STONY BROOK HARBOR:
AN INTERDISCIPLINARY ANALYSIS

S.K. ROBBINS

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Approved for Distribution

J. R. Schubel

J. R. Schubel, Director

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

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The persons who were kind enough to give me interviews are named in the List of Persons Interviewed. I would especially like to thank J. Jarden Guenther for getting me interested in Stony Brook Harbor and for providing much valuable information from the files of the Stony Brook Harbor Association.

Lastly, I would like to thank my husband Sy for his patience and encouragement during the months this paper was in preparation, and my parents for their unswerving confidence in me throughout my life.

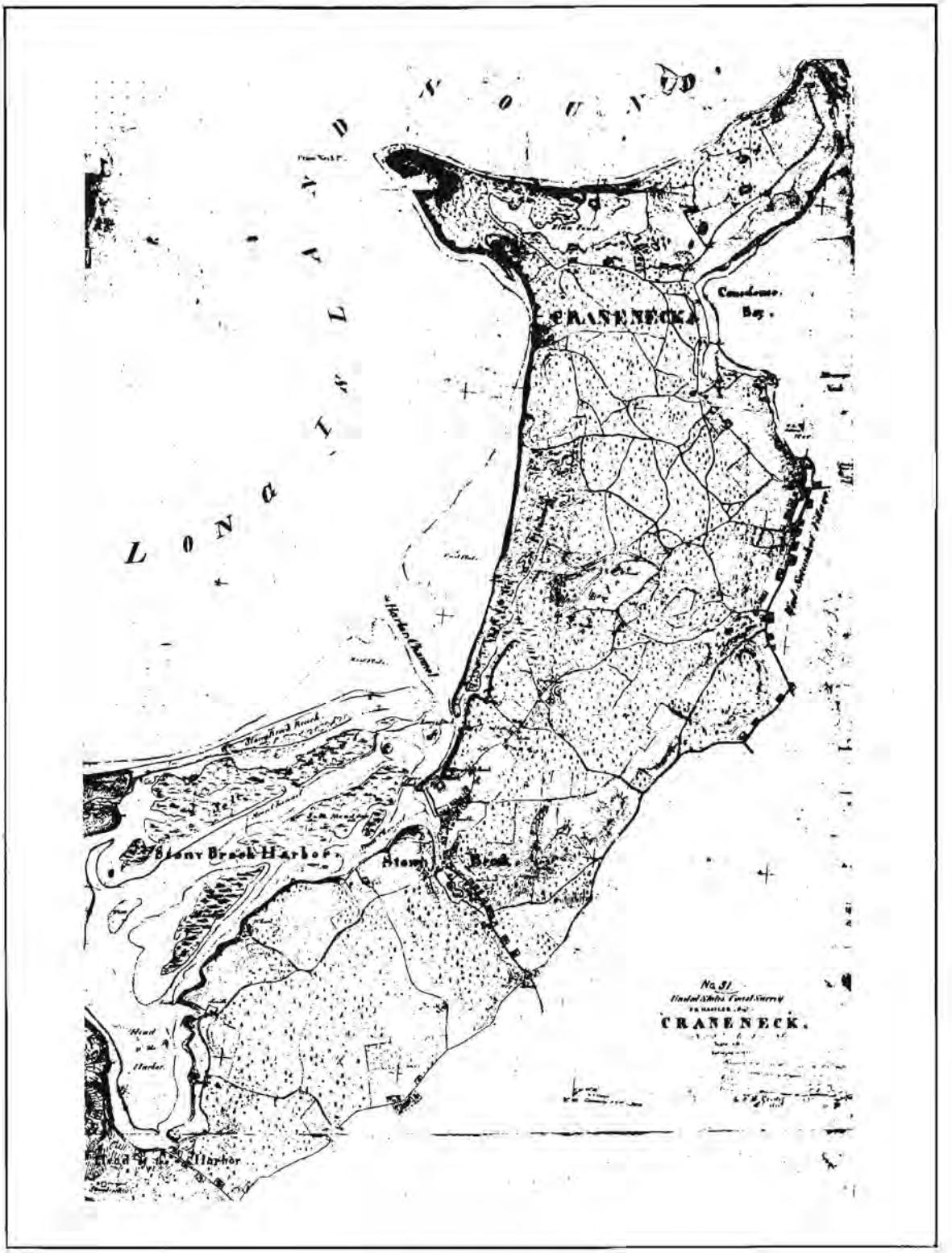
LIST OF PERSONS INTERVIEWED

Larry Czapliski - Harbor Master, Town of Smithtown
Erwin Ernst - Teacher, Three Village School District and area resident
J. Jarden Guenther - Chairman, Stony Brook Harbor Association
Richard Jessup - Treasurer, Village of Nissequogue
Arthur Kunz - Assistant Planning Director, Suffolk County Planning Department
Frederick Meyer - Planning Director and Chairman, Conservation Advisory Council, Town of Smithtown
Charles Murphy - North Suffolk Management Corporation and Stony Brook Community Fund
Jerry Newman - Suffolk County Planning Department
Norman O'Berry - lifelong area resident
George Proios - Director of Environmental Protection, Town of Brookhaven
John Renkavinsky - Division of Fish and Wildlife, New York State Department of Environmental Conservation
Steve Resler - Environmental Aide, Town of Smithtown
Sy Robbins - Suffolk County Planning Department
Richard Ryan - Land Acquisition Unit, NYDEC
Percy Smith - lifelong (over 80 years) area resident
Barbara Van Liew - Society for the Preservation of Long Island Antiquities, Suffolk County Council on Environmental Quality and area resident
Andrew Yerman - Division of Pure Waters, NYDEC

April 17, 1937

August 17, 1960

Stony Brook Harbor photos
Aero Service Division,
Western Geophysical Company of America



Stony Brook Harbor -1837

(U.S. Coast and Geodetic Survey, Topographic Survey No. 31, 1837)

ABSTRACT

Increasing and competing demands upon lands and waters of our coastal zone necessitate development of a management plan stressing wise use of those resources. The first step in developing such a plan is the acquisition of a comprehensive and well-organized information base. An inventory of available data and knowledge concerning Stony Brook Harbor, an embayment on the north shore of Long Island, is presented as an example of such an information base.

The framework within which information is collected and organized consists of: definition of the resource; patterns of use (past, present and alternative), and their compatibility; distribution of governmental authority; management and planning policies. Information is gathered from many sources, including interviews, informal reports and internal documents.

Stony Brook Harbor is well-suited to residential and recreational activities, two major uses of the resource. The development of the surrounding area helped determine what the harbor looks like today and how it is used. Competition among users of the resource and their alteration of its environment generate conflicts, which are often resolved by governmental action, especially the exercise of local governmental regulatory authority. Overlapping jurisdictions and lack of cooperation slow development of an official plan or policy to guide present and future use of the resource.

This paper is meant to serve as an example of the kind of study that could be done for other Long Island harbors and bays, as a first step in the development of management plans for their use.

INTRODUCTION

Our Nation's coastal zone is recognized to be one of our most valuable and most easily disrupted natural resources (Coastal Zone Management Act of 1972, PL 92-583). Much attention has been focused recently on the pressures which American society is placing on our coastal resources, and it has become apparent that if we are to ensure the long term conservation of our marine edge, steps must be taken now toward a rational management plan which encourages wise use. Congress has declared that it is National policy to preserve, protect, develop, and where possible, to restore or enhance, the resources of the Nation's coastal zone for this and succeeding generations. The Coastal Zone Management Act encourages the States to exercise their full authority over the lands and waters in the coastal zone, in cooperation with Federal and local governments, by developing land and water use programs.

The issues involved in managing our coastal resources and in planning for their future use are complex and they cross the traditional boundaries between disciplines. Scientific information combined with political, economic and social realities must be considered when analyzing the impact of man's activities in the coastal zone.

The first step in the development of a management and planning program for a marine resource is the acquisition of a comprehensive and well-organized information base. The purpose of this paper is to organize and evaluate data and knowledge concerning a marine resource so that it is presented in a form useful to

managers and planners. Stony Brook Harbor, an embayment on the north shore of Long Island, and its adjacent land area, covering approximately 23 km^2 (9 $miles^2$), was chosen as the case study, partly because of its convenient location, but mostly because no such investigation of the harbor has previously been performed.

It is not the purpose of this paper to present all available information on the harbor (although all promising sources of information were investigated), but to identify the scope of information which should be included in such a study. All of the information categories touched upon in this analysis do not necessarily have to be treated in the same way for other resources. Different aspects will probably have to be stressed, depending upon the character of the resource and how it is used by man.

The framework of the methodology employed in this study consists of the following categories under which information is collected and organized: definition of the resource; past, present and alternative patterns of use; compatibility of present uses; existing distribution of authority and responsibility; and management and planning policies presently in force. The sources referenced throughout this paper are indicative of the locations at which pertinent information can be found, and can help guide the efforts of some other investigator organizing a similar information base for another resource. Knowledge gaps, where they exist, are noted.

DEFINITION OF THE RESOURCE

The first step in the development of an information base for a resource such as Stony Brook Harbor is the definition of the resource, i.e. the collection and compilation of data and knowledge relevant to both the physical and human environments of the study area. The features of the natural environment of the Stony Brook Harbor area that should be inventoried are: geological structure and history; physical layout of the harbor; location and quality of marine wetlands; stability of the shoreline; extent of the drainage basin and its water budget, soil and topography; harbor water quality; biota of the harbor and shoreline; hydrography; and sediment distribution. Features of the human environment of the harbor area that should be covered include: existing land use patterns; local zoning; and population and income distribution.

In the following definition of the resource, a general description of the harbor and surrounding area is presented first, as an introduction to the physical setting. Then land use in the surrounding upland and along the shoreline is inventoried, to give an idea of the character of development in the area. Lastly, a detailed description of the marine environment of the harbor itself is presented, including chemical, biological, physical and geological aspects.

General Description

Stony Brook Harbor is located on the north shore of Long Island on the boundary of Smithtown and Brookhaven Townships (over 90 percent in Smithtown), in western Suffolk County (Figure 1). It is a broad, shallow, roughly L-shaped body of water. The outer (east-west) section is 3.2 km (2 mi) long and 1 km (.6 mi) wide, and is mostly marshes. The inner (north-south) section is 2.8 km (1.7 mi) long and .5 km (.3 mi) wide at the head, and is mostly open water. The harbor has an average depth of 0.9 m (3 ft) at Mean Low Water (47), with the greatest depths located in the inner section (over 3 m [10 ft] deep). Separated from Long Island Sound by two baymouth bars, Long Beach and West Meadow Beach, a narrow inlet (app. 130 m or 400 ft wide) at its northeastern corner connects the harbor with Smithtown Bay. West Meadow Creek, which is located behind West Meadow Beach, is the principal

Base map: Nassau-Suffolk Regional Planning Board

FIGURE 1 LOCATION MAP--STONY BROOK HARBOR

tributary, entering the harbor near the inlet.[1]

The harbor's drainage basin consists of rolling, wooded hills with low density residential development and much open space. The only site of intensive development is the commercial portion of Stony Brook village, near the entrance to the harbor.

The name "Stony Brook Harbor" is derived from the community of Stony Brook, once an active commercial port. The community was named for the small watercourse that enters the harbor at the village waterfront (and has been dammed to form a mill pond). The designation "harbor" has been loosely applied to a number of protected waterbodies along the Long Island shoreline, and does not necessarily pertain to their suitability as ports.

Stony Brook Harbor is a recreational waterbody, used for activities such as boating, clamming, swimming and fishing. There is no industry anywhere on the shoreline and only one parcel zoned for industrial use in the drainage basin. It is probably the least spoiled (closest to natural condition) of any of the harbors on the north shore of Long Island. The National Park Service is presently considering the harbor as a potential Natural Landmark. It is also an historic resource, listed in the New York State Division of Historic Preservation's Historic Resources Survey as an Historic and Natural District, under the following themes: Geological formation, Natural environment, Incentive for settlement, Patterns of transportation development (sloop and packet), Military history, and Economic factors (shipbuilding, cordwood and other shiping).

Geological Structure and History

The north shore of Long Island is classified by Shepard(66) as a primary coast: one whose character is due to the sea level coming to rest against a land form that was the result of terrestrial agencies. In this case, the terrestrial agency is glacial deposition and the partially submerged land form is a moraine. The action of waves and currents has modified the configuration of the north shore in the area of Stony Brook Harbor through the formation of baymouth bars which separate the harbor from Long Island Sound.

Stony Brook Harbor is relatively young geologically. Its origin can be traced back only as far as the late Cretaceous or the early Tertiary periods (app. 60 to 70 million years before present). At that time, a northerly flowing stream, draining into what is now Long Island Sound, cut a valley through sedimentary deposits laid down earlier in the Cretaceous. During the Pleistocene epoch (app. 3 million to 10,000 years before present), glacial action scoured out the valley, enlarging it and giving it its present broad, smooth shape(16).

The upland surrounding the harbor is composed of glacial drift[2] deposited during the most recent stage of glaciation, the Wisconsinin. These deposits are part of the Harbor Hill moraine, the ridge which runs roughly east-west along almost the entire length of Long Island, forming the hilly topography of the north shore. This glacial drift overlies steep sand bluffs (some as high as 46 m [150 ft]) which front on Long Island Sound(28). These bluffs are the edge of a plateau composed of till[3] and gravel (the Manhasset formation) deposited during an earlier episode of glaciation(18).

