Distribution of Surficial Sediments and Eelgrass in New York's South Shore Bays:
An Assessment from the Literature

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marine sciences research center
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J. R. Schubel

J. R. Schubel, Director

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ABSTRACT

We completed an investigation of all published and unpublished information available on the distributions of surficial sediment and eelgrass (*Zostera marina*) in New York's south shore bays. This report presents graphical and tabular summaries of our findings for sediment texture and eelgrass cover.

INTRODUCTION

Objectives

The primary purpose of the initial phase of this study was to collect, review, and synthesize all existing data, both published and unpublished, on the distributions of surficial sediments and eelgrass (*Zostera marina*) in the south shore bays of Long Island. This report is a summary of our findings.

The sources and kinds of data are summarized in tabular form. Maps are presented for the aggregated observations of sediment texture for: Moriches Bay and eastern and western Great South Bay. Maps are also presented for observations of eelgrass for: Great South Bay, South Oyster Bay and eastern Hempstead Bay.

Methods

The principal sources of information were: published papers, master's theses, unpublished reports, field notes and personal communications from individuals with a variety of Federal, state, county, and town governmental agencies, as well as with private consulting firms and universities. A list of individuals we contacted is presented in Appendix A. The sediment studies we were able to obtain were summarized in Table 1; the eelgrass data in Table 2. The data in Tables 1 and 2 are arranged by bay from east to west. A more detailed description of each of the studies listed in Tables 1 and 2 can be found in the annotated bibliography, Appendix B.

For each sediment study we have prepared a list of: stations, station locations and texture of the surficial sediments. When studies had few samples, we sometimes combined two, or more studies in a single list for a particular bay. We plotted the position of each station on maps to assist the reader. We aggregated, by bay, those sediment texture data reported in the original sources as percentages of sand, silt, and clay, and have presented the results as composite maps.

Sand-sized particles are defined as those with projected diameters greater than 1/16 mm; silt as particles with diameters greater than 1/256 mm; and clay as particles smaller than 1/256 mm. The triangle diagram, Fig. 1, (Trefethen, 1950) represents a means of classifying unconsolidated sediment on a basis of grain size. Shepard (1954) also proposed a ternary classification similar to the diagram below, consisting of ten classes.

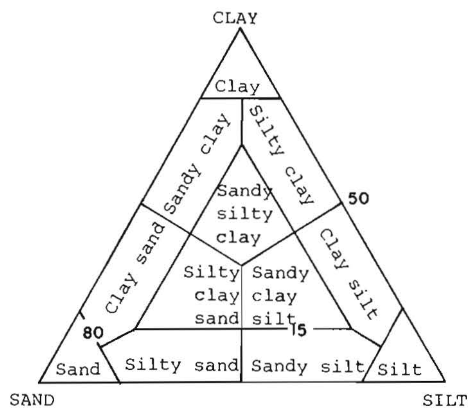

Figure 1. End-member triangle for classifying unconsolidated sediment on a basis of grain size. From: Trefethen, 1950.

TABLE 1. South Shore Bays Sediment Information

STUDY AREA (EAST TO WEST)	NUMBER OF STATIONS	METHODS FOR LOCATING STATIONS	TYPE OF SAMPLING	INVESTIGATOR(S)	SEDIMENT STUDIES CONDUCTED	SOURCE OF INFORMATION
Shinnecock Bay	17	Near or at buoys along Intra-coastal Waterway	Grab	Corps of Engineers, New York District	1. Wet sieving 2. Pipette analysis 3. Total carbon with correction for inorganic carbon 4. Elutriate analyzed for C.O.D., oil and grease, arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc	1. U.S. Army Engineer District, New York, New York. A. Maintenance of Great South Bay Channel and Patchogue River and Long Island Intracoastal Waterway, New York. Navigation Projects. 1975. (Final Environmental Impact Statement). B. Public Notice 8548, 15 July 1976. C. Personal communication with Bill Slezak and Linda Baxter (operations section).
Shinnecock Bay	19	Close by well-marked and numbered buoys	Core	D. W. Dooley	1. Wet sieving 2. Dry sieving: -2ϕ to 4ϕ; 0.5ϕ intervals from -1ϕ to 4ϕ 3. Pipette analysis 4. Mineralogy--optical and x-ray analysis	A Preliminary Investigation of the Sediments of Shinnecock Bay, Long Island, New York (Master of Science Thesis, 1974).
Shinnecock Bay	Numerous (exact number not available)	1. Horizontal Sextant 2. Some near buoys	1. Grab 2. Collection by divers 3. Core	J. R. Welker	1. Wet sieving 2. Pipette analysis	Phone conversation--information from personal field notes in prep. and unavailable at this time.

TABLE 1 (continued)

STUDY AREA (EAST TO WEST)	NUMBER OF STATIONS	METHODS FOR LOCATING STATIONS	TYPE OF SAMPLING	INVESTIGATOR(S)	SEDIMENT STUDIES CONDUCTED	SOURCE OF INFORMATION
Moriches Bay	46	1. Horizontal Sextant 2. Location via nautical charts	Core	M. M. Nichols	1. Dry sieving 2. Pipette analysis 3. Organic matter percent by dry weight after digestion in hydrogen peroxide 4. Mineralogy using x-ray diffraction	1. Characteristics of Sedimentary Environments in Moriches Bay. 1964. Published in: "Papers in Marine Geology." Shepard Commemorative Volume. 2. Personal field notes from M. M. Nichols. NOTE: Samples taken in 1956.
Moriches Bay	18	Near or at buoys along Intracoastal Waterway	Grab	Corps of Engineers, New York District	1. Wet sieving 2. Pipette analysis 3. Total carbon with correction for inorganic carbon 4. Elutriate analyzed for C.O.D., oil and grease, arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc	1. U.S. Army Engineer District New York, New York. A. Maintenance of Great South Bay Channel and Patchogue River and Long Island Intracoastal Waterway, New York. Navigation Projects. 1975. (Final Environmental Impact Statement). B. Public Notice 8548, 15 July 1976. C. Personal communication with Bill Slezak and Linda Baxter (Operations Section).
Moriches Bay (Narrows Bay at Smith Point Bridge)	28	1. 200 feet west of Smith Point Bridge perpendicular to bridge pilings 2. Beneath Smith Point Bridge between pilings	Core	1. R. Rozsa 2. G. Roth	1. Dry sieving. -1ϕ to 4ϕ at 1ϕ intervals	A Preliminary Survey of the Benthic Communities at Smith Point. 1974. (Study conducted for college course project). NOTE: Samples taken in 1973.

TABLE 1 (continued)

STUDY AREA (EAST TO WEST)	NUMBER OF STATIONS	METHODS FOR LOCATING STATIONS	TYPE OF SAMPLING	INVESTIGATOR(S)	SEDIMENT STUDIES CONDUCTED	SOURCE OF INFORMATION
Moriches Bay Inlet	139	Distance in feet from a base line and a range line	Core	N. E. Taney, Beach Erosion Board, U.S. Army Corps of Engineers	1. Dry sieving A. Median diameter B. Skewness C. Coefficient of sorting	Littoral Materials of the South Shore of Long Island, N.Y. Technical Memorandum No. 129, 1961. NOTE: Samples taken in 1953 and 1954.
Moriches Bay Inlet	16	Not specified	Core	D. M. Caldwell	1. Wet and dry sieving 2. Analysis of core stratification	A Sedimentological Study of an Active Part of a Modern Tidal Delta, Moriches Inlet, Long Island, New York, (Master of Arts Thesis, 1972).
Moriches Bay	1	One hundred feet barrier margin	Collected by hand	M. G. Mackenzie	1. Dry sieving 2. Mineralogy 3. Percent carbonate	Environments of Deposition on an Offshore Barrier Sand Bar, Moriches Inlet, L.I., N.Y., 1967. Published in: "Tulane Studies in Geology."
Great South Bay (entire bay)	21	Location via nautical charts	Grab	1. G. N. Bigham 2. D. S. Becker	1. Wet sieving 2. Organic carbon-weight loss on ignition at 500°C (percent) 3. Visual description of sediment 4. Sediment temperature	Benthic Oxygen Demand Measurements in Long Island Bays. Tetra Tech 1977 (Report prepared for Nassau Suffolk Regional Planning Board).

TABLE 1 (continued)

STUDY AREA (EAST TO WEST)	NUMBER OF STATIONS	METHODS FOR LOCATING STATIONS	TYPE OF SAMPLING	INVESTIGATOR(S)	SEDIMENT STUDIES CONDUCTED	SOURCE OF INFORMATION
Great South Bay[a]	Unknown	Unknown	Unknown	C. Rockwell	See Annotated Bibliography	Recent Sedimentation in Great South Bay, Long Island, New York, 1974. G.S.A. Abstracts for 1961, Special Papers, Number 68.
Great South Bay Fire Island Inlet	Not available	Horizontal Sextant	Grab	G. Hoffman	1. Wet and dry sieving 2. Rapid sediment analyzer 3. Tidal currents	Personal conversation with Dr. Anthony Cok, Adelphi Univ. concerning student Masters Thesis (1977). In prep.
Great South Bay Fire Island Inlet	2	Location via nautical charts	Grab	Corps of Engineers, New York District	1. Wet and dry sieving 2. Elutriate analyzed for C.O.D., oil and grease, arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc.	1. U.S. Army Engineer District, New York. A. Personal communication with Bill Slezak (Operations Section).
Great South Bay-Eastern	169	1. Horizontal Sextant 2. Stations located on a grid interval of ½ mile.	Grab	1. G. T. Greene 2. A. C. F. Mirchel 3. W. Behrens 4. D. S. Becker	1. Wet sieving 2. Pipette analysis 3. Organic carbon--weight loss on ignition at 500°C (percent) 4. Carbonate (shell material)	Surficial Sediments and Seagrasses in Eastern Great South Bay, N.Y. Report to be included in the MSRC Special Report Series.

[a]Note added in proof. A Copy of Rockwell's (1974) thesis was obtained after this report was completed. Rockwell collected short cores from 224 stations on 35 N-S transects at one mile intervals between Cedar Island in Great South Bay on the west and Seatuck Cove in Moriches Bay in the east. At each station he determined the texture of the surficial sediments and reported his results on maps of the median diameter in ϕ-units ($\phi \equiv -\log_2$ diam. in mm) and the Trask coefficient of sorting ($S = \sqrt{Q_1/Q_3}$; where Q_1 and Q_3 are the first and third quartiles). Rockwell (1974) also presented maps of the distribution of heavy metals. Since Rockwell's original data of the mass percentages of sand, silt, and clay are no longer available, we were unable to include his textural data in our maps. We have presented a copy of his textural map in Appendix C.

TABLE 1 (continued)

STUDY AREA (EAST TO WEST)	NUMBER OF STATIONS	METHODS FOR LOCATING STATIONS	TYPE OF SAMPLING	INVESTIGATOR(S)	SEDIMENT STUDIES CONDUCTED	SOURCE OF INFORMATION
Great South Bay-Eastern and Patchogue River	11	Near or at buoys along Intra-coastal Waterway and landmarks in Patchogue River	Grab	Corps of Engineers, New York District	1. Wet sieving 2. Pipette analysis 3. Total carbon with correction for inorganic carbon 4. Elutriate analyzed for C.O.D., oil and grease, arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc	1. U.S. Army Engineer District, New York, New York. A. Maintenance of Great South Bay Channel and Patchogue River and Long Island Intra-coastal Waterway, N.Y. Navigation Projects 1975 (Pub.) Final Environmental Impact Statement. 2. Corps of Engineers Public Notice 8548, 15 July 1976 (Pub.). 3. Personal communication with Bill Slezak and Linda Baxter (Operations Section).
Great South Bay-Patchogue Bay	14	Not specified	Grab	1. J. S. O'Connor 2. P. M. Lin	1. Wet and dry sieving 2. Pipette analysis 3. Ammonia, nitrate, nitrite and phosphate determinations of interstitial water	Data Report on Six South Shore Bays, Nassau and Suffolk Counties, Long Island, New York, 1976, (MSRC Special Data Report). NOTE: Samples taken in 1972.
Great South Bay-Eastern	6	Landmarks	Core	F. J. Turano	1. Dry sieving 2. Organic carbon--weight loss on ignition at 600°C (g/m^2)	The Oxygen Consumption of Selected Sediments of Great South Bay and Some of its Tributary Rivers, (Master of Science Thesis, 1968). NOTE: Samples taken in 1966-1967.
Great South Bay-Central and Eastern	29	1. Landmarks 2. Location via nautical charts	Grab	1. G. T. Greene 2. D. S. Becker	1. Wet sieving 2. Pipette analysis 3. Organic carbon--weight loss on ignition at 500°C (percent)	Winterkill of Hard Clams in Great South Bay, New York, 1976-1977. (MSRC Special Report 9, 1977).

TABLE 1 (continued)

STUDY AREA (EAST TO WEST)	NUMBER OF STATIONS	METHODS FOR LOCATING STATIONS	TYPE OF SAMPLING	INVESTIGATOR(S)	SEDIMENT STUDIES CONDUCTED	SOURCE OF INFORMATION
Great South Bay-Central	9	Not specified	Core	A. D. Sajecki	1. Visual description of cores	An Investigation of the Mercury in the Water, Plankton and Sediments of the Great South Bay, Long Island, New York, (Master of Science Thesis, 1971).
Great South Bay-Central	Approx. 500	1. Horizontal Sextant 2. Stations on a grid pattern ¼ mile apart	Grab	S. Buckner	1. Visual inspection to determine percentage of sand, salt, clay. The main purpose of this study was focused on the Hard Clam population, abundance, and distribution	Personal communication with Stuart Buckner, Islip Town Bay Management, regarding clam study presently under investigation, 1977.
Great South Bay and Connetquot River	6	Not specified	Not specified	J. R. Gaw	1. Visual inspection of substrate	Seasonal Variations in the Fish Populations of Great South Bay and the Connetquot River, L.I., N.Y. (Master of Science Thesis, 1972, Adelphi Univ., Garden City, New York.)
Great South Bay-Central-Connetquot River	Numerous (Exact number not available)	1. Horizontal Sextant 2. Some near bouys.	1. Core 2. Grab	A. Cok et al.	1. Wet and dry sieving 2. Pipette analysis 3. Heavy metal analysis 4. Color (G.S.A. Rock Color Chart) 5. Seismic examinations where possible 6. Organic carbon	Personal conversation with Dr. Anthony Cok, Adelphi Univ., 1977. 1. Connetquot River Study with tentative plans to extend study to Nicholl Pt. 2. Yearly surface sampling at major buoys from Robert Moses Causeway to Smith Pt. (Field Notes and Data not Available).

TABLE 1 continued

STUDY AREA (EAST TO WEST)	NUMBER OF STATIONS	METHODS FOR LOCATING STATIONS	TYPE OF SAMPLING	INVESTIGATOR(S)	SEDIMENT STUDIES CONDUCTED	SOURCE OF INFORMATION
Great South Bay-Central	20	Landmarks	Core	M.H. Koenig	1. Visual description of cores.	An Investigation of the Lead in the Water, Plankton, and Sediments of the Great South Bay, L.I., N.Y., (Master of Science Thesis, 1972).
Great South Bay-Central and Western	17	1. Location via nautical charts 2. Landmarks	Grab	K. Koetzner	1. Dry Sieving	Field notes from Ken Koetzner, N.Y. State Dept. of Environmental Conservation, 1973.
Great South Bay-Central	21	Not specified, (mainly near boat channels).	1. Core 2. Grab	B.E. Bruderer	1. Dry Sieving 2. Magnetic and optical mineralogical analysis 3. Visual description of cores.	A Preliminary Investigation of the Sediments of the Great South Bay, Long Island, New York, (Master of Science Thesis, 1970).
Great South Bay-Western	14	Not specified, (mainly near boat channels).	1. Core 2. Grab	S.H. Penn	1. Dry Sieving 2. Optical and spectroscopic mineralogical analysis 3. Visual description of cores.	A Preliminary Investigation of the Sediments of the Great South Bay, L.I., N.Y., (Master of Science Thesis, 1968).
Great South Bay-Western Carlls River Mouth	8	Not specified	Grab	1. J.S. O'Connor 2. P.M. Lin	1. Wet and dry sieving 2. Pipette analysis 3. Ammonia, nitrite, nitrate and phosphate determinations of interstitial water.	Data Report on Six South Shore Bays, Nassau and Suffolk Counties, Long Island, New York, 1976, (MSRC Special Data Report). NOTE: Samples taken in 1972.
Great South Bay-Western	45	Loran	1. Borings 2. Hand probes	Bowe, Walsh & Associates	1. Visual inspection to determine depths of sand, silt & clay. 2. Resistivity tests.	Southwest Sewer District No. 3 Outfall Sewer. Preliminary Phase, Basic Data Report, 1972.
Great South Bay-Western	35	Landmarks and spans of the Causeway Bridge.	Core	D. Burrier	1. Dry Sieving, (data unavailable). 2. Color (G.S.A. Rock Chart).	The Depth of Burial in Different Sediment Types of The Hard Shell Clam, *Mercenaria mercenaria*

TABLE 1 continued

STUDY AREA (East to West)	NUMBER OF STATIONS	METHODS FOR LOCATING STATIONS	TYPE OF SAMPLING	INVESTIGATOR(S)	SEDIMENT STUDIES CONDUCTED	SOURCE OF INFORMATION
					3. Visual Core descriptions.	in the Babylon Area of Great South Bay, 1974. (study conducted for college course project).
Great South Bay-Western	Not Available	Horizontal Sextant	Core	A. Cok et al.	1. Heavy metal analysis. 2. Stratigraphy. 3. Organic Carbon	1. Personal conversation with Dr. A. Cok, Adelphi Univ., 1977. Study in prep. 2. Tentative plans to core islands from Cedar Island to N.Y. City Line.
Great South Bay-Western	9	Loran	Borings - (borings same as Bowe, Walsh, and Associates, above).	M. Rampino	1. Carbon 14 dating of Holocene. 2. Stratigraphy and transgression of the Pleistocene.	Phone conversation with M. Rampino concerning Ph.D. Dissertation, 1977. In prep. NOTE: samples taken in 1972.
Great South Bay-Western and South Oyster Bay	37	Loran	Grab	MSRC for Bowe, Walsh and Associates	1. Wet and dry sieving. 2. Pipette analysis 3. Organic carbon-weight loss on ignition at 550°C (percent). 4. Heavy metal analysis.	Final Report of the Oceanographic and Biological Study for Southwest Sewer Dist. No. 3, Suffolk County, N.Y., Vol. 1, 1973. NOTE: Samples taken in 1972.
Western Great South Bay and South Oyster Bay	15 (Analyzed same station samples taken for Southwest Sewer Dist. No. 3 Final Report).	Loran	Grab	1. N.R. O'Brien 2. S.A. Ali	1. Wet and dry sieving. 2. Pipette analysis. 3. X-ray analysis. 4. Mineralogy and distribution of the clay fraction.	Clay Mineral Composition of Bottom Sediments: Western Great South Bay and South Oyster Bay, L.I., N.Y., 1974. Published in: "Maritime Sediments."
Great South Bay-Western and South Oyster Bay	37 (Analyzed same station samples	Loran	Grab	1. S.A. Ali 2. R.H. Lindemann 3. P.H. Feldhausen	1. Wet and dry sieving. 2. Pipette analysis. Phi size range from $< -2\phi$ to $\geq +10\phi$.	A Multivariate Sedimentary Environmental Analysis of Great South Bay and South Oyster

TABLE 1 Continued

STUDY AREA (EAST TO WEST)	NUMBER OF STATIONS	METHODS FOR LOCATING STATIONS	TYPE OF SAMPLING	INVESTIGATOR(S)	SEDIMENT STUDIES CONDUCTED	SOURCE OF INFORMATION
	taken for Southwest Sewer Dist. No. 3 Final Report).				3. Development of depositional environments based on sedimentary facies.	Bay, L.I., N.Y. 1976. Published in: "Mathematical Geology." NOTE: Samples taken in 1972.
South Oyster Bay and Hempstead Bay	2 7	Location via nautical charts	Grab	1. G.N. Bigham 2. D.S. Becker	1. Wet sieving. 2. Organic carbon-weight loss on ignition at 500^{o}C (percent). 3. Visual description of sediment. 4. Sediment temperature.	Benthic Oxygen Demand Measurements in Long Island Bays. Tetra Tech, 1977. (Report prepared for the Nassau-Suffolk Regional Planning Board).
South Oyster Bay and Hempstead Bay	15	Landmarks and Buoys	Core	Leonard S. Wegman Co.	1. Visual description of cores (original data not available).	Channel and Eelgrass Study, 1967.
Hempstead Bay Area (Parsonage Cove and Baldwin Bay) Hewlett Bay	18 10	Not Specified	Grab	1. J.S. O'Connor 2. P.M. Lin	1. Wet and dry sieving. 2. Pipette analysis. 3. Ammonia, nitrite, nitrate and phosphate determinations of interstitial water.	Data Report on Six South Shore Bays, Nassau and Suffolk Counties, Long Island, New York, 1976, (MSRC Special Data Report). NOTE: Samples taken in 1972.
Hempstead Bay	12	Not Specified	Core	Testing Service Corporation, for Consoer, Townsend and Associates.	1. Visual description of twelve cores taken on Bay bottom. Additional cores were taken on the islands within the Bay and offshore. 2. Stress vs. strain. 3. Grain size analysis (sieving) on offshore cores.	Report of Soils Investigation Proposed Outfall Line for Wantagh Water Pollution Control Plant, Nassau County, New York, 1969.
Hempstead Bay	18	Landmarks and Buoys	Core	Town of Hempstead (Dept. of Conservation and Waterways)	1. Dry Sieving 2. Pipette Analysis	Analysis of Surficial Sediment within the Hempstead Estuary, 1977 (unpublished data report). NOTE: Samples taken in 1972.

TABLE 2

South Shore Bays Eelgrass (*Zostera marina*) Distribution Information

STUDY AREA (EAST TO WEST)	TIME OF SAMPLING	ABUNDANCE REPRESENTATION	NUMBER OF STATIONS	INVESTIGATOR(S)	SOURCE OF INFORMATION
Great South Bay (entire bay)	1969 - 1972	Percent Cover by Area: 0,0-25,25-50, 50-75, 75-100. Determined by visual observations and sampling (dry mass).	89 visual observations	1. Kenneth Koetzner	1. Eelgrass Production in Long Island Waters, Tetra Tech, 1976* *NOTE: abundance of eelgrass obtained via personal cummunication by Tetra Tech with K. Koetzner of N.Y.S.D.E.C.
Great South Bay - Eastern	3 Aug. 1977	g/m^2 - determined by sampling (dry mass) to confirm visual observations.	3	1. G. T. Greene 2. A. C. F. Mirchel 3. W. Behrens 4. D. S. Becker	Surficial Sediments and Seagrasses in Eastern Great South Bay, New York. (in prep.) Report to be included in MSRC Special Report Series.
Great South Bay - Western	16 Aug. 1972 21 Aug. 1972	Percent Cover by Area: 0-100. Determined by aerial observations and confirmed by sampling (dry mass).	12	MSRC for Bowe, Walsh and Associates	Final Report of the Oceanographic and Biological Study for Southwest Sewer District No. 3, Suffolk County, New York, Vol. 1, 1973.
Great South Bay - Central (Transect from Heckscher State Park to Ocean Beach on Fire Island)	Summer 1965	Tons/acre determined by sampling (dry mass).	21	1. Ronald S. Wilson 2. A. Harry Brenowitz	A Report on the Ecology of Great South Bay and Adjacent waters, 1966.
South Oyster Bay and Hempstead Bay	July 1966	Tons/acre determined by sampling (dry mass).	35	Leonard S. Wegman Co.	Channel and Eelgrass Study, 1967.
South Oyster Bay and Hempstead Bay	July 1968	Tons/acre determined by sampling (dry mass) and visual observations.	21	1. Paul R. Burkholder 2. Thomas E. Doheny	The Biology of Eelgrass, 1968.

Class limits were defined by the 20, 50, and 75 percentiles of each component.

The results of each eelgrass study are summarized on a separate map because of the large seasonal variability of the abundance of eelgrass.

SEDIMENT OBSERVATIONS

Shinnecock Bay

We obtained data from two sediment studies of Shinnecock Bay, Figure 2. The first study was done in conjunction with maintenance dredging of the Intercoastal Water by the U. S. Army Corps of Engineers (1976). Sampling was restricted to the channel; the results are summarized in Table 3.

The second study was part of an M.S. degree fulfillment (Dooley, 1974). Dooley split his samples into two factions -- sand and silt plus clay -- and reported textural analysis of each of the two functions. Unfortunately, he did not combine the results for the two size fractions, sand and mud, and never recorded their individual masses so it is impossible to convert his data to percentages of sand, silt, and clay, except for those few samples which were almost entirely sand (Dooley, personal communication), Figure 2, Table 4. Because of the paucity of data, we were not able to construct a textural map of the sediments in Shinnecock Bay.

Moriches Bay

Sediment studies conducted in Moriches Bay are summarized in Table 1. Station locations are plotted in Figure 3, and the data are summarized in Tables 5-7. The most comprehensive study is that of Nichols (1964) whose 46 samples were collected in 1956 (Nichols, personal communication). Additional samples analyzed by the U. S. Army Corps of Engineers (1976) and Rozza and Roth (1974) have been incorporated in our composite textural maps of Moriches Bay, Figure 4.

As indicated in Table 7, the area near Smith Point Bridge sampled by Rozza and Roth, Figure 3, was predominately sand. The exceptions are two stations at distances of forty-five and sixty-five meters from the mainland. Near Smith Point Bridge the coarsest sediments are found close to the Intracoastal Waterway and they become finer toward the mainland.

According to Nichols (1964) the shallow tributaries are soupy, black, clayey silt while deeper portions of the central bay contain clayey silt with abundant shell fragments. Landward, in the shallow water off the estuary mouths and open coves, the sediments grade from clayey silt to silt or sandy silt. The southern areas of Moriches Bay along the barrier beach are predominantly sand.

Approximately 49% of the area of the Moriches Bay bottom is blanketed by sediment that is less than 20% (by mass) silt plus clay. Eighteen percent of the bay bottom exceeds eighty percent (by mass) silt plus clay.

