.0	20.3
0-8	1015	"	4.6	0.3	20.1	20.0	23.5
		"		3.6	27.0	24.3	8.2
0-9		7/27/73	13.8	0.3	36.0	3.4	11.8
		"		12.8	35.0	4.4	31.9
		"	14.7	0.3	36.0	7.8	28.2
				13.7	38.0	8.0	32.5
		8/23/73	10.1	0.3	32.0	6.6	15.2
		"		9.1	33.0	-	-
		"	12.6	0.3	26.0	12.6	-
		"		11.6	26.5	5.6	17.9
0-10	1020	11/12/74	5.5	0.3	24.0	7.0	28.6
		"		4.5	22.3	14.1	72.7
0-11	1025	"	9.1	0.3	22.0	6.6	12.1
		"		8.1	26.0	8.8	38.6
0-12	1030	"	11.3	0.3	26.0	4.2	19.1
		"		10.3	25.5	3.6	5.5
0-13		7/27/73	15.6	0.3	34.0	4.2	38.1
		"		14.6	33.0	9.5	36.4
		"	16.8	0.3	34.0	4.4	59.1
		"		15.8	36.0	4.6	43.5
		8/23/73	15.6	0.3	29.0	3.0	5.2
		"	15.6	0.3	35.0	6.8	-
		"		14.6	36.0	2.2	-
0-14	0700	11/8/73	10.1	0.3	-	0.6	33.3
			10.1	9.1	-	1.2	-

STATION NO.	TIME	DATE	WATER DEPTH (meters)	SAMPLE DEPTH (meters)	SALINITY (°/oo)	TOTAL SUSPENDED MATTER (mg/l)	PERCENT ORGANICS
0-14	0800	11/8/73	10.1	0.3	-	2.6	46.2
			10.1	9.1	-	1.0	20.0
	0900		10.1	0.3	-	3.4	11.8
			10.1	9.1	-	12.0	78.3
		11/8/73	10.1	0.3	NOT TAKEN	-	-
	1000	"	10.1	9.1		2.2	45.5
		"	10.1	0.3		2.6	-
			"	9.1		1.2	33.3
	1200	"	"	0.3		8.4	28.6
			"	9.1		-	-
	1300	"	"	0.3		5.0	32.0
			"	9.1		4.8	20.8
	1400	"	"	0.3		3.2	-
			"	9.1		4.0	30.0
	1500	"	"	0.3		4.8	4.2
			"	9.1		4.4	27.3
	1600	"	"	0.3		5.0	28.0
			"	9.1		3.8	15.8
	1700	"	"	0.3		3.4	100.0
			"	9.1		1.2	16.7
	1800	"	"	0.3		6.0	20.0
			"	9.1		-	-
	1900	"	"	0.3		3.6	88.9
			"	9.1		4.9	36.7
0-15	1100	3/7/74	9.1	0.3		3.8	-
			"	4.7		4.6	-

STATION NO.	TIME	DATE	WATER DEPTH (meters)	SAMPLE DEPTH (meters)	SALINITY (o/oo)	TOTAL SUSPENDED MATTER (mg/1)	PERCENT ORGANICS
0-15			9.1	9.1		10.6	20.8
	1200	3/7/74	"	0.3		4.0	0.0
			"	4.7		3.4	0.0
			"	9.1		8.6	7.9
	1300	"	"	0.3		4.4	4.5
			"	4.7		6.4	9.4
			"	9.1		10.6	3.8
	1400		"	0.3		11.6	12.1
			"	4.7		7.0	0.0
			"	9.1		10.6	-
	1500		"	0.3		9.0	7.8
			"	4.7		7.0	8.6
			"	9.1		11.6	8.6
	1600		"	0.3		4.0	-
			"	4.7		3.8	5.3
			"	9.1		7.0	22.9
0-16		6/26/73	11.0	0.3		4.6	0.0
			"	5.2		2.2	-
			"	10.0		2.4	8.2
0-17		"	12.2	0.3		5.6	14.3
			"	5.8		4.6	30.4
			"	11.2		3.2	18.7
0-18		8/14/73	12.2	0.3	31.5	18.8	28.7
			"	11.2	31.5	8.8	31.8
		"	"	0.3	30.0	6.0	41.0
			"	11.2	32.0	5.0	36.0