The Harbor Hill moraine is in two sections: the terminal moraine and, lying directly north of it, the ground moraine[4] (Figure 2). The terminal moraine is a series of hills ranging in height from 45 to over 60 m (150 to over 200 ft). It is composed mostly of crudely stratified sand and gravel with some till(28). The ground moraine, which covers most of the area directly around the harbor, has a lower elevation than the terminal moraine, ranging in height from 15 to 45 m (50 to 150

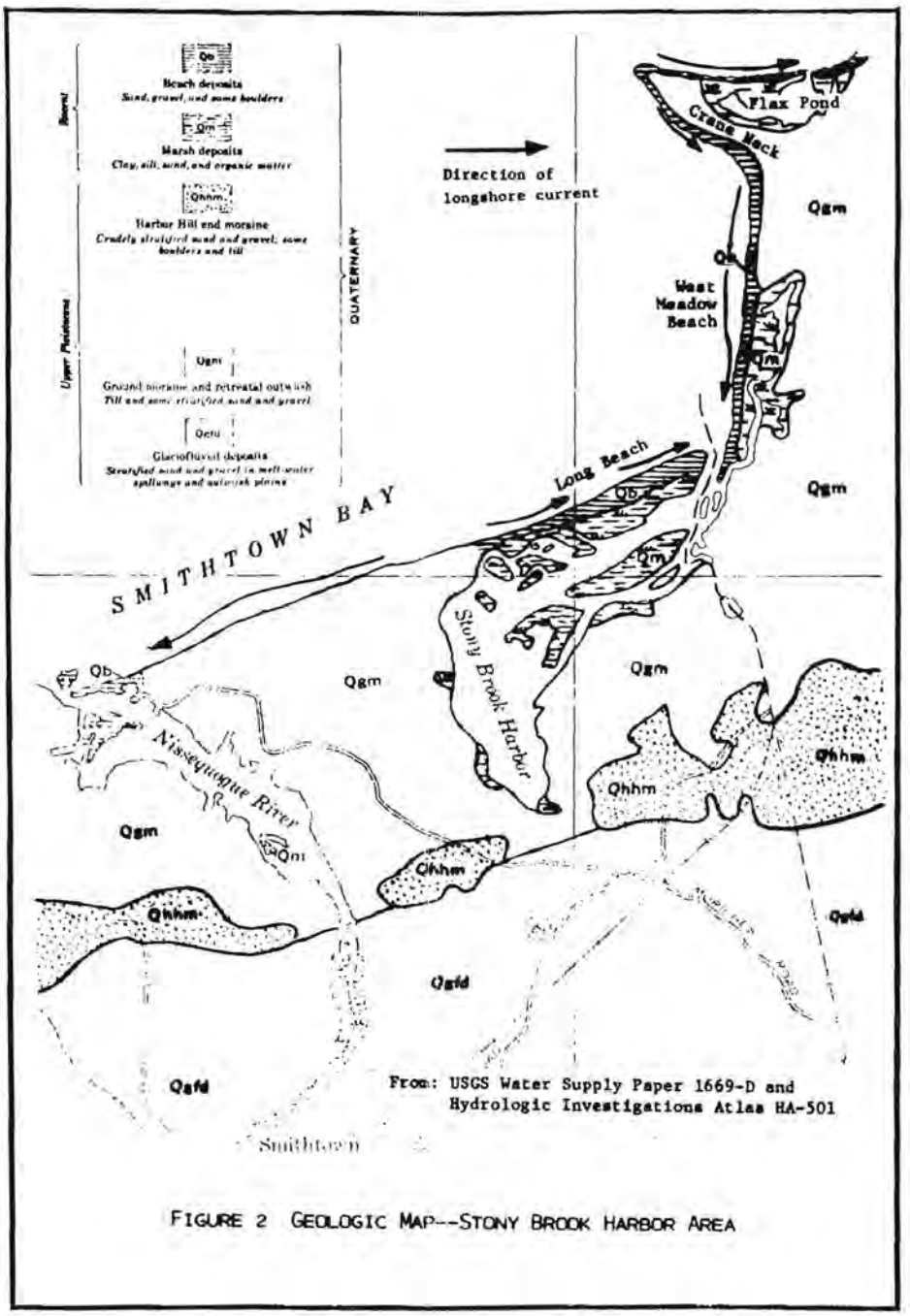


FIGURE 2 GEOLOGIC MAP--STONY BROOK HARBOR AREA

ft). The ground moraine deposits are mostly till with some stratified sand and gravel(28).

The youngest geological features of Stony Brook Harbor are the baymouth bars and the marshes behind them(16). As sea level rose following the retreat of the last glaciation, wave and current action eroded the bluffs and beaches at Nissequogue and Crane Neck (Figure 2). The longshore current carried some of the eroded material (mostly the sand fraction) east from Nissequogue and south from Crane Neck Point, forming, respectively, Long Beach and West Meadow Beach. Nissequogue is a double winged headland flanked by two baymouth bars, Long Beach to the east and Short Beach to the west (the "wings"). Crane Neck is a double pointed headland (composed of Crane Neck and Old Field Points) with attached baymouth bars at West Meadow Beach, Flax Pond and Old Field Beach(80). In the calm waters behind the bars, salt marsh plants could take root and grow. As these plants trapped fine sediments carried in on the tide, the salt marsh expanded, growing both in level, in response to rising sea level, and in areal extent.

Physical Description

Stony Brook Harbor and its major tributary, West Meadow Creek, cover an area of 4.8 km^2 (1200 acres), approximately 3.0 km^2 (750 acres) of open water and 1.8 km^2 (450 acres) of island and marsh (Figure 3). They have roughly 23 km (14.3 mi) of shoreline. Their average depth at Mean Low Water is only about 0.9 m (3 ft)(47). West Meadow Creek, which is tidal for its entire length of 2.4 km (1.5 mi), meanders from the north, entering the northeastern corner of the harbor near the inlet. The other tidal creek, Stony Brook Creek (the "mill creek"), enters the harbor in the southeastern corner. About 0.4 km (¼ mi) upstream is a mill dam, forming two ponds which flow one into the other; a small upper pond and the mill pond. The creek is little more than a trickle at low tide as it passes through the marsh at its mouth. A small watercourse, dry most of the year, feeds into the extreme southern end (the head) of the harbor. It carries runoff from the land during spring thaw and rainstorms(47).

There are two major channels in Stony Brook Harbor, both in the outer section. Porpoise Channel runs westerly from the inlet along the southern shore of Long Beach (Figure 3). It has been dredged for its entire length and is about 1.8 m (6 ft) deep at Mean Low Water. The other channel, the "main" channel, runs southerly from the inlet to the southeastern corner of the harbor. It has also been dredged, and ranges from 2.4 to 3.7 m (8 to 12 ft) deep. There is another channel which swings to the east of Hart Island, hugging the eastern shoreline. This is the original natural channel, which was bypassed when the "main" channel was dredged. It is very shallow now, only about 0.9 m (3 ft) at MLW.

The channel in West Meadow Creek is shallow for most of its length, ranging from nearly 0 to 1.2 m (0 to 4 ft) deep, except for the two dredged areas: the northern, which is as deep as 6.1 m (20 ft) in spots, and Aunt Amy's Creek, dredged irregularly to 0.9 to 2.4 m (3 to 8 ft).[5]

There are two small, narrow channels which run south of the large marsh island in the outer harbor: "Commarge" Channel and, below it, "Emmet" Channel, running along the southern shoreline. Other shallow channels connect the outer harbor with the head of the harbor.

The harbor inlet, where Porpoise and the "main" channels converge, reaches depths of up to 4 m (13 ft). Outside the inlet, a channel winds northerly and then northwesterly across the sand flats into Smithtown Bay. This channel has never been dredged, and is generally 0.9 to 1.5 m (3 to 5 ft) deep.

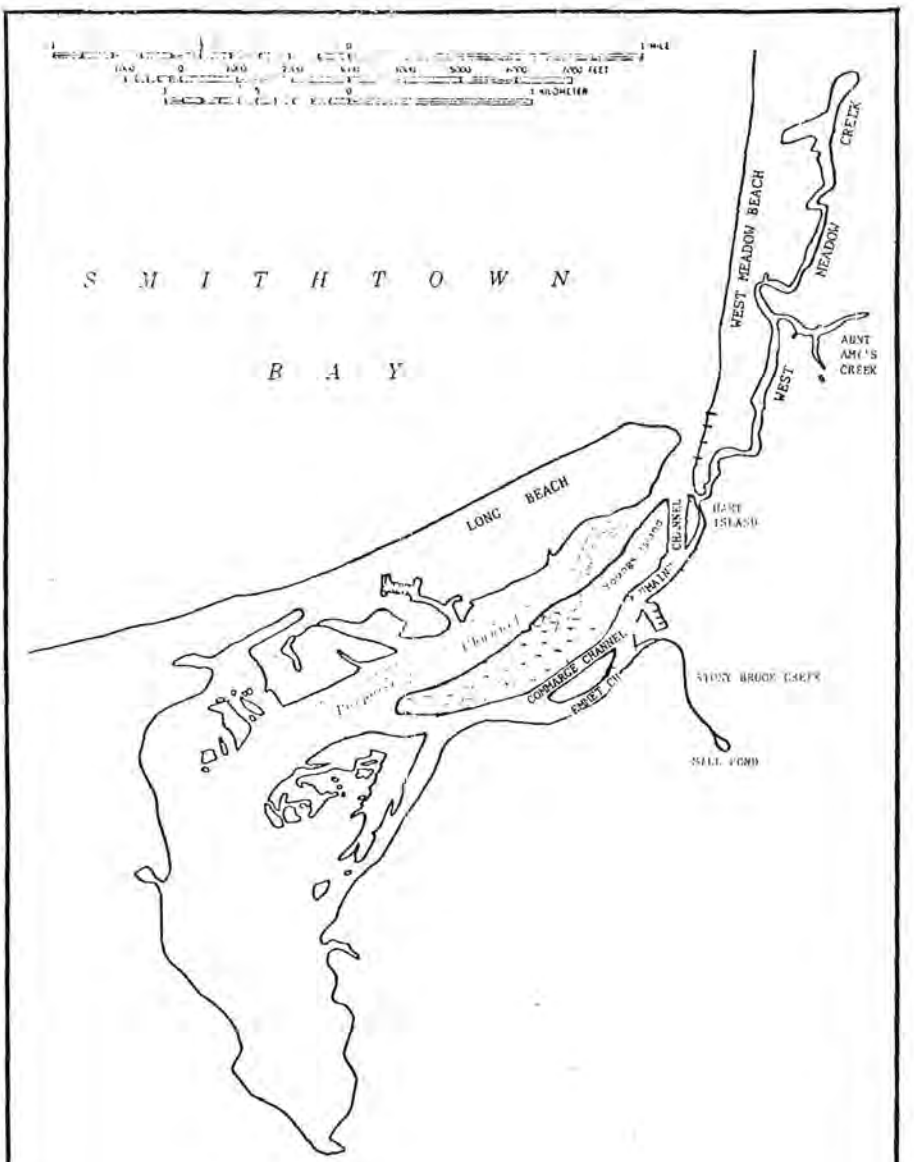


FIGURE 3 PLACE NAMES--STONY BROOK HARBOR

Wetlands

Much of the shoreline and most of the islands in Stony Brook Harbor support a healthy growth of salt marsh grass. Most of the western shore of West Meadow Creek is part of an extensive, well developed salt meadow, or high marsh (Figure 4). There are 1.7 km^2 (431 acres) of marine wetlands in Stony Brook Harbor and West Meadow Creek.[6] On the 1.3 km^2 (328 acres) in the harbor and Stony Brook Creek, 98 percent of the vegetation is *Spartina alterniflora* (salt marsh cord grass, or thatch), which is generally restricted to areas below MHW (intertidal marsh). The 0.4 km^2 (103 acres) at West Meadow support a growth of 30 percent *Spartina alterniflora*, app. 50 percent *Spartina patens* (salt meadow grass, or salt hay) and app. 20 percent *Distichlis spicata* (spike grass) (55).

The marine wetlands in their natural state perform a variety of valuable functions which affect the whole web of life:

1) Basic food production - Marsh grasses and algae carry on the energy transformation process called photosynthesis. A high yield salt marsh with *S. alterniflora* as the main producing unit ranks as one of the world's most productive natural or cultivated ecosystems(12).

2) Essential habitat - The marine wetlands support a variety of invertebrates, fish and wildlife. Shellfish live on or in the bottom, and finfish breed and/or live in the sheltered waters. Wildlife, especially waterfowl, nest, rest and find protection and food in the wetlands.

3) Marine nursery - Commercially and recreationally valuable finfishes such as striped bass (*Morone saxatilis*), bluefish (*Pomatomus saltatrix*), fluke or summer flounder (*Paralichthys dentatus*), menhaden (*Brevoortia tyrannus*) and winter flounder (*Pseudopleuronectes americanus*) grow and develop in wetland areas where they find abundant food and protection(78).

4) Buffers to storms and sediment traps - Marine wetlands protect the upland from the destructive force of the sea by mitigating the effect of storm tides and waves. Their "growing edge" has been able to keep pace with the progressively rising sea level on the Atlantic coast(50) because they act as sediment traps, i.e. as the tide floods the wetlands, the velocity of the water is reduced, allowing suspended sediment (mostly clay and silt size) to settle out on the marsh surface.

5) Water treatment system - Salt marshes function like a secondary sewage treatment plant. They settle out suspended matter and transform waste products into useful nutrient materials by both chemical and biological processes(41).

Upland

Drainage Basin

The upland watershed, or drainage basin, of Stony Brook Harbor is relatively small, covering 18 km^2 (4,500 acres), or about 3½ times the area of the harbor and West Meadow Creek (Figure 5). The boundaries of the drainage basin were determined on the basis of topography, i.e. the overall slope of the land within the drainage basin is downward in the direction of the harbor. The southern boundary coincides with the highest elevations of the Harbor Hill terminal moraine. The eastern and western boundaries are defined by a series of smaller ridges running along the Harbor Hill ground moraine in a roughly north-south direction.

A portion of the rain which falls in the drainage basin, and is not lost to the air by evaporation and plant transpiration (evapotranspiration), reaches the harbor as surface runoff and as groundwater underflow.