As indicated in Table 1, one hundred and thirty-nine samples were taken in the Moriches Inlet area in 1953-1954 by Taney (1961). These stations were not plotted since the data were presented as median diameter, sorting, and skewness rather than percentages of sand, silt, and clay. The data show, however, that all samples range between medium and fine sand with very little silt. This is typical of an inlet with strong tidal currents.

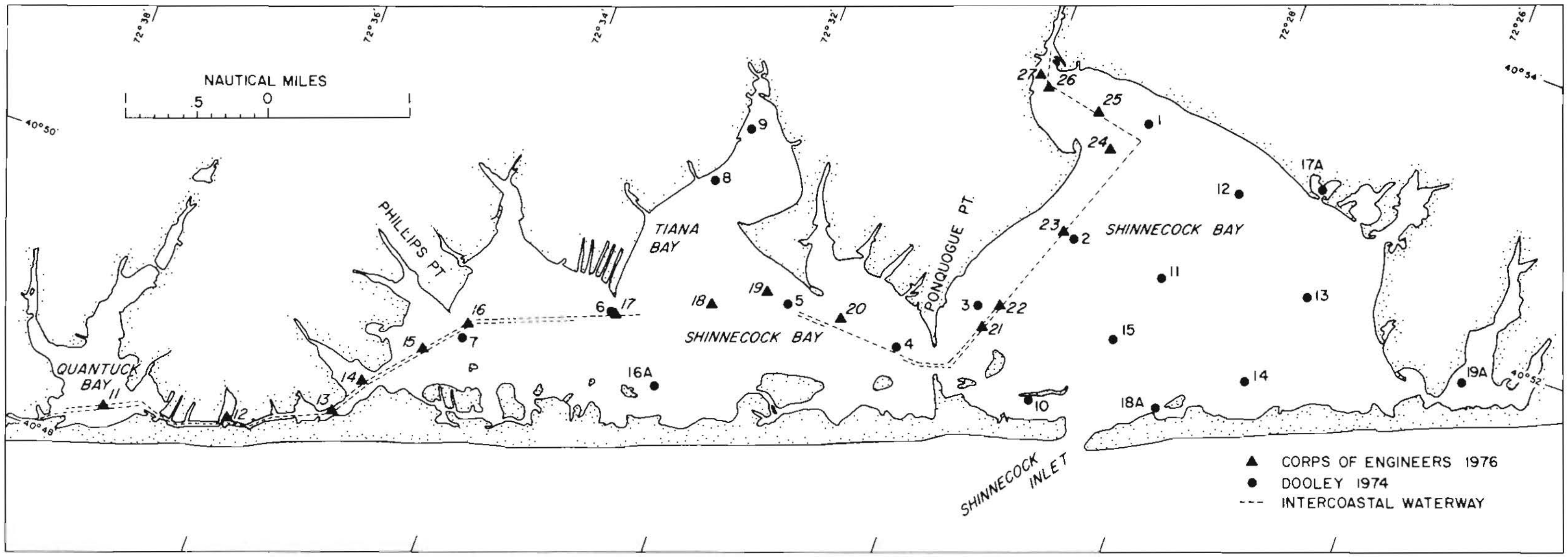

Figure 2. Sediment sampling stations in Shinnecock Bay.

TABLE 3

Textural data for stations shown in Figure 2.

(U. S. Army Corps of Engineers, 1976)

STATION NUMBER	STATION LOCATIONS N. LAT.	W. LONG.	PERCENT (MASS) SAND	PERCENT (MASS) SILT + CLAY
11	40°48'19"	72°37'08"	54.8	45.2
12	40°48'31"	73°36'00"	93.6	6.4
13	40°48'51"	72°35'00"	99.1	0.9
14	40°49'05"	72°34'58"	97.5	2.5
15	40°49'28"	72°34'32"	63.6	36.4
16	40°49'44"	72°34'15"	55.9	44.1
17	40°50'10"	72°33'01"	52.0	48.0
18	40°50'29"	72°32'12"	68.7	31.3
19	40°50'41"	72°31'44"	99.7	0.3
20	40°50'39"	72°31'01"	99.8	0.2
21	40°51'00"	72°29'46"	99.3	0.7
22	40°51'10"	72°29'52"	98.5	1.5
23	40°51'49"	72°29'23"	43.2	56.8
24	40°52'28"	72°29'15"	32.9	67.1
25	40°52'40"	72°29'28"	97.1	2.9
26	40°52'45"	72°30'00"	75.6	24.4
27	40°52'50"	72°30'04"	99.0	1.0

TABLE 4

Textural data[a] for stations shown in Figure 2.

(Dooley, 1974)

STATION NUMBER	STATION LOCATIONS N. LAT.	W. LONG.	PERCENT (MASS) SAND	PERCENT (MASS) SILT + CLAY
3	40°51'10"	72°29'52"	100.00	0.0
10	40°50'40"	72°29'07"	99.9	0.1
13	40°52'00"	72°26'48"	98.0	2.0
16A	40°49'50"	72°32'26"	99.7	0.3
17A	40°52'50"	72°27'17"	99.7	0.3
18A	40°50'52"	72°28'00"	99.8	0.2
19A	40°51'39"	72°25'24"	99.0	1.0

[a]Dooley wet sieved each sample to separate the sand from the silt + clay. Each of these two fractions--sand and silt + clay--were analyzed texturally, and the results reported as mass percentages for size classes within that fraction. The results were not related to the total mass of each sample, and therefore are of limited value in preparing maps of the percent sand and silt + clay. For a small number of stations Dooley reported that there was insufficient fine material to warrant a pipette analysis. For these samples, he reported the percent of the total samples accounted for by sand and we have included these samples in Table 4.

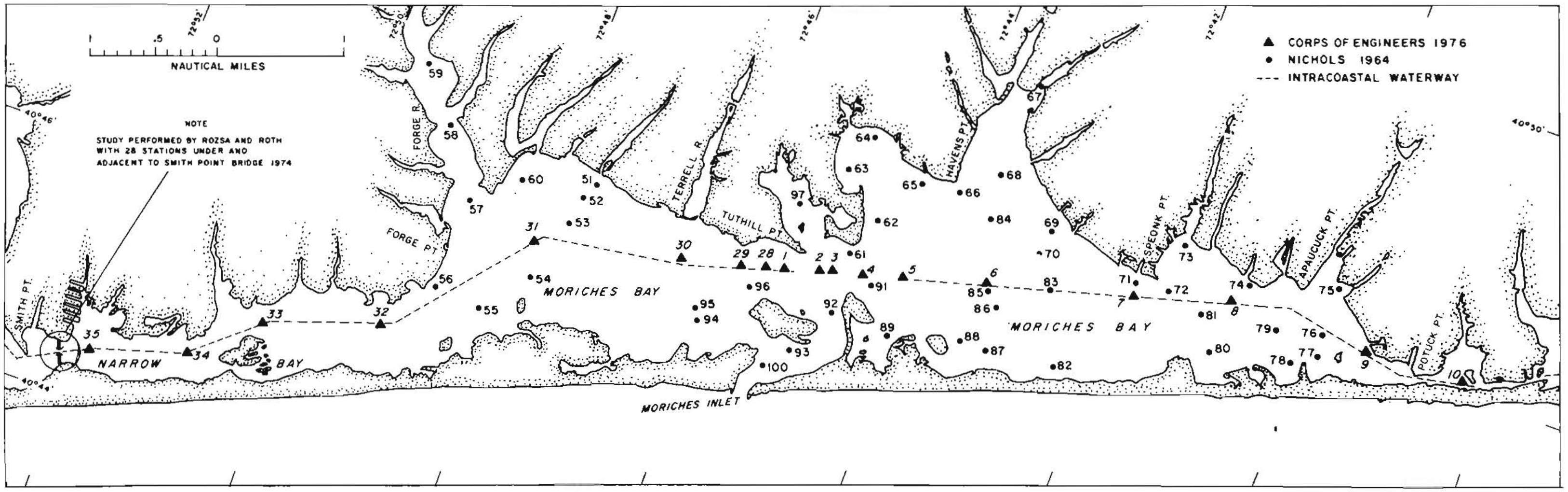

Figure 3. Sediment sampling stations in Moriches Bay.

TABLE 5

Textural data for stations shown in Figure 3.

(Nichols, 1964)

The data are mapped in Figure 4.

STATION NUMBER	STATION LOCATIONS N. LAT.	W. LONG.	PERCENT (MASS) SAND	PERCENT (MASS) SILT + CLAY
51	40°46'58"	72°47'28"	91.3	8.7
52	40°46'50"	72°47'34"	34.5	65.5
53	40°46'36"	72°47'36"	20.4	79.6
54	40°46'06"	72°47'46"	80.0	20.0
55	40°45'44"	72°48'10"	95.5	4.5
56	40°45'46"	72°48'40"	90.0	10.0
57	40°46'30"	72°48'38"	36.7	63.3
58	40°47'02"	72°49'06"	8.4	91.6
59	40°47'23"	72°49'33"	2.3	97.7
60	40°46'48"	72°48'13"	26.1	73.9
61	40°44'43"	72°44'44"	54.0	46.0
62	40°47'27"	72°44'34"	18.6	81.4
63	40°47'44"	72°45'04"	3.0	97.0
64	40°48'05"	72°44'53"	0.9	99.1
65	40°47'52"	72°44'16"	10.0	90.0
66	40°47'53"	72°43'52"	88.3	11.7
67	40°48'53"	72°43'28"	1.7	98.3
68	40°48'08"	72°43'33"	22.0	78.0
69	40°47'51"	72°42'50"	67.2	32.8
70	40°47'38"	72°42'52"	10.8	89.2
71	40°47'42"	72°41'48"	80.0	20.0
72	40°47'42"	72°41'27"	7.0	93.0
73	40°48'07"	72°41'29"	2.4	97.8
74	40°48'00"	72°40'41"	80.0	20.0
75	40°48'12"	72°39'49"	56.2	43.8
76	40°47'49"	72°39'49"	76.6	23.4
77	40°47'38"	72°39'47"	93.0	7.0
78	40°47'31"	72°40'02"	82.0	18.0
79	40°47'43"	72°40'17"	96.3	3.6
80	40°47'22"	72°40'52"	88.8	11.2
81	40°47'38"	72°41'05"	59.7	40.3
82	40°46'51"	72°42'19"	80.0	20.0
83	40°47'25"	72°42'38"	10.0	90.0
84	40°47'46"	72°43'29"	5.3	94.7
85	40°47'15"	72°43'15"	12.7	87.3
86	40°47'08"	72°43'05"	29.0	71.0
87	40°46'48"	72°43'03"	97.0	3.0

TABLE 5 (continued)

STATION NUMBER	STATION LOCATIONS N. LAT.	W. LONG.	PERCENT (MASS) SAND	PERCENT (MASS) SILT + CLAY
88	40°46'48"	72°43'20"	36.2	63.8
89	40°46'37"	72°44'04"	80.0	20.0
91	40°46'58"	72°44'24"	18.3	81.7
92	40°46'40"	72°44'42"	99.3	0.7
93	40°46'15"	72°44'59"	100.0	0.0
94	40°46'15"	72°46'00"	30.7	69.3
95	40°46'19"	72°46'05"	10.0	90.0
96	40°46'37"	72°45'24"	43.6	56.4
97	40°47'22"	72°45'25"	10.0	90.0
100	40°46'04"	72°45'23"	100.0	0.0

TABLE 6

Textural data for stations shown in Figure 3.

(U. S. Army Corps of Engineers, 1976)

The data are mapped in Figure 4.

STATION NUMBER	STATION LOCATIONS N. LAT.	W. LONG.	PERCENT (MASS) SAND	PERCENT (MASS) SILT + CLAY
1	40°46'51"	72°45'20"	68.1	31.9
2	40°46'55"	72°45'02"	55.7	44.3
3	40°46'57"	72°44'52"	99.1	0.9
4	40°47'02"	72°44'32"	98.9	1.1
5	40°47'06"	72°44'09"	98.8	1.2
6	40°47'20"	72°43'13"	44.4	55.6
7	40°47'38"	72°41'48"	61.7	38.3
8	40°47'50"	72°40'49"	49.1	50.9
9	40°47'50"	72°39'20"	99.5	0.5
10	40°47'52"	72°38'19"	94.8	5.2
28	40°46'49"	72°45'32"	58.0	42.0
29	40°46'46"	72°45'43"	87.3	12.7
30	40°46'36"	72°46'26"	49.6	50.4
31	40°46'24"	72°47'52"	53.9	46.1
32	40°45'23"	72°49'05"	98.7	1.3
33	40°45'04"	72°50'14"	97.9	2.1
34	40°44'39"	72°50'50"	99.9	0.1
35	40°44'23"	72°51'55"	100.0	0.0

TABLE 7

Sediment textural data[a] for area of Narrow Bay shown in Fig. 3 (Rozsa and Roth, 1974).

SEDIMENT STATIONS (South to North under Smith Point Bridge between each piling)	PERCENT (MASS) SAND	PERCENT (MASS) SILT + CLAY
17	97.0	3.0
18	100.0	0.0
19	100.0	0.0
20	100.0	0.0
21	100.0	0.0
22	100.0	0.0
23	100.0	0.0
24	100.0	0.0
25	100.0	0.0
26	100.0	0.0
27	43.3	56.7
28	85.3	14.7
SEDIMENT STATIONS (South to North, 200 feet West of Smith Pt. Bridge perpendicular to pilings)		
1	100.0	0.0
2	96.4	3.6
3	100.0	0.0
4	100.0	0.0
5	100.0	0.0
6	100.0	0.0
7	94.6	5.4
8	100.0	0.0
9	100.0	0.0
10	100.0	0.0
11	100.0	0.0
12	100.0	0.0
13	54.1	45.9
14	97.1	2.9
15	97.0	3.0
16	91.1	8.9

[a]The stations for this study were not plotted because of the concentrations of stations in the relatively small area of the Smith Point Bridge. With the exception of stations 27 and 13, which are at a distance from the mainland of forty-five and sixty-five meters respectively, all samples contain greater than eighty percent sand.

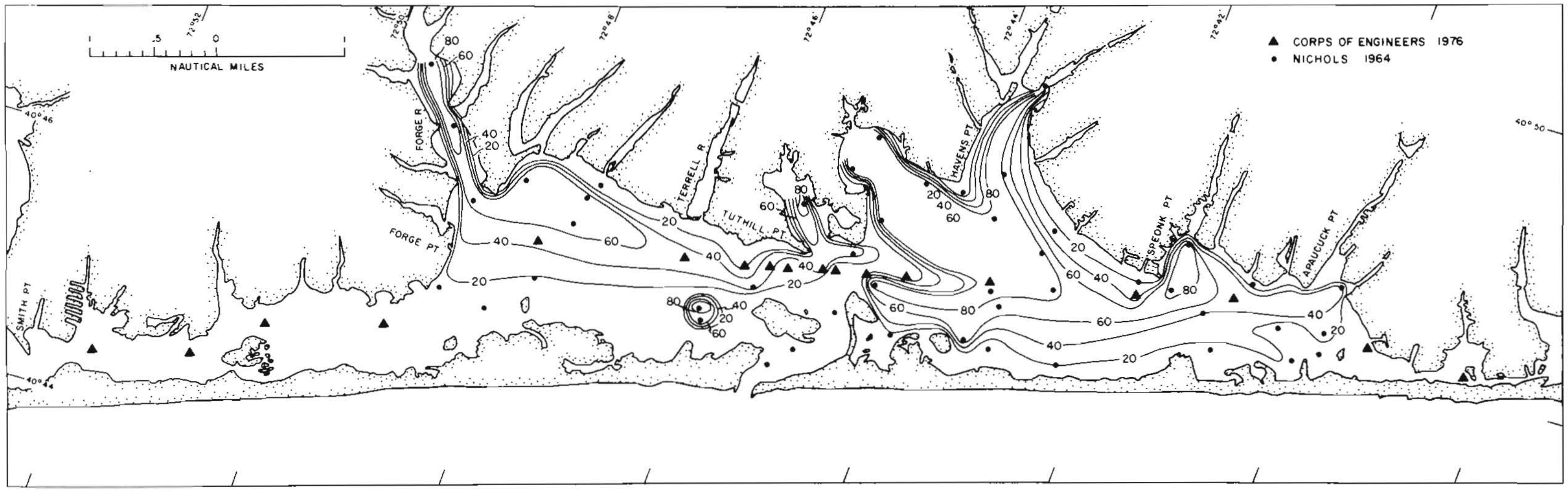

Figure 4. Percent (mass) silt plus clay distribution in Moriches Bay.

Great South Bay

In the entire Great South Bay, extending from the Nassau-Suffolk County line on the west to Smith Point on the east, approximately 300 sediment samples have been taken that are useful for contouring the percentages of sand, and silt plus clay of the surficial sediments.

Eastern Great South Bay

Of the above mentioned 300 samples, more than two thirds have been taken in the eastern section of the bay, Figures 5 and 6 (Tables 8-11). The density of the samples is sufficiently great for accurate contouring of the sediment texture in the eastern portion of Great South Bay, Figure 7. Approximately 62% of the area of eastern Great South Bay bottom is blanketed by sediment that is less than 20% (by mass) silt plus clay. Nine percent of the bay bottom exceeds eighty percent (by mass) silt plus clay.

Central Great South Bay

There are far fewer samples from the central portion of Great South Bay. Five independant studies were conducted from 1968 to 1977, resulting in a total of only forty-five sediment samples (Figure 8, Tables 12-14). The combined data from these stations did not permit accurate contouring since some stations were closely clustered, leaving a relatively small number of stations with a wide variation in sediment texture between stations spread throughout the large remaining area of central Great South Bay.

Western Great South Bay and South Oyster Bay

Numerous sediment samples have been taken in conjunction with seven studies of western Great South Bay and South Oyster Bay between 1968 and 1977, Figures 9-12, Tables 15-18. These data permitted a good description of the variation in sediment texture throughout most of western Great South Bay, Figure 13. Approximately 94% of the bottom sampled in western Great South Bay is blanketed by sediment that is less than 20% (by mass) silt plus clay. Less than 1% of the bay bottom exceeds 80% (by mass) silt plus clay.

The combined data from the stations in South Oyster Bay did not permit contouring because the density of stations was too low.

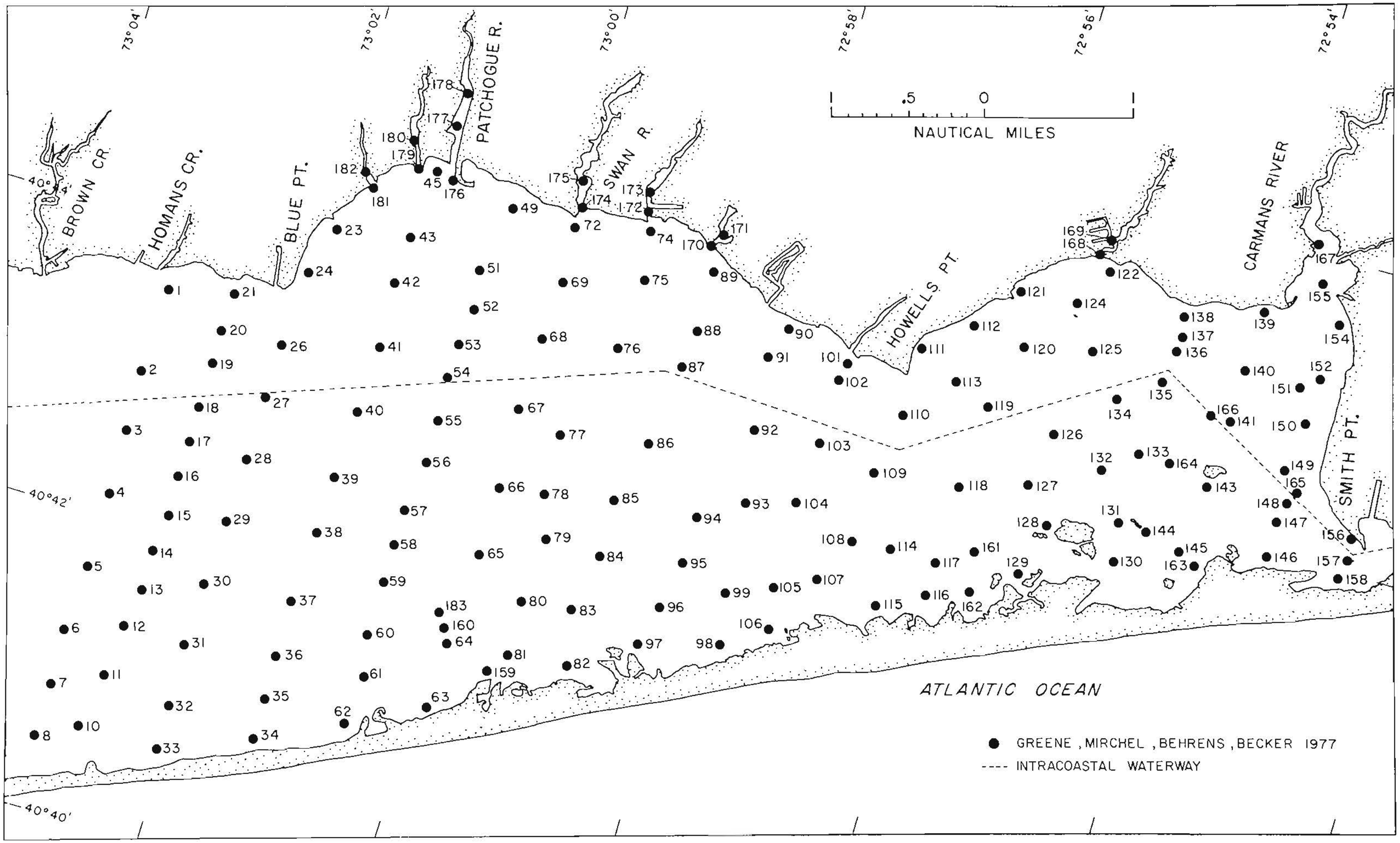

Figure 5. Sediment sampling stations in eastern Great South Bay.

TABLE 8

Textural data for stations shown in Figure 5.

(Greene et al., 1977)

The data are mapped in Figure 7.

STATION NUMBER	STATION LOCATIONS N. LAT.	W. LONG.	PERCENT (MASS) SAND	PERCENT (MASS) SILT + CLAY
1	40°43'31"	73°03'08"	98.2	1.8
2	40°43'01"	73°03'08"	9.8	90.2
3	40°42'36"	73°03'08"	26.8	73.2
4	40°42'10"	73°03'08"	57.7	42.3
5	40°41'40"	73°03'08"	81.9	18.1
6	40°41'13"	73°03'08"	98.1	1.9
7	40°40'50"	73°03'08"	98.6	1.4
8	40°40'27"	73°03'08"	98.7	1.3
10	40°40'36"	73°02'44"	98.8	1.2
11	40°41'01"	73°02'41"	96.3	3.7
12	40°41'20"	73°02'38"	96.8	3.2
13	40°41'53"	73°02'35"	94.6	5.4
14	40°41'37"	73°02'35"	72.9	27.1
15	40°42'08"	73°02'35"	90.6	9.4
16	40°42'25"	73°02'35"	88.9	11.1
17	40°42'40"	73°02'35"	34.1	65.9
18	40°42'55"	73°02'35"	17.6	82.4
19	40°43'12"	73°02'35"	15.5	84.5
20	40°43'24"	73°02'35"	12.6	87.4
21	40°43'47"	73°02'35"	98.9	1.1
23	40°44'17'	73°01'55"	90.9	9.1
24	40°43'56"	73°02'00"	17.6	82.4
26	40°43'25"	73°02'02"	95.8	4.2
27	40°43'03"	73°02'02"	28.6	71.4
28	40°42'38"	73°02'02"	78.8	21.2
29	40°42'11"	73°02'04"	78.5	21.5
30	40°41'45"	73°02'04"	87.1	12.9
31	40°41'19'	73°02'04"	98.6	1.4
32	40°40'54"	73°02'02"	98.7	1.3
33	40°40'35"	73°02'02"	99.2	0.8
34	40°40'52"	73°01'15"	98.0	2.0
35	40°40'54"	73°01'16"	98.5	1.5
36	40°41'15"	73°01'16"	98.5	1.5
37	40°41'09"	73°01'15"	93.2	6.8
38	40°42'18"	73°01'15"	62.0	38.0
39	40°42'43"	73°01'13"	92.2	7.8
40	40°43'10"	73°01'13"	7.7	92.3
41	40°43'38"	73°01'11"	19.8	80.2

TABLE 8 (continued)

STATION NUMBER	STATION LOCATIONS N. LAT.	W. LONG.	PERCENT (MASS) SAND	PERCENT (MASS) SILT + CLAY
42	40°44'04"	73°01'15"	5.1	94.9
43	40°44'23"	73°01'13"	8.5	91.5
45	40°44'52"	73°01'13"	23.3	76.7
49	40°44'44"	73°00'33"	68.8	4.0
51	40°44'18"	73°00'33"	12.8	87.2
52	40°44'01"	73°00'31"	26.3	73.7
53	40°43'45"	73°00'33"	51.8	48.2
54	40°43'30"	73°00'33"	50.1	49.9
55	40°43'14"	73°00'31"	67.0	33.0
56	40°42'57"	73°00'31"	82.9	17.1
57	40°42'38"	73°00'33"	81.9	18.1
58	40°42'22"	73°00'33"	98.3	1.7
59	40°42'07"	73°00'33"	95.3	4.7
60	40°41'44"	73°00'31"	96.7	3.3
61	40°41'28"	73°00'30"	97.6	2.4
62	40°41'58"	73°00'33"	99.0	1.0
63	40°41'24"	72°59'54"	96.3	3.7
64	40°41'50"	72°59'54"	95.4	4.6
65	40°42'29"	72°59'50"	93.2	6.8
66	40°42'50"	72°59'50"	95.4	4.6
67	40°43'29"	72°59'54"	97.0	3.0
68	40°43'58"	72°59'50"	59.2	40.8
69	40°44'23"	72°59'50"	20.8	79.2
72	40°44'45"	72°59'53"	96.9	3.1
74	40°44'53"	72°59'14"	90.7	9.3
75	40°44'27"	72°59'13"	12.4	87.6
76	40°44'02"	72°59'13"	64.4	35.6
77	40°43'22"	72°59'36"	90.2	9.8
78	40°43'00"	72°59'28"	77.8	22.2
79	40°42'40"	72°59'22"	92.2	7.8
80	40°42'14"	72°59'22"	96.1	3.7
81	40°41'52"	72°59'21"	97.9	2.1
82	40°41'55"	72°58'50"	98.5	1.5
83	40°42'19"	72°56'56"	98.6	1.4
84	40°42'43"	72°58'50"	96.5	3.5
85	40°43'05"	72°58'58"	97.3	2.7
86	40°43'31"	72°58'47"	84.4	15.6
87	40°44'03"	72°58'35"	52.3	47.7
88	40°44'20"	72°58'34"	36.0	64.0
89	40°44'47"	72°58'35"	98.6	1.4
90	40°44'32"	72°57'51"	98.6	1.4