NOT TAKEN

STATION NO.	TIME	DATE	WATER DEPTH (meters)	SAMPLE DEPTH (meters)	SALINITY (°/oo)	TOTAL SUSPENDED MATTER (mg/l)	PERCENT ORGANICS
0-18		8/14/73	12.2	0.3	31.0	8.2	41.5
			"	11.2	32.0	7.6	34.2
		"	"	0.3	30.5	9.6	29.2
			"	11.2	32.0	19.2	62.5
		8/14/73	"	0.3	31.0	5.2	30.8
				11.2	32.0	4.0	55.0
		"	"	0.3	31.0	10.8	29.6
				11.2	31.5	8.0	32.5
		"	"	0.3	31.0	8.2	39.0
				11.2	32.0	3.2	0.0
		"	"	0.3	31.0	4.8	4.2
				11.2	32.0	4.0	-
		"	"	0.3	31.5	16.4	34.1
				11.2	32.0	7.8	41.0
		"	"	0.3	31.0	7.0	54.3
				11.2	32.0	2.8	21.4
		"	"	0.3	31.5	-	-
				11.2	32.0	8.8	43.2
		"	"	0.3	31.5	6.4	62.5
				11.2	32.0	3.8	-
		"	"	0.3	32.0	12.8	79.7
				11.2	32.0	16.2	29.6
0-19		6/26/73	12.8	0.3	-NOT TAKEN-	5.0	53.8
			"	6.1		2.2	100.0
			"	11.8		5.2	24.0

STATION NO.	TIME	DATE	WATER DEPTH (meters)	SAMPLE DEPTH (meters)	SALINITY (°/oo)	TOTAL SUSPENDED MATTER (mg/l)	PERCENT ORGANICS
0-20	1441	12/28/74	12.2	0.3		2.6	-
		"		11.2		2.0	-
0-21	1448	"	12.2	0.3		2.2	-
		"		11.2		2.6	-
0-22	1501	"	13.1	0.3		1.6	-
		"	"	12.1		5.0	-
0-23	1511	"	9.4	0.3		3.4	-
0-24	1525	"	8.8	0.3		14.0	12.8
0-25	1134	12/16/74	5.5	0.3	29.0	27.7	26.4
		"	"	4.5	29.5	47.7	23.7
0-26	1215	"	7.6	0.3	23.7	22.7	13.2
		"	"	6.6	22.2	28.3	20.1
0-27	1205	"	8.2	0.3	27.9	23.0	29.1
		"	"	7.2	25.5	28.0	8.2
0-28	1154	"	5.5	0.3	23.8	35.7	20.5
		"	"	4.5	28.0	39.0	18.7
0-29	1142	"	4.0	0.3	27.2	39.7	23.4
		"	"	3.0	25.2	126.7	17.1
0-30	1120	"	10.7	0.3	30.0	3.8	94.7
		"	"	9.7	29.5	4.8	50.0
0-31	1530	12/28/74	13.4	0.3		1.0	-
0-32	1539	"	13.1	0.3		1.0	-
0-33	1548	"	11.9	0.3		1.4	-
0-34	1557	"	11.6	"		0.8	25.0
0-35	1605	"	11.6	"		0.4	-
0-36	0835	6/6/74	3.7	"	27.0	82.2	16.3