Surface runoff enters the harbor and

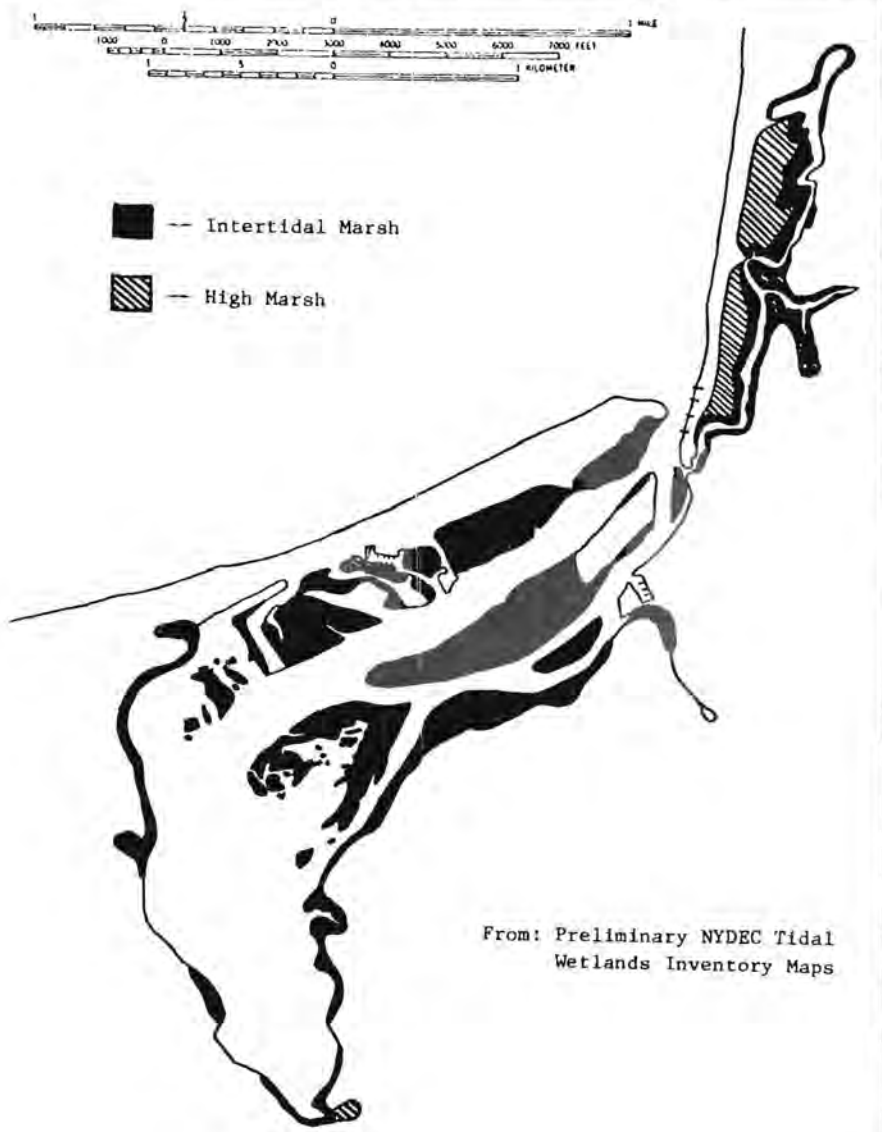


FIGURE 4 MARINE WETLANDS--STONY BROOK HARBOR

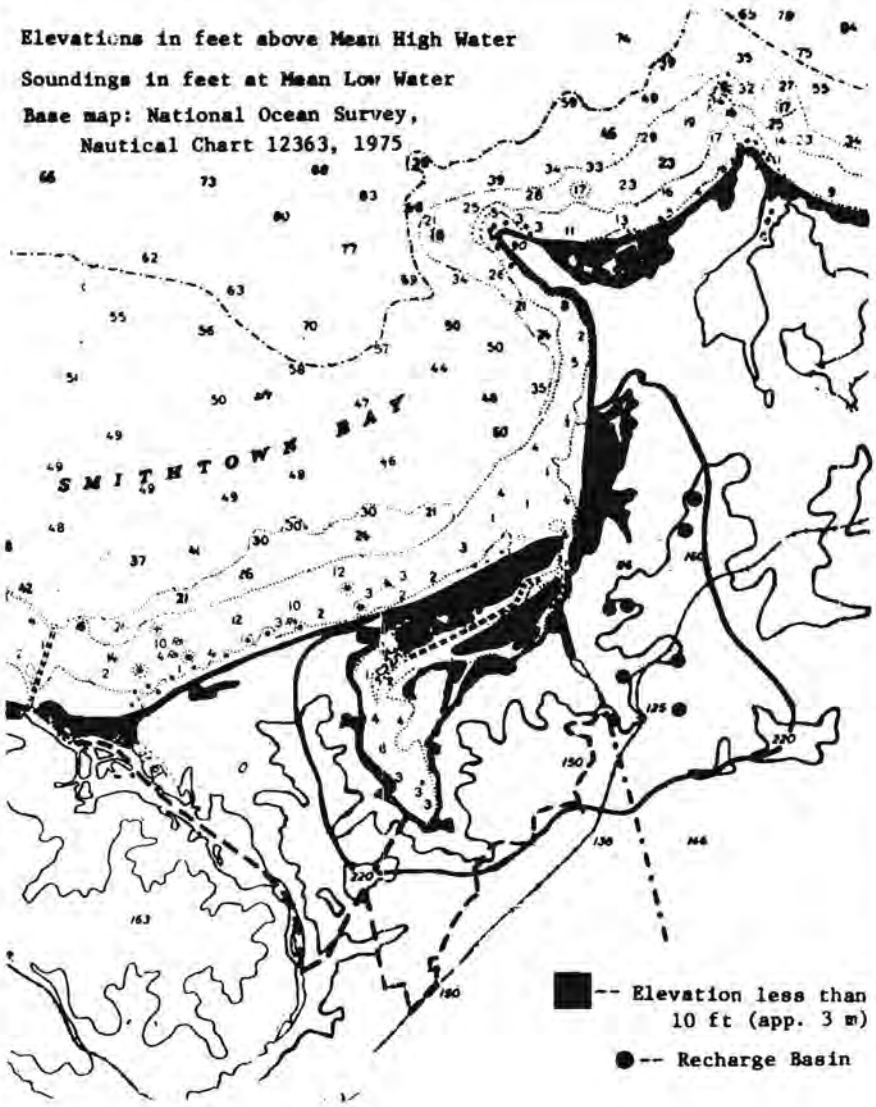


FIGURE 5 STONY BROOK HARBOR DRAINAGE BASIN

the two creeks along their perimeters. In some places, such as the southern end of the head of the harbor, the runoff follows a natural drainage channel down to the harbor and, at times of especially heavy rains, a small stream is temporarily created. Storm drains have been installed along roads within the drainage basin to prevent their flooding during heavy rains. A few of these drains carry runoff directly into the harbor or the creeks. An inspection of the shoreline by boat revealed 8 storm drains emptying into West Meadow Creek and the Stony Brook village waterfront. In the Town of Smithtown, one culvert was found at the extreme head of the harbor (connecting a pocket of marine and freshwater wetlands with the harbor). Most storm drains, however, carry the runoff to numerous underground catch basins, or to the app. 8 surface recharge basins in the drainage basin (all located in the Town of Brookhaven), where the water can seep into the ground (Figure 5).

The amount of fresh water entering the harbor as surface runoff is considered to be negligible when compared with that entering as groundwater underflow, which is the largest contributor(18). Groundwater is discharged directly into the harbor and the creeks by underflow through their bottoms and around the shoreline.[7] Groundwater also emerges at a few springs, especially where the land rises steeply from the shore and in some places feeds into small streams which flow into the harbor. (Ninety-five percent of stream flow on Long Island is contributed by groundwater seepage[13].)

Soil and Topography

The soil in the Stony Brook Harbor drainage basin is generally less than 1.5 m (5 ft) thick, blanketing the glacial sand and gravel deposits(28). It is composed mostly of Riverhead sandy loam (Rd), with areas of Carver and Plymouth loamy sand (Pl), and some localized Haven loam (Ha) and Cut and Fill land (Cu), all of them acid (Figure 6). The sandy loam soil is well drained and moderately coarse textured, suited to both agricultural and residential use. The sands and loamy sand are excessively drained, coarse textured soils, well suited to residential use; the sands are poorly suited to agriculture, the loamy sand moderately suited. The loam is a well drained, medium textured soil, well suited to agriculture and more versatile than the other types. Cut and Fill land has been altered by grading operations, and is suited to housing but not agriculture. Localized areas of Fill land (dredge spoil) (Fd) and Beach and Dune land (B-D) are scattered along the shoreline. The fill land is moderately suited only to residential use, and the Beach and Dune land is not suited to any such active use (it is best as recreation or conservation areas)(83).

The general elevation of the drainage basin is between 15 and 60 m (50 and 200 ft) above sea level. The surface relief ranges from gently sloping (3 to 8 percent slope) to steep (25 to 35 percent slope); most of the land has a gentle to strong slope (3 to 15 percent). The small fraction of the area that is nearly level (0 to 3 percent slope) occurs in relatively small, scattered patches(38). The western and southern shores of the harbor are ringed with steep, mostly heavily wooded hills, cut by small valleys leading down to the shore. Along the northern part of the Stony Brook village waterfront and the southeastern shore of the harbor, just west of Stony Brook Creek, are steep sand bluffs. The upland around West Meadow Creek is generally more gently sloping.

All of the West Meadow Creek area and most of the Long Beach peninsula are part of the coastal flood plain, i.e. those areas subject to tidal flooding during storms. The entire flood plain is subject to inundation during a standard project hurricane, which is defined as a "hypothetical hurricane intended to represent the most severe combination of hurricane parameters that is reasonably

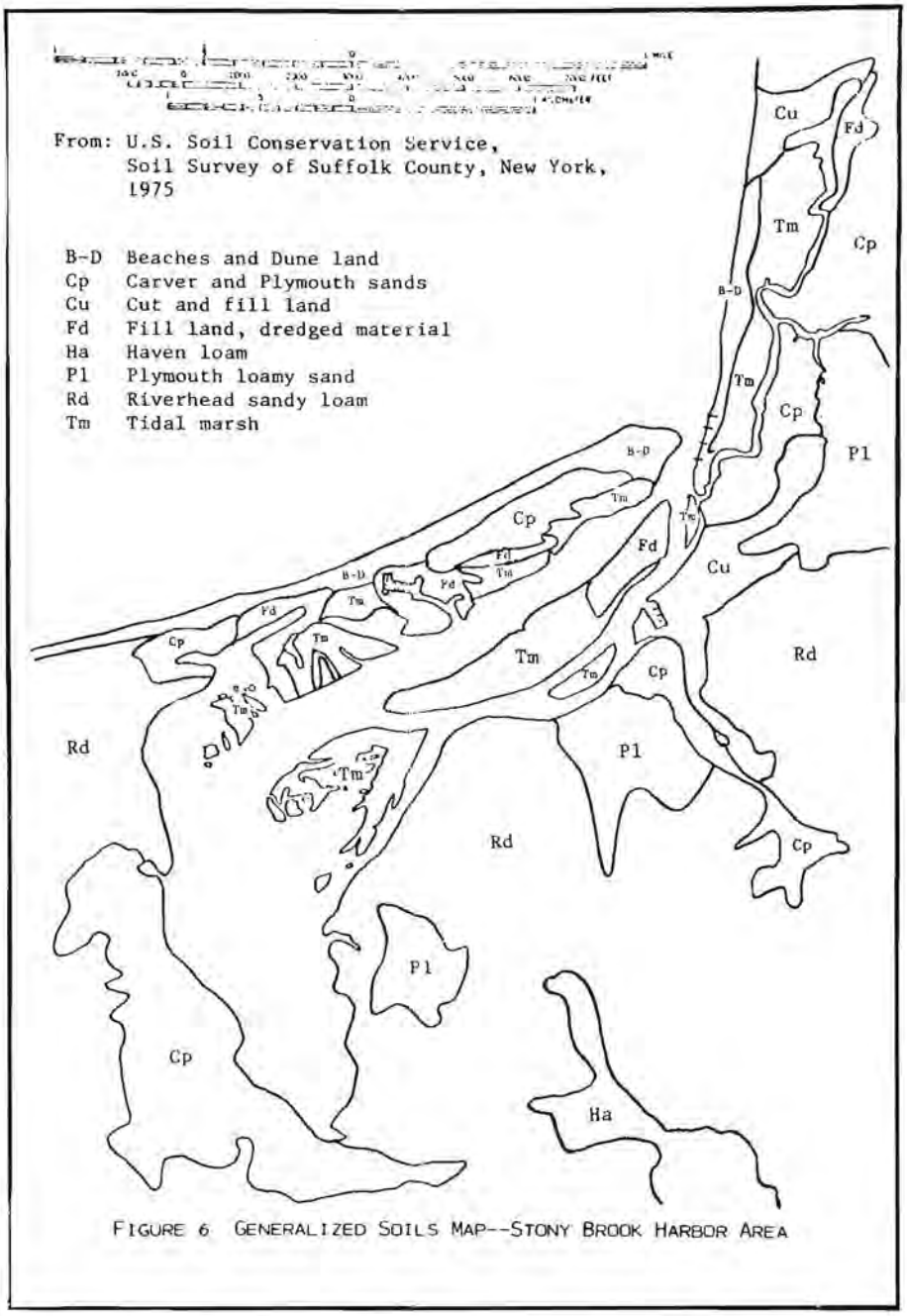


FIGURE 6 GENERALIZED SOILS MAP--STONY BROOK HARBOR AREA

characteristic of a specified region"(15). Areas subject to inundation by the standard project hurricane tide at Stony Brook Harbor are those situated less than 4 m (13 ft) above sea level. Figure 5 presents a conservative estimate of the flood plain, as determined by the location of the 3 m (10 ft) contour. (*Shoreline Stability*, p. 23, treats this topic in more detail.)

Land Use

The combination of soil types and topography described above helps to make the area around Stony Brook Harbor a very scenic locale. Rolling hills and valleys covered with a dense growth of hardwood trees interspersed with gently sloping fields give variety and color to the landscape and provide fine locations for houses and small farms.

The area is overwhelmingly residential, but still retains much of its rural Colonial character. A large number of fine old houses, dating from the Colonial period and the early 19th Century, are still standing and in good repair. There are several acres of farmland under cultivation, and many acres of open fields and thick woodlands.

The upland within the Stony Brook Harbor drainage basin comes under the jurisdiction of four local governments: the incorporated villages of Head-of-the-Harbor and Nissequogue, in the Town of Smithtown, and the Town of Brookhaven (Figure 5). The two Villages and the Town of Brookhaven have the zoning power for almost all of the land within the drainage basin.

Stony Brook. To the east of the harbor, the unincorporated community of Stony Brook occupies the section of the drainage basin that is within the Town of Brookhaven. It is a residential community with a long established central core surrounded by developments built largely on former farmland. The developments, built within the past 20 years, are composed of one-family houses on 22,500 sq. ft lots (slightly greater than ½ acre) zoned "B" Residence 1, to the north of Route 25A, and on 15,000 sq. ft lots (slightly greater than 1/3 acre) zoned "B" Residence, to the south (Figure 7). In May 1975, the Brookhaven Town Board upzoned the undeveloped land around West Meadow Creek, including West Meadow Beach and the wetlands behind it, the north end of the Creek and the Aunt Amy's Creek area, from "B" Residence 1 to "A" Residence 1 (minimum lot size app. 1 acre).[8] Table 1 lists the Town of Brookhaven zoning districts which have been assigned to Stony Brook and the major requirements of each district.

The oldest part of Stony Brook, the "village", which was built up before the age of zoning, has a slightly greater building density than the developments. The old houses and churches are kept in excellent condition and the village has the air of a prosperous, 19th Century country town. This area is presently being surveyed for New York State's Inventory of Historic Resources, and the State Board of Historic Preservation is considering it for designation as an historic district(58).