TABLE 8 (continued)

STATION NUMBER	STATION LOCATIONS N. LAT.	W. LONG.	PERCENT (MASS) SAND	PERCENT (MASS) SILT + CLAY
91	40°44'18"	72°57'55"	98.8	1.2
92	40°43'49"	72°57'51"	99.1	0.9
93	40°43'18"	72°57'44"	93.5	6.5
94	40°43'08"	72°58'09"	93.6	6.6
95	40°42'47"	72°58'08"	96.1	3.9
96	40°42'28"	72°58'14"	97.6	2.4
97	40°42'12"	72°58'16"	98.3	1.7
98	40°42'18"	72°57'35"	98.8	1.2
99	40°42'42"	72°57'39"	94.4	5.6
101	40°44'25"	72°57'15"	97.6	2.4
102	40°44'18"	72°57'15"	92.0	8.0
103	40°43'50"	72°57'15"	94.0	5.6
104	40°43'24"	72°57'43"	95.3	4.7
105	40°42'47"	72°57'20"	98.4	1.6
106	40°42'30"	72°57'15"	99.6	0.4
107	40°42'57"	72°57'00"	99.2	0.8
108	40°43'15"	72°56'49"	98.2	1.8
109	40°43'47"	72°56'49"	94.7	5.3
110	40°44'08"	72°56'37"	98.4	1.6
111	40°44'41"	72°56'37"	80.7	19.3
112	40°44'55"	72°56'11"	13.9	86.1
113	40°44'29"	72°56'13"	32.9	67.1
114	40°43'17"	72°56'17"	97.9	2.1
115	40°42'51"	72°56'17"	98.2	1.8
116	40°43'00"	72°56'00"	98.6	1.4
117	40°43'14"	72°55'57"	98.0	2.0
118	40°43'50"	72°55'55"	91.4	8.6
119	40°44'23"	72°55'53"	46.9	53.3
120	40°44'53"	72°55'45"	12.9	87.1
121	40°45'17"	72°55'53"	77.2	22.8
122	40°45'29"	72°55'15"	96.6	3.4
124	40°45'14"	72°55'30"	18.4	81.6
125	40°44'57"	72°55'12"	38.5	61.5
126	40°44'22"	72°55'20"	71.0	29.0
127	40°43'57"	72°55'25"	97.4	2.6
128	40°43'43"	72°55'22"	96.8	3.2
129	40°43'23"	72°55'15"	93.3	6.7
130	40°43'38"	72°54'27"	90.7	9.3
131	40°43'54"	72°54'32"	97.3	2.7
132	40°44'12"	72°54'49"	92.0	8.0
133	40°44'21"	72°54'32"	76.7	23.2

TABLE 8 (continued)

STATION NUMBER	STATION LOCATIONS N. LAT.	W. LONG.	PERCENT (MASS) SAND	PERCENT (MASS) SILT + CLAY
134	40°44'42"	72°54'54"	93.4	6.6
135	40°44'54"	72°54'32"	6.4	93.6
136	40°45'06"	72°54'32"	12.7	87.3
137	40°45'11"	72°54'32"	96.8	3.2
138	40°45'22"	72°54'32"	68.9	31.1
139	40°45'32"	72°53'52"	92.5	7.5
140	40°45'07"	72°53'52"	35.1	64.9
141	40°44'46"	72°53'52"	80.7	19.3
143	40°44'43"	72°53'52"	95.3	4.7
144	40°43'53"	72°54'18"	98.7	1.3
145	40°43'48"	72°53'56"	93.0	7.0
146	40°43'57"	72°53'47"	97.4	2.6
147	40°44'11"	72°53'47"	93.7	6.3
148	40°44'20"	72°53'09"	98.9	1.1
149	40°44'33"	72°53'15"	87.8	12.2
150	40°44'55"	72°53'47"	5.5	94.5
151	40°45'07"	72°53'20"	91.6	8.4
152	40°45'16"	72°53'47"	19.1	80.9
154	40°45'16"	72°53'47"	96.6	3.4
155	40°45'50"	72°53'34"	5.4	94.6
156	40°44'13"	72°52'34"	97.7	2.3
157	40°44'05"	72°52'32"	23.0	77.0
158	40°43'57"	72°52'34"	94.9	5.1
163	40°43'46"	72°53'45"	22.0	78.0
164	40°44'21"	72°54'14"	31.6	68.4
165	40°44'23"	72°53'06"	99.2	0.8
166	40°44'44"	72°53'58"	32.7	67.3
167	40°46'06"	72°53'35"	1.6	98.4
168	40°45'37"	72°55'23"	12.8	87.2
169	40°45'42"	72°55'18"	1.2	98.8
170	40°44'53"	72°58'41"	27.1	72.9
171	40°44'57"	72°58'38"	2.4	97.6
172	40°44'57"	72°59'17"	3.1	96.9
173	40°45'02"	72°59'18"	5.6	94.4
174	40°45'53"	72°59'52"	2.4	97.6
175	40°45'01"	72°59'04"	2.8	97.2
176	40°44'48"	73°01'00"	2.5	97.5
177	40°45'11"	73°01'05"	41.1	58.9
178	40°45'23"	73°01'07"	17.4	82.6
179	40°44'50"	73°01'21"	7.1	92.9
180	40°44'56"	73°01'24"	5.1	94.9

TABLE 8 (continued)

STATION NUMBER	STATION LOCATIONS N. LAT.	W. LONG.	PERCENT (MASS) SAND	PERCENT (MASS) SILT + CLAY
181	40°44'38"	73°01'39"	3.4	96.6
182	40°44'40"	73°01'43"	3.4	96.6
183	40°42'00"	72°59'55"	99.1	0.9
184	40°44'32"	72°53'09"	79.7	20.3
185	40°45'00"	72°53'23"	27.5	72.5
186	40°45'24"	72°53'17"	12.6	87.4

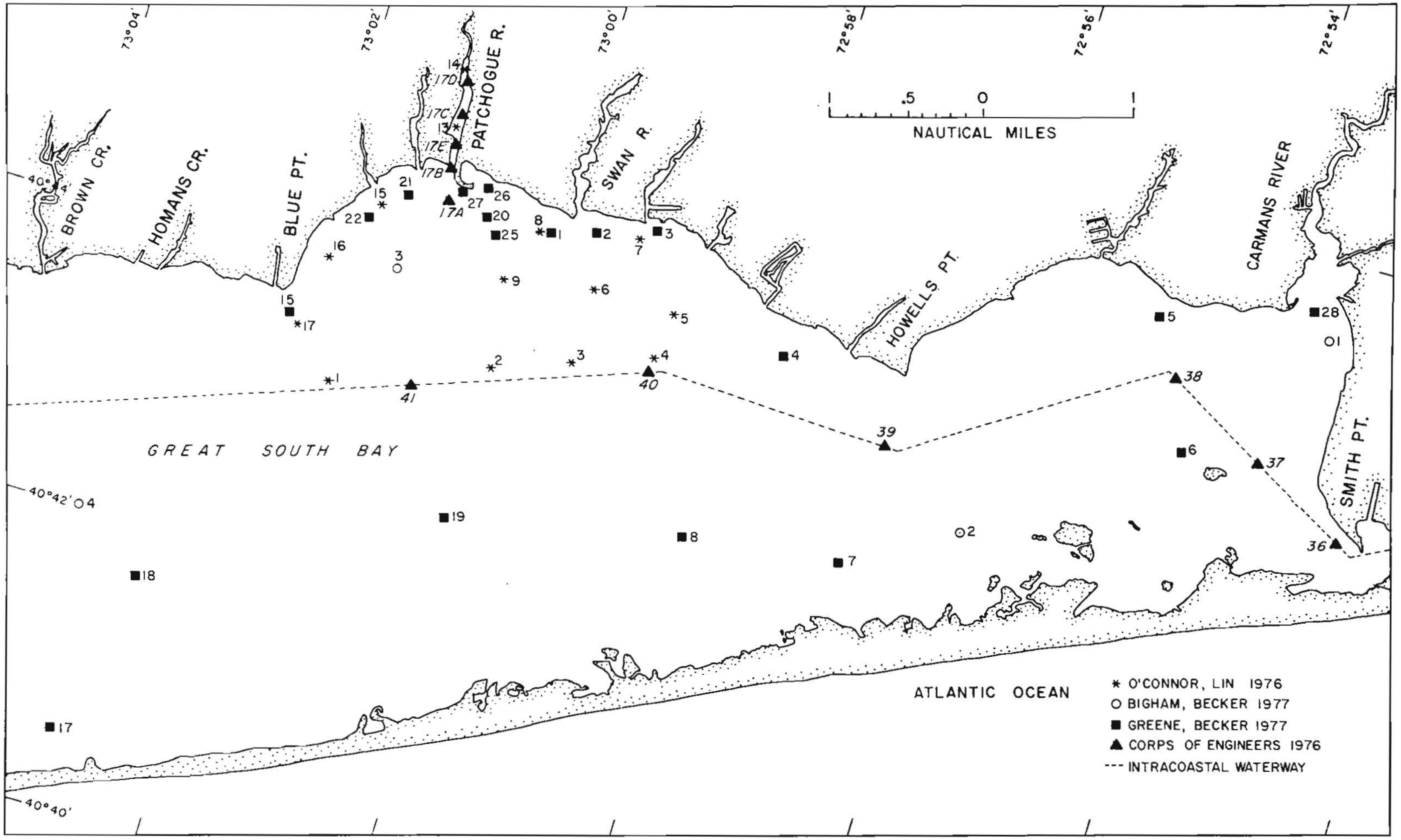

Figure 6. Sediment sampling stations in eastern Great South Bay.

TABLE 9

Textural data for stations shown in Figure 6
(O'Connor and Lin, 1976)
The data are mapped in Figure 7.

STATION NUMBER	STATION LOCATIONS N. LAT.	W. LONG.	PERCENT (MASS) SAND	PERCENT (MASS) SILT + CLAY
1	40°43'18"	73°01'30"	54.8	45.2
2	40°43'42"	73°00'12"	90.8	9.2
3	40°43'54"	72°59'30"	60.3	39.7
4	40°44'00"	72°58'48"	70.1	29.9
5	40°44'24"	72°58'48"	67.2	32.8
6	40°44'24"	72°59'30"	45.2	54.8
7	40°44'48"	72°59'12"	98.4	1.6
8	40°44'42"	73°00'06"	98.6	1.4
9	40°44'18"	73°00'18"	2.3	97.7
13	40°45'12"	73°01'06"	59.7	40.3
14	40°45'30"	73°01'12"	73.1	26.9
15	40°44'24"	73°01'30"	49.5	50.5
16	40°44'06"	73°01'48"	38.1	61.9
17	40°43'24"	73°01'54"	39.7	60.3

TABLE 10

Textural data for stations shown in Figure 6
(Bigham and Becker, 1977; U. S. Army Corps of Engineers, 1976)
The data are mapped in Figure 7.

STATION NUMBER	STATION LOCATIONS N. LAT.	W. LONG.	PERCENT (MASS) SAND	PERCENT (MASS) SILT + CLAY
(Bigham and Becker)				
1	40°45'27"	72°53'15"	97.0	3.0
2	40°43'33"	72°55'42"	99.0	1.0
3	40°44'15"	73°01'10"	17.0	83.0
4	40°42'00"	73°03'30"	95.0	5.0
(Corps of Engineers N.Y., Dist.)				
36	40°44'12"	72°52'40"	88.5	11.5
37	40°44'33"	72°53'31"	99.0	1.0
38	40°44'57"	72°54'25"	52.0	48.0
39	40°43'56"	72°56'42"	71.2	28.8
40	40°43'58"	72°58'53"	79.7	20.3
41	40°43'25"	73°00'52"	65.2	34.8
17A	40°44'41"	73°01'00"	45.3	54.7
17B	40°44'49"	73°01'02"	61.1	38.9
17C	40°45'16"	73°01'07"	77.4	22.6
17D	40°45'29"	73°01'13"	60.9	39.1
17E	40°45'01"	73°01'05"	62.3	37.7

TABLE 11

Textural data for stations shown in Figure 6

(Greene and Becker, 1977)

The data are mapped in Figure 7.

STATION NUMBER	STATION LOCATIONS N. LAT.	W. LONG.	PERCENT (MASS) SAND	PERCENT (MASS) SILT + CLAY
1	40°44'44"	73°00'20"	98.6	1.4
2	40°44'42"	73°00'04"	97.9	2.1
3	40°44'57"	72°59'14"	97.4	2.6
4	40°44'30"	72°57'38"	97.9	2.1
5	40°45'23"	72°54'58"	90.3	9.7
6	40°44'22"	72°54'03"	87.1	12.9
7	40°42'58"	72°56'47"	96.3	3.7
8	40°43'00"	72°58'10"	94.4	5.6
15	40°43'42"	73°02'06"	96.8	3.2
17	40°40'27"	73°02'43"	97.4	2.6
18	40°41'40"	73°02'43"	95.7	4.3
19	40°42'40"	73°00'15"	98.1	1.9
20	40°44'40"	73°00'40"	89.3	10.7
21	40°44'41"	73°01'26"	94.7	5.3
22	40°44'30"	73°01'42"	97.1	2.9
25	40°44'37"	73°00'32"	14.5	85.5
26	40°44'50"	73°00'41"	97.3	2.7
27	40°44'44"	73°00'49"	93.1	6.9
28	40°45'37"	72°53'29"	34.1	65.9

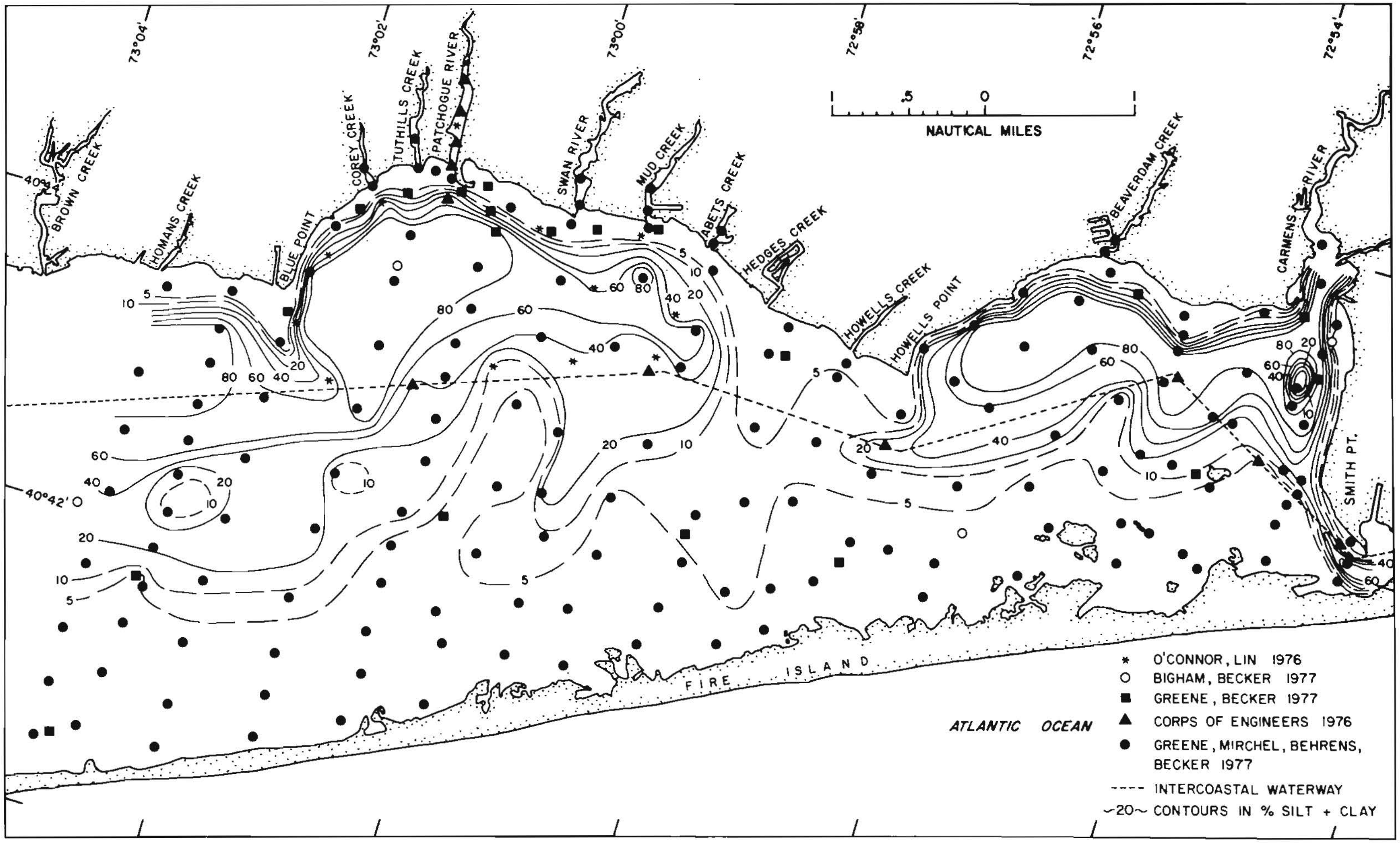

Figure 7. Percent (mass) silt plus clay distribution in eastern Great South Bay. Modified from: Surficial Sediments and Seagrasses in Eastern Great South Bay, New York - Greene et al., in prep.

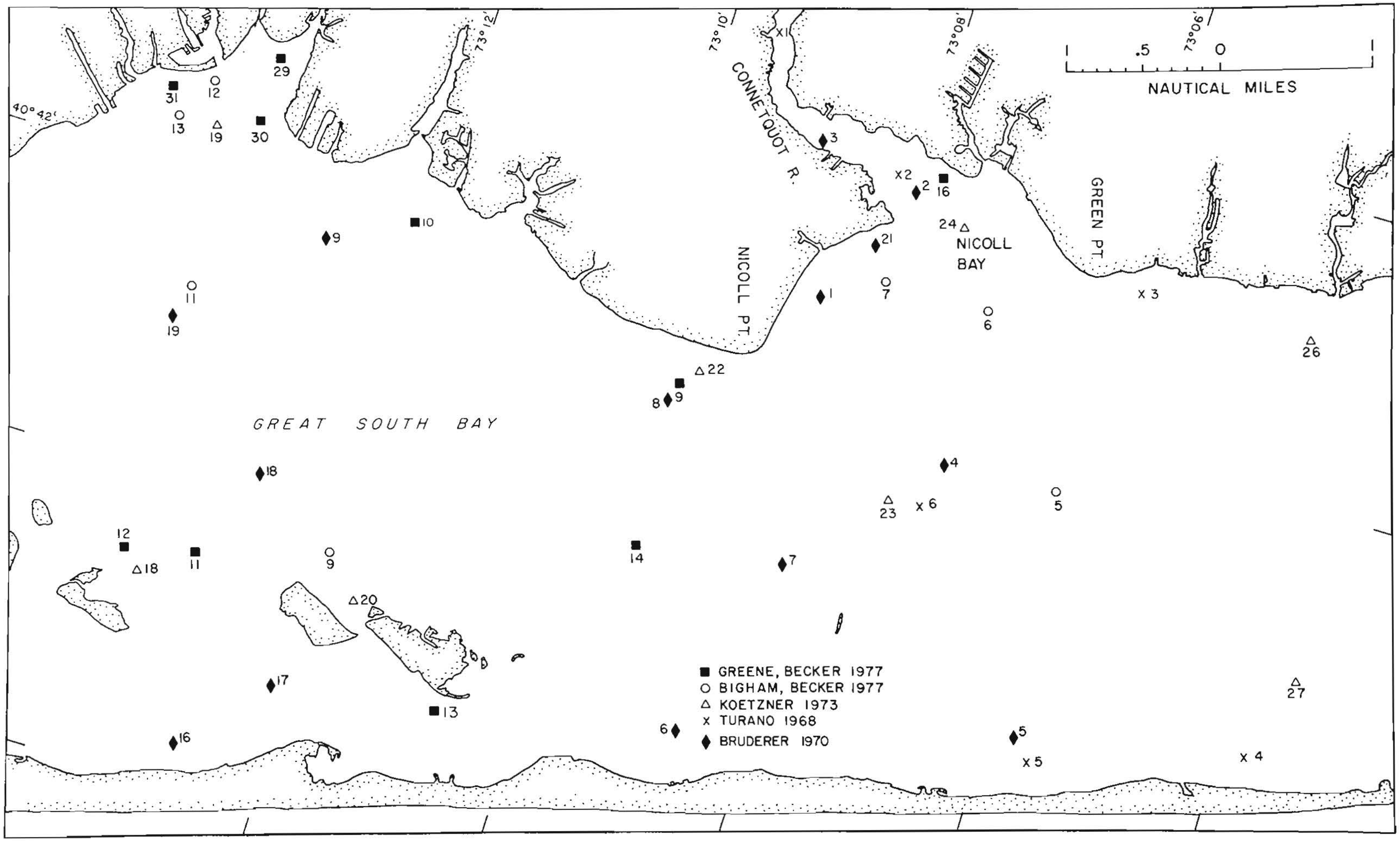

Figure 8. Sediment sampling stations in central Great South Bay.

TABLE 12

Textural data for stations shown in Figure 8

(Greene and Becker, 1977; Bigham and Becker)

STATION NUMBER	STATION LOCATIONS N. LAT.	W. LONG.	PERCENT (MASS) SAND	PERCENT (MASS) SILT + CLAY
(Greene and Becker)				
9	40°41'50"	73°12'50"	98.3	1.7
10	40°42'07"	73°12'10"	98.2	1.8
11	40°39'33"	73°13'08"	93.2	6.8
12	40°39'28"	73°13'45"	97.3	2.7
13	40°38'00"	73°10'40"	93.3	6.7
14	40°40'28"	73°09'26"	96.1	3.9
16	40°38'18"	73°12'50"	96.3	3.7
29	40°42'55"	73°13'40"	96.7	3.3
30	40°42'30"	73°13'40"	83.0	17.0
31	40°42'32"	73°14'32"	96.7	3.3
(Bigham and Becker)				
5	40°41'36"	73°06'00"	99.0	1.0
6	40°42'49"	73°07'09"	89.0	11.0
7	40°42'42"	73°08'00"	94.0	6.0
9	40°39'48"	73°12'00"	98.0	2.0
11	40°41'09"	73°13'48"	93.0	7.0
12	40°42'53"	73°14'10"	99.0	1.0
13	40°42'27"	73°14'24"	95.0	5.0

TABLE 13

Textural data for stations shown in Figure 8

(Turano, 1968; Koetzner, 1973)

STATION NUMBER	STATION LOCATIONS N. LAT.	W. LONG.	PERCENT (MASS) SAND	PERCENT (MASS) SILT + CLAY
(Turano)				
1	40°44'03"	73°09'34"	99.2	0.8
2	40°43'22"	73°08'12"	99.0	1.0
3	40°41'04"	73°05'50"	95.9	4.1
4	40°40'17"	73°03'46"	90.5	9.5
5	40°39'50"	73°05'35"	90.6	9.4
6	40°41'15"	73°07'08"	76.3	23.7
(Koetzner)				
18	40°39'17"	73°13'37"	98.3	1.7
19	40°42'20"	73°14'03"	44.9	55.1
20	40°39'33"	73°11'40"	95.5	4.5
22	40°41'42"	73°09'20"	95.7	4.3
23	40°41'15"	73°07'23"	66.8	33.2
24	40°43'09"	73°07'28"	99.7	0.3
26	40°43'06"	73°04'18"	99.3	0.7
27	40°40'51"	73°03'34"	99.4	0.6

TABLE 14

Textural data for stations shown in Figure 8
(Bruderer, 1970)

STATION NUMBER	STATION LOCATIONS N. LAT.	W. LONG.	PERCENT (MASS) SAND	PERCENT (MASS) SILT + CLAY
1	40°42'30"	73°08'30"	49.2	50.8
2	40°43'20"	73°08'00"	41.0	59.0
3	40°43'20"	73°09'00"	14.0	86.0
4	40°41'40"	73°07'00"	77.7	22.3
5	40°40'00"	73°05'40"	100.0	0.0
6	40°39'30"	73°08'20"	72.5	27.5
7	40°40'40"	73°08'05"	81.1	18.9
8	40°41'30"	73°09'30"	98.1	1.9
9	40°41'50"	73°12'50"	99.2	0.8
16	40°38'20"	73°12'50"	100.0	0.0
17	40°38'50"	73°12'05"	100.0	0.0
18	40°40'10"	73°12'45"	81.1	18.9
19	40°41'00"	73°13'55"	97.9	2.1
21	40°42'55"	73°08'10"	99.3	0.7

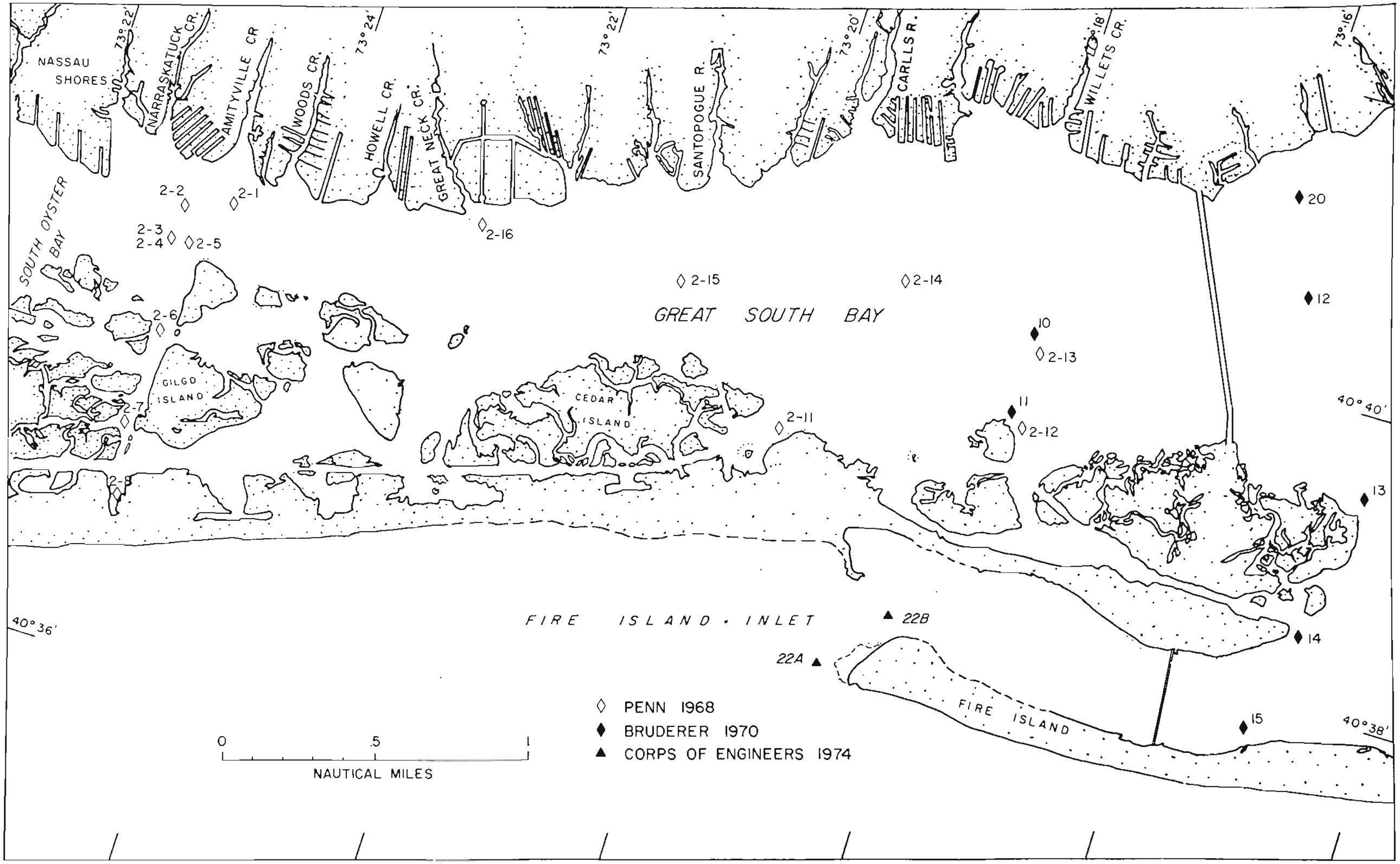

Figure 9. Sediment sampling stations in western Great South Bay.