NOT TAKEN

STATION	TIME	DATE	WATER DEPTH (meters)	SAMPLE DEPTH (meters)	SALINITY (°/oo)	TOTAL SUSPENDED MATTER (mg/l)	PERCENT ORGANICS
0-37	0839	6/6/74	13.3	0.3	28.0	80.4	16.9
0-38	0841	"	16.5	"	28.0	32.0	18.1
0-39	0845	"	10.1	"	28.0	22.8	24.6
0-40	0841	"	7.8	"	28.0	22.6	38.9
	0851	"	12.0	"	28.5	27.2	30.9
0-41	0855	"	7.3	"	29.0	21.2	28.3
0-42	0858	"	2.4	"	29.5	22.0	25.4
	0902	"	2.1	"	30.0	20.6	31.1
0-43	0905	"	5.2	"	29.5	15.2	38.1
0-44	0910	"	5.2	"	29.5	8.2	43.9
0-45	0913	"	4.0	"	29.5	7.2	52.7
0-46	0916	"	5.5	"	29.5	5.4	55.5
0-47	0919	"	7.9	"	29.5	4.4	54.5
0-48	0922	"	9.1	"	30.0	6.0	56.7
0-49	0925	"	11.0	"	30.0	8.2	60.9
0-50	0955	"	13.7	"	29.5	9.0	62.2
0-51	1020	"	18.9	"	29.5	6.0	70.0
0-52	1045	"	18.3	"	30.0	6.8	67.6
0-53	1110	"	17.7	"	30.0	5.4	74.1
0-54	1135	"	20.7	"	29.5	5.0	72.0
0-55	1158	"	22.6	"	29.5	5.4	77.7
0-56	1223	"	25.6	"	29.0	7.8	74.4
0-57	MLW	Summer 1970	5.8	0.6	29.5	19	-
	"	"	"	3.0	30.0	24	-
	"	"	"	5.5	30.0	32	-

STATION NO.	TIME	DATE	WATER DEPTH (meters)	SAMPLE DEPTH (meters)	SALINITY (°/oo)	TOTAL SUSPENDED MATTER (mg/1)	PERCENT ORGANICS
0-57	Mid-Flood	Summer 1970	7.0	0.6	32.5	190	-
	"	"	"	3.0	33.0	285	-
	"	"	"	5.5	33.0	300	-
	MHW	"	8.2	0.6	34.0	70	-
	"	"	8.2	3.0	34.0	93	-
	"	"	"	5.5	34.5	108	-
	Mid-Ebb	"	7.0	0.6	33.5	160	-
	"	:	"	3.0	34.0	235	-
	"	"	"	5.5	34.5	255	-
0-58	MLW	"	6.7	0.6	29.0	10	-
	"	"	"	3.0	29.0	16	-
	"	"	"	5.5	29.5	20	-
	Mid-Flood	"	7.9	0.6	32.5	210	-
	"	"	"	3.0	32.5	263	-
	"	"	"	5.5	32.5	295	-
	"	"	"	7.6	33.0	294	-
	MHW	"	9.1	0.6	32.5	37	-
	"	"	"	3.0	33.5	41	-
	"	"	"	5.5	34.0	52	-
	"	"	"	7.9	35.0	61	-
	Mid-Ebb	"	7.9	0.6	33.0	140	-
	"	"	"	3.0	33.5	155	-
	"	"	"	5.5	33.5	180	-
	"	"	"	7.6	33.5	205	-

STATION NO.	TIME	DATE	WATER DEPTH (meters)	SAMPLE DEPTH (meters)	SALINITY (°/oo)	TOTAL SUSPENDED MATTER (mg/1)	PERCENT ORGANICS
0-59	MLW	Summer 1970	12.8	0.6	28.0	17	-
	"	"	"	3.0	28.5	23	-
	"	"	"	5.5	29.0	24	-
	"	"	"	7.9	29.5	28	-
	"	"	"	10.4	30.0	23	-
	Mid-Flood	"	14.0	0.6	31.0	95	-
	"	"	"	3.0	31.0	124	-
	"	"	"	5.5	31.0	127	-
	"	"	"	7.9	31.5	110	-
	"	"	"	10.4	31.5	105	-
	"	"	"	12.8	32.0	122	-
	MHW	"	15.2	0.6	31.5	31	-
	"	"	"	3.0	32.0	22	-
	"	"	"	5.5	33.5	35	-
	"	"	"	7.9	34.5	37	-
	"	"	"	10.4	34.5	33	-
	"	"	"	12.8	35.0	47	-
	Mid-Ebb	"	14.0	0.6	30.5	72	-
	"	"	"	3.0	31.5	83	-
	"	"	"	5.5	33.0	150	-
	"	"	"	7.9	33.5	310	-
	"	"	"	10.4	33.5	345	-
	"	"	"	12.8	33.5	440	-
0-60	MLW	"	10.7	0.6	30.5	13	-