The only commercial property in Stony Brook is situated in small parcels along Route 25A (zoned "J" Business 2 - General Business), and in the village shopping center (zoned "J" Business 3 - Commercial Center). The commercial establishments are mostly small shops, food stores, restaurants and professional offices. The State University of New York at Stony Brook occupies a large tract (about 4.4 km^2 or 1100 acres), just south of Route 25A. The single industrial parcel in the entire drainage basin, owned by the Gyrodyne Corp. of America, straddles the boundary between Brookhaven and Smithtown on the southern boundary of the drainage basin. It is zoned "L" Industrial 1 - Light Industry. The parcel is heavily wooded and the facilities there are used mostly for office space and auto repair shops by smaller companies that rent space from Gyrodyne. All the vacant land in

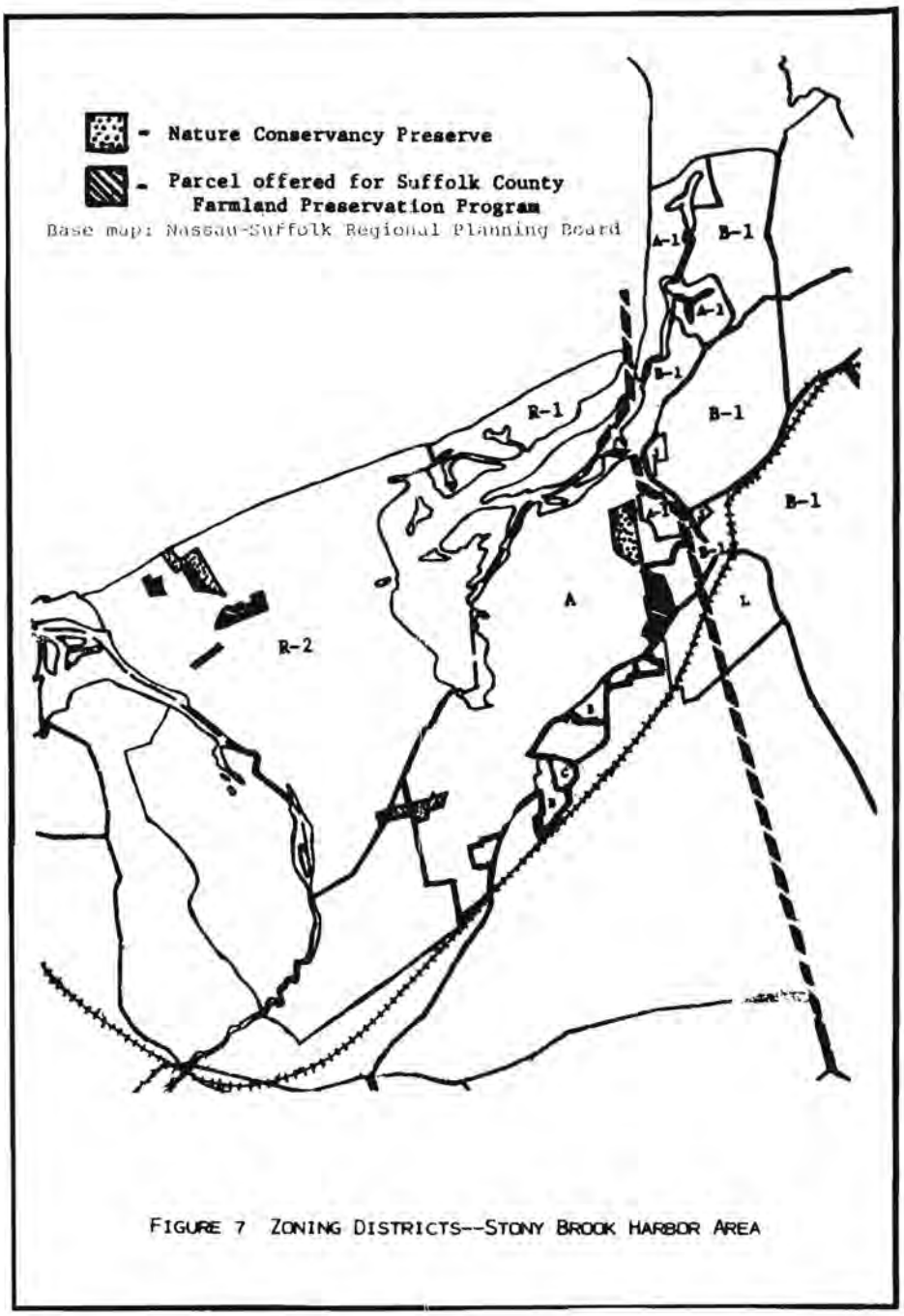


FIGURE 7 ZONING DISTRICTS--STONY BROOK HARBOR AREA

Table 1. Major Requirements of the Town of Brookhaven Zoning Districts Found in Stony Brook				
District	Permitted Uses*	Minimum Lot Area	Minimum Front Yard Depth	Maximum Building Height
"A" Residence 1	Single-family dwelling	40,000 sq ft (app. 1 acre)	50 ft	35 ft (2½ stories)
"B" Residence 1	Single-family dwelling	22,500 sq ft (app. ½ acre)	40 ft	35 ft
"B" Residence	Single-family dwelling	15,000 sq ft (app. 1/3 acre)	40 ft	35 ft
"J" Business 2	General business, e.g. wholesale and retail stores, banks, offices, restaurants	4,000 sq ft	15 ft	50 ft (3 stories)
"L" Industrial 1	Light industry: any lawful business or industrial use except those that may be "injurious, hazardous, noxious or offensive to the surrounding area"	20,000 sq ft	30 ft	50 ft

*Note: Zoning ordinances have a pyramidal structure. That is, the uses permitted in any district include all those uses permitted in the more restrictive districts above it on the pyramid.

Source: Code of the Town of Brookhaven, Chapter 85 - Zoning (updated 5/25/76).

Stony Brook is zoned residential(35).

Head-of-the-Harbor. The incorporated Village of Head-of-the-Harbor, located to the south of Stony Brook Harbor, is almost completely within the drainage basin, except for the extreme south-west corner (Figure 5). Like Stony Brook, Head-of-the-Harbor is a residential community. It is much less densely developed, however. Almost all of the Village is zoned for 2 acre residential use ("A" and "A-1"), including the entire harbor shoreline (which is "A") (Table 2, Figure 7). The Village zoning ordinance includes a special proviso for all lots fronting on Stony Brook Harbor: any structure (except a tennis court) must be built more than 100 ft from the mean high water line or 50 ft from the top edge of the bluff.

Little of the Village has been subdivided and there are a number of private estates, mostly along the harborfront. A small area near Route 25A is zoned for 1 acre ("B") residential use. A number of old houses in excellent condition are found throughout the Village. Many of the large homesteads built by the original European settlers of the area still stand, especially along Route 25A, which has been the main thoroughfare in the area for centuries. A 0.8 km^2 (200 acre) corridor along Route 25A, known as the Mills Pond Historic District, has been placed on the National Register of Historic Places (Newsday, 5/17/74).

The tiny commercial section of the Village lies along its southern boundary, at the intersection of Route 25A and Moriches Road. It is zoned "C" - Limited Business and ½ acre residential. No part of the Village is zoned industrial. According to a survey made in the late 1960's by the Nassau-Suffolk Regional Planning Board(35), there were 0.8 km^2 (200 acres) of farmland within the Village. The owner of a 0.18 km^2 (45.6 acre) farm in the eastern part of the Village (Figure 7) has offered to sell the development rights to the land (for $600,000) to Suffolk County, as part of the County's Farmlands Preservation Program (J.V.N. Klein, personal communication). The survey mentioned above(35) found 3.3 km^2 (830 acres), or 44 percent, of the Village's area vacant[9], all of which is zoned residential(40).

There are two nature preserves in the Village. East Farm Preserve, in the northeastern part of the Village (Figure 7), is a 0.22 km^2 (54 acre) tract of farm fields, meadows and woodlands, donated to the Nature Conservancy in 1970. In the southwestern section of the Village is the Butler-Huntington Woods Preserve, 0.26 km^2 (66 acres) of wooded glacial hills and ravines. This preserve extends partly into the Village of Nissequogue and partly outside of either Village.

Nissequogue. The incorporated Village of Nissequogue lies between Stony Brook Harbor to the east, the Nissequogue River to the west and Long Island Sound to the north. Only the eastern half of the Village is within the Stony Brook Harbor drainage basin (Figure 5). Like Head-of-the-Harbor, it is a low density residential community, except that it is zoned entirely for residential use. All of the Village within the drainage basin is in the "R-2" zoning district (2 acre minimum lot size) with the exception of the Long Beach peninsula, which is in the "R-1" district (1 acre minimum lot size) (Table 3, Figure 7).

The heavily treed, often steep hills of the eastern Village are, like the western Village, dotted with private estates and houses on large lots. The Nassau-Suffolk Regional Planning Board land use survey(35) found 67 percent of the Village to be vacant land in 1968.

The owners of all of the 0.23 km^2 (58 acres) of farmland within the Village (Figure 7) have offered to sell their development rights to Suffolk County (J.V.N. Klein, personal communication). There is a 0.32 km^2 (80.4 acres) wildlife sanctuary, the David Weld Sanctuary, in the northern part of the Village. It is a

Table 2. Major Requirements of the Zoning Districts of the Village of Head-of-the-Harbor

District	Permitted Uses*	Minimum Lot Area	Minimum Front Yard Depth	Maximum Building Height
"A" Residence	One-family dwelling**	2 acres	100 ft	34 ft
"A-1" Residence	One-family dwelling	2 acres	75 ft	34 ft
"B" Residence	One-family dwelling	1 acre	100 ft	34 ft
"C" Residence & Limited Business	Individual local retail stores, personal service shops, lodging houses, restaurants, banks, and social and business associations and offices	7500 sq ft (.5 acres for residential use)	45 ft (75 ft for residential use)	34 ft

*See Table 1 - Note

**Also permitted are Village Hall, Court, Police Station and other Village use: and Village park, wildlife preserve and natural park reservation.

Source: Board of Trustees of the Village of Head-of-the-Harbor, "Local law no. 1 of the year 1974", 1974.

Table 3. Major Requirements of the Zoning Districts of the Village of Nissequogue

District	Permitted Uses*	Minimum Lot Area	Minimum Front Yard Depth	Maximum Building Height
"R-2" Residence	One-family dwelling**	2 acres	100 ft	35 ft (2½ stories)
"R-1" Residence	One-family dwelling	1 acre	50 ft	35 ft (2½ stories)

*See Table 1 - Note

**Also permitted are Village Hall, Police Station, Fire Station or other Village use; and Village park, playground, wildlife preserve and natural park reservation.

Source: 1968 Zoning Ordinance of the Village of Nissequogue, adopted March 5, 1969.

woodland tract donated to the Nature Conservancy in 1969. A second Nature Conservancy sanctuary, the 0.06 km^2 (15 acres) Delafield Woods, is located in the western part of the Village, near the Nissequogue River. A 0.10 km^2 (25 acres) preserve, owned by the Village of Nissequogue, lies at the eastern tip of Long Beach (see Town of Smithtown, p. 22).

Population and Income

The area within the Stony Brook Harbor drainage basin falls within four different reporting localities of the U.S. Bureau of the Census: Stony Brook, Stony Brook South (which are census tracts), Head-of-the-Harbor and Nissequoque (sub-divisions of a census tract)(Figure 8). The population of the drainage basin can be estimated reasonably well by taking the census figures for Stony Brook and Head-of-the-Harbor, and half of that for Nissequogue. In 1970, this figure was 7,894: 6,391 in Stony Brook, 943 in Head-of-the-Harbor and 560 in half of Nissequoque(82). The average density was very low: 450 people per km^2 (2 people per acre).

The median family income in 1969 was $17,083 for Stony Brook and $17,153 for Nissequogue and Head-of-the-Harbor combined. Not surprisingly, these figures are quite high in comparison to the median family incomes for the two Townships: $13,845 for Smithtown and $11,143 for Brookhaven. The figure for Suffolk County was $12,084(39).

Shoreline Development

Town of Brookhaven

The entire length of West Meadow Beach, from the Village of Old Field boundary, south 2089 m (6850 ft) to Shipman's Point (at the Stony Brook Harbor inlet), is owned by the Town of Brookhaven, as far east as the right-of-way of Trustees Road. At the northerly end is a Town beach with parking and bath house facilities. South of the beach, app. 80 private houses and a private beach club (Brookhaven Bathing Association) occupy the shorefront property facing Smithtown Bay and the inlet. The owners of these buildings have leases with the Town of Brookhaven, and they each pay rent, taxes, garbage fees, etc. to the Town (C. Murphy, personal communication). At the southern end of West Meadow Beach, fronting on the inlet are one timber and six stone groins (Figure 9). The timber groin, of unknown age and ownership, is 30.5 m (100 ft) long. The stone groins, built in 1948 and owned by New York State Dept. of Public Works, are 45.8 to 61.0 m (150 to 200 ft) long. They are in poor condition and partially buried in sand (80).

Behind West Meadow Beach is the West Meadow Creek area. The western shore of the creek is mostly salt marsh, in its natural state except for some "mosquito ditches", dug to drain standing water from the marsh surface. All of the salt marsh on the western shore of the creek, and some on the eastern shore (in the "Aunt Amy's Creek" area), a total of 0.38 km^2 (95 acres), are owned by the Stony Brook Community Fund. Ward Melville, a prominent Stony Brook resident, purchased the marsh land from private owners over a period of 12 years.[10] In 1974, he donated it to the Community Fund, to be kept in its natural state as a wildlife preserve. It has been named the "West Meadow Wetlands Wildlife Preserve" (Figure 9). Located within the preserve, on the western shore of the creek just above Aunt Amy's Creek, is a small building housing a nature study center operated by Dr. Erwin Ernst of the Three Village School District (northwestern Brookhaven). The school district rents a 10 acre section of the preserve from the Community Fund, at a nominal fee, for use as an outdoor classroom.

The community Fund is presently negotiating with the Nature Conservancy, a private, tax-exempt conservation organization, to have them act as "watch dog", insuring that the preserve is never allowed to be developed (C. Murphy, personal