TABLE 15

Textural data for stations shown in Figure 9
(Penn, 1968; Bruderer, 1970; U. S. Army Corps of Engineers, 1974)
The data are mapped in Figure 13.

STATION NUMBER	STATION LOCATIONS N. LAT.	W. LONG.	PERCENT (MASS) SAND	PERCENT (MASS) SILT + CLAY
(Penn)				
2-1	40°39'06"	73°24'42"	75.3	24.7
2-2	40°39'00"	73°25'06"	75.7	24.3
2-3	40°38'48"	73°25'06"	86.5	13.5
2-4	40°38'48"	73°25'06"	90.7	9.3
2-5	40°38'48"	73°25'00"	75.4	24.6
2-6	40°38'12"	73°25'00"	66.0	34.0
2-7	40°37'30"	73°25'00"	76.7	23.3
2-8	40°37'00"	73°24'54"	83.2	16.8
2-11	40°38'48"	73°19'36"	99.9	0.1
2-12	40°39'12"	73°17'42"	85.4	14.6
2-13	40°39'48"	73°17'42"	82.5	17.5
2-14	40°40'00"	73°19'00"	78.5	21.5
2-15	40°39'36"	73°20'48"	84.6	15.4
2-16	40°39'30"	73°22'36"	70.2	29.8
(Bruderer)				
10	40°39'50"	73°17'45"	81.6	18.4
11	40°39'15"	73°17'45"	94.9	5.1
12	40°40'40"	73°15'45"	96.8	3.2
13	40°39'30"	73°14'40"	100.0	0.0
14	40°38'30"	73°14'50"	100.0	0.0
15	40°37'50"	73°15'00"	100.0	0.0
20	40°41'15"	73°16'00"	97.2	2.8
(U. S. Army Corps of Engineers)				
22A	40°37'20"	73°18'43"	99.9	0.1
22B	40°37'48"	73°18'15"	99.9	0.1

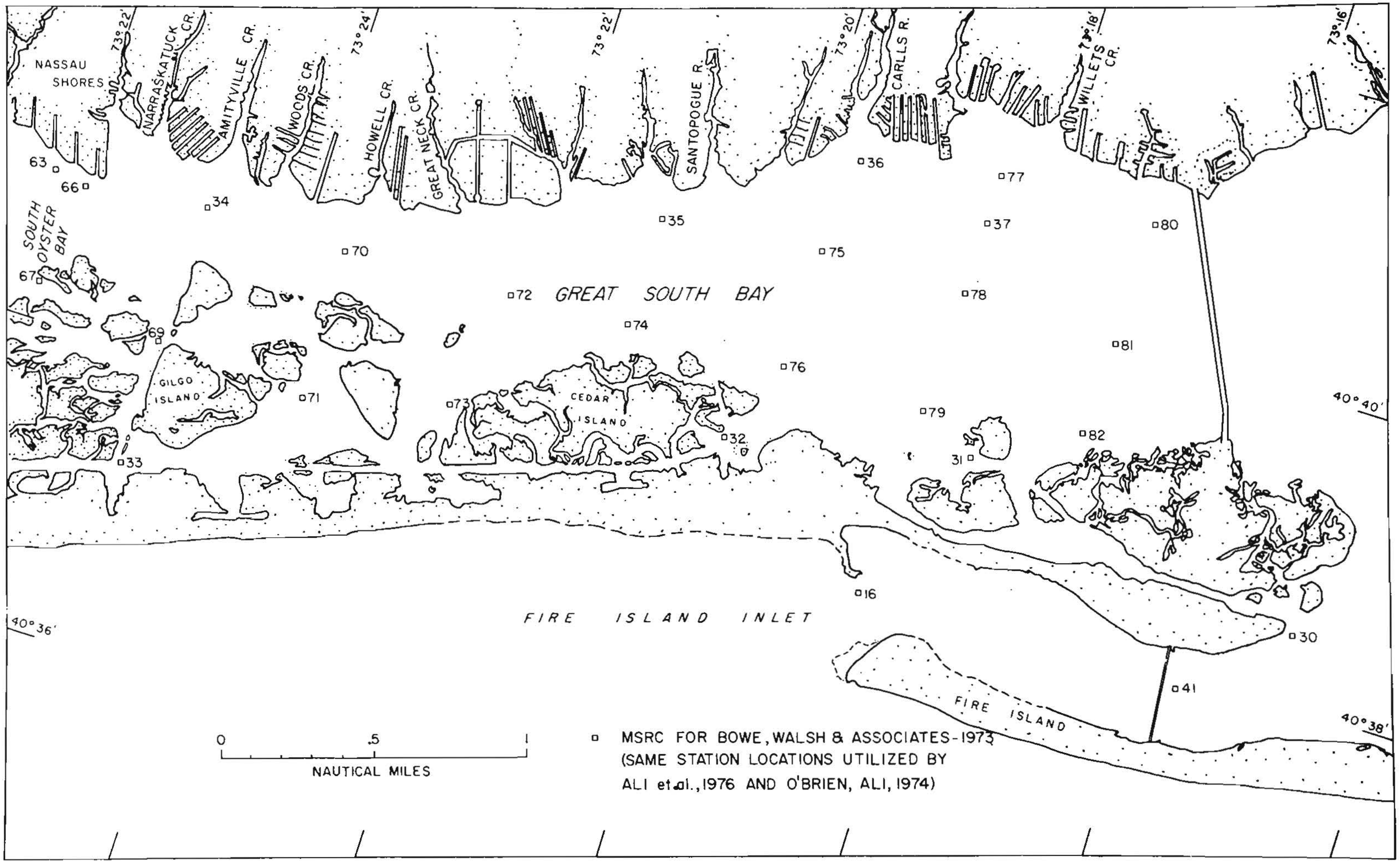

Figure 10. Sediment sampling stations in western Great South Bay and South Oyster Bay.

TABLE 16

Textural data for stations shown in Figure 10
(MSRC for Bowe, Walsh, and Assoc., 1973)
The data are mapped in Figure 13.

STATION NUMBER	STATION LOCATIONS N. LAT.	W. LONG.	PERCENT (MASS) SAND	PERCENT (MASS) SILT + CLAY
16	40°37'54"	73°18'30"	97.4	2.6
30	40°38'30"	73°14'45"	98.9	1.1
31	40°39'00"	73°17'35"	70.0	30.0
32	40°38'38"	73°19'58"	44.9	55.1
33	40°37'15"	73°24'57"	99.0	1.0
34	40°39'04"	73°24'54"	59.7	40.3
35	40°39'55"	73°21'07"	36.3	63.7
36	40°40'39"	73°19'36"	14.8	85.2
37	40°40'32"	73°18'25"	84.8	15.2
41	40°37'54"	73°15'36"	100.0	0.0
63	40°39'00"	73°26'15"	53.5	46.5
66	40°38'58"	73°25'58"	65.9	34.9
67	40°38'12"	73°26'10"	63.7	36.3
69	40°38'08"	73°24'58"	35.1	64.9
70	40°39'03"	73°23'38"	92.4	7.6
71	40°38'03"	73°23'38"	54.1	45.9
72	40°39'05"	73°22'10"	92.9	7.1
73	40°38'18"	73°22'23"	100.0	0.0
74	40°39'08"	73°21'07"	98.0	2.0
75	40°00'00"	73°19'42"	71.1	28.9
76	40°39'10"	73°19'42"	95.9	4.1
77	40°40'50"	73°18'25"	49.5	50.5
78	40°00'00"	73°18'25"	98.0	2.0
79	40°39'10"	73°18'25"	100.0	0.0
80	40°40'50"	73°17'00"	98.5	1.5
81	40°40'00"	73°17'00"	98.2	1.8
82	40°39'22"	73°17'00"	96.4	3.6

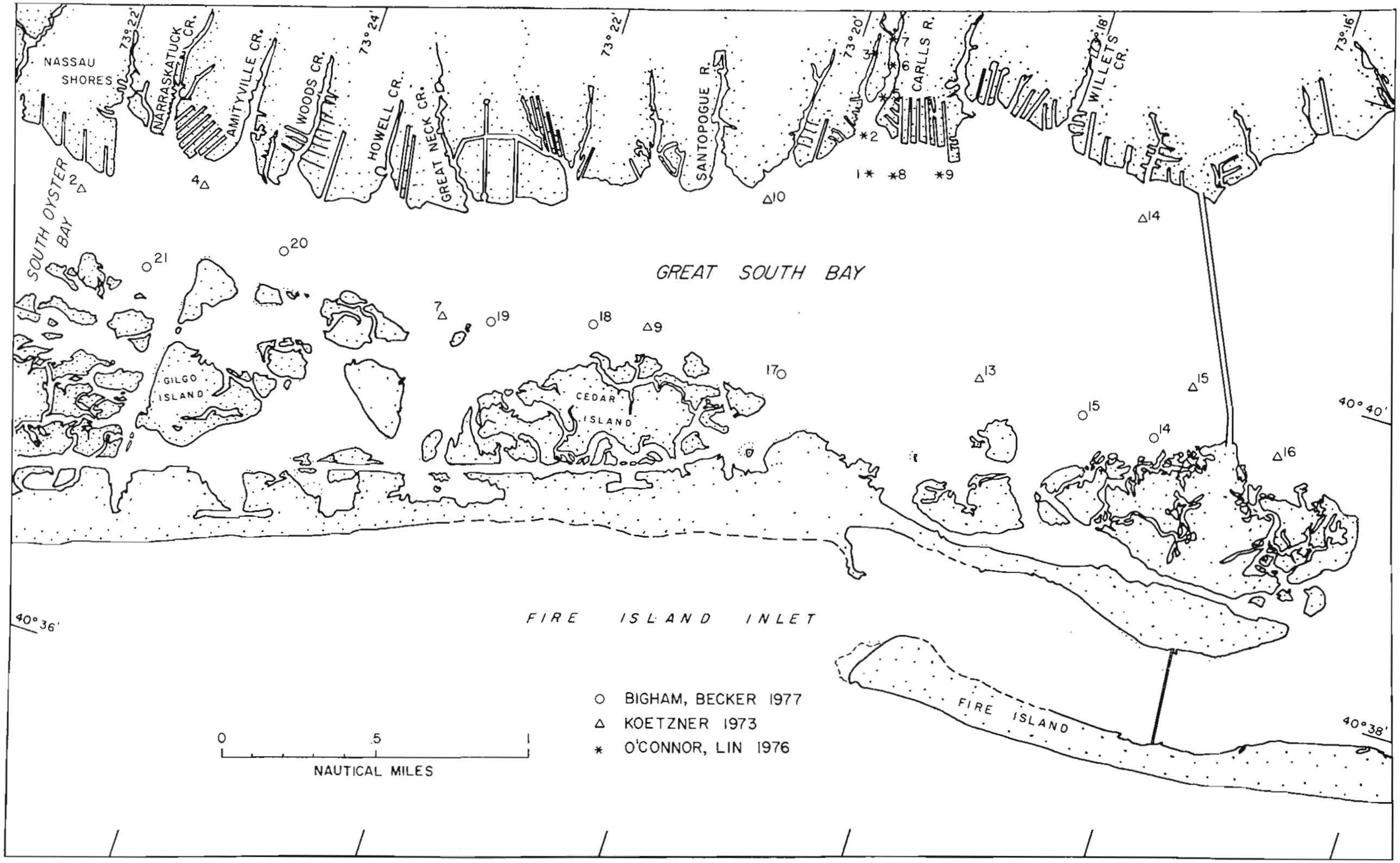

Figure 11. Sediment sampling stations in western Great South Bay and South Oyster Bay.

TABLE 17

Textural data for stations shown in Figure 11
(Koetzner, 1973; Bigham and Becker, 1977; O'Connor and Lin, 1976)
The data are mapped in Figure 13.

STATION NUMBER	STATION LOCATIONS N. LAT.	W. LONG.	PERCENT (MASS) SAND	PERCENT (MASS) SILT + CLAY
(Bigham and Becker)				
14	40°39'31"	73°16'34"	98.0	2.0
15	40°39'28"	73°17'11"	97.0	3.0
17	40°39'09"	73°19'48"	97.0	3.0
18	40°39'04"	73°21'23"	96.0	4.0
19	40°38'49"	73°22'24"	97.0	3.0
20	40°38'49"	73°24'12"	92.0	8.0
21	40°38'29"	73°25'21"	71.0	29.0
(Koetzner)				
2	40°38'55"	73°26'07"	92.0	8.0
4	40°39'10"	73°25'05"	99.5	0.5
7	40°38'48"	73°22'46"	96.2	3.8
9	40°39'10"	73°21'00"	97.8	2.2
10	40°40'15"	73°20'22"	98.3	1.7
13	40°39'30"	73°18'08"	96.9	3.1
14	40°40'50"	73°17'13"	99.6	0.4
15	40°39'53"	73°16'20"	92.8	7.2
16	40°39'36"	73°15'25"	99.1	0.9
(O'Connor and Lin)				
1	40°40'36"	73°19'36"	49.5	50.5
2	40°40'48"	73°19'42"	14.0	86.0
3	40°41'18"	73°19'54"	19.3	80.7
5	40°41'06"	73°19'42"	22.5	77.5
6	40°41'18"	73°19'42"	6.5	93.5
7	40°41'36"	73°19'42"	3.5	96.5
8	40°00'36"	73°19'24"	25.8	74.2
9	40°00'42"	73°19'00"	92.3	7.7

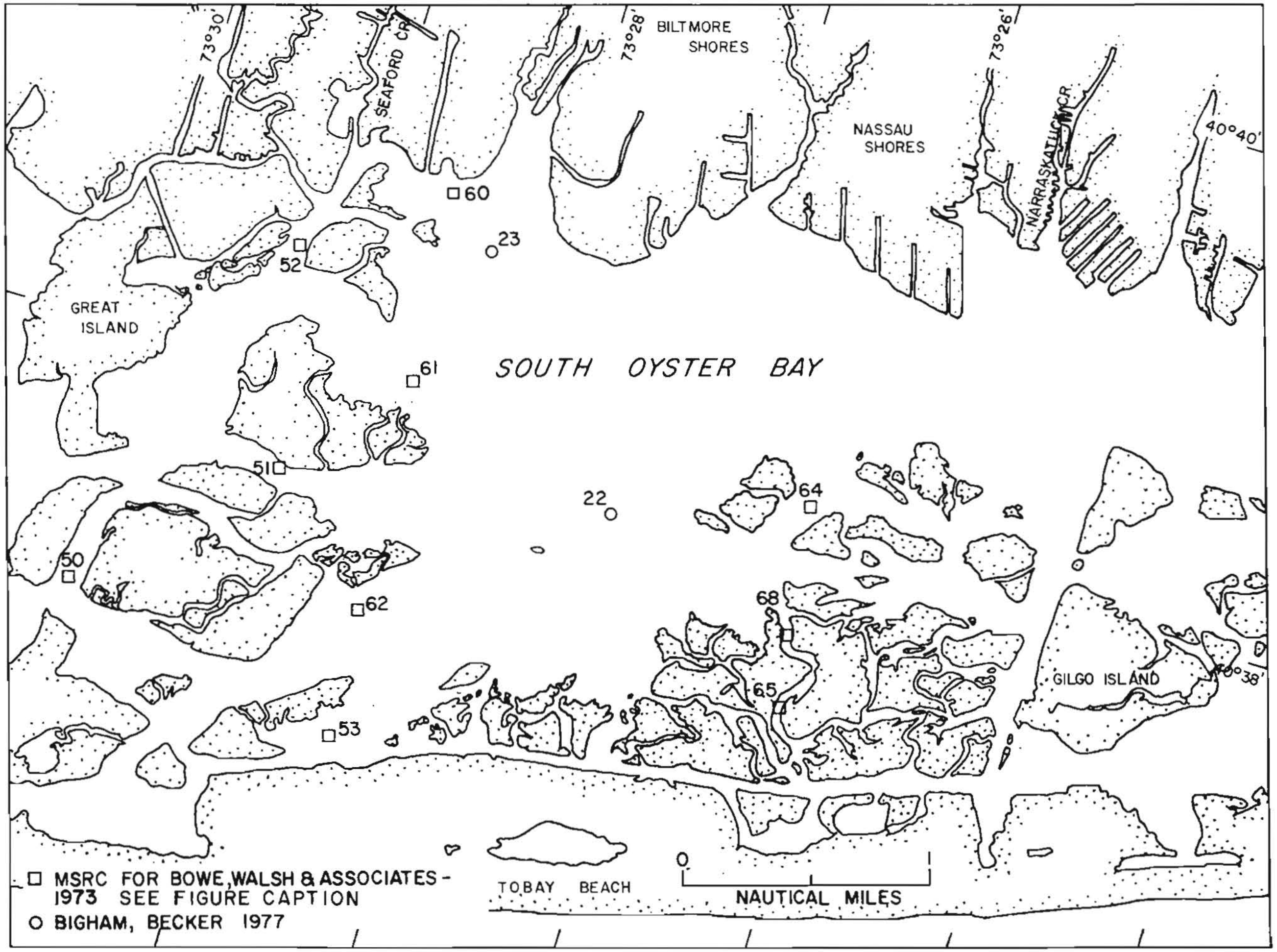

Figure 12. Sediment sampling stations in South Oyster Bay. Studies by Ali et al., 1976 and O'Brien and Ali, 1974, used the same station locations as MSRC for Bowe, Walsh and Associates, 1973.

TABLE 18

Textural data for stations shown in Figure 12

(MSRC for Bowe, Walsh, and Assoc., 1973; Bigham and Becker, 1977)

STATION NUMBER	STATION LOCATIONS N. LAT.	W. LONG.	PERCENT (MASS) SAND	PERCENT (MASS) SILT + CLAY
(Bowe, Walsh and Assoc.)				
50	40°36'55"	73°30'03"	72.6	27.4
51	40°37'39"	73°29'06"	97.0	3.0
52	40°38'31"	73°29'19"	94.6	5.4
53	40°36'35"	73°28'27"	99.8	0.2
60	40°38'57"	73°28'30"	98.5	1.5
61	40°38'06"	73°28'30"	59.2	40.8
62	40°37'13"	73°28'27"	51.4	48.6
64	40°38'05"	73°26'15"	66.0	34.0
65	40°37'18"	73°26'15"	95.8	4.2
68	40°37'37"	73°26'10"	38.6	61.4
(Bigham and Becker)				
22	40°37'54"	73°27'13"	48.0	52.0
23	40°38'42"	73°28'18"	46.0	54.0

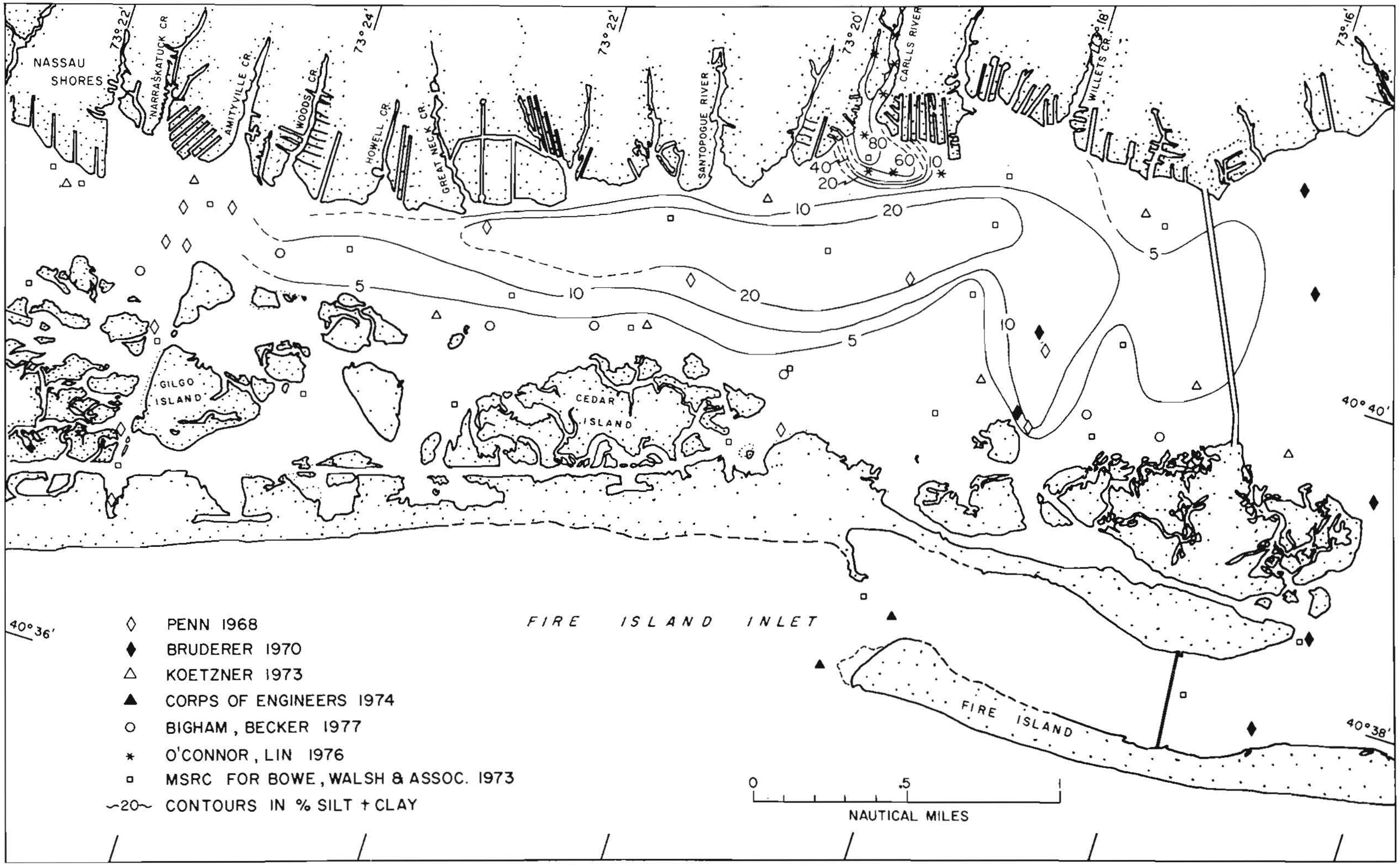

Figure 13. Percent (mass) silt plus clay distribution in western Great South Bay. Studies by Ali et al., 1976 and O'Brien and Ali, 1974, used the same station locations as MSRC for Bowe, Walsh and Associates, 1973.

Hempstead Bay

We identified three sediment studies within the Hempstead Bay area: Bigham and Becker (1977), O'Connor and Lin (1976), and a study by the Town of Hempstead's Department of Conservation and Waterways (1977).

Bigham and Becker analyzed three samples from East Bay, three from Middle Bay, and one from Hewlett Bay. O'Connor and Lin reported the results of analyses of eighteen samples distributed among Baldwin Bay, Middle Bay, and Parsonage Cove, and ten samples from Hewlett Bay.

The largest sampling program in the Hempstead Bay area (eighty samples) was completed by the Town of Hempstead's Department of Conservation and Waterways. The majority of their samples were collected from channels and creeks. Only the relatively few samples from the open areas of East Bay, Baldwin Bay, Middle Bay, Parsonage Cove, Hewlett Bay are appropriate for our study.