STATION NO.	TIME	DATE	WATER DEPTH (meters)	SAMPLE DEPTH (meters)	SALINITY (°/oo)	TOTAL SUSPENDED MATTER (mg/l)	PERCENT ORGANICS
0-60	MLW	Summer 1970	10.7	3.0	30.5	24	-
	"	"	"	5.5	31.0	27	-
	"	"	"	7.9	31.5	32	-
	"	"	"	10.4	31.5	85	-
	Mid-Flood	"	11.9	0.6	30.5	34	-
	"	"	"	3.0	31.0	43	-
	"	"	"	5.5	32.0	76	-
	"	"	"	7.9	32.0	97	-
	"	"	"	10.4	32.5	104	-
	MHW	"	13.4	0.6	33.0	17	-
	"	"	"	3.0	34.0	23	-
	"	"	"	5.5	35.0	22	-
	"	"	"	7.9	35.0	28	-
	"	"	"	10.4	35.5	33	-
	"	"	"	12.8	35.5	36	-
	Mid-Ebb	"	11.9	0.6	31.0	24	-
	"	"	"	3.0	31.0	25	-
	"	"	"	5.5	31.5	33	-
	"	"	"	7.9	31.5	39	-
	"	"	"	10.4	32.5	54	-
0-61	MLW	"	11.6	0.6	29.5	13	-
		"	"	3.0	30.5	22	-
		"	"	5.5	31.0	21	-
		"	"	7.9	31.5	18	-

STATION NO.	TIME	DATE	WATER DEPTH (meters)	SAMPLE DEPTH (meters)	SALINITY (°/oo)	TOTAL SUSPENDED MATTER (mg/l)	PERCENT ORGANICS
0-60	MLW	Summer 1970	10.7	3.0	30.5	24	-
	"	"	"	5.5	31.0	27	-
	"	"	"	7.9	31.5	32	-
	"	"	"	10.4	31.5	85	-
	Mid-Flood	"	11.9	0.6	30.5	34	-
	"	"	"	3.0	31.0	43	-
	"	"	"	5.5	32.0	76	-
	"	"	"	7.9	32.0	97	-
	"	"	"	10.4	32.5	104	-
	MHW	"	13.4	0.6	33.0	17	-
	"	"	"	3.0	34.0	23	-
	"	"	"	5.5	35.0	22	-
	"	"	"	7.9	35.0	28	-
	"	"	"	10.4	35.5	33	-
	"	"	"	12.8	35.5	36	-
	Mid-Ebb	"	11.9	0.6	31.0	24	-
	"	"	"	3.0	31.0	25	-
	"	"	"	5.5	31.5	33	-
	"	"	"	7.9	31.5	39	-
	"	"	"	10.4	32.5	54	-
0-61	MLW	"	11.6	0.6	29.5	13	-
		"	"	3.0	30.5	22	-
		"	"	5.5	31.0	21	-
		"	"	7.9	31.5	18	-

STATION NO.	TIME	DATE	WATER DEPTH (meters)	SAMPLE DEPTH (meters)	SALINITY (°/oo)	TOTAL SUSPENDED MATTER (mg/1)	PERCENT ORGANICS
0-61	MLW	Summer 1970	11.6	10.4	32.0	38	-
	Mid-Flood	"	12.7	0.6	31.0	34	-
		"	"	3.0	31.5	45	-
		"	"	5.5	32.0	73	-
		"	"	7.9	33.0	89	-
		"	"	10.4	34.0	110	-
	MHW	"	13.7	0.6	34.0	38	-
		"	"	3.0	34.5	46	-
		"	"	5.5	35.0	34	-
		"	"	7.9	35.0	32	-
	"	"	"	10.4	35.5	44	-
	"	"	"	12.8	35.5	56	-
	Mid-Ebb	"	12.7	0.6	30.5	11	-
		"	"	3.0	30.5	15	-
		"	"	5.5	31.0	18	-
		"	"	7.9	31.5	33	-
		"	"	10.4	32.0	62	-
0-62	MLW	"	6.7	0.6	29.5	20	-
	"	"	"	3.0	30.0	27	-
	"	"	"	5.5	31.0	34	-
	Mid-Flood	"	7.9	0.6	32.0	35	-
	"	"	"	3.0	37.5	34	-
	"	"	"	5.5	32.5	49	-
	"	"	"	7.8	33.5	107	-