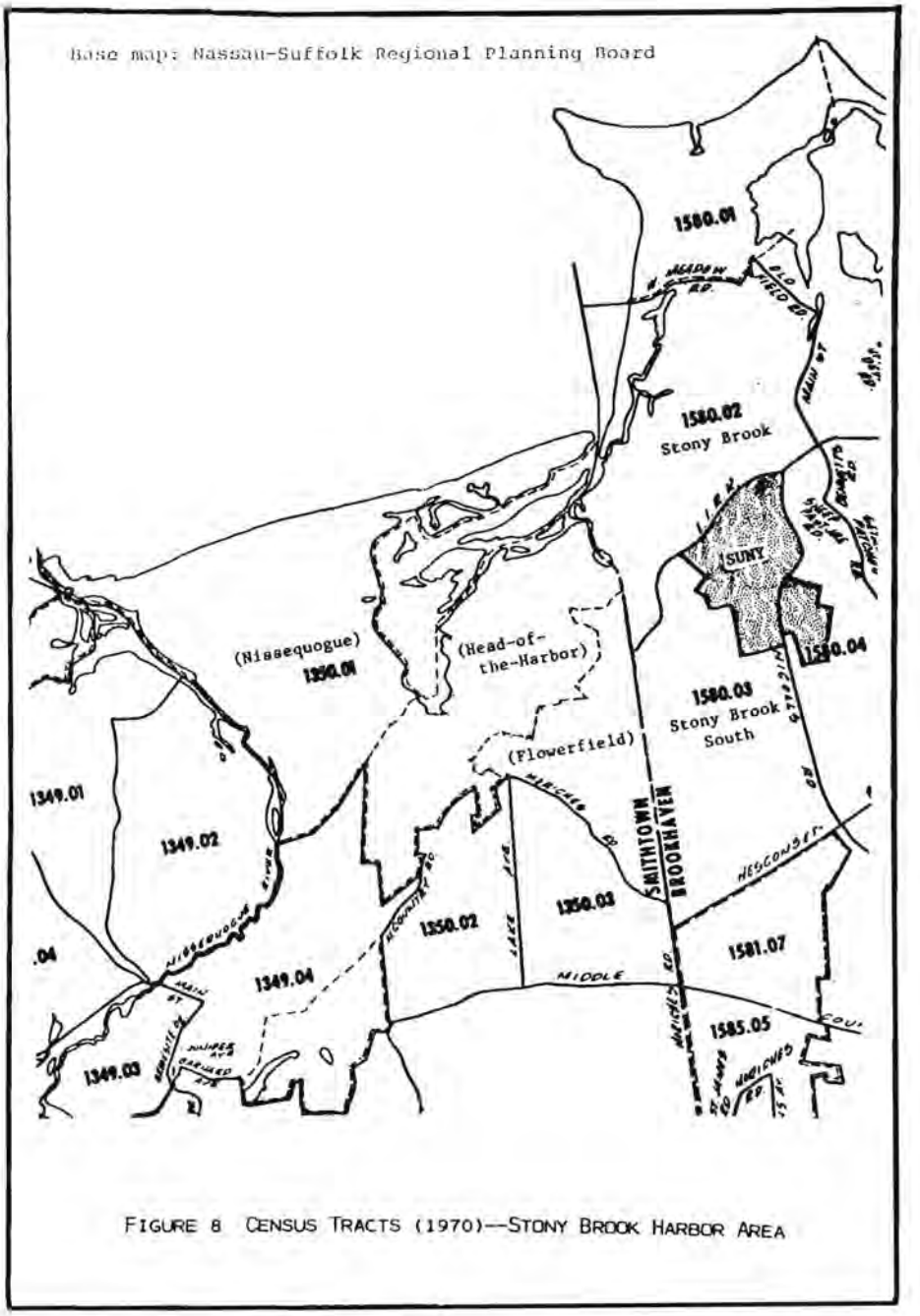


FIGURE 8 CENSUS TRACTS (1970)—STONY BROOK HARBOR AREA

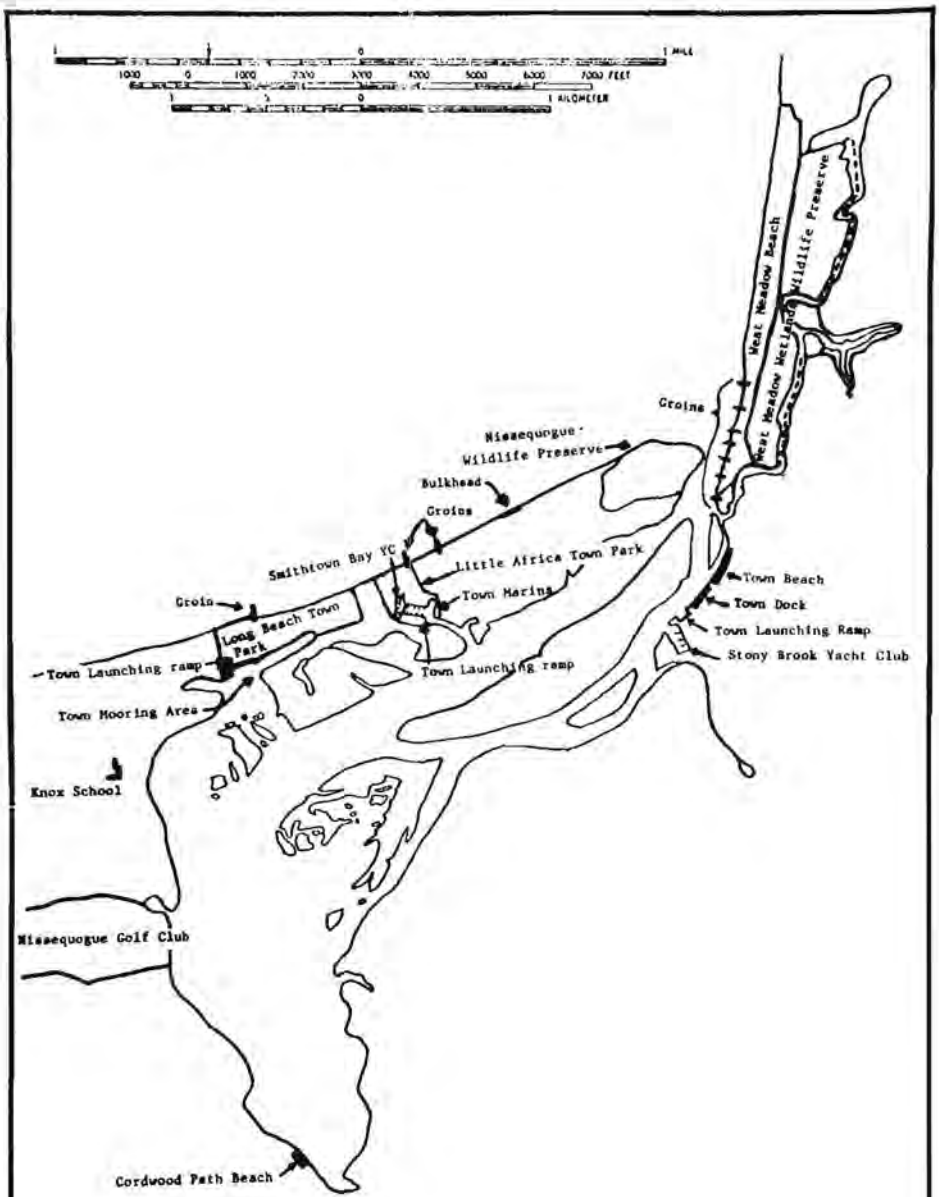


FIGURE 9 SHORELINE DEVELOPMENT--STONY BROOK HARBOR

communication).

The northern and eastern shores of West Meadow Creek are in private ownership. The northern shore is the site of the North Shore Horse Show Grounds, Play Groups School (a private day school owned by the Stony Brook Community Fund) and the private Old Field Club. Along the eastern shore are private houses and small, private beaches, and Wells' shipyard providing storage and repair services for small boats.

At the mouth of West Meadow Creek, where it empties into Stony Brook Harbor, begins the Stony Brook village waterfront. A small beach, owned by the Town of Brookhaven, occupies the shoreline below the sand bluff (Figure 9). Farther to the south, where the shoreline swings to the west, are the Town owned dock, parking lot and boat launching ramp. Adjacent to these facilities is the Stony Brook Yacht Club, a private establishment with berths for 85 boats. On the filled area to the southwest of the Yacht Club, where Stony Brook Creek enters the harbor, is a privately owned boat repair and marine supply business.

Town of Smithtown

The remainder of the harbor shoreline is in the Villages of Head-of-the-Harbor and Nissequogue, which are within the Town of Smithtown. From the Stony Brook Creek westward, the shoreline in Head-of-the-Harbor is all privately owned, with one exception: the small Town of Smithtown beach at the base of Cordwood Path (Cordwood Path Beach), near the Nissequogue Village boundary. Most of the shoreline within Head-of-the-Harbor is divided into private estates (ranging in size from 23 to 50 acres each) and houses on large lots (3 to 5 acres).

The western shoreline, in the Village of Nissequogue, is completely in private ownership. Here, as in Head-of-the-Harbor, large estates (between 20 and 30 acres each) line much of the shoreline. Some of the shoreline has been divided into smaller lots, of from 2 to 7 acres in size. Halfway up the shoreline is the 0.4 km^2 (102 acre) private Nissequogue Golf Club (formerly an estate). In the northwest corner of the harbor, still in the Village of Nissequogue, is the 0.2 km^2 (60 acre) campus of the Knox School, a girl's preparatory school, which was formerly a private estate. There are only about 35 houses on the 9 km (5.6 mi) of shoreline just described.

Much of the southern shore of the Long Beach peninsula has been developed as a Town of Smithtown recreation center. In the western corner, is a Town owned mooring basin with a launching ramp and space for about 130 boats. To the east, is a marina shared by the private Smithtown Bay Yacht Club (with space for 105 boats) and the Town of Smithtown "Little Africa" marina (with 110 berths). At the marina there is also a Town launching ramp (Figure 9). Directly north of the marina is the Town owned Little Africa park, which extends the width of Long Beach, to Smithtown Bay. A 0.1 km^2 (20 acre) tract on the eastern tip of Long Beach, owned by the Village of Nissequogue, is the site of the Nissequogue Wildlife Preserve.[11] Access to the preserve is limited because it is a fragile environment and the site of an important heron rookery (see Section Shorebirds).

Along the northern shore of Long Beach, fronting on Smithtown Bay, are two Town of Smithtown beaches: at Long Beach Town Park (697 m or 2284 ft long) and at Little Africa Town Park (185 m or 605 ft long). There are about 26 private houses on Long Beach between Little Africa Town Park and the Nissequogue Wildlife Preserve. Only a few of the houses are on the harbor or bay shoreline. There are three stone groins and one timber bulkhead along the Smithtown Bay shoreline. One groin (50 m or 163 ft long) is in Long Beach Town Park, one (23 m or 75 ft long) at the eastern end of Little Africa Town Park and the third (28 m or 90 ft long) a few hundred meters further east in a Town

right-of-way. All three were built in 1947-48 and are owned by the New York State Dept. of Public Works. The 7.6 m (25 ft) timber bulkhead, of unknown age and in poor condition, is several hundred meters east of Little Africa Town Park(80).

Shoreline Stability

The shoreline along Long Beach and West Meadow Beach, fronting on Smithtown Bay, and the low-lying shore areas around Stony Brook Harbor are subject to erosion by wave action and/or tidal inundation during tropical storms, hurricanes (moderate and intense tropical cyclones, respectively) and extratropical storms (called northeasters). Severe storms can cause the loss of beach and bluff areas due to erosion, and the inundation or damage or structures as a result of the tidal flooding accompanying such storms.

Based on observed frequencies of tropical cyclones over the 85-year period 1886 to 1970, the probability that either a tropical storm or a hurricane will occur in the Long Island area in any one year is 11 percent. The recurrence interval of northeasters which cause significant water damage (based on the period 1921 to 1962) is about 1.2 years. Based on a record of storms for the period 1800 to 1962, the Long Island area experiences a storm which causes moderate damage about once every two years; unusually severe storms occur approximately three times every Century (15).

Hurricanes and northeasters play an important role in the modification of the shoreline. Both produce a storm surge, a departure of tide level from normal (i.e. the difference between the observed sea level and that which would have occurred in the absence of the storm). A storm surge essentially creates, for a few hours, a new shoreline of submergence in areas not normally exposed to direct wave and tidal action, resulting in dune and bluff erosion and beach recession.[12]

The U.S. Federal Insurance Administration, as part of the National Flood Insurance Program, is identifying those areas of Long Island subject to tidal flooding. Areas of designated flood hazards are classified into zones based on the degree of flood hazard: Zone A - area of special flood hazards for which base flood elevations have not yet been determined; Zones A1 through A30 - area of special flood hazards with base flood elevations designated (base flood elevation in the Stony Brook area is 3.4 m [11 ft] above MSL for a tide with a 100-year frequency in Long Island Sound); Zone B - area of moderate flood hazard; and Zone C - area of minimal flood hazard.

The West Meadow Creek area and the Stony Brook village waterfront are designated Zone A5 (Figure 10). A thin strip further inland of Zone A5 along West Meadow Creek is designated Zone B, and the rest of the adjacent land is in Zone C. In the Villages of Nissequogue and Head-of-the-Harbor, the shoreline and islands of Stony Brook Harbor are designated Zone A. Most of the Long Beach peninsula is in Zone A. (From U.S. Flood Insurance Administration, Flood Hazard Boundary and Flood Insurance Rate Maps, 1976 edition.)

Shoreline Changes - Smithtown Bay

The shoreline along Long Beach and West Meadow Beach has, on the average, advanced slightly seaward over the past century (an average accretion rate of approximately 0.12 m per year [0.4 ft per year] for the northern section of West Meadow Beach and the eastern section of Long Beach, and a rate of app. 0.12 to 0 m per year [0.4 to 0 ft per year] for the western end of Long Beach)(15). These figures represent the net result of erosion and accretion. Examination of U.S. Coast and Geodetic Survey maps and charts of surveys made in the 19th and 20th Centuries(80) reveals the episodes of erosion and accretion which marked the history of this shoreline.

The earliest hydrographic survey of

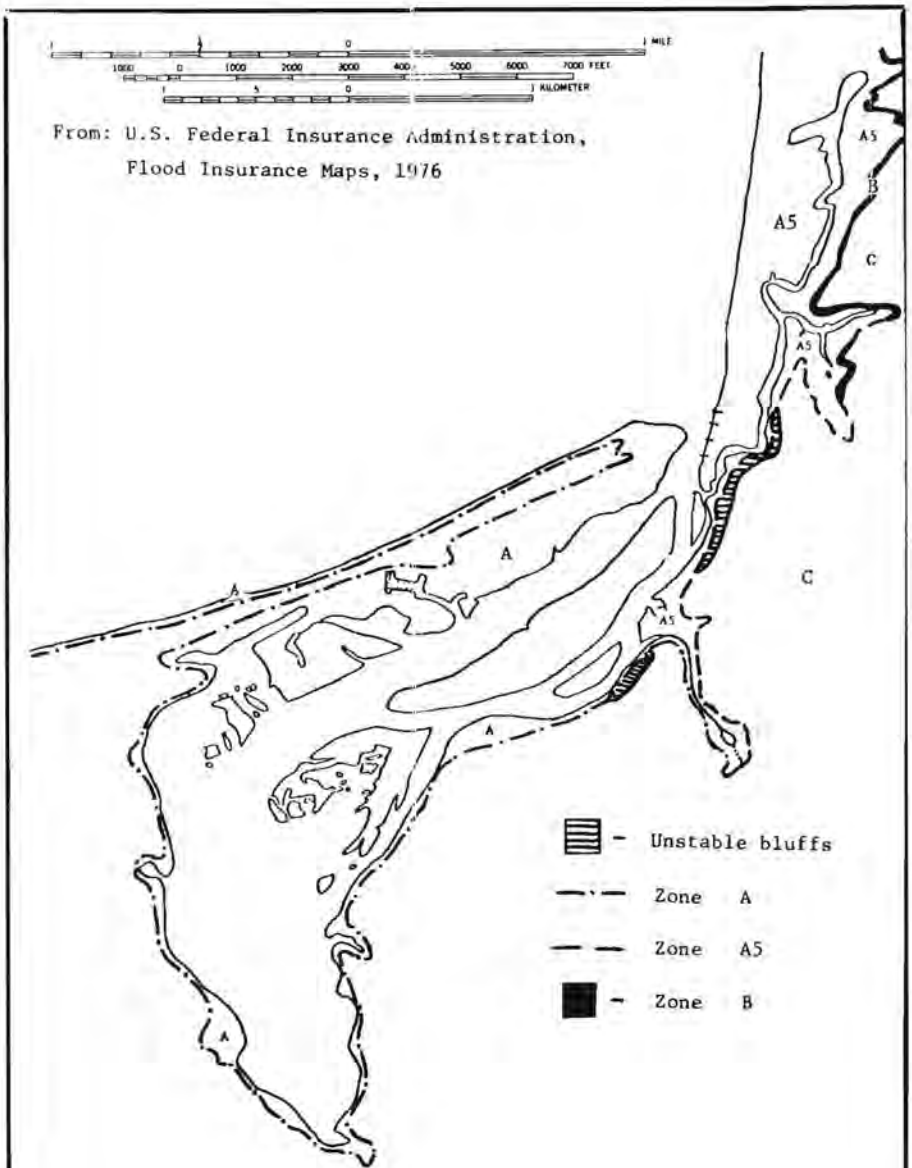


FIGURE 10 FLOOD HAZARD AREAS-- STONY BROOK HARBOR

the Stony Brook Harbor area was performed in 1837 Between then and 1885-1886, when the next survey was made, the Long Beach shoreline generally advanced to the north, or seaward, from 18 to 37 m (60 to 120 ft), except at the east end, adjacent to the harbor inlet, where there was a recession of up to 28 m (90 ft). The eastern end of Long Beach receded 67 m (220 ft) to the west. The West Meadow Beach shoreline experienced an advance of between 21 and 143 m (70 and 470 ft), the largest advance occurring where Crane Neck joins West Meadow Beach (Figure 11).