Because of the limited number of samples available for Hempstead Bay, it was not possible to contour the data in any meaningful way, Figures 14-16, Tables 19-21.

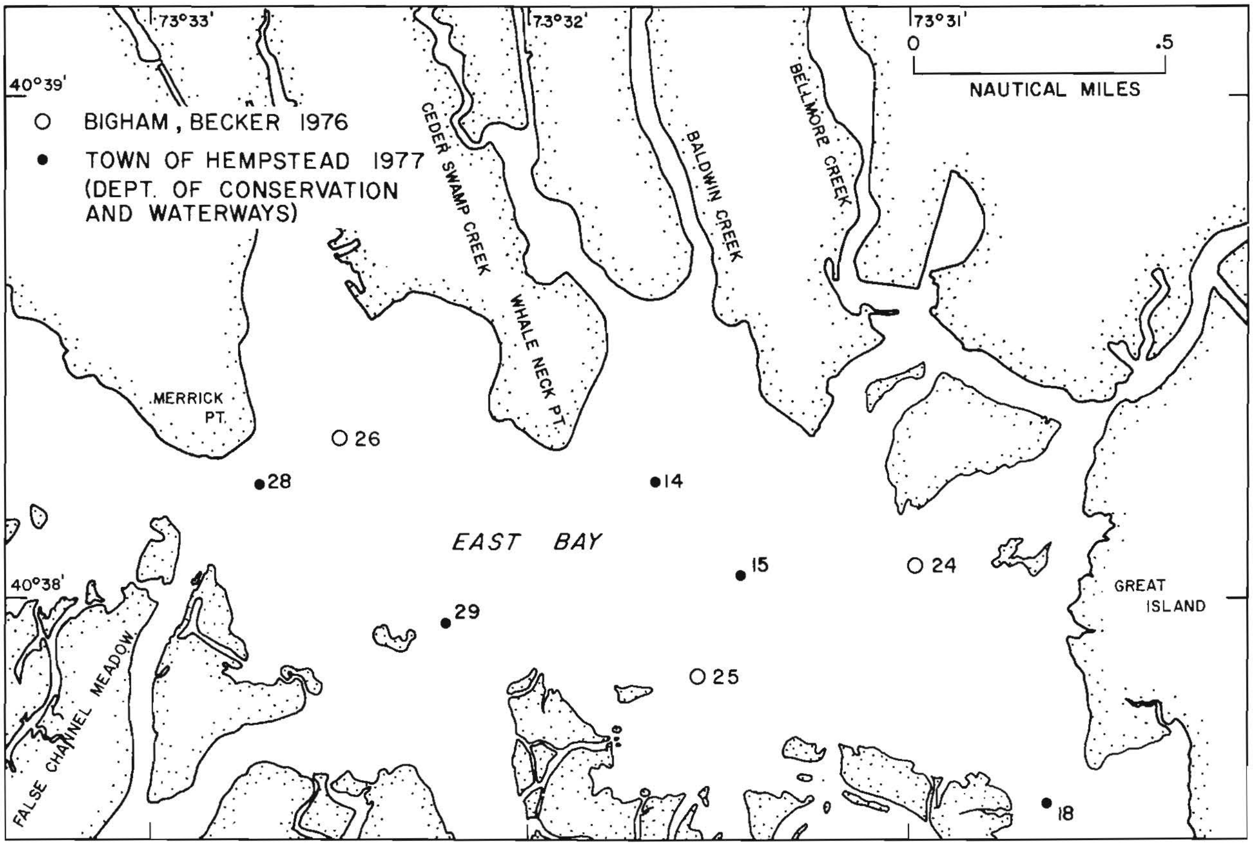

Figure 14. Sediment sampling stations in East Bay.

TABLE 19

Textural data for stations shown in Figure 14
(Bigham and Becker, 1977; Town of Hempstead, 1977)

STATION NUMBER	STATION LOCATIONS N. LAT.	W. LONG.	PERCENT (MASS) SAND	PERCENT (MASS) SILT + CLAY
(Bigham and Becker)				
24	40°38'04"	73°30'58"	87.0	13.0
25	40°37'51"	73°31'33"	91.0	9.0
26	40°38'19"	73°32'29"	74.0	26.0
(Town of Hempstead)				
14	40°38'14"	73°31'40"	25.3	74.7
15	40°38'03"	73°31'26"	76.3	23.7
18	40°37'37"	73°30'38"	80.7	19.3
28	40°38'14"	73°32'42"	66.6	33.4
29	40°37'58"	73°32'13"	67.0	33.0

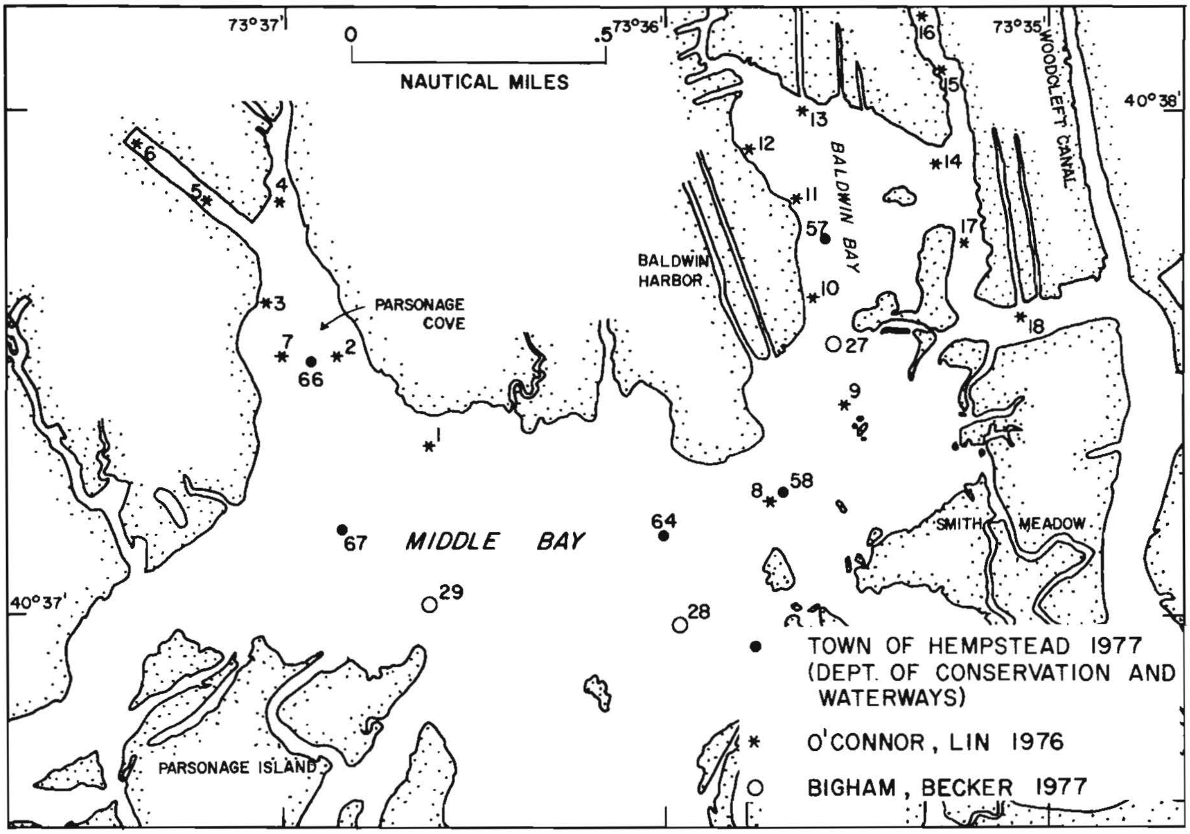

Figure 15. Sediment sampling stations in Baldwin Bay, Middle Bay, and Parsonage Cove.

TABLE 20

Textural data for stations shown in Figure 15
(O'Connor and Lin, 1976; Bigham and Becker, 1977;
Town of Hempstead, 1977)

STATION NUMBER	STATION LOCATIONS N. LAT.	W. LONG.	PERCENT (MASS) SAND	PERCENT (MASS) SILT + CLAY
(O'Connor and Lin)				
1	40°37'18"	73°36'36"	5.2	94.8
2	40°37'30"	73°36'48"	4.5	95.5
3	40°37'36"	73°37'04"	1.7	98.3
4	40°37'48"	73°37'00"	14.4	85.6
5	40°37'48"	73°37'12"	15.1	84.9
6	40°37'54"	73°37'21"	12.6	87.4
7	40°37'30"	73°37'00"	11.5	88.5
8	40°37'12"	73°35'42"	68.0	32.0
9	40°37'24"	73°35'31"	10.7	89.3
10	40°37'36"	73°35'36"	93.9	6.1
11	40°37'48"	73°35'36"	41.6	58.4
12	40°37'54"	73°35'46"	12.9	87.1
13	40°38'00"	73°35'36"	16.3	83.7
14	40°37'54"	73°35'16"	23.9	76.1
15	40°38'06"	73°35'16"	3.7	96.3
16	40°38'18"	73°35'20"	2.8	92.2
17	40°37'42"	73°35'12"	70.0	30.0
18	40°37'33"	73°35'06"	96.0	4.0
(Bigham and Becker)				
27	40°37'27"	73°35'33"	81.0	19.0
28	40°36'54"	73°35'56"	87.0	13.0
29	40°37'00"	73°36'42"	92.0	8.0
(Town of Hempstead)				
57	40°37'42"	73°35'34"	43.4	56.6
58	40°37'13"	73°35'41"	49.3	50.7
64	40°37'09"	73°36'00"	73.8	26.2
66	40°37'29"	73°36'55"	38.0	62.0
67	40°37'09"	73°36'50"	91.0	9.0

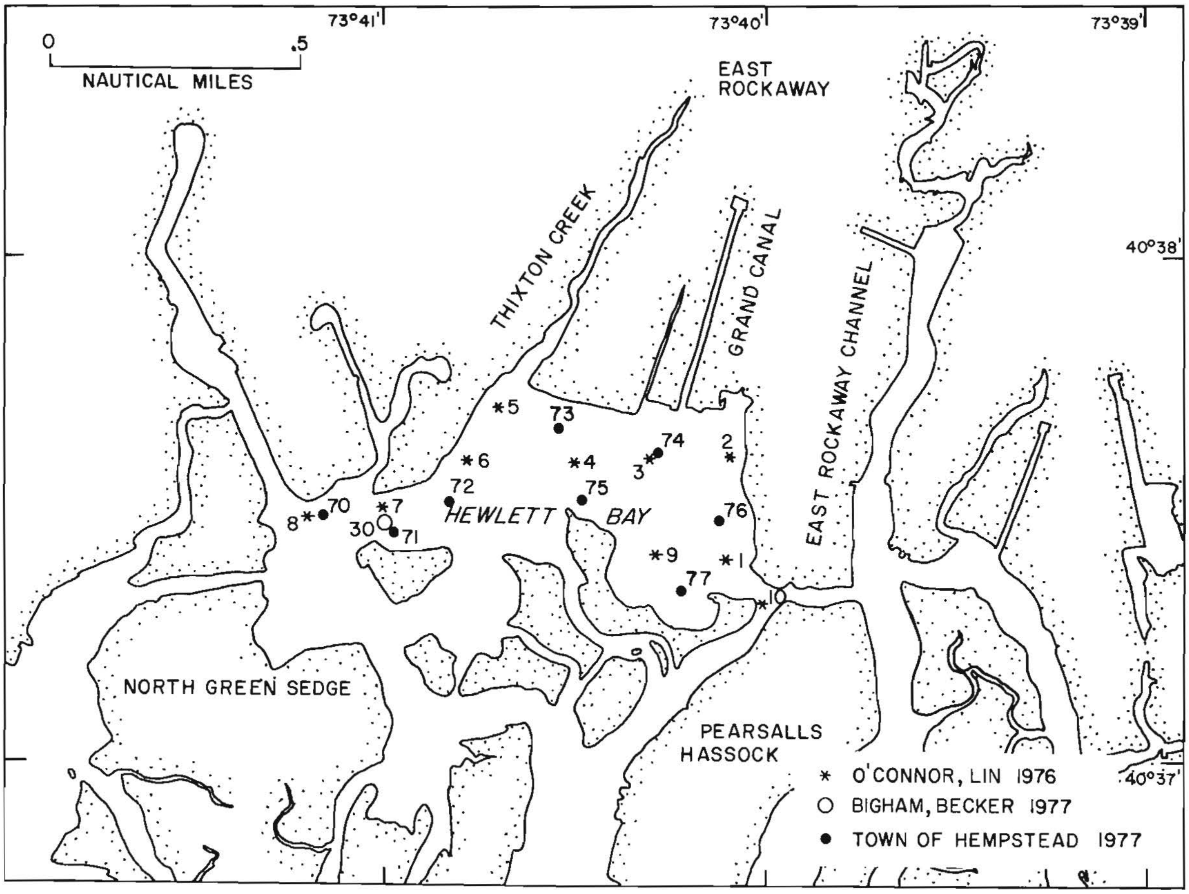

Figure 16. Sediment sampling stations in Hewlett Bay.

TABLE 21

Textural data for stations shown in Figure 16 (O'Connor and Lin, 1976; Bigham and Becker, 1977; Town of Hempstead, 1977)

STATION NUMBER	STATION LOCATIONS N. LAT.	W. LONG.	PERCENT (MASS) SAND	PERCENT (MASS) SILT + CLAY
(O'Connor and Lin)				
1	40°37'24"	73°40'06"	76.4	23.6
2	40°37'36"	73°40'06"	14.4	85.6
3	40°37'36"	73°40'18"	75.6	24.4
4	40°37'36"	73°40'30"	71.8	28.2
5	40°37'42"	73°40'42"	6.9	95.1
6	40°37'36"	73°40'48"	11.5	88.5
7	40°37'30"	73°41'00"	70.6	29.4
8	40°37'30"	73°41'12"	5.7	94.3
9	40°37'24"	73°40'12"	60.6	39.4
10	40°37'18"	73°40'00"	78.5	21.5
(Bigham and Becker)				
30	40°37'29"	73°40'58"	84.0	16.0
(Town of Hempstead)				
70	40°37'29"	73°41'10"	36.4	63.6
71	40°37'27"	73°40'58"	71.8	28.2
72	40°37'30"	73°40'50"	40.5	59.5
73	40°37'40"	73°40'33"	53.3	46.7
74	40°37'36"	73°40'18"	39.9	60.1
75	40°37'31"	73°40'29"	80.4	19.6
76	40°37'28"	73°40'08"	52.1	47.9
77	40°37'20"	73°40'13"	86.3	13.7

EELGRASS OBSERVATIONS

Eelgrass studies of Long Island's south shore bays are summarized in Table 2, and in Figures 17-23.

Koetzner's observations (reported by Elder, 1976) consisted of visual estimates of the abundance of eelgrass (as percent cover) between 1969 and 1972, Figures 17-19. These observations were made, not as a special study of eelgrass, but in conjunction with numerous trips to Great South Bay for a variety of studies (Koetzner, personal communication).

Greene et al. (in preparation) recently completed a study of the eelgrass abundance in eastern Great South Bay. They estimated the abundance of eelgrass as percent cover visually from a small boat, and made detailed determinations of the abundance (mass/area) of eelgrass by harvesting the grass from selected $1m^2$ areas. Their observations were made in August, 1977, and are summarized in Figure 20.

Scientists of the Marine Sciences Research Center of the State University of New York at Stony Brook conducted a survey in August, 1972 to map the distribution of eelgrass in western Great South Bay for Bowe, Walsh and Associates (1973). Their results are presented as percent cover, Figure 21.

Wilson and Brenowitz (1966) summarized the distribution of eelgrass along a transect from Heckscher State Park to Ocean Beach on Fire Island in the summer of 1965. Their results are not included because the original station data are not available. Wilson and Brenowitz indicate that the average dry weight of the eelgrass was eight and one half tons per acre, ranging from 1-23 tons per acre.

The Leonard S. Wegman Co. conducted an eelgrass study in July, 1966 for the Nassau County Department of Public Works. The area surveyed extended from the Nassau-Suffolk County line to the west limit of the Hempstead-Oyster Bay town line, Figure 22. Their data are represented in tons/acre.

In July, 1968 eelgrass abundance information was included in a report by Burkholder and Doheny (1968) for the South Oyster Bay and Hempstead Bay Area, Figure 23. The eelgrass abundance is represented in tons/acre.

[1]REFERENCES

Shepard, F. P. 1954. Nomenclature based on Sand-Silt-Clay ratios. J. Sedim. Petrol. 24, 151-158.

Trefethen, J. M. 1950. Classification of Sediments. Am. J. Sci. Vol. 248, 55-62.

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[1]All other references cited in this report may be found in the Annotated Bibliography.

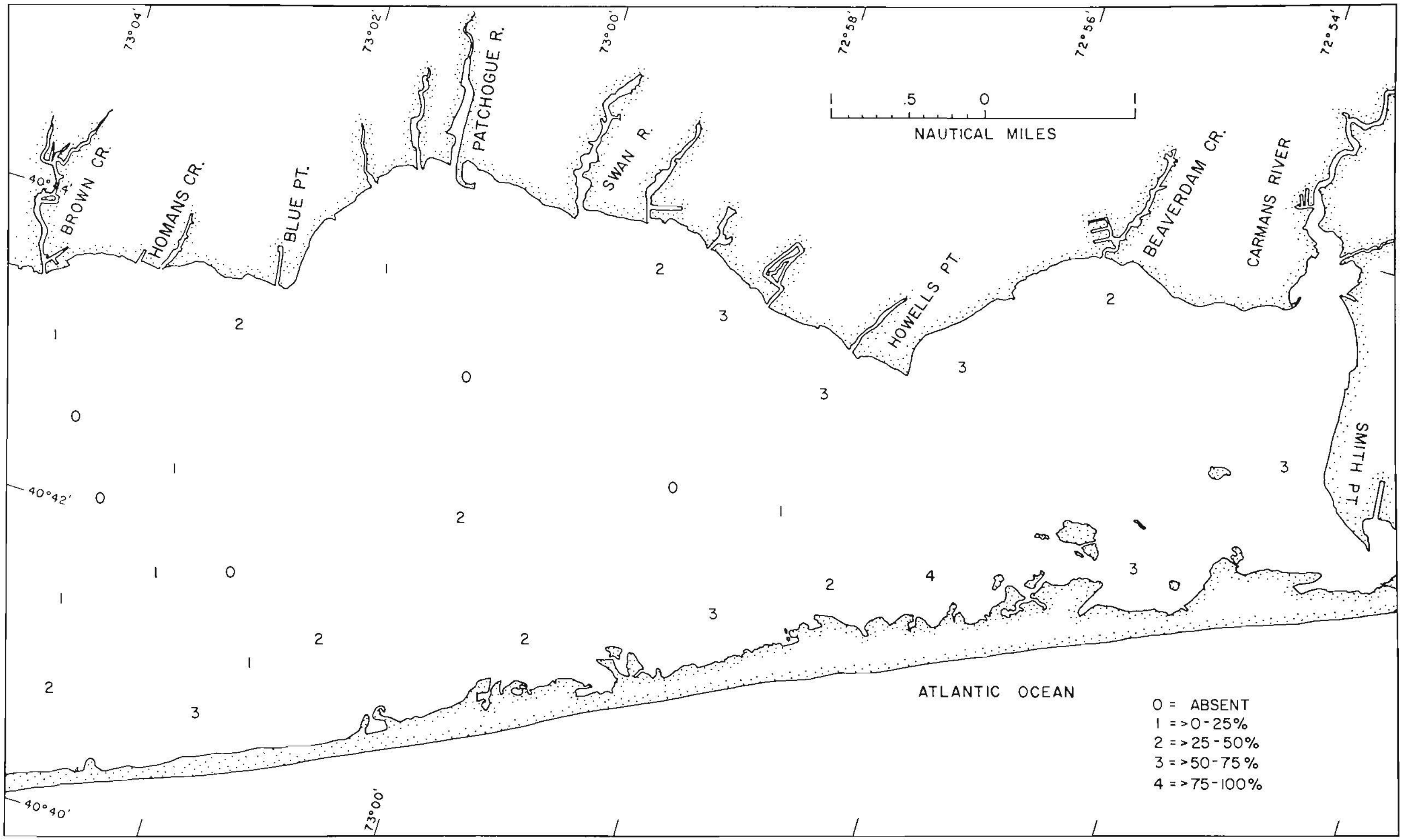

Figure 17. Eelgrass distribution (percent cover by area) in eastern Great South Bay, 1969 - 1972. From: Eelgrass Production in Long Island Waters - Elder, 1976.

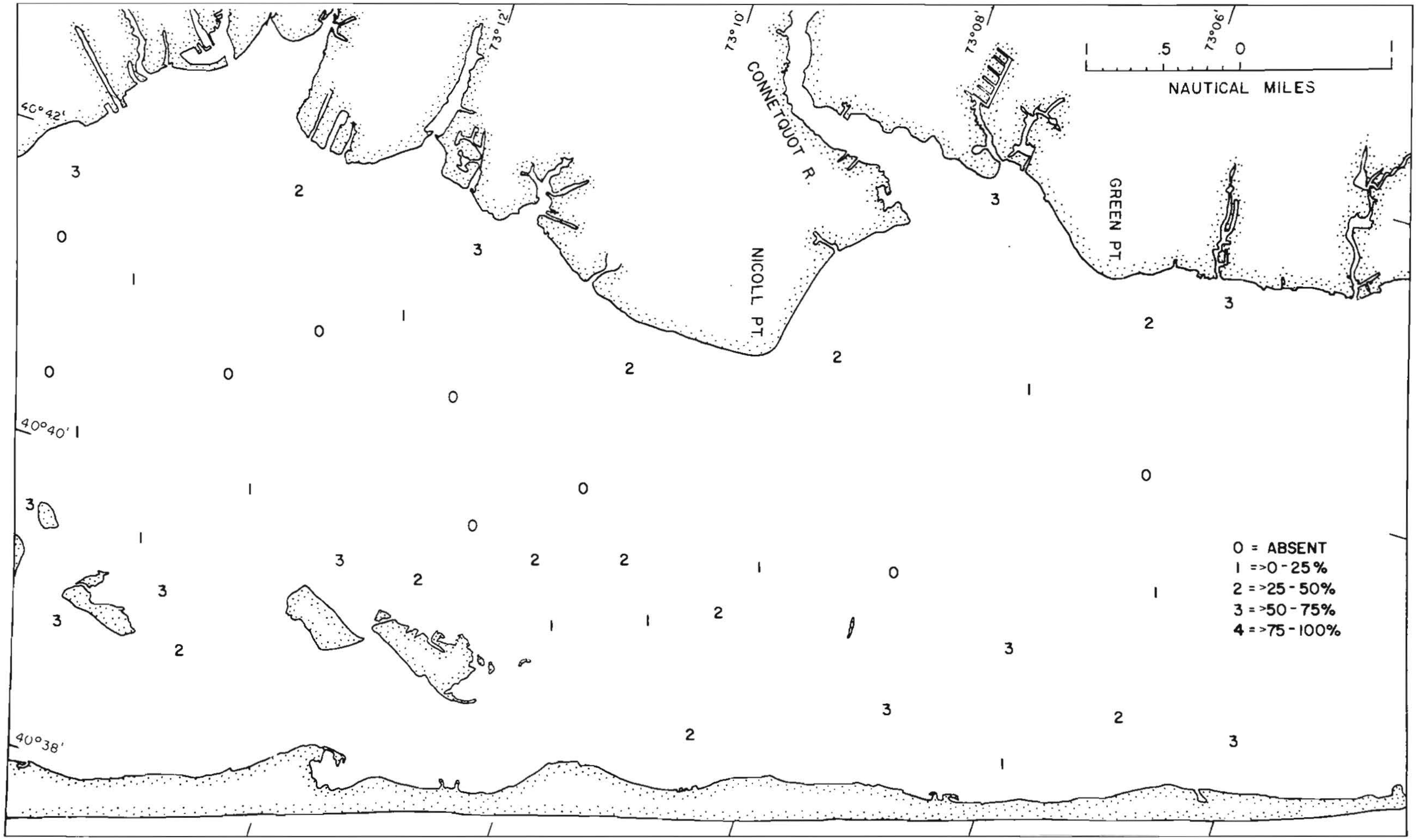

Figure 18. Eelgrass distribution (percent cover by area) in central Great South Bay, 1969 - 1972. From: Eelgrass Production in Long Island Waters - Elder,

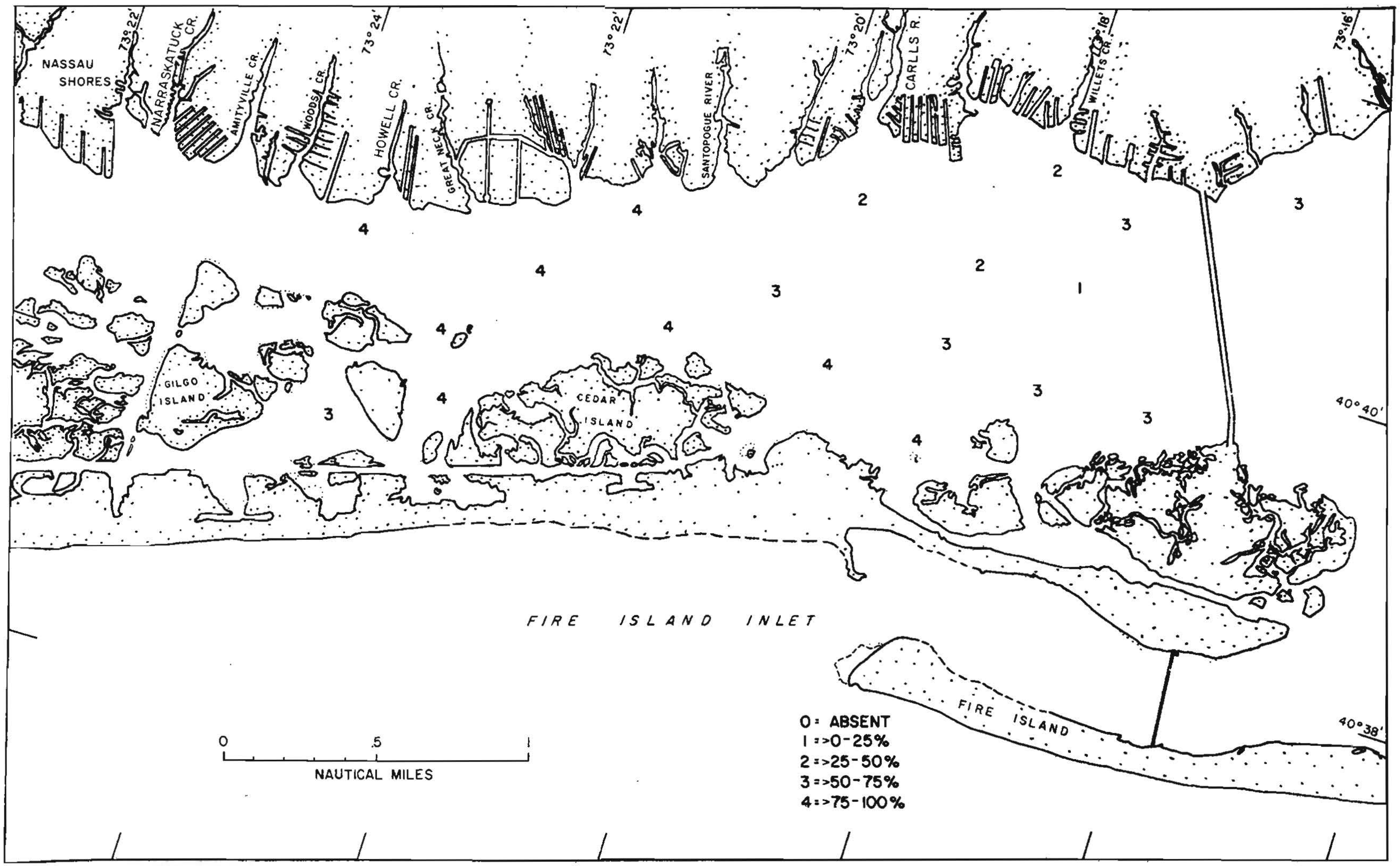

Figure 19. Eelgrass distribution (percent cover by area) in western Great South Bay, 1969 - 1972. From: Eelgrass Production in Long Island Waters - Elder, 1976.