STATION NO.	TIME	DATE	WATER DEPTH (meters)	SAMPLE DEPTH (meters)	SALINITY (°/oo)	TOTAL SUSPENDED MATTER (mg/1)	PERCENT ORGANICS
0-62	MHW	Summer 1970	9.1	0.6	34.5	40	-
	"	"	"	3.0	34.5	52	-
	"	"	"	5.5	35.0	42	-
	"	"	"	7.9	35.0	37	-
	Mid-Ebb	"	7.9	0.6	30.5	17	-
	"	"	"	3.0	30.5	31	-
	"	"	"	5.5	31.5	97	-
0-63	MLW	"	1.8	0.6	29.5	18	-
	Mid-Flood	"	2.4	0.6	33.0	19	-
	MHW	"	3.0	0.6	35.5	25	-
	Mid-Ebb	"	2.4	0.6	32.5	13	-
0-64	MLW	"	3.0	0.6	30.0	15	-
	Mid-Flood	"	3.5	0.6	33.0	22	-
	"	"	"	3.0	34.0	35	-
	MHW	"	5.5	0.6	35.5	16	-
	"	"	"	3.0	35.5	27	-
	Mid-Ebb	"	3.5	0.6	32.5	9	-
	"	"	3.5	3.0	32.5	16	-
0-65	MLW	"	6.7	0.6	29.0	11	-
	"	"	"	3.0	29.5	19	-
	"	"	6.7	5.5	31.5	45	-
	Mid-Flood	"	7.3	0.6	32.5	14	-

STATION NO.	TIME	DATE	WATER DEPTH (meters)	SAMPLE DEPTH (meters)	SALINITY (°/oo)	TOTAL SUSPENDED MATTER (mg/1)	PERCENT ORGANICS
0-65	Mid-Flood	Summer 1970	7.3	3.0	34.5	18	-
	"	"	"	5.5	35.0	43	-
	MHW	"	8.5	0.6	35.5	12	-
	"	"	"	3.0	35.5	15	-
	"	"	"	5.5	36.0	20	-
	"	"	"	7.9	36.0	26	-
	Mid-Ebb	"	7.3	0.6	32.0	70	-
	"	"	"	3.0	32.5	14	-
	"	"	"	5.5	33.0	17	-
0-66	MLW	"	8.8	0.6	28.5	7	-
	"	"	"	3.0	30.5	14	-
	"	"	"	5.5	31.5	42	-
	"	"	"	7.9	33.0	131	-
	Mid-Flood	"	9.6	0.6	33.0	16	-
	"	"	"	3.0	33.5	22	-
	"	"	"	5.5	35.0	38	-
	"	"	"	7.9	35.5	69	-
	MHW	"	10.7	0.6	36.0	4	-
	"	"	"	3.0	36.0	5	-
	"	"	"	5.5	36.0	8	-
	"	"	"	7.9	36.0	11	-
	"	"	"	10.4	36.0	17	-
	Mid-Ebb	"	9.6	0.6	30.5	15	-
	"	"	"	3.0	31.0	13	-

STATION NO.	TIME	DATE	WATER DEPTH (meters)	SAMPLE DEPTH (meters)	SALINITY (°/oo)	TOTAL SUSPENDED MATTER (mg/1)	PERCENT ORGANICS
O-66	Mid-Ebb	Summer 1970	9.6	5.5	31.5	19	-
	"	"	"	7.9	32.5	47	-
O-67	MLW	"	6.1	0.6	30.0	13	-
	"	"	"	3.0	30.5	17	-
	"	"	"	5.5	31.0	19	-
	Mid-Flood	"	6.9	0.6	33.5	84	-
	"	"	"	3.0	33.5	195	-
	"	"	"	5.5	34.0	245	-
	MHW	"	7.7	0.6	35.5	7	-
	"	"	"	3.0	35.5	5	-
	"	"	"	5.5	36.0	8	-
	Mid-Ebb	"	6.9	0.6	30.0	19	-
	"	"	"	3.0	31.5	23	-
	"	"	"	5.5	32.5	47	-
C SERIES							
C-1	1330	2/26/75	11.9	0.3		66.0	19.3
		"		10.9		38.7	21.2
C-2	1322	2/26/75	11.7	0.3		18.0	31.0
				10.7		32.3	23.4
C-3	1315	2/26/75	4.3	0.3		23.0	13.0
			"	3.3		23.8	11.3
C-4	1303	2/26/75	5.8	0.3		17.4	10.3
			"	4.8		26.0	14.4