During the period 1885-1886 to 1965, the major shoreline change was the migration of the eastern end of Long Beach 244 m (800 ft) eastward. Along two short segments, there were recessions of up to 18 m (60 ft). Along West Meadow Beach, the southerly 763 m (2500 ft) of shore (the section adjacent to the harbor entrance) experienced recessions of up to 37 m (120 ft), while the 1220 m (4000 ft) of shore to the north advanced up to 31 m (100 ft).[13]

Over the entire period of record, the Long Beach shoreline experienced an overall recession of app. 31 m (100 ft), while the eastern end, adjacent to the harbor inlet, advanced seaward 183 m (600 ft) and migrated eastward 168 m (550 ft). Along segments of the southerly 732 m (2400 ft) of shore at West Meadow Beach, there were recessions of up to 24 m (80 ft). (Dredge spoil was placed between and on top of the groins here in the 1960's, in an attempt to nourish the beach[15].) North of this section, along the entire 3355 m (11,000 ft) of shore up to Crane Neck, there was an advance of between 24 and 104 m (80 and 341 ft), but generally over 61 m (200 ft). During the period of record, the shoreline adjacent to the Nissequogue bluffs, west of Long Beach, advanced app. 31 to 46 m (100 to 150 ft), while the tip of Crane Neck Point receded 61 m (200 ft), and the south side of the Point 82 m (270 ft).

The bluffs at both Nissequogue and Crane Neck Point receded during this period. Only recent recession rates for Crane Neck Point have been calculated, however. Over the past 40 years, these bluffs have been receding 0.5 m (1.6 ft) per year(15).

Shoreline Changes - Stony Brook Harbor and West Meadow Creek

The shorelines of Stony Brook Harbor and West Meadow Creek experienced little change due to natural causes since the survey of 1837. The major changes were the result of human activities, principally dredging and filling. Appendix C presents a detailed description of shoreline alteration by dredging and filling.

Water Quality

Bacteriological

The surface waters of Stony Brook Harbor and West Meadow Creek were classified by the New York State Water Resources Commission as "SA", which means that shellfishing is considered their "best usage." Along with SA classification, a body of water is assigned standards which must be met if shellfish taken from there are to be used for marketing purposes (Appendix A). Stony Brook Harbor and West Meadow Creek have consistently met these standards and are at present 100 percent "open" (certified for shellfishing, as well as for bathing, fishing and any other uses). Only one other harbor on the north shore of Long Island, Mt. Sinai Harbor, shares this distinction.

Under the New York State Environmental Conservation Law Section 17-0301, the NYDEC has the responsibility of enforcing and revising surface water quality standards. The DEC Bureau of Shellfish and Algae, through its Shellfish Sanitation Program, has established 19 stations in the harbor and creek (Figure 12) at which they periodically take surface water samples to be analyzed for the presence of coliform bacteria[14] and for salinity (sometimes), and at which they measure water temperature. The shoreline and drainage basin around the

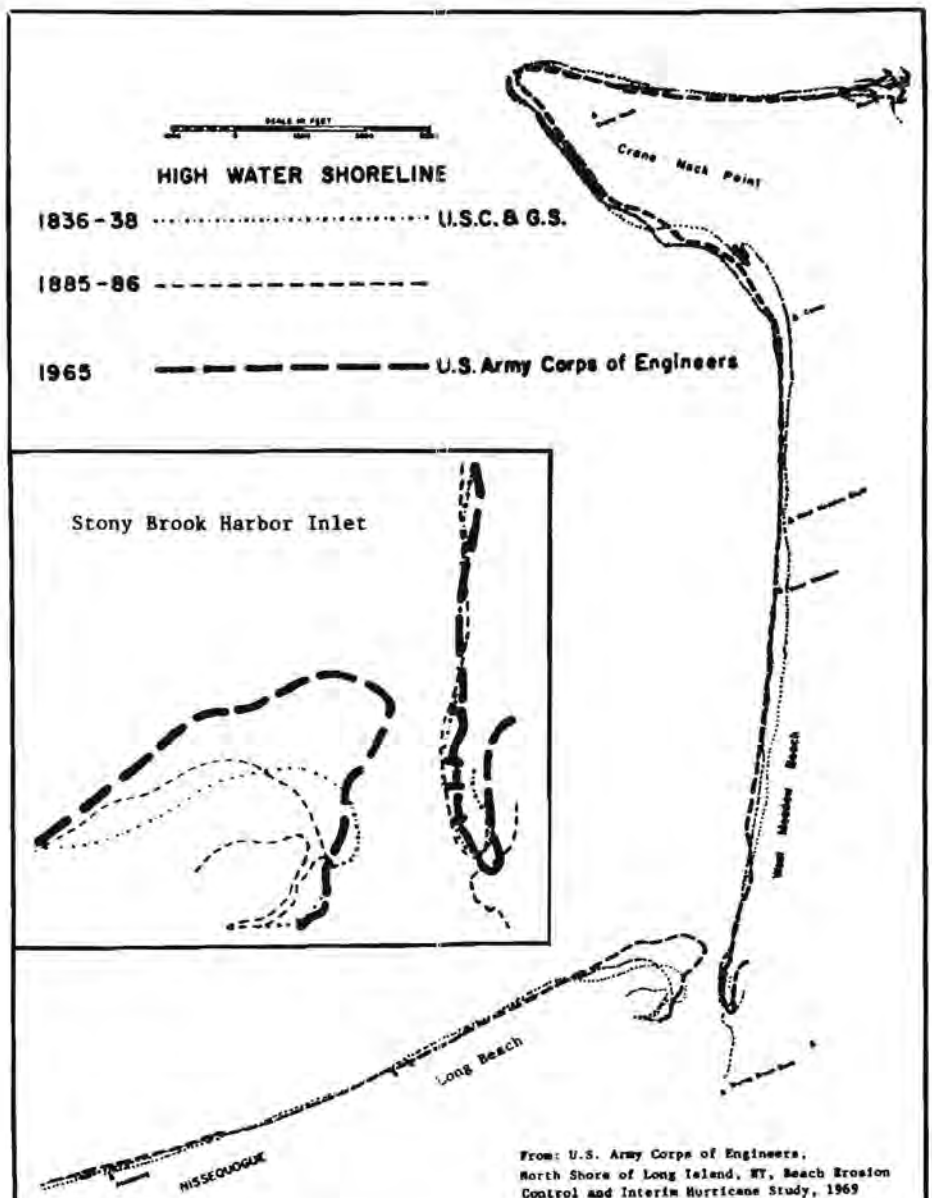


FIGURE 11 SHORELINE CHANGES--SMITHTOWN BAY

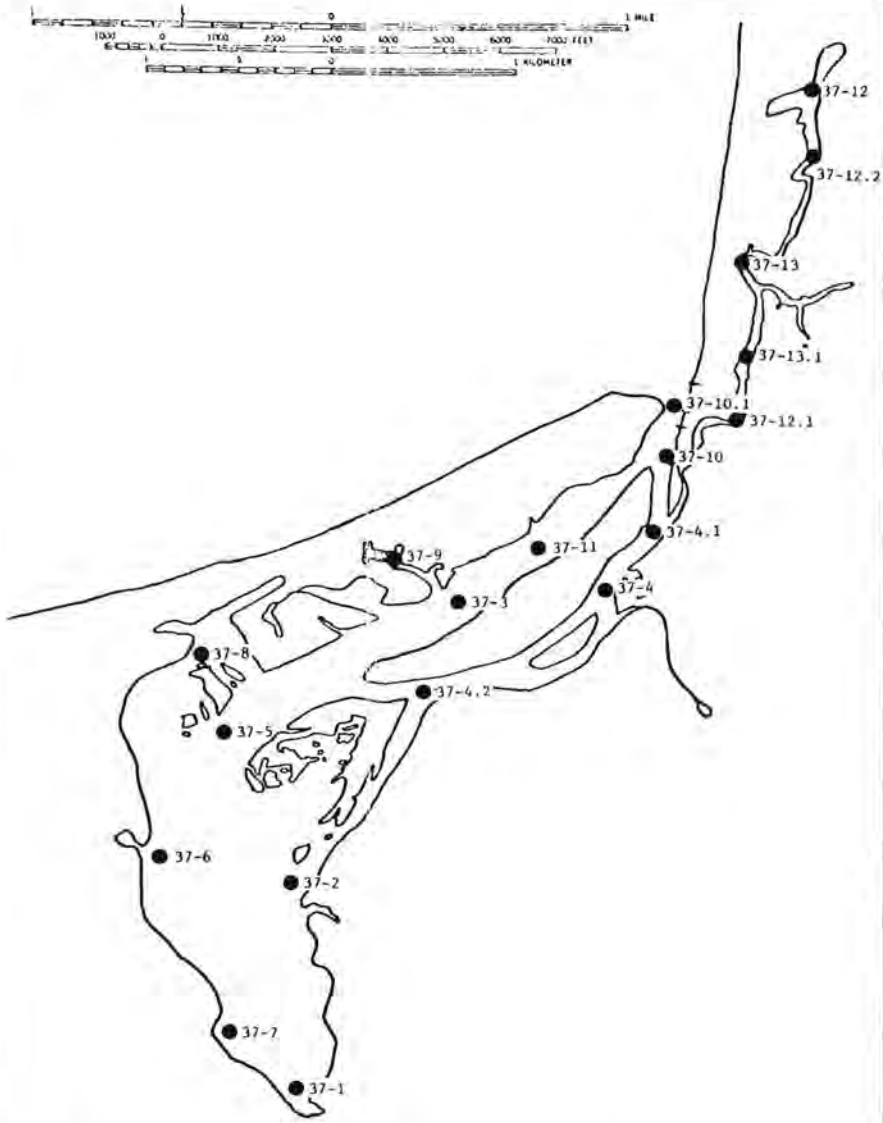


FIGURE 12 NYDEC SHELLFISH SANITATION PROGRAM SAMPLING STATIONS IN STONY BROOK HARBOR

harbor are also inspected to locate any possible sources of pollution. Because there are no known major sources of pollution discharging into the harbor's waters, testing for dissolved oxygen, Biochemical Oxygen Demand, Radio-nuclides and pesticides is not performed.

Although the waters of Stony Brook Harbor and West Meadow Creek have consistently met the SA standards, there are three locations which have recently shown increased coliform counts and which the State watches closely(47,48).

The first location is at the extreme head of the harbor (Station # 37-1, Figure 12) where a small watercourse enters the harbor. The low intensity of the tidal flushing action in this part of the harbor, combined with the surface runoff[15] entering the harbor through the watercourse, probably account for the elevated coliform counts (slightly above the standard, but not sufficiently high to merit closing of the area)(47).

The second location is in West Meadow Creek (Station #37-13, Figure 12). West Meadow Beach has a high density of houses, many of which are built close to the western shore of the creek. The houses use sub-surface sewage disposal systems (cesspools and septic tanks) from which wastes may enter the surrounding soil and from there be carried by groundwater discharging into the creek(48).

The third location is at the northern end of West Meadow Creek (Station #37-12, Figure 12). No speculation was made by the NYDEC as to the possible source of the elevated coliform counts. (Not enough samples were taken to determine if the standard was exceeded[47].) The only structures in the area are the North Shore Horse Show Grounds (used only a few times a year), the Old Field Club and a day school. As at the head of the harbor, the combination of surface runoff and low intensity tidal flushing action may cause the elevated coliform counts.

The amount of waste discharged from marine sanitation devices aboard boats berthed in or using the harbor or creek is not known, but the majority of them are too small to be equipped with on-board waste disposal facilities (see Boating, p. 51). This should be considered as a possible source of bacteriological contamination, however, especially during the summer boating season.

Physical and Chemical

The NYDEC, as part of its Shellfish Sanitation Program, regularly measures the salinity and temperature of the surface waters of Stony Brook Harbor and West Meadow Creek. The average salinity is 26 ppt with a variation of ±2 for most of the harbor and creek. The exception is the head of the harbor, where the influx of fresh water, especially through springs, reduces the salinity to as low as 15 ppt at low tide. (There does not seem to be a comparable fresh water influx at the head of West Meadow Creek.) The water temperature ranges from 0 to 26° C over the course of a year. At any one time, the salinity and temperature usually vary from one part of the harbor and creek to another (with the exception of the head of the harbor) by no more than 1 ppt or 2° C, respectively.

The data gathered on nutrient concentrations and dissolved oxygen levels in Stony Brook Harbor are very few and far between. (Only one dissolved oxygen measurement could be located[86].) Stony Brook Harbor has probably been studied so seldom because it has no known environmental problems to interest researchers. Suffolk County Dept. of Environmental Control has recently (1974) begun a water quality monitoring program for all marine waters within the County(72). One station in Stony Brook Harbor (off of the Stony Brook Yacht Club dock) is sampled at least once every month for nutrient concentrations (Nitrite, Nitrate, Total Dissolved Phosphorus, Dissolved Ortho Phosphate), pH and temperature(73). The preliminary data indicate relatively low nutrient levels and high dissolved oxygen content (compared to

other north shore harbors). Plankton blooms, the result of an overabundance of nutrients(18), do not appear to be a problem in Stony Brook Harbor or West Meadow Creek.

The high level of water quality in the harbor and creek is probably due, in part, to the lack of pollution sources, such as industrial development or high density residential areas on the shoreline or in the drainage basin, or a sewage treatment plant discharging its effluent into the harbor or creek. The shallowness of the harbor and the large tidal range (see Tides and Tidal Currents, p. 32) keep the harbor waters well mixed vertically, making oxygen depletion unlikely. The large tidal exchange between the harbor and Smithtown Bay (see Circulation, p. 33) is important because it helps to dilute and disperse any dissolved substances that may find their way into the waters of the harbor or creek.

This exchange of water with Smithtown Bay inextricably ties the water quality of the harbor and the creek to that of Long Island Sound. There are no sewage treatment plants or industrial outfalls into the Sound in the vicinity of Stony Brook Harbor,[16] and the quality of the Sound water is comparable to that of the harbor(86).