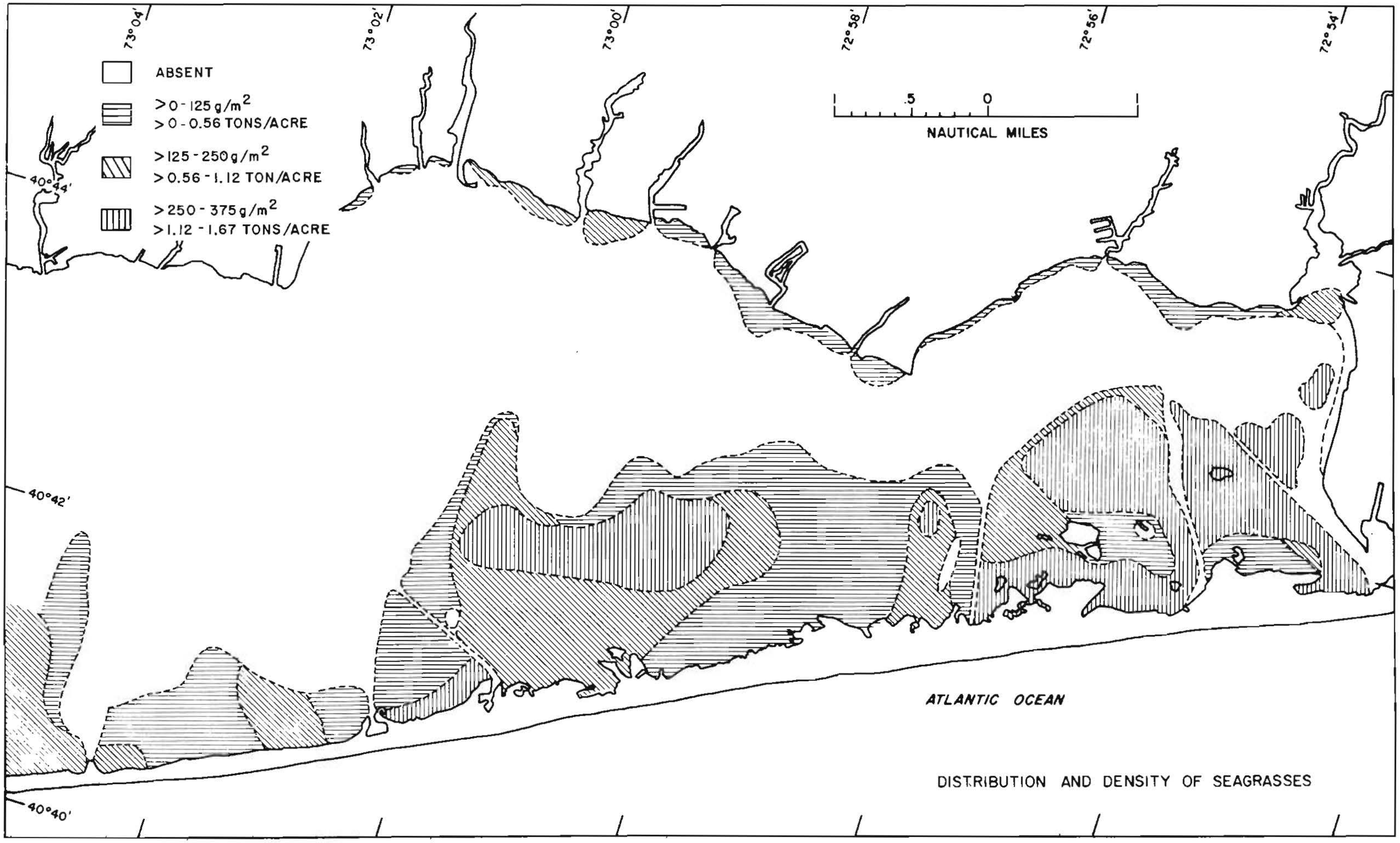

Figure 20. Eelgrass distribution (g/m^2 and/or tons/acre) in eastern Great South Bay, August 1977. From: Surficial Sediments and Seagrasses in Eastern Great South Bay, New York - Greene et al., in prep.

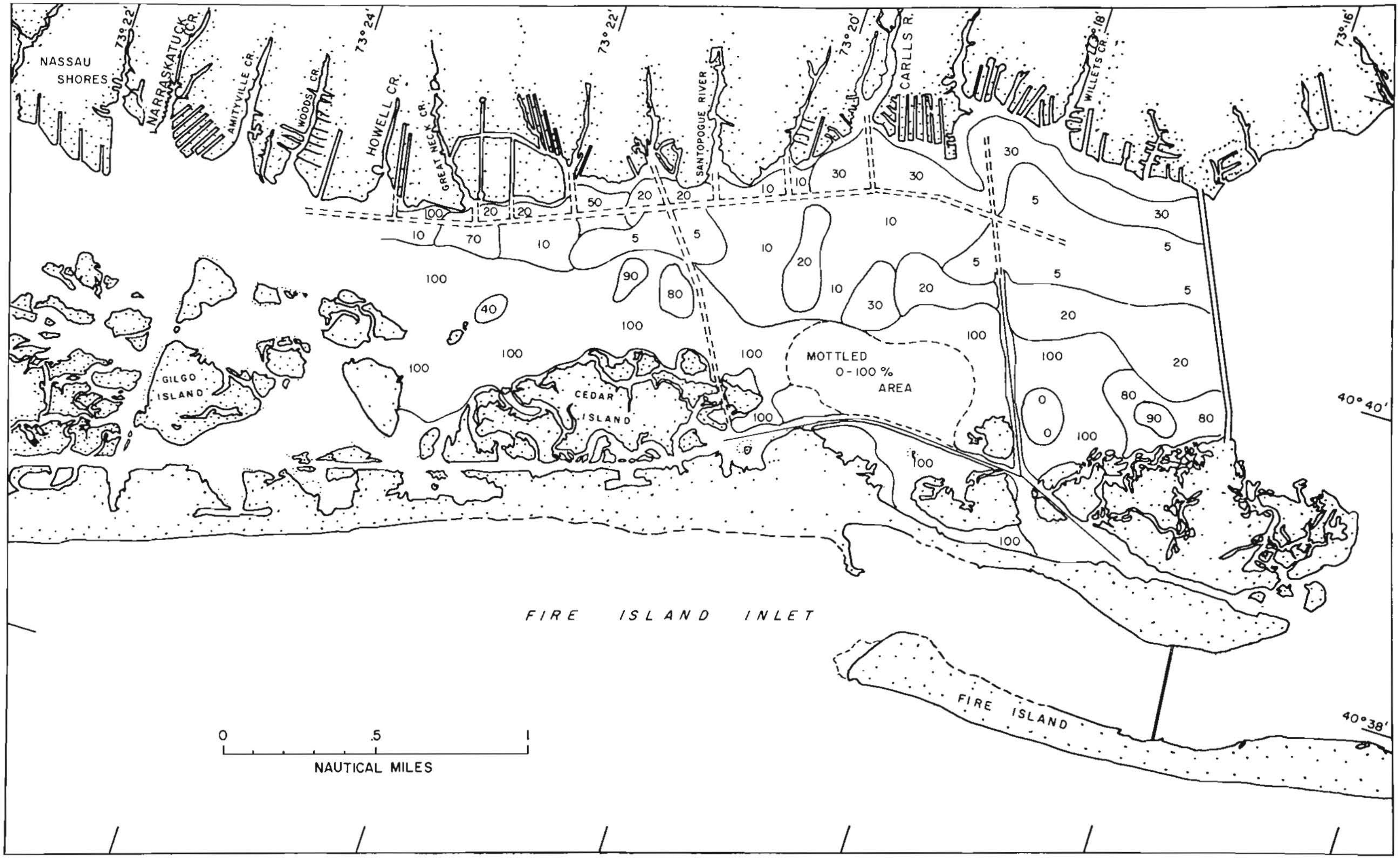

Figure 21. Eelgrass distribution (percent cover by area) in western Great South Bay, August 1972. From: Final Report of the Oceanographic and Biological Study for Southwest Sewer District No. 3, Suffolk County, New York, Vol. 1. - Bowe, Walsh and Associates, 1973.

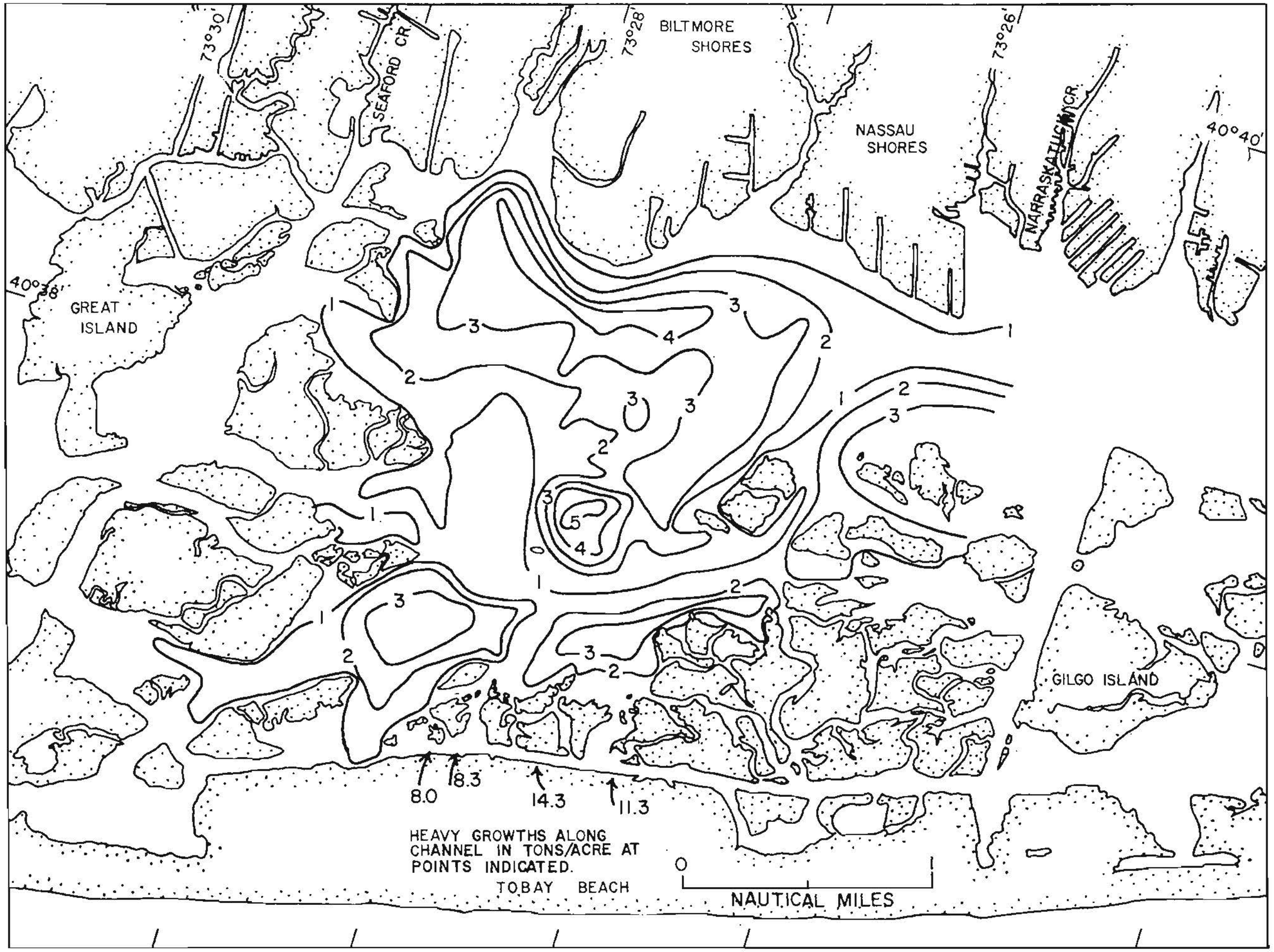

Figure 22. Eelgrass distribution (tons/acre) in South Oyster Bay and eastern Hempstead Bay, July 1966. From: Channel and Eelgrass Study - Leonard S. Wegman Co., 1967.

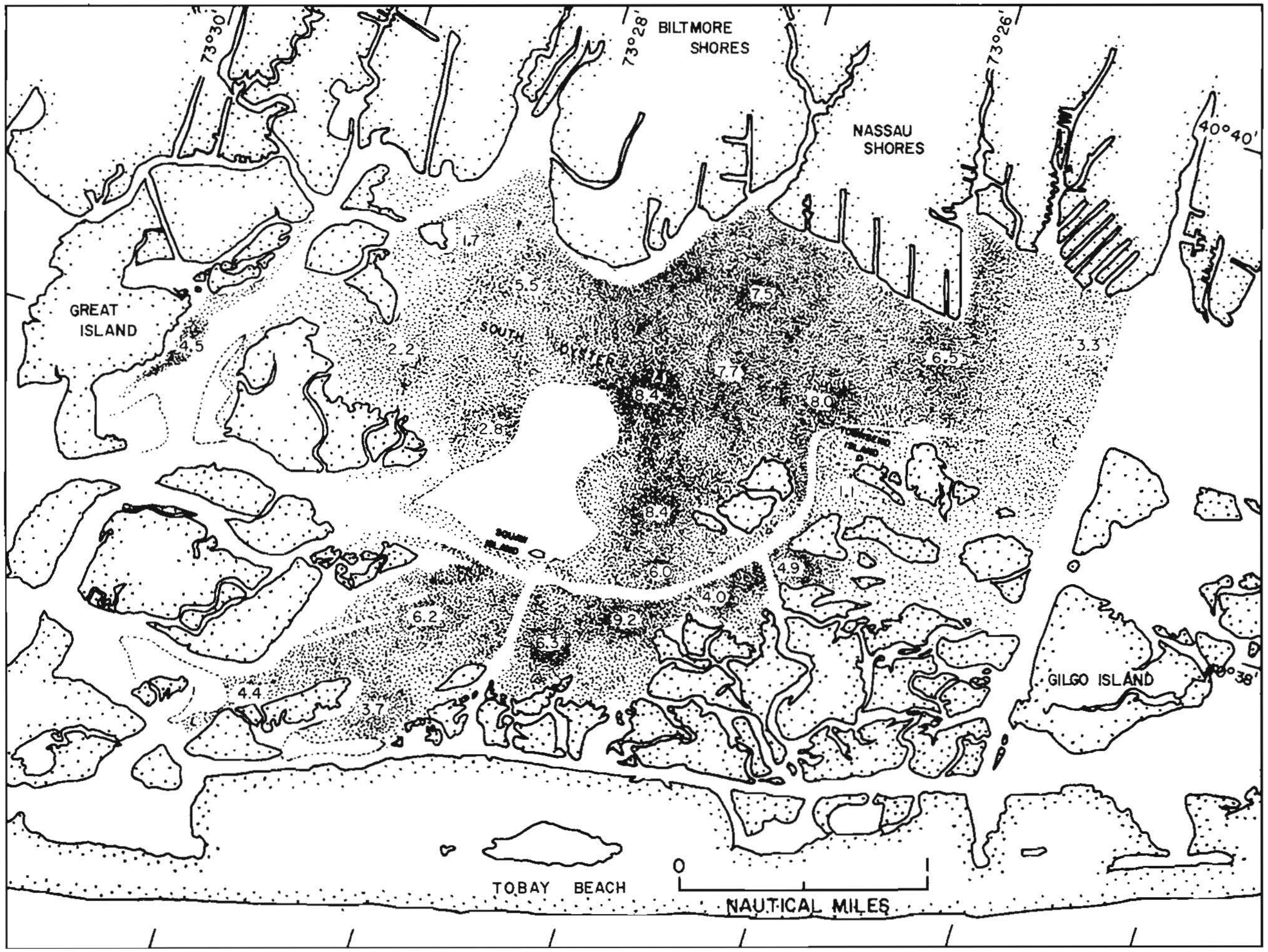

Figure 23. Eelgrass distribution (tons/acre) in South Oyster Bay and eastern Hempstead Bay, July 1968. From: The Biology of Eelgrass - Burkholder and Doheny, 1968.

APPENDIX A

ALPHABETICAL LISTING OF ALL INDIVIDUALS AND LIBRARIES CONTACTED FOR PREPARATION OF THIS REPORT

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Library - Main, Earth and Space Science, and Biology libraries at SUNY at Stony Brook, Stony Brook, New York

Library - C. W. Post College of Long Island University, Brookville, New York

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APPENDIX B

ANNOTATED BIBLIOGRAPHY

Ali, Syed A., R. H. Lindemann and P. H. Feldhausen. 1976. A Multivariate Sedimentary Environmental Analysis of Great South Bay and South Oyster Bay, New York. Mathematical Geology 8(3):283-304.

A multivariate statistical strategy for classifying paleoenvironments is effective for studying modern sedimentary processes in western Great South Bay and South Oyster Bay, New York. The 13 whole phi weight percent variables were tested for redundancy with R-mode cluster analysis. The samples were partitioned statistically into five environmentally significant facies using Q-mode cluster analysis: (A) sandy gravel, (B) sandy silt, (C) silty sand, (D) slightly gravelly sand, and (E) fine sand. An ordination depicted gradation relationships among the samples and the facies. It was used to evaluate the environmental and textural parameter gradients within the sample space. Interpretations obtained in this manner and by examination of the grain-size curves suggest that these sediments were deposited by waves and currents on beaches and in wave zones (facies C and E), shoal areas (facies B), and tidal channels (facies A and D). Tidal currents, wave action, and eelgrass control the distribution of sediments within the two bays.

Bigham, G. N. and D. S. Becker. 1977. Benthic Oxygen Demand Measurements in Long Island Bays. Tetra Tech, Inc., Smithtown, New York. (Prepared for the Nassau-Suffolk Regional Planning Board, Hauppauge, New York). 40 pp. plus one appendix.

The authors discuss the results of over 85 measurements of sediment oxygen demand at 30 stations during July and August, 1976, and integrate the results of sediment oxygen demand with benthic macrophyte production to develop total benthic oxygen demand/ production inputs to the water quality models for the South Shore Bays, Manhasset Bay, and Hempstead Harbor. Percent sand, percent organic matter (weight loss on combustion at 500°C), visual description of sediment samples, sediment temperature, water temperature, and water depth are also presented.

Bowe, Walsh & Associates. 1973. Final Report of the Oceanographic and Biological Study for Southwest Sewer District No. 3, Suffolk County, New York. Marine Sciences Research Center, S.U.N.Y., Stony Brook, New York. Vol. I: 695 pp., II: 384 pp., III: 419 pp.

A three volume report. Volume one presents a comprehensive investigation of the environmental features of South Oyster Bay, western Great South Bay and the nearshore ocean, in the environs of Fire Island and Jones Inlets. The studies provided data on the physical and chemical oceanography, surficial sediments, benthic fauna, plankton, bacteria, fisheries, and macrophytes. An ecological inventory of the wetlands and the barrier beach, and considerations in the planning, construction, and operation of the ocean waste outfall are presented. Volume two is a graphical summary, and volume three contains the basic data.

Bowe, Walsh & Associates. 1972. Southwest Sewer District No. 3 - Outfall Sewer, Preliminary Phase Basic Data Report. Huntington Station, New York. 216 pp.

This report is an interim document summarizing work completed as of 15 October 1972 for the subsequent Final Design Phase Investigations and Conclusions. The project's principal goal was the planning, design, and construction of an ocean outfall system that would meet the required water quality State Standards measured at the shoreline. The major portion of this report was developed from existing data with few new samples. The reports discuss physical and chemical oceanography, bacterial reduction, biologically toxic and adverse biostimulatory effects, subsoil (borings and hand probes) investigations from Fleet Point through the Cedar Island Marsh area to the Barrier Beach, outfall design factors, construction considerations, maintenance, alternate routes, water quality modeling of the coastal Atlantic Ocean and Great South Bay in the study area, and the economic impact of the areas affected by the construction of the sewer outfall.

Bruderer, B. E. 1970. A Preliminary Investigation of the Sediments of the Great South Bay, Long Island, New York. C. W. Post College, Brookville, New York. M.S. Thesis. 86 pp.

A preliminary investigation and analysis was undertaken of the surficial sediments of central Great South Bay, Long Island, New York. Utilizing an area grid system, twenty-one stations were chosen from which core samples were obtained. The cores were divided at observable contacts and sieved to produce a particle size range distribution. The mineralogy of the sediments was recorded, and pH measurements of the interstitial water chemistry, and organic content of the sediments yielded tentative conclusions concerning their origin, means of transport, and deposition. From these data, their analysis, and a comparison with the earlier work performed by others, it was possible to project the amount and type of sediment to be expected in various parts of the study area in the near future.

Burkholder, P. R. and T. E. Doheny. 1968. The Biology of Eelgrass. Contribution No. 3 from the Department of Conservation and Waterways, Town of Hempstead, New York. Contribution No. 1227 from the Lamont Geological Observatory, Palisades, New York. 120 pp.

To evaluate the natural production of plant life in South Oyster Bay and the Town of Hempstead, with particular reference to eelgrass and algae, many stations had been established for making collections of water, plankton and macro-vegetation. Eighteen stations were selected for studies conducted in 1966. Other study locations were added in 1967 and 1968, both within the estuary and outside in the deeper coastal waters. Small motor boats were used to make numerous observations and collections. During every month from April to December, 1966, information concerning chemistry, physical properties and biology of the estuary were made in the field and in the laboratory. In 1967 and 1968, certain special studies of eelgrass, macroalgae and phytoplankton had been continued. The authors report some of the goals, methods and preliminary results obtained in this work up to July, 1968. A complete review of the literature concerning eelgrass was accomplished and the pertinent historical information is presented along with a complete bibliography of *Zostera marina* up to 1967.

Burrier, D. 1974. The Depth of Burial in Different Sediment Types of the Hard-Shell Clam *Mercenaria mercenaria* in the Babylon Area of Great South Bay. Marine Sciences Research Center, S.U.N.Y., Stony Brook, New York. (Student report, J. L. McHugh's Library). 17 pp.

The depth of burial of the hard-shell clam *Mercenaria mercenaria* in the Babylon area of Great South Bay, Long Island, is in part related to the nature of the bottom sediments. *Mercenaria* burrows to a greater depth in substrates composed of poorly sorted, very fine-grained sand with a high silt and clay fraction (mud) than in well-sorted fine-grained sands with little or no silt and clay (sand). The depth of burial is a function of the compactness or hardness of the bottom sediment. A mud bottom is a much softer substrate than a sandy one and, consequently, hard-shell clams are able to borrow to a greater depth. Hard-shell clams may burrow to a depth of twenty-one centimeters in the mud and nine centimeters in the sand.

Caldwell, D. M. 1972. A Sedimentoligical Study of an Active Part of a Modern Tidal Delta, Moriches Inlet, Long Island, New York. Columbia University, New York. M.A. Thesis. 70 pp.

This study of an active part of the Moriches tidal delta provides information which extends the present knowledge of sediment distribution and internal structure of tidal deltas as a whole. Because the study area itself is a small-scale tidal delta, results of a detailed study can be extrapolated to tidal deltas in general.

The tidal delta contains several depositional environments. These environments include channels, mussel beds, active sand lobes, tidal flats and marshes. Sediment distribution among the various environments is controlled primarily by the energy level of the environment. Energy levels are related to location within the delta. Energy levels, and consequently the average grain size of sediments, decrease away from the apex of the delta.

Energy level, rate of sediment supply and amount of organic activity are the three most important factors influencing the kind of internal structures developed within the various depositional environments. Cross-strata are produced in the channel and active sand-lobe environments where the energy level and rate of sediment supply are moderate to high. Horizontal strata are formed where either the energy level or rate of sediment supply is low. Horizontal strata are found in all environments except mussel beds. Burrow structures predominate in the tidal-flat environment where organic activity flourishes in response to low energy levels and low rates of sediment supply.

Dooley, D. W. 1974. A Preliminary Investigation of the Sediments of Shinnecock Bay, Long Island, New York. C. W. Post College, Brookville, New York. M.S. Thesis. 80 pp.