NOT TAKEN

STATION NO.	TIME	DATE	WATER DEPTH (meters)	SAMPLE DEPTH (meters)	SALINITY (°/oo)	TOTAL SUSPENDED MATTER (mg/l)	PERCENT ORGANICS
C-5	1250	2/26/75	6.1	0.3	NOT TAKEN	3.8	42.1
			"	5.7		22.4	13.4
C-6	1242	2/26/75	6.7	0.3		2.5	32.0
			"	5.7		2.1	23.8
C-7	1228	2/26/75	6.1	0.3		3.6	5.6
			"	5.1		4.6	21.7
C-8	1220	2/26/75	10.1	0.3		4.2	9.5
			"	9.1		9.3	38.7
C-9	1815	8/26/75	3.7	0.3	24.0	11.2	0.0
			"	2.7	25.0	81.2	22.2
C-10	1820	8/26/75	13.3	0.3	25.0	4.5	5.6
			"	12.3	26.0	23.1	2.5
C-11	1825	8/26/75	16.5	0.3	25.0	6.5	11.5
			"	15.5	26.0	18.0	7.9
C-12	1830	8/26/75	10.1	0.3	26.0	8.5	5.9
			"	9.1	26.0	16.0	0.0
C-13	1835	8/26/75	7.8	0.3	26.0	6.5	42.3
			"	6.8	27.0	11.0	15.9
C-14	1840	8/26/75	7.3	0.3	26.0	5.0	15.0
			"	7.3	27.0	7.1	3.1
C-15	1845	8/26/75	2.4	0.3	26.5	5.3	33.4
			"	1.4	27.5	15.1	26.5
C-15a	1850	8/26/75	2.1	0.3	28.0	4.0	16.8
				1.1	28.0	6.0	6.7
C-16	1855	8/26/75	3.7	0.3	28.0	7.8	32.3
			"	2.7	29.5	7.3	1.7

STATION NO.	TIME	DATE	WATER DEPTH (meters)	SAMPLE DEPTH (meters)	SALINITY (°/oo)	TOTAL SUSPENDED MATTER (mg/1)	PERCENT ORGANICS
C-17	1900	8/26/75	5.2	0.3	28.5	3.0	0.0
			"	4.2	28.5	2.8	-
C-18	1905	8/26/75	4.6	0.3	29.0	2.2	0.0
			"	3.6	29.5	2.2	0.0
C-19	1910	8/26/75	4.9	0.3	29.5	5.6	28.6
			"	3.9	30.0	2.9	0.0
C-20	1915	8/26/75	6.4	0.3	29.5	0.6	0.0
			"	5.4	30.5	2.0	0.0
C-21	1920	8/26/75	7.9	0.3	29.5	3.5	28.6
			"	6.9	31.0	5.3	24.5
C-22	1925	8/26/75	10.7	0.3	30.0	2.5	30.0
			"	9.7	31.5	0.6	0.0
C-23	1930	8/26/75	13.7	0.3	30.5	4.1	-
			"	12.7	32.0	6.9	47.8
C-24	1948	8/26/75	18.9	0.3	26.5	2.9	44.8
			"	17.9	32.0	4.6	37.0
C-25	2015	8/26/75	18.3	0.3	30.5	1.8	33.3
			"	17.3	32.5	5.3	47.2
C-26	2115	8/26/75	11.7	0.3	32.0	2.2	45.5
			"	16.7	32.5	3.3	60.6
C-27	2140	8/26/75	20.7	0.3	27.0	3.1	29.0
			"	19.7	32.0	4.9	18.4
C-28	2210	8/26/75	22.6	0.3	31.5	2.9	-
			"	21.6	28.5	1.2	0.0
C-29	2240	8/26/75	25.6	0.3	33.0	3.6	44.4
			"	24.6	31.0	1.4	-