Biota

Stony Brook Harbor and West Meadow Creek support a wide variety of plant and animal life. To date, no comprehensive biological survey is known to have been conducted in Stony Brook Harbor itself.[17] However, the biota are probably similar to those found in Flax Pond, a tidal marsh-pond 3.5 km (2 mi) to the northeast (Figure 2), and in Cold Spring Harbor, a north shore harbor app. 27 km (17 mi) west of Stony Brook Harbor. A 1967 invertebrate survey of Flax Pond enumerated 18 species from the tidal marsh and 112 from the immediately adjacent waters, representing 12 Phyla(20). Another survey of Flax Pond conducted in 1971 by Hall and Woodwell, Biology Department, Brookhaven National Laboratory, encountered 24 species of fish (cited in [55]). A survey of plant life conducted in the inner section of Cold Spring Harbor about 60 years ago, when it was still a relatively undisturbed ecosystem, recorded app. 40 species of marine algae and app. 50 species of beach and marsh plants(70).

Molluscan Shellfish

Molluscan shellfish, along with finfish and waterfowl, are conspicuous forms of animal life in the harbor area because they are harvested by the inhabitants, for sport and for food. Molluscan shellfish grow in the sheltered waters of the harbor and West Meadow Creek, as well as in the nearshore areas of Smithtown Bay. There are about 855 acres of shellfish producing bottom within the harbor(85). The molluscan shellfish population includes, roughly in decreasing order of abundance: blue mussel (*Mytilus edulis*), soft shell clam or "steamers" (*Mya arenaria*), hard shell clam or quahog (*Mercenaria mercenaria*) and oyster (*Crassostrea virginica*). Hard shell clams and oysters are generally found in the sheltered waters of the harbor and creek. Soft shell clams generally grow in West Meadow Creek, in the harbor just inside the inlet and on the flats off of West Meadow Beach in Smithtown Bay. The mussel banks are especially conspicuous because they can get quite large in area and are often exposed at low tide. Extensive mussel beds are located in the southern section of the inner harbor (in Commarge and Emmet's Channels), just south and east of the inlet (where West Meadow Creek enters the harbor) and just outside the inlet in Smithtown Bay (to the west of the channel). The last bed is exceptionally large, covering an area of app. 0.1 km^2 (25 to 30 acres).

Finfish

The finfish found in the harbor and creek fall into two major categories: migratory and permanent inhabitants. Most

of the recreational species are migratory, visiting the harbor waters during the warmer months in search of food. They include: striped bass (*Morone saxatilis*), sea bass (*Centropristis striata*), bluefish (*Pomatomus saltatrix*) and snapper blues (juvenile bluefish), fluke or summer flounder (*Paralichthys dentatus*), weakfish (*Cynoscion regalis*) and porgy or scup (*Stenotomus chrysops*). Of these, weakfish and scup are known to spawn in inshore waters such as the harbor.

The permanent inhabitants include two recreational species: tautog or blackfish (*Tautoga onitis*) and winter flounder (*Pseudopleuronectes americanus*) which use the harbor as a spawning ground(84). The small "bait fish" which many of the recreational species feed on, killifish (*Fundulus sp.*) and silversides (*Menidia menidia*), are also permanent inhabitants of the harbor and creek. In years when the "bait fish" are not available, sea bass and bluefish have been known to feed on the winter flounder, reducing its population considerably (E. Ernst, personal communication).

Waterfowl

Stony Brook Harbor, along with the rest of Long Island, is in a major path of the Atlantic Flyway(55), the route migratory waterfowl follow in their annual journeys between winter feeding grounds to the south and summer nesting grounds in the northern United States and Canada(78). Some waterfowl only stop briefly in the area, while others spend weeks, months or even the entire winter.

Large flocks of up to several hundred Greater Scaup (*Aythya marila nearctica*) and Lesser Scaup (*Aythya affinis*), and smaller groups of American Widgeon or Baldpate (*Mareca americana*), Red-Breasted Merganser (*Mergus serrator*), Bufflehead (*Glaucionetta albeola*), Mallard (*Anas platyrhynchos*), Black Duck (*Anas rubripes*) and Canada Goose (*Branta canadensis*) can be seen bobbing up and down on the waters of the harbor and creek in fall and winter. An informal survey conducted by a local resident in 1974, listed 21 species of waterfowl that frequent the area, 3 of which remain to breed.

The following is a list of the total wintering waterfowl counts for Stony Brook Harbor from 1965 to 1971, taken from the NYDEC "Water Fowl Survey" (cited in [78]):

1965	1966	1967	1968	1969	1971
335	47	112	348	485	510

Winter waterfowl population counts vary widely from year to year for all the bays and harbors on the north shore of Long Island. A number of factors are probably involved, including general weather patterns along the east coast of the United States, and local hunting pressures.

The waterfowl feed on the plants and animals, including small shellfish, such as the gem clam (*Gemma gemma*), which grow on the bottom. They can often be seen diving underwater, reappearing in another spot, or tipping up to probe the bottom in shallow water.

Shorebirds

Large populations of shorebirds frequent the Stony Brook Harbor area at various times of the year. The informal survey mentioned in the previous section lists 25 species. Eighteen of these species, mostly summer visitors, use the wetlands and shoreline to breed and to raise their young. This group includes herons and egrets, rails, sandpipers and terns. Some of the shorebirds, mostly gulls, are winter visitors, returning north in the Spring. And a few, mostly gulls and a few Great Blue Heron (*Ardea herodias*) and Clapper Rail (*Rallus longirostris*) remain year-round.

The acres of salt marsh, tidal creeks and mudflats, beaches, clean water and undeveloped shoreline of the Stony Brook Harbor area provide the necessities of life that attract the shorebirds. The creeks and mudflats of the wetlands support the fish, shellfish and crustaceans on

which the birds feed, while the marshes provide nesting sites and cover. Some shorebirds, although they feed in the wetlands, require an upland location, close to their feeding grounds, for nesting. One such upland nesting area is the heron rookery on the eastern tip of Long Beach, in the Nissequogue Wildlife Preserve. It is significant in that such a large community, over 100 nesting pairs(65), remains active in an area so close to human activities. In the past several years, over 100 pairs of Black-Crowned Night Heron (*Nycticorax nycticorax*), 6 pairs of Snowy Egret (*Leucophoyx thula*) and 2 pairs of Green Heron (*Butorides virescens*) have built their nests each year in a "sunken forest" of Scrub oak (*Quercus sp.*), Swamp maple (*Acer*) and Northern white cedar (*Thuja occidentalis*), nestled behind primary and secondary dunes which front on Smithtown Bay(65). Among the dunes and in the rookery itself grows the Prickly Pear (*Opuntia sp.*), Long Island's only native cactus. It is a fragile, specialized habitat that can easily be disturbed by the action of man.

Another breeding colony of shorebirds, Least Tern (*Sterna albifrons*), is located on Young's Island, just south of the harbor inlet. Although this "island" is not a natural feature of the harbor (it is a mound of material dredged from the harbor bottom), it is well-suited as a Tern nesting site. It is said, by local residents, to be one of the last Least Tern breeding colonies in the area.

Vegetation

The vegetation of coastal marine communities is dominated by species from two major plant groups - angiosperms and macroscopic algae. The environmental conditions dominant in a habitat (tidal range, salinity, light, wave action, substrate, etc.) are responsible for the composition and distribution patterns of a plant community (60). The three major plant habitats in Stony Brook Harbor and the environmental conditions dominant in each are: the sand beach (wave action and wind), the salt marsh (elevation/tidal range, salinity and drainage) and the tide pool, or sublittoral tidal waters (salinity and substrate).

The sandy beach habitat includes the sections of Long Beach and West Meadow Beach fronting on Smithtown Bay. It is a harsh environment, exposed to the wind and to wave action from Long Island Sound. The plants growing on these beaches must be able to withstand both shifting sands and salt spray. On the upper beach and windward side of the dunes is an herbaceous community usually dominated by dune grass (*Ammophila breviligulata*), a good sand stabilizer, and including such species as sea rocket (*Cakile edentula*), seaside goldenrod (*Solidago sempervirens*) and beach pea (*Lathyrus japonicus*). In the more protected areas behind the dunes is a shrub community including poison ivy (*Rhus radicans*), salt spray rose (*Rosa rugosa*), beach plum (*Prunus maritima*) and, on Long Beach, the prickly pear cactus (*Opuntia sp.*). Behind the shrubs is a woodland community consisting of scrub oak (*Quercus ilicifolia*), white cedar (*Chamaecyparis thyoides*) and red cedar (*Juniperus virginiana*), among others.

The above beach communities are more easily seen on Long Beach, where there has been less residential development and alteration of natural vegetation than on West Meadow Beach.

In the sheltered waters behind Long Beach and West Meadow Beach is the salt marsh habitat, which includes most of the West Meadow Creek area and the shoreline and islands of the harbor. The major environmental conditions affecting plant growth in a salt marsh are elevation/tidal range (how much tidal inundation an area receives), soil/water salinity and drainage. Two species of grass, salt marsh grass (*Spartina alterniflora*) and salt meadow grass (*Spartina patens*), dominate the salt marshes of the harbor and creek (see *Wetlands*, p. 8). In the intertidal areas of the marsh (below the mean high

water level), *S. alterniflora* grows in virtually pure stands. *S. patens*, in combination with other grasses, grows in the high marsh (which is subjected to periodic rather than twice daily flooding). Some other species of the high marsh are spike grass (*Distichlis spicata*), woody glasswort (*Salicornia virginica*) and sea lavender (*Limonium carolinianum*). At the upland edge of the salt marsh habitat grow the common reed (*Phragmites communis*) and shrubs such as the groundsel bush (*Baccharis halimifolia*).

The third major plant habitat in Stony Brook Harbor is the tide pool, including the parts of West Meadow Creek and the harbor which are subtidal (submerged at MLW). It is a more moderate habitat than the beach or the salt marsh. The dominant environmental conditions are the salinity of the water and the bottom type. The major plant groups occupying this habitat are the shallow submergent grasses and the benthic macro-algae. The grasses, eel grass (*Zostera marina*) and pondweed (*Ruppia maritima*), are anchored by rhizomes to substrates ranging from mud to a mixture of sand and gravel. The benthic algae are much more abundant than the grasses, often covering large areas of the harbor and creek bottom. They are generally attached by holdfasts, but can also rest on the bottom. The green, brown and red algal groups are represented in the harbor and creek. Two of the most abundant species are *Fucus sp.* (a brown alga) and sea lettuce (*Ulva lactuca*), a flat, green alga which often grows in thick layers where the bottom is muddy.

Hydrography

Tides and Tidal Currents

Tides in Long Island Sound are dominated by the semidiurnal lunar tide, with two high tides and two low tides every tidal day (24 hours, 50 minutes). Because the natural frequency of the Sound basin approximates the natural period of oscillation of the semidiurnal tide, tidal ranges in Long Island Sound tend to be large (from 0.76 m [2.5 ft] at the Race to 2.2 m [7.3 ft] just east of the mouth of Hempstead Harbor)(18). The mean tidal range in Smithtown Bay is app. 2.0 m (6.7 ft).[18]

The mean tidal range in Stony Brook Harbor is 1.9 m (6.1 ft), measured in the outer harbor in the vicinity of the Stony Brook Yacht Club.[19] The mean tidal range in the inner harbor, measured at the head of the harbor, has been reported as 1.8 m (5.8 ft).[20] A recent study by the Marine Sciences Research Center of the State University of New York at Stony Brook confirmed that the tidal range at the head of the harbor is about 95 percent of the tidal range at the Stony Brook Yacht Club (i.e. 1.8 m or 5.8 ft) (S. Robbins, personal communication). The MSRC study also found that there is a 15 minute delay between the time of high tide at the Yacht Club and at the head of the harbor. Low tide at the head of the harbor was found to occur nearly 1 hour, 15 minutes after low tide at the Yacht Club.

The difference in tidal range between Smithtown Bay and the outer harbor is the result of the inability of the harbor to drain completely at low tide. This is most likely due to the configuration of the harbor in the area of the inlet and the presence of shoals just outside the inlet. On the outgoing tide, much of the water from the inner harbor flows along Porpoise Channel, converging with the flows of the "main" channel and West Meadow Creek just inside the inlet. One can see the turbulence which develops when this great amount of water is funneled into the narrow inlet. This bottleneck produces a large head (pressure gradient) across the inlet which results in strong currents, with velocities of up to 1.5 m per second (3.4 miles per hour or 3 knots).[21] The currents produce a scouring action which keeps the inlet open and the channel through it quite deep, up to 4 m (13 ft) in places. The ebb flow

emerges from the inlet as a jet stream, scouring a shallow channel 0.9 to 1.2 m (3 to 4 ft) deep through the shoals outside the inlet in Smithtown Bay.

The inlet configuration of an embayment such as Stony Brook Harbor, i.e. the width of the inlet and the depth of the channel through it, tends to find an equilibrium state at which the current velocities are just high enough to produce a mild scouring action. If there were no constriction at the inlet, the water level would lower inside the harbor as fast as it lowers in Smithtown Bay, producing weak currents which would allow the accumulation of sand, thus reducing the size of the inlet. If there were too much constriction, the head across the inlet would be very large, producing high velocity currents which would scour out the inlet, enlarging it. Figure 11 shows the configuration of the Stony Brook inlet in 1837, 1886 and 1965, demonstrating its dynamic nature.

The difference in tidal range between the outer harbor and the head of the harbor is probably due to the shallowness of the harbor at low tide and the constricted nature of the channels through which the inner harbor drains. For example, there is a shoal area at the end of Porpoise Channel, where it meets the "main " channel, which restricts the flow of water. On the out-going tide, a virtual waterfall develops as the water flowing along Porpoise Channel crosses the shoal area and enters the deeper channel into the inlet. The large time delay in low tide between the two sections of the harbor indicates that frictional forces are preventing the inner harbor from draining fully.

Circulation

Pollution Susceptibility(93) is a one-dimensional, steady-state model of the hydrography of an embayment. The model utilizes tidal information to calculate the "flushing action" at different points within the embayment. Pollution Susceptibility (PS) contours indicate the approximate concentrations, in parts per billion, which would result from a unit discharge rate of one ton per day of a conservative pollutant. PS contours for Stony Brook Harbor are indicated in Figure 13. Flushing action at the head of the harbor is approximately one order of magnitude (10 times) less than that at the inlet (due to the smaller volumes of water which are moved by the tide at the head of the harbor).

The PS value at the Stony Brook Harbor inlet (app. 100) is a direct function of the tidal prism of the harbor (the volume of water flushing through the inlet during each tidal period), which is about 5.4×10^{-3} km^3 (1.4×10^9 gallons). Therefore, it is about half as large as the PS value at the mouth of Mt. Sinai Harbor (app. 200), which has half as large a tidal prism, and about twice as large as the PS value at the mouth of Port Jefferson Harbor (app. 50), which has twice as large a tidal prism.

The Pollution Susceptibility model can also be used to estimate the flushing time of a harbor, i.e. the effective time required to flush a dissolved substance from the harbor. The flushing time for Stony Brook Harbor is about 2 to 3 days. This suggests that the harbor is in very good communication with Long Island Sound.

Sediments

Stony Brook Harbor acts as a sediment trap in that particles either washed into the harbor from land drainage or carried there from Smithtown Bay by tidal currents are likely to remain within the harbor. Suspended matter carried in on the flood tide has time to settle out before the ebb tide can carry it back out of the harbor. Ebb currents are not strong enough, especially in the inner harbor, to scour out and resuspend all the particles deposited by the preceding flood and slack water(18).