A preliminary investigation was undertaken of the surficial sediments of Shinnecock Bay, Long Island, New York. Nineteen stations were selected from which core samples were obtained on October 4, 1971. These samples were analyzed for their particle size distribution, mineralogy, and the pH of the interstitial water. The analysis of these sediments yielded tentative conclusions concerning their origin, mode of transport, and deposition.

Elder, J. 1976. Eelgrass Production in Long Island Waters. Tetra Tech. Inc., Lafayette, California. (Prepared for the Nassau-Suffolk Regional Planning Board, Hauppauge, New York). 23 pp.

This report was prepared from the existing literature to determine environmental requirements and productivity of Long Island's eelgrass. Depth, substrate, salinity, temperature, and current speed requirements for optimum growth are presented. Nutrient uptake by eelgrass is according to the author, speculative, but the preferred route may be through the leaves. Only when nutrient levels in the water column get too low to make this route advantageous will the plant make use of its "nutrient reservoir" -- the substrate. A conceptual model expressing the instantaneous productivity of eelgrass along with its formulation and a simple eelgrass energy flow model are presented. A map indicating the percentage of bottom substrate covered by eelgrass in Great South Bay is included.

Gaw, J. R. 1972. Seasonal Variations in the Fish Populations of Great South Bay and the Connetquot River, Long Island, New York. Adelphi University, Garden City, New York. M.S. Thesis. 50 pp.

The fish populations of the Great South Bay and Connetquot River were sampled by trawlnet from October 1970 -October 1971. Number of species (S), number of individuals (Log N + 1), biomass species richness (S-1), community structure (H), and evenness (J) were computed. Seasonal cycles were found to exist for numbers of species (S), number of individuals (Log N + 1), biomass species richness (S-1) and community structure (H), with a strongly dampened evenness (J) cycle. Population structure was influenced by the immigration and emigration of migratory fish species superimposed on the local fluctuation of the resident fish populations in the estuary. Results show the Great South Bay and

Connetquot River to be important nursery and feeding grounds for many game, forage, and bate fish species, important to the New York Marine District, sport, and commercial fisheries.

Greene, G. T. and D. S. Becker. 1977. Winterkill of Hard-Clams in Great South Bay, New York 1976-77. Special Report 9. Marine Sciences Research Center, S.U.N.Y., Stony Brook, New York. 23 pp.

To estimate mortality of the commercially important hard-clam (*Mercenaria mercenaria*) resources of Great South Bay, New York, during the severe winter of 1976-77, clams were sampled at 31 stations in the Bay. Mortality was quite variable and ranged from 0 to 27.2%. Mortality showed no strong relation to any of the variables measured at each station: depth, salinity, substrate particle size, substrate organic content, and clam density. High mortality (10% and higher) was confined to one small area of the Bay and was apparently not due to winter stress alone, but to a combination of factors, perhaps including disease. With the exception of the one area, mortality of the hard-clam over the winter was not extreme and averaged 1.6%. Shelf lives of clams from each station were also determined. Shelf life, represented by the time taken for the first 10 clams from a sample of 30 to die under constant temperature and humidity, varied from 15 to 38 days and showed no strong correlation with mortality or any of the other variables observed at each station. Some clams survived 59 days out of water, the duration of the shelf life experiment.

Greene, G. T., A. C. F. Mirchel, W. Behrens, and D. S. Becker. In prep. Surficial Sediments and Seagrasses in Eastern Great South Bay, New York. Marine Sciences Research Center, S.U.N.Y., Stony Brook, New York.

During the spring of 1977 a study was conducted of the sediments in eastern Great South Bay from Homans Creek east to Smith Point. A total of 186 stations were sampled in the open bay and in channels, creeks and rivers. Sediments were characterized according to two variables - particle size and organic content. During the summer of 1977 a survey was made of the distribution and density of seagrasses present in the study area.

Most of the Bay bottom consists of sandy sediments with low organic content. High organic muds were found in the deeper areas of the Bay off Bayport and in Patchogue and Bellport Bays. Distribution of mud and organic content was closely correlated with depth. Gravel content of sediments was usually very low. Some areas, however, contained high percentages of shell material. Creek sediments were extremely high in mud and organic content. Approximately 1/3 of the Bay sediments were covered with rooted seagrasses, almost exclusively *Zostera marina*. Estimation of the total biomass of seagrasses in the study area suggested they may play an important role in the nutrient balance of the Bay.

The character of sediments in the Bay probably has a large effect on growth, survival and abundance of the commercially important hard-clam, *Mercenaria mercenaria*, and these relationships are discussed.

Koenig, M. H. 1972. An Investigation of the Lead in the Water, Plankton, and Sediments of the Great South Bay, Long Island, New York. C. W. Post College, Brookville, New York. M.S. Thesis. 21 pp. plus one appendix.

An investigation of the lead concentration of the sediments, plankton and water from the Great South Bay of Long Island was undertaken. Twenty stations were chosen for this investigation. Analysis of core samples did not indicate any significant pattern, except a higher concentration of lead in organic sediments. Water and plankton samples provided relatively low concentrations of lead.

Koetzner, K. L. 1973. Unpublished field notes. N. Y. S. Department of Environmental Conservation, S.U.N.Y., Stony Brook, New York.

Field notes consisting of grain size sieving analysis data and frequency curves for the sediments sampled in central and western Great South Bay.

Leonard S. Wegman Co. 1967. Channel and Eelgrass Study. New York, New York. 32 pp. plus five appendices.

Considers the effects of the proposed east-west County channel on eelgrass and algae growth, and the effects on boating, fishing, recreational and other uses of South Oyster Bay. The feasibility of channel construction, considering the physical factors of depth, width, alignment, bottom soil conditions, disposal of dredged material, and costs, have been studied and are discussed.

Mackenzie, M. G. 1967. Environments of Deposition on an Offshore Sand Bar, Moriches Inlet, Long Island, New York. Tulane Studies in Geology 5-6:67-80.

Environments of deposition associated with an offshore barrier sand bar system at Moriches Inlet, Long Island, New York, were studied by mechanical analysis and heavy mineral analysis. Samples collected from six traverses normal to the barrier trend were statistically defined by measurement of mean diameter ($M\phi$) and standard deviation ($\sigma\phi$). Variations in heavy mineral content in different parts of the sand bar are related to the concept of hydraulic equivalent size in sedimentation. By relating threshold velocity (V_t) to grain characteristics, the concept of hydraulic equivalent size, developed for water-transported sands, can be effectively extended to wind-blown particles.

Two distinct sedimentary regimes are defined by the methods used in this study, namely, a forebar and a backbar. The small dimensions of the environments studied preclude further subdivision by these methods.

Results are discussed with reference to fossil shoestring sand bodies found in the geologic record. It is concluded that lateral mineralogical and textural variations should be combined with gross geometric properties in studies involving the genesis of shoestring sands.

Nichols, M. M. 1964. Characteristics of Sedimentary Environments in Moriches Bay. Papers in Marine Geology, Shephard Commemorative Volume. pp. 363-383.

The intent of this paper is to describe the environments of deposition in Moriches Bay and to relate the distribution pattern of recent sediments to their general conditions of formation.

Shallow tributaries are striking in their content of soupy, black, clayey silt that has a rich odor of hydrogen sulfide. The sediments lack internal structures and are extremely high in organic matter as a result of discharge from duck farms. Coarse fractions have abundant wood fragments; mica is common and ferruginous aggregates are usually present. Lagoonward, clay content decreases and sediments grade to well-sorted silt or sandy silt.

Deeper portions of the central bay also contain clayey silt, but the coarse-fraction content is different from the estuary environment. Shell fragments occur everywhere, and wood, mica, and ferruginous aggregates are present in moderate proportions. Indistinct mottling and occasional thin shell layers of *Mytilus edulis* are characteristic.

On barrier shoals the sediments are influenced by storm washovers, inlet breakthroughs, and reworking by waves within the lagoon. As a result of these processes, the sediments are largely well-sorted sand. Shell, mica, wood, and ferruginous aggregates, occur irregularly and are somewhat more common along the mainland margin. Sediments in the present inlet have excellent sorting and coarse fractions contain greater percentages of shell and dark minerals.

O'Brien, N. R. and S. A. Ali. 1974. Clay Mineralogy Composition of Bottom Sediments: Western Great South Bay and South Oyster Bay, Long Island, New York. Maritime Sediments 10(3): 107-109.

Sediment distribution within the study area is related to the complex tidal currents of variable velocities. The shallow sand flats consist of very fine sands and dominate the western and southern portions of western Great South Bay and the southeastern portion of South Oyster Bay. Shallow flats consisting of very fine muddy sands dominate the central and northern portions of South Oyster Bay. Variations of water mass circulation and tidal current velocities apparently account for the presence or absence of silts and clays within the shallow areas dominated by dense growths of eelgrass. Sediment type and distribution in the deeper part of the open bay is variable; significant percentages of silt and clay occur at all stations.

Sediments in the channels reflect the relative strength of tidal currents. Gravelly coarse sands are present in Fire Island Inlet. Finer silts, clays and organic detritus accumulate within the channels of the bay where currents are weak.

X-ray analysis of the clay-size fraction of sediment in western Great South Bay and South Oyster Bay indicates a uniformity in mineral composition. Illite and chlorite predominate with illite greater in abundance in the clay-size fraction. Mixed-layered clays are present but to a much lesser amount.

O'Connor, J. S. and P. M. Lin. 1976. Data Report on Six South Shore Bays, Nassau and Suffolk Counties, Long Island, New York. Special Data Report 1. Marine Sciences Research Center, S.U.N.Y., Stony Brook, New York. 29 pp.

Data was gathered on Hewlett Bay, Parsonage Cove, Baldwin Bay, Carlls River Mouth, Patchogue Bay, and Flanders Bay to provide data for long-range planning of Long Island's coastal zone. These bays all exhibited symptoms of environmental stress. Tables summarize the standard hydrographic measurements at each station, the concentrations of ammonia, nitrite, nitrate, and phosphate in the water column and in the interstitial water, and the sediment characteristics at each station.

Penn, S. H. 1968. A Preliminary Investigation of the Sediments of the Great South Bay, Long Island, New York. C. W. Post College, Brookville, New York. M.S. Thesis. 57 pp.

A preliminary investigation was undertaken of the surficial sediments of the Great South Bay, Long Island, New York. Twenty-one stations were selected from which core samples were obtained that were analyzed chamically, optically, and spectroscopically. A particle size range distribution was prepared. From their dimensions, shape, mineralogy, chemistry, and organic content, certain tentative conclusions have been drawn upon the origin and mode of transport of these sediments. Based upon the findings, it was possible to predict future depositional trends.

Rockwell, C. 1974. Recent Sedimentation in Great South Bay, Long Island, New York. Cornell University, Ithaca, New York. Ph.D. Dissertation. 147 pp.

Great South Bay, on the south shore of Long Island, is shielded from the currents and waves of the Atlantic Ocean by a barrier beach (Fire Island) throughout its entire length of 24 miles. Beach sands are transported from east to west along the seaward side of the barrier by longshore currents. Sediments from the barrier beach are swept through two tidal inlets by the combined effects of tidal action and longshore drift. The barrier beach furnishes sediments to tidal deltas near the two tidal inlets located at the eastern and western ends of Fire Island. Longshore currents do not permit tidal deltas to form seaward of the inlets. Recent investigations determined that these tidal deltas serve as temporary "sand reservoirs." From them, the finer sediments are drawn off and subsequently deposited by distributive currents which result in: (1) an expansion of the tidal-marsh areas characterized by an accumulation blanket of mud sizes; and (2) a continual back filling of Great South Bay.

Velocities of .910 to 4.45 feet per second were measured in Fire Island Inlet. Analysis of sediments from velocity-gaging stations in the inlet show that tidal currents permit hydraulically equivalent minerals to adjust themselves to the environment.

Wind-blown sediments derived from Long Island and the barrier beach contribute to the sedimentary complex in Great South Bay.

Sediments studied from the mouths of streams flowing into Great South Bay indicate that these streams are transporting outwash into the Bay from the Wisconsin terminal moraine of Long Island.

Rozsa, R. and G. Roth. 1974. A Preliminary Survey of the Benthic Communities at Smith Point. Marine Ecosystems Analysis, S.U.N.Y., Stony Brook, New York. Student report. 20 pp.

In January, 1973 a quantitative benthic survey was undertaken in Narrow Bay adjacent to Smith Point Bridge. Analyses of the surficial sediment and benthic communities were completed for the immediate area of the bridge.

The sediments are coarsest at those stations nearest the boat channel changing in composition to sandy sediments near Fire Island and silty sediments near the mainland.

The silty sediments adjacent to the mainland are composed of silt, decaying *Zostera marina* and layers of fresh and decaying mucous tubes of *Ampelisca*. Coarse sand predominates on the Fire Island side which grades into "rocky" sediment at the boat channel.

The two well defined communities of *Crepidula-Neopanope-Unciola* and *Ampelisca* constitute the respective communities of "rocky" and silty environments at Smith Point.

Sajecki, A. D. 1971. An Investigation of the Mercury in the Water, Plankton, and Sediments of the Great South Bay, Long Island, New York. C. W. Post College, Brookville, New York. M.S. Thesis. 22 pp. plus one appendix.

An investigation of the mercury concentration of the sediments, plankton and water from the Great South Bay of Long Island was undertaken. Nine stations were chosen for sampling from areas of both high and low sedimentation rates. Analysis of core samples indicates an increase of mercury with organic sediment content, and similarity between the mercury content of organic sediments and plankton mercury concentration.

Taney, N. E. 1961. Littoral Materials of the South Shore of Long Island, New York. Technical Memorandum No. 129. Arlington, Virginia. 59 pp.

Investigation dealing with sediment transport littoral drift, sediment distribution, particle size (median diameter), sorting, skewness, beaches, and currents for the coastal reach of the south shore of Long Island. A limited amount of data on such physical properties as mineral composition, roundness and sphercity of grains, specific gravity and mass density are also tabulated in limited areas where data permitted. Interrelation of these sedimentary properties and their relationship of geographic locations are also investigated.

Testing Service Corporation. 1969. Report of Soils Investigation, Proposed Outfall Line for Wantagh Water Pollution Control Plant, Nassau County, New York. Department of Public Works, Mineola, New York. 12 pp. plus seven appendices.

This report covers the results of a study made to determine soil conditions for a proposed outfall line for the Wantagh Pollution Control Plant.

The proposed Outfall Line will exit from the Plant Site, cross Hempstead Bay and various Island land areas, to cross the offshore Island at Tobay Beach. The line will then go more or less perpendicular to the beach for a distance of about 12,000 feet. The distance from the Plant Site to Tobay Beach is over four miles.

The results of the study are presented in the appendices which contain boring location plans, profiles and general soil conditions, boring logs, stress vs. strain curves, grain-size distribution curves, and consolidation test curves.

Town of Hempstead (Department of Conservation and Waterways). 1977. Analysis of Surficial Sediment within the Hempstead Estuary. 8 pp.

In 1972 bottom sediment samples were taken at 80 stations in conjunction with a comprehensive study of the ecology of Hempstead Bay. Sediment texture was determined by dry sieving and pipette analysis with the percentages (by mass) of sand, silt, and clay presented in tabular form.

Turano, F. J. 1968. The Oxygen Consumption of Selected Sediments of Great South Bay and Some of its Tributary Rivers. Adelphi University, Garden City, New York. M.S. Thesis. 27 pp.

The oxygen comsumption of whole sediment cores was measured over a period of twenty-four hours. Attempts were made to determine the influence of seasonal temperature changes on the sediment oxygen consumption and to examine the relationship between oxygen consumption and the concentrations of organic matter and water in the sediments. The areas of Forge River and Seatuck Cove have sediments that are among the highest in organic matter and these sediments consume three to seven times as much oxygen as any other sediments sampled. Low temperatures (3°C) tended to depress oxygen consumption to a uniform level regardless of the sediment organic content. At 23°C sand areas showed a more uniform increase in oxygen consumption than mud areas. This indicates that in mud areas the quality of the organic matter is at least as important as the quantity accumulated since similar accumulations show markedly different oxygen consumptions. There was no demonstrable relationship between grain size and oxygen consumption for the sand sediments of Great South Bay.

U. S. Army Corps of Engineers. 1975. Maintenance of Great South Bay Channel and Patchogue River and Long Island Intercoastal Waterway, New York, Navigation Projects, Final Environmental Statement. U. S. Army Engineer District, New York, New York. 72 pp. plus four appendices.

Present and future dredging action and maps indicating the dredging routes are presented. The impacts of dredging on a particular type of environmental setting, such as productive shellfish areas, and impacts of disposing the dredged material are discussed. An analysis for C.O.D., oil and grease and heavy metals in the sediments and water in Patchogue River, Moriches Bay, and Shinnecock Bay is listed.

U. S. Army Corps of Engineers. 1976. Public Notice No. 8548. U. S. Army Engineer District, New York, New York. 4 pp.

This notice indicates that the U. S. Army Engineer District, New York, proposes to perform maintenance dredging of the Long Island Intracoastal Waterway Federal Navigation Project along the south shore of Suffolk County, Long Island, from Great South Bay opposite the Patchogue Channel to the south end of the Shinnecock Canal.

Forty-one samples were taken along the entire length of the project area. The dredged material is mostly coarse material with an average composition of 78% sand, 17% silt, and 5% clay. Of these forty-one samples, twenty-two were composed of over 80% sand and unpolluted. The remaining nineteen samples were polluted with zinc, cadmium, copper, or a combination of these heavy metals.

U. S. Army Corps of Engineers. 1976. Report of Test #39268. U. S. Army Engineer District, New York, New York. 9 pp.

Results of tests performed by Chemical Services Division, New Jersey, for the U. S. Army Corps of Engineers, for analysis of C.O.D., oil and grease, heavy metals, percent grain size analysis, total carbon on a percent dry basis, and salinity.

Wilson, R. S. and A. H. Brenowitz. 1966. A Report on the Ecology of Great South Bay and Adjacent Waters. Adelphi University, Garden City, New York. 57 pp.

This study of the extensive and complex Great South Bay system has provided information on several of the many diverse problems the system presents. To study some of these problems, the ecosystem approach was used. The dominant plant in the bay system prior to 1931 was eelgrass (*Zostera marina*). Its disappearance in that year was accompanied by a reduction or total disappearance of one third of the animal species. In the last few years, eelgrass has returned to the South Shore of Long Island in abundance. Sampling in a representative area of the bay indicates that in water less than six feet deep, the average dry weight of grass is about 8 tons per acre. It is estimated that between the Suffolk-Nassau County line and the Robert Moses Bridge, 7,000 acres of bay bottom has 60,000 tons of grass (dry weight) or 300,000 tons wet weight. A small percentage of the growing grass breaks off, floats to the surface or accumulates on shore. A similar condition existed before 1931 but at that time the grass drifted up on marshes which have since been filled in and developed. It is this drifting grass that causes the most local concern. The growth of eelgrass in Great South Bay is a normal occurrence in bays of this type and not a result of pollution. This was experimently demonstrated in the laboratory studies which indicated that extensive flushing of the bay would not affect the growth of eelgrass. The luxurious growth of eelgrass with its associated community of animals beneficial to man can, with appropriate study and management, continue to be an increasingly important economic and recreational resource to Long Island.

Studies of the oxygen budget and total biological activity in the bay system indicate that the bay is comparatively healthy and highly productive with a suggestion of super-productivity, perhaps caused by fertilization. This contrasts sharply with the study in the Carmans River which clearly indicated a grossly disturbed system.

Nutrient studies found that some patches of water in the bay do tend

to have high concentrations of phosphate. The highest concentrations of phosphate were found from Smith Point eastward, in the areas of duck farms. However, in August 1965, the high nutrient level had spread more or less uniformly throughout the bay and this coincided with a bloom of small algae, probably *Nannochloris* (a difficult species to identify).

The authors feel that the immediate problems with eelgrass would be solved by removal of floating grass and that which drifts up on shore. The long range solution to the problem will be the development of an economic use for eelgrass that will at least pay for the collecting, processing and transportation of eelgrass. Further, it is recommended that studies continue to examine the ecological aspects of the bay system in order to develop and manage this economic and recreational resource without damaging it.

APPENDIX C

Sediment station locations and surficial sediment median diameter distribution expressed in phi (ϕ) units ($\phi \equiv -\log_2$ diam. mm) from Rockwell (1974).

Additional information is contained in Table 1, page 5, and in the Annotated Bibliography, Appendix B, page 68.

A copy of Rockwell's dissertation may be obtained from:

University Microfilms International
Dissertation Copies - P.O. Box 1764
Ann Arbor, Michigan 48106.

TABLE C-1

Sediment grain size cross reference

Phi (ϕ)	Millimeters	Wentworth Size Class
-12	4096	
-10	1024	Boulder
- 8	256	
- 6	64	Cobble
- 4	16	Pebble
- 2	4	
- 1.75	3.36	
- 1.5	2.83	Granule
- 1.25	2.38	
- 1.0	2.00	
- 0.75	1.68	
- 0.5	1.41	Very coarse sand
- 0.25	1.19	
0.0	1.00	
0.25	0.84	
0.5	0.71	Coarse sand
0.75	0.59	
1.0	0.50	
1.25	0.42	
1.5	0.35	Medium sand
1.75	0.30	
2.0	0.25	
2.25	0.210	
2.5	0.177	Fine sand
2.75	0.149	
3.0	0.125	
3.25	0.105	
3.5	0.088	Very fine sand
3.75	0.074	
4.0	0.0625	
4.25	0.053	
4.5	0.044	Coarse silt
4.75	0.037	
5.0	0.031	
6.0	0.0156	Medium silt
7.0	0.0078	Fine silt
8.0	0.0039	Very fine silt
9.0	0.0020	
10.0	0.00098	Clay
11.0	0.00049	
12.0	0.00024	
13.0	0.00012	
14.0	0.00006	

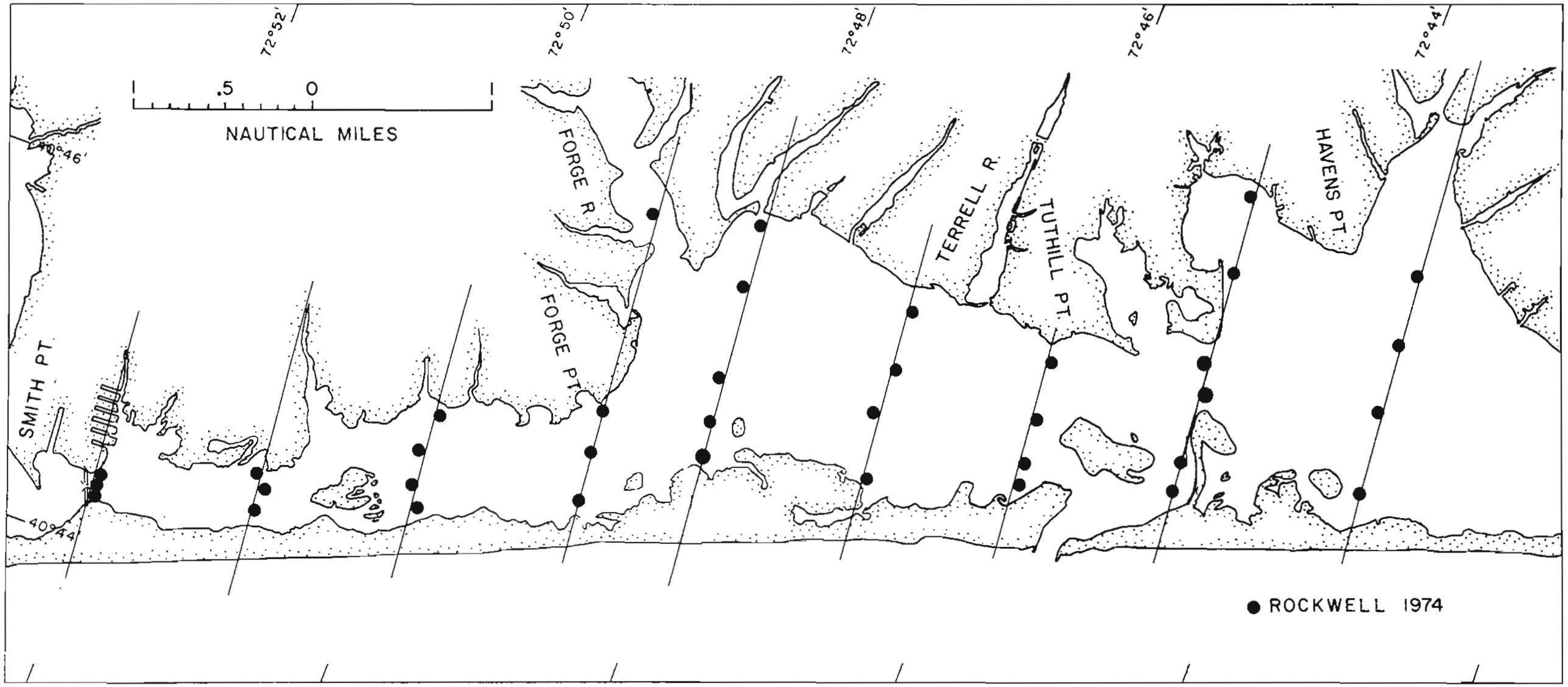

Figure C-1. Sediment sampling stations in Moriches Bay. From: Recent Sedimentation in Great South Bay, Long Island, New York, 1974. Sediment samples were taken in 1968.

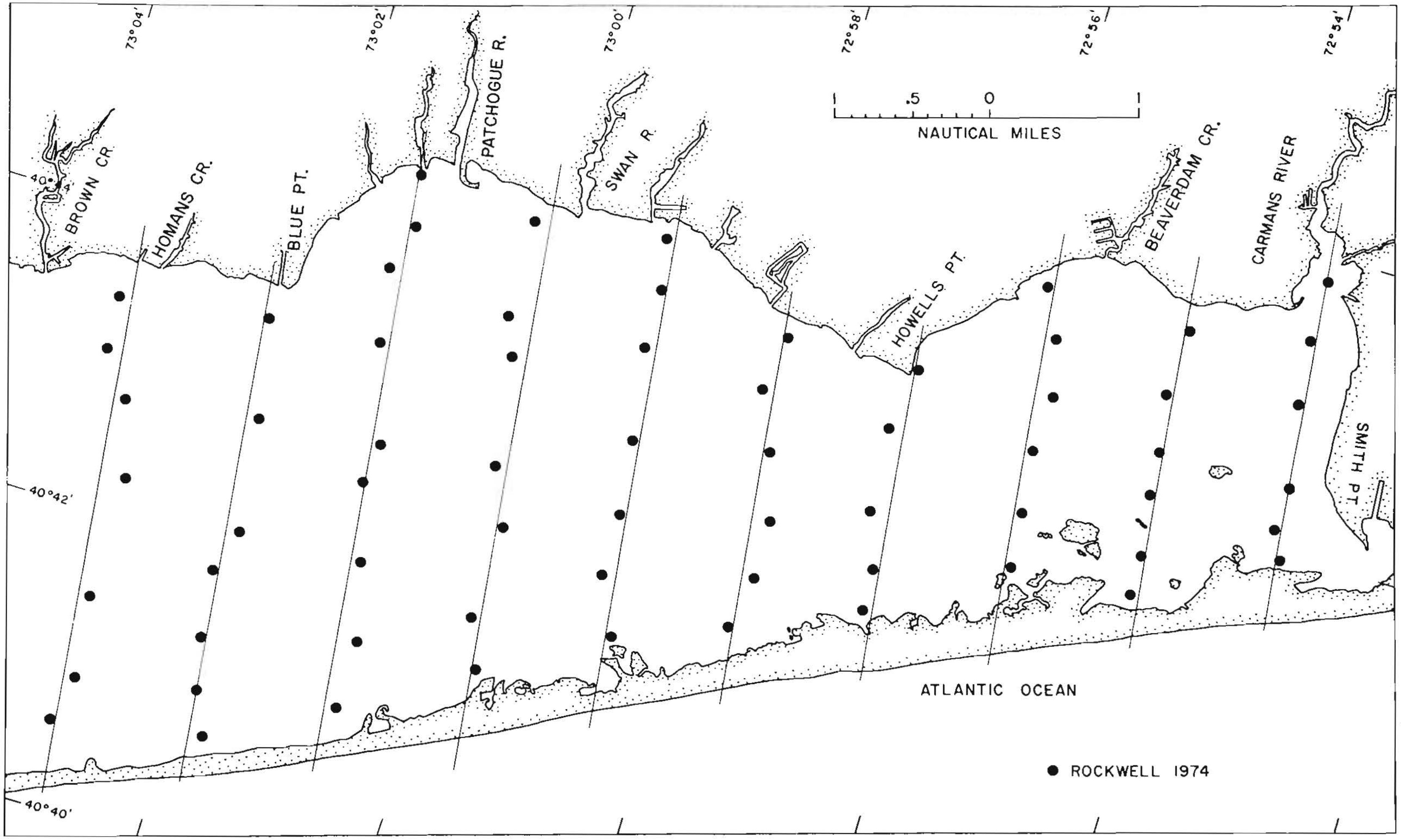

Figure C-2. Sediment sampling stations in eastern Great South Bay. From: Recent Sedimentation in Great South Bay, Long Island, New York, 1974. Sediment samples were taken in 1968.

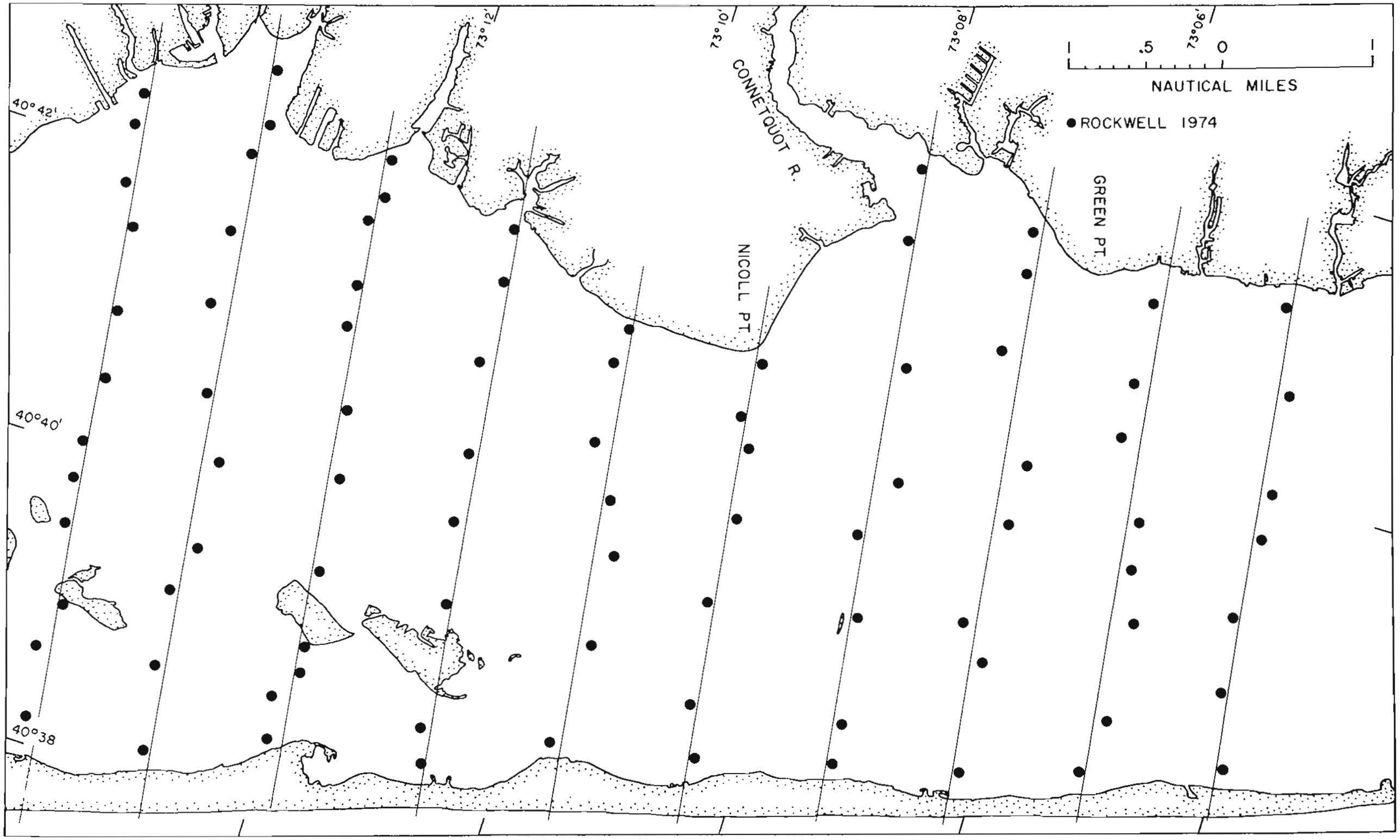

Figure C-3. Sediment sampling stations in central Great South Bay. From: Recent Sedimentation in Great South Bay, Long Island, New York, 1974. Sediment samples were taken in 1968.

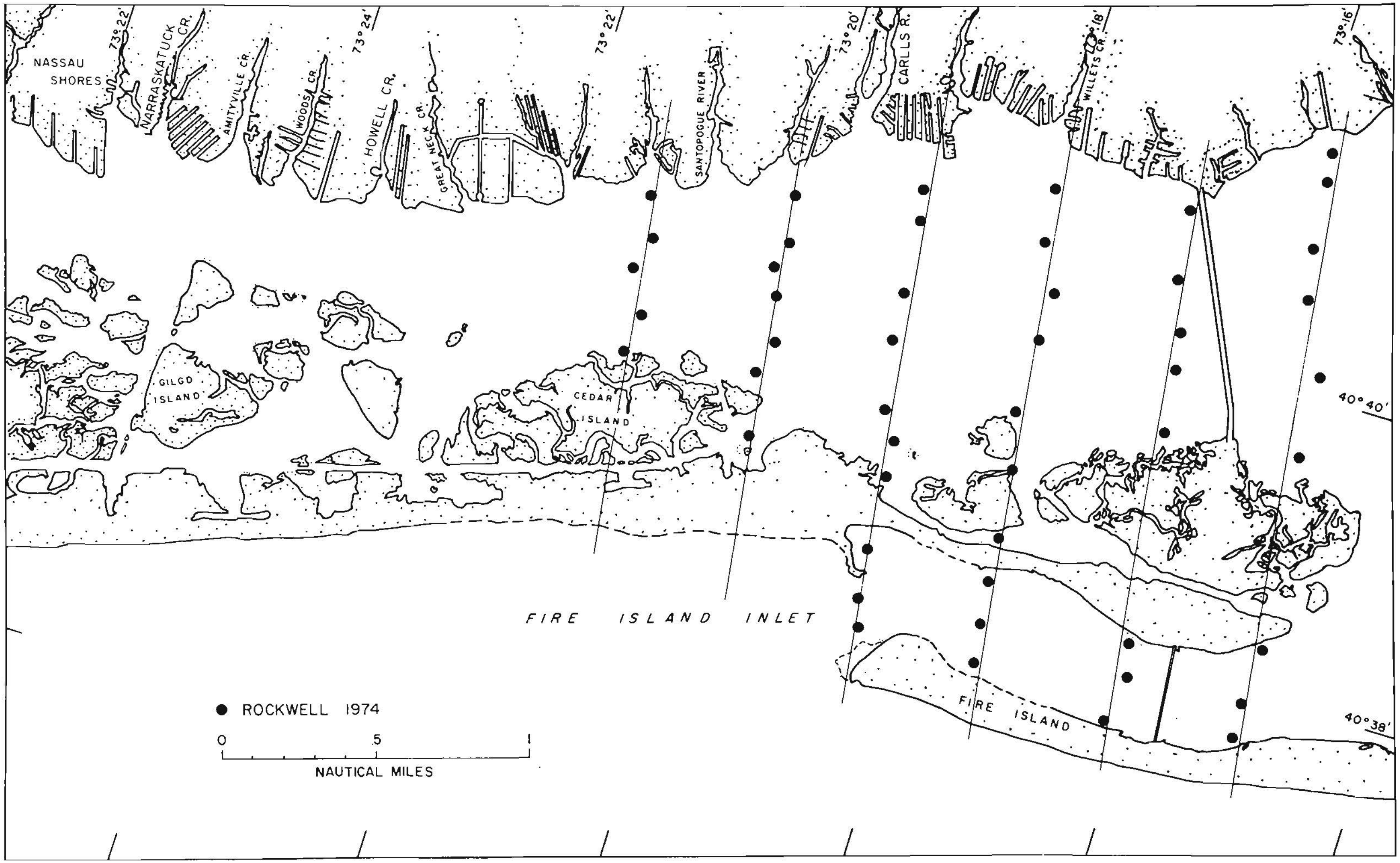

Figure C-4. Sediment sampling stations in western Great South Bay. From: Recent Sedimentation in Great South Bay, Long Island, New York, 1974. Sediment samples were taken in 1968.

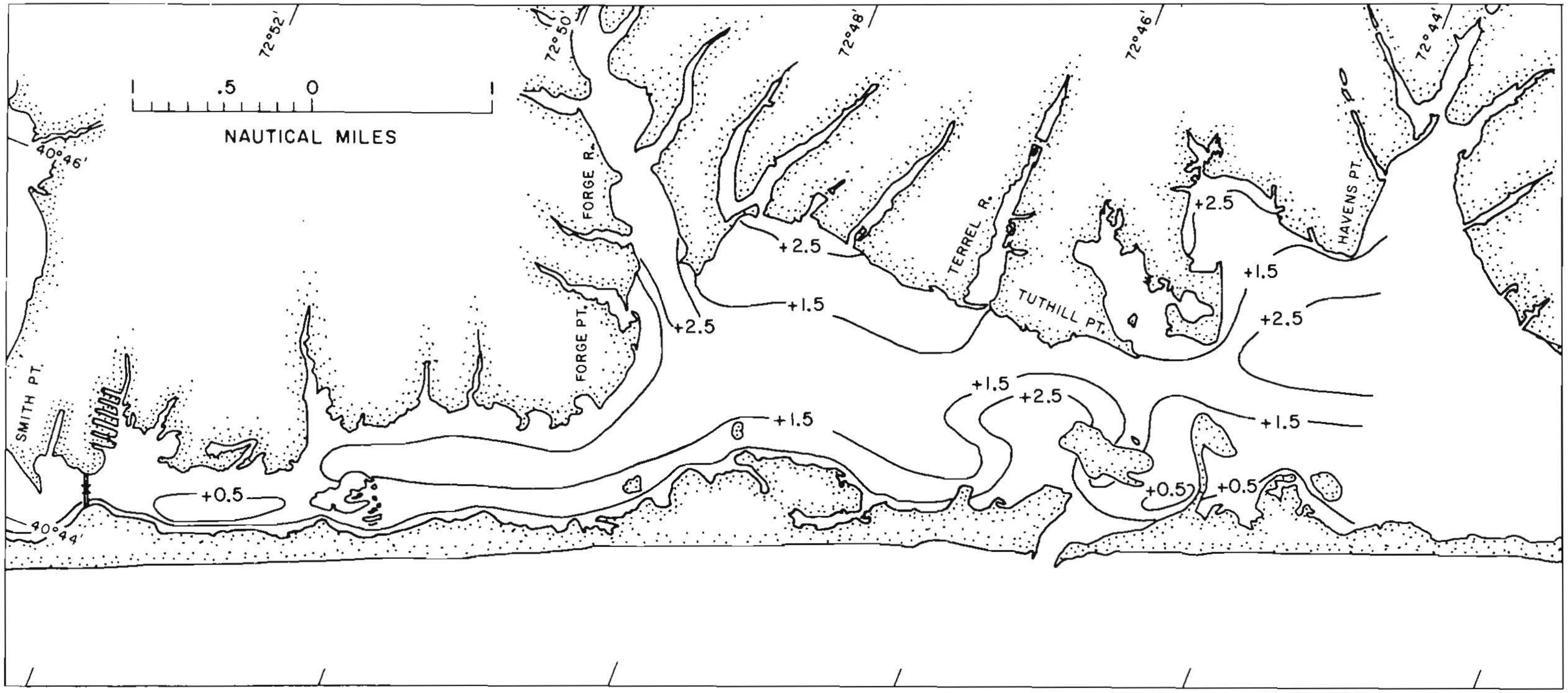

Figure C-5. Median diameter (phi units) distribution of sediment in Moriches Bay. From: Recent Sedimentation in Great South Bay, Long Island, New York, 1974.

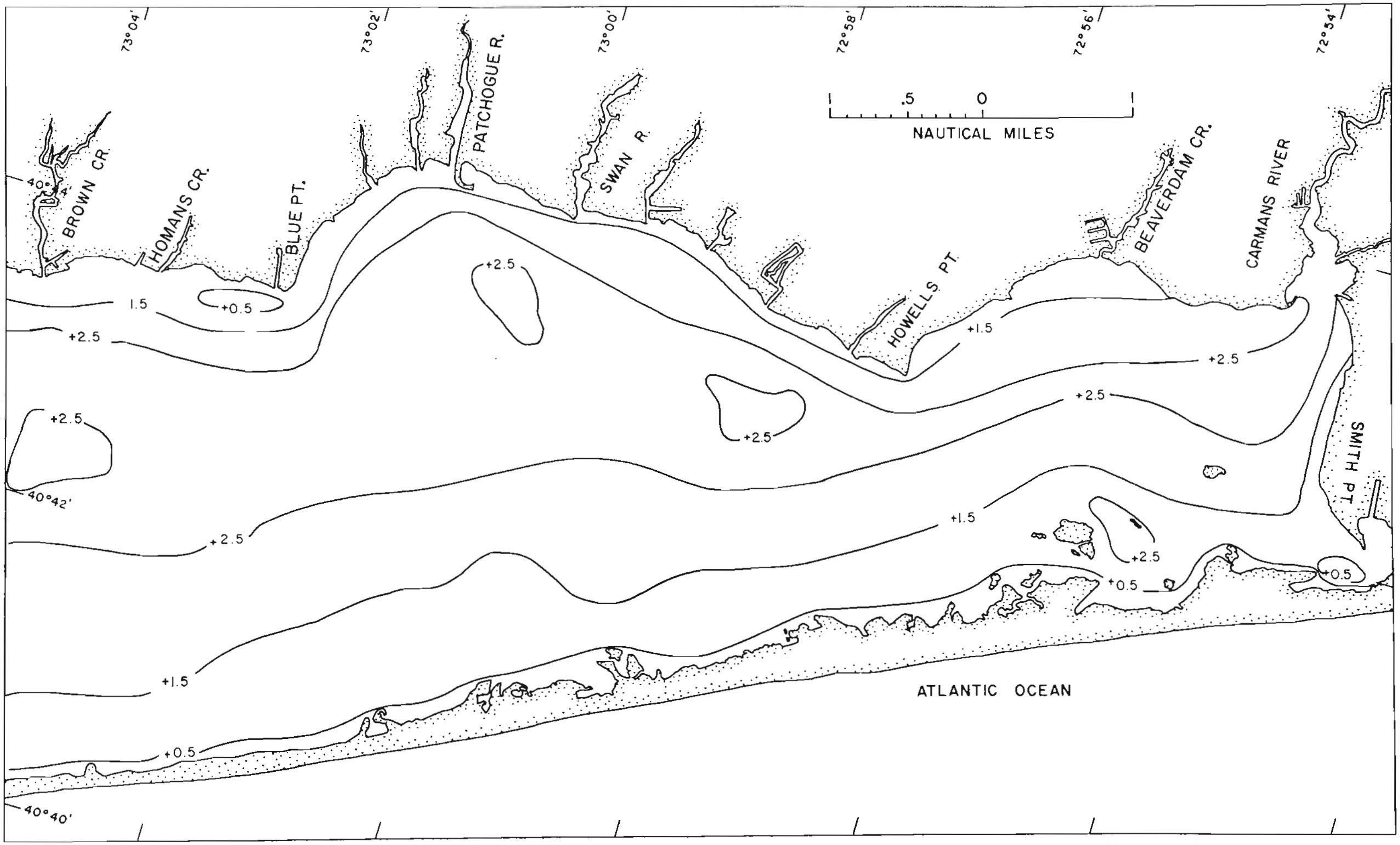

Figure C-6. Median diameter (phi units) distribution of sediments in eastern Great South Bay.
From: Recent Sedimentation in Great South Bay, Long Island, New York, 1974.

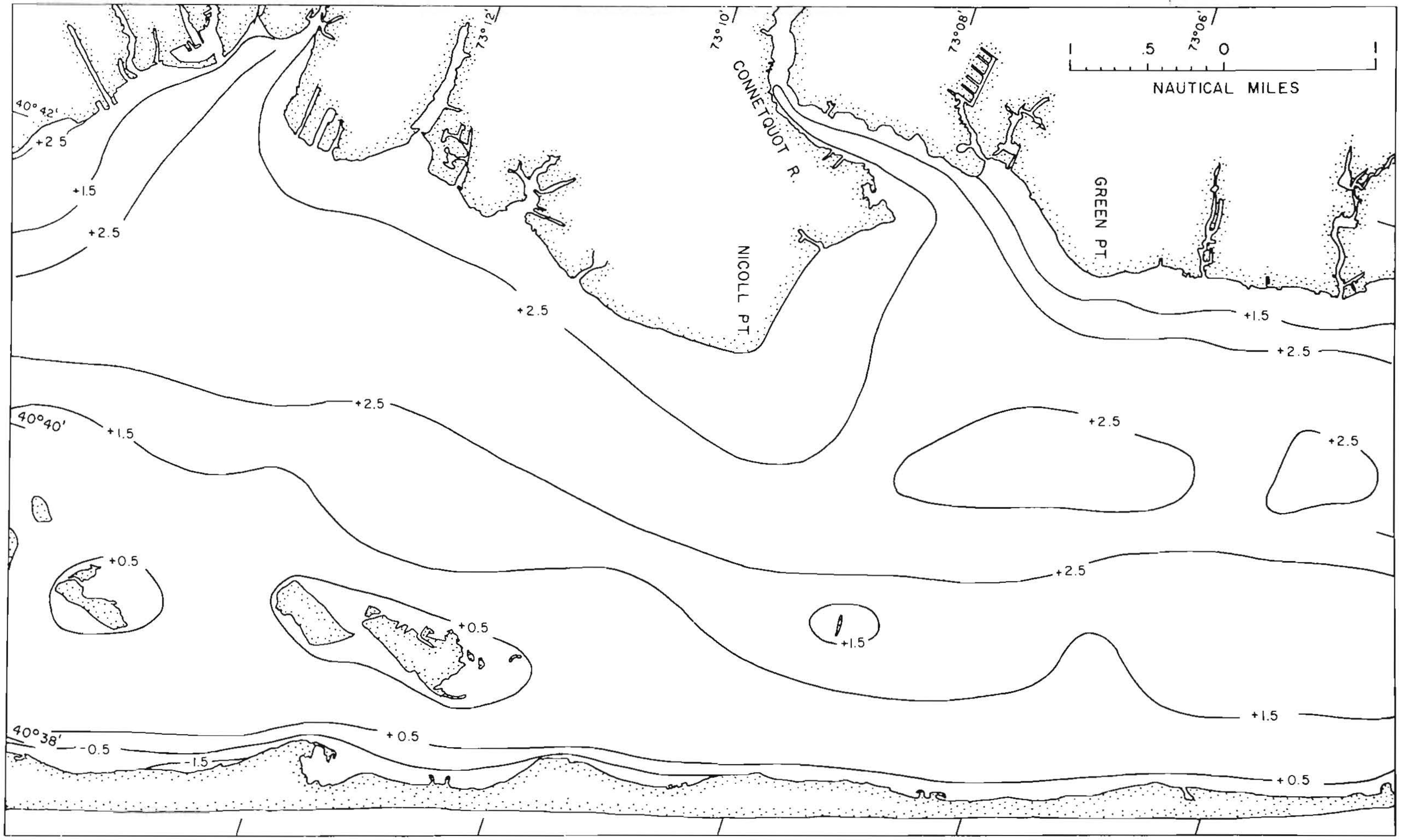

Figure C-7. Median diameter (phi units) distribution of sediments in central Great South Bay.
From: Recent Sedimentation in Great South Bay, Long Island, New York, 1974.

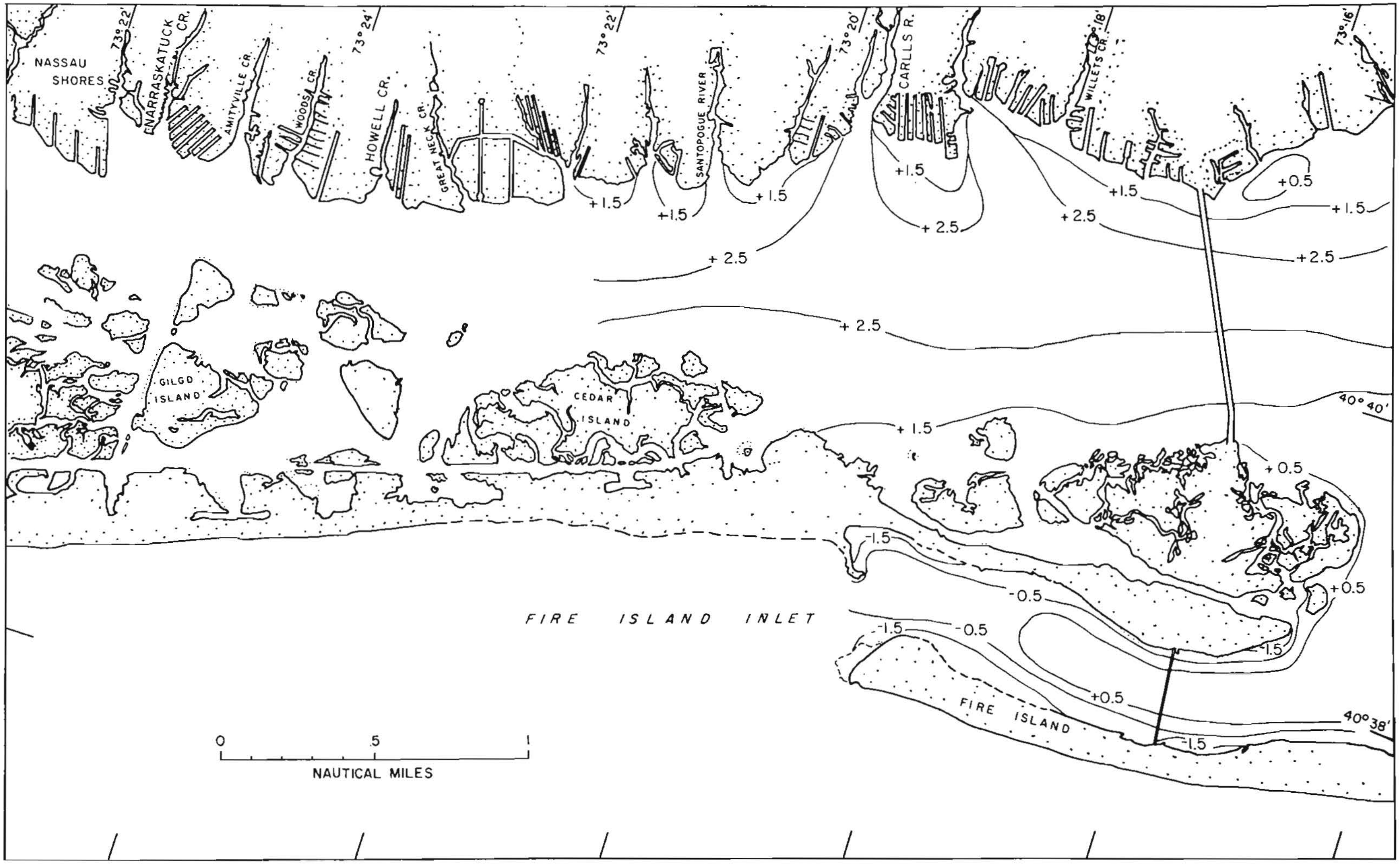

Figure C-8. Median diameter distribution of sediments in western Great South Bay. From: Recent Sedimentation in Great South Bay, Long Island, New York, 1974.