According to Omholt(56), there are three potential sources for the sediment

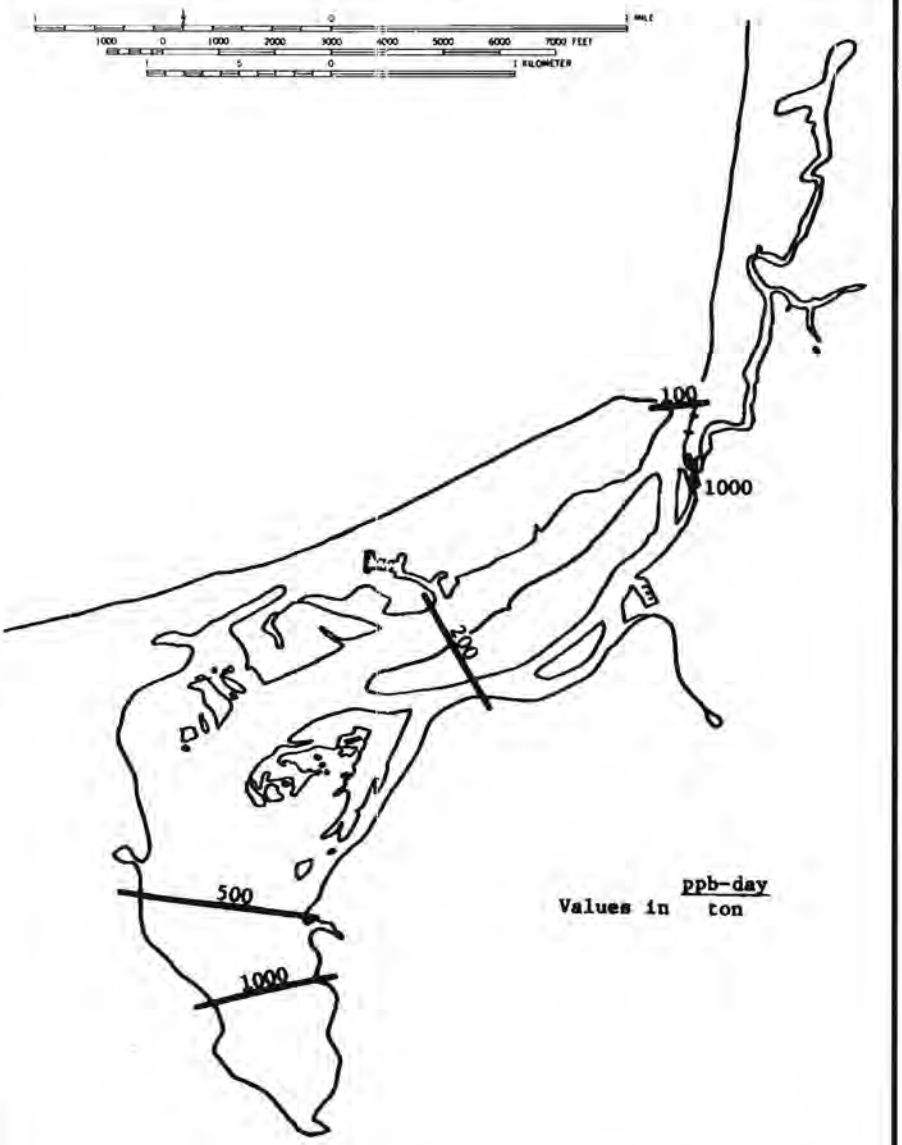


FIGURE 13 STEADY-STATE POLLUTION SUSCEPTIBILITY CONTOURS FOR STONY BROOK HARBOR

which finds its way into Stony Brook Harbor: the bluffs at Nissequogue and Crane Neck, and Young's Island (inside the harbor).

Erosion of the bluffs at Nissequogue and at Crane Neck supplies material (mostly sand) to the littoral drift, which moves eastward along Long Beach and southward along West Meadow Beach. Some of this material is picked up by the incoming (flood) tide and transported into the harbor. Finer material (silt and clay-sized), eroded from the bluffs and carried offshore to be deposited in large shoals, is also transported into the harbor on the flood tide.

Young's Island, just inside the harbor inlet, is an artificially created island of unstabilized dredge spoil. Evidence indicates that the elevation of Young's Island has greatly decreased since its creation. Most of the sediment along the island's shoreline below the water line is of gravel size, indicating the loss of the finer sized particles(56). Dredge spoil was also deposited on the wetlands along the southern shore of Long Beach. According to local residents, this material is eroding into the harbor like Young's Island. The relative importance of these sediment sources is not known(56).

A fourth source of sediment is the adjacent upland. The amount of sediment contributed to the harbor from this source is probably small, because most of the upland is well vegetated and soil erosion is kept at a minimum.

Omholt sampled 19 locations in Stony Brook Harbor using a mechanical grab sampler which penetrated 2 to 4 inches into the substrate (Figure 14). Standard sieving techniques were used to separate the size fractions of the sediments, which were then weighed to establish the weight percentage(56). Figure 14 shows the distribution of sediment size in the harbor (based on median grain diameter). It is a relatively simple distribution, with a general increase in grain size the closer the station is to the inlet. Tidal currents are probably the dominant force controlling sediment distribution within the harbor. Near the inlet and along Porpoise Channel, the sediments range from coarse sand to pebble (0.5 to 64 mm median grain diameter), the result of strong tidal currents carrying away the fine-grained materials. The inner harbor, where the currents are weakest, is covered by clay to medium sand sized particles (less than 0.0625 to 0.5 mm median grain diameter), probably deposited as the incoming tide slows down to the point where it can no longer keep the fine-grained particles in suspension.

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[1]Hydrographic and topographic data on the Stony Brook Harbor area are presented in: U.S. National Ocean Survey, small craft chart 12364 (formerly 117-SC), 1975, and U.S. Geological Survey, Saint James Quadrangle topographic map, 1967.

[2]Drift is the general term applied to all deposits that are laid down directly or indirectly as a result of glacial activity.

[3]Till is an unstratified deposit composed of rock material ranging in size from microscopic clay particles to boulders weighing several tons.

[4]The terminal moraine is a ridge of glacial deposits that marks the utmost limit of the glacier's southerly advance, where it reached the critical point of equilibrium - the point at which it wastes away at exactly the same rate as it is nourished. The ground moraine is composed of drift laid down as the main body of the glacier melted, forming gently rolling topography.

[5]Both of these areas were dredged to provide fill for the adjacent upland, so the depths vary from spot to spot.

[6]Wetland acreages obtained from preliminary maps prepared for New York State Dept. of Environmental Conservation (NYDEC) as

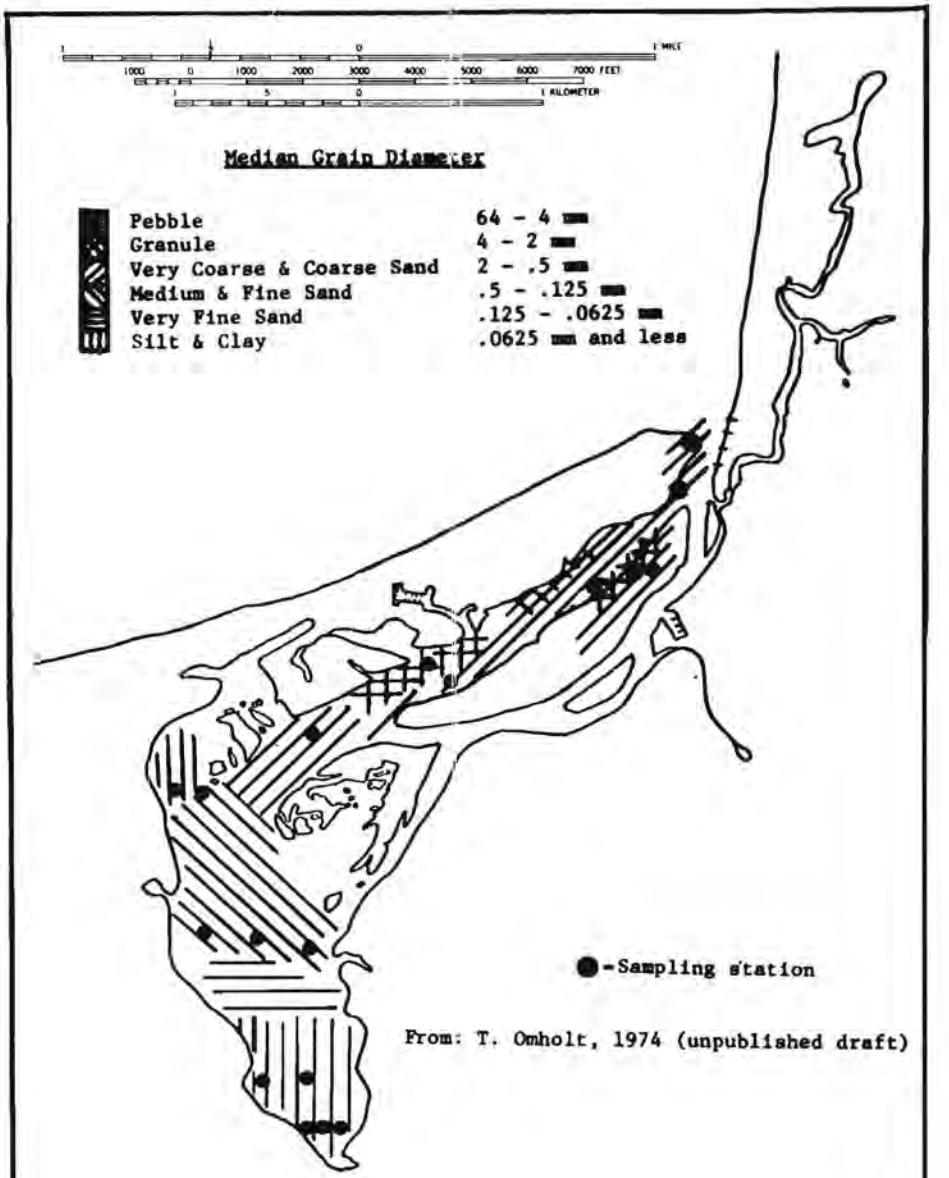


FIGURE 14 SEDIMENT SIZE DISTRIBUTION--STONY BROOK HARBOR

part of the tidal wetlands inventory, as required by the New York State Tidal Wetlands Act.

[7]The amount of groundwater underflow entering the harbor and creeks has been estimated as 9×10^6 m^3 per year (7×10^6 gallons per day), based on estimates of the groundwater recharge rate and on the size of the drainage basin(18) (see Circulation, p. 33).

[8]This action was taken to protect the marine wetlands around the Creek and to discourage development on the coastal flood plain, in accordance with the Brookhaven Master Plan (see *Brookhaven*, p. 78).

[9]Including tidal land, land not in use and land containing abandoned buildings.

[10]This action was prompted by a Town of Brookhaven plan, during the early 1960's, to build a marina about halfway up the creek (E. Ernst, personal communication).

[11]The Village purchased this land in the late 1960's from a sand and gravel company which had plans to mine it (F. Meyer, personal communication).

[12]The highest recorded tides in the Stony Brook Harbor area occurred during the hurricane of August 31, 1954; a storm surge height of 2.9 m, or 9.45 ft above Mean Sea Level was recorded at Port Jefferson Harbor(80).

[13]The shoreline segments which experienced erosion during the period 1885 to 1965 are those areas where protective structures (groins) were installed during the late 1940's. These structures were placed upstream (referring to direction of littoral drift) from the eroded areas. While helping to hold the beach on the upstream side(80), the groins probably contributed to erosion downstream.

[14]Coliform bacteria are "indicator organisms": their presence is used to indicate the contamination of a given sample of water by excreta from warm-blooded animals, and the possible contamination by pathogenic bacteria and viruses.

[15]Surface runoff carries with it such things as oil, salt, pesticides and organic matter containing coliform bacteria acquired principally from paved areas and lawns.

[16]The nearest significant sewage discharges into local waters are from the Port Jefferson Sewage Treatment Plant on Port Jefferson Harbor, app. 5 km (3 mi) to the east, and from the Kings Park State Hospital treatment plant on the Nissequogue River 7 km (4.5 mi) to the west.

[17]The Town of Smithtown is presently conducting an inventory of marine biota in Stony Brook Harbor. Originally the inventory was to cover only shellfish, recording population density and size and age distribution, and important plant species. It has been expanded to include all species encountered (S. Resler, personal communication).

[18]From: U.S. Army Corps of Engineers, New York District, "General map, St. James Harbor, N.Y.", April 1950.

[19]From: U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Ocean Survey, "Tide tables, high and low water predictions, 1974, east coast of North and South America."

[20]see footnote 18 above

[21]From: Office of H. Tuthill, Superintendent of Highways, Suffolk County, N.Y., "Chart showing current velocities and tide levels at Stony Brook Harbor", September 1940. This is the only measurement that could be found. The 1950 U.S. Coast Pilot (89) estimates the tidal current velocity at the narrowest part of the entrance channel to be 2.6 m per second (5.8 mi per hour or 5 knots). Estimates by boaters currently using the entrance channel fall into the 1.5 to 2.6 m per second range.

HISTORY OF THE STONY BROOK HARBOR AREA

To fully understand the present state of a natural resource such as Stony Brook

Harbor, including its physical condition as well as how it is utilized by man, or to be able to plan effectively for its future, the manager or planner must know something of the harbor's past. The activities of people who lived around and used the harbor in earlier times have helped determine what it looks like and how it is used today. The harbor itself has, in turn, had an effect on the lives of the people who have used it and has helped determine what the surrounding area looks like today. The following is an examination of this man-environment interaction through time.

Prior to Mid 17th Century

Indians lived on the shores of Stony Brook Harbor for many years,[1] taking advantage of many of the same assets which attract man to the area today. The physical layout of the harbor, the small, unobtrusive entrance and calm inner waters, provided protection from and quick access to Long Island Sound. From the harbor waters and bottom, the Indians harvested the abundant finfish and shellfish for food and fertilizer,[2] and for use in trade. Dried oysters and "wampum" beads made from mollusc shells were valuable as barter. The wealth of Stony Brook Harbor's shellfish resource at that time is evident from the heaps of shells left along its shores[3] (which the European settlers used to lime the acidic local soil)(76). The site of an especially large quantity of shells was the "Seatalcott" Indian village of Wopowog, now known as Stony Brook, said to be the largest village in the area(27).

The wetlands supplied "thatch", or cord grass, which the Indians used to weave mats and other household articles. They hunted the marsh birds and gathered their eggs for food(27).

The gently rolling land around the harbor was covered with forests alive with game and full or timber for canoe building, fuel and other domestic purposes. Fresh water streams fed by cool, clear groundwater flowed into the harbor. The soil was moderately productive when cultivated, and the Indians cleared small tracts on which they planted food crops such as corn(27).

The Indians disturbed the harbor and the land around it very little in all the years they lived there. Their numbers were never large, probably no more than a few hundred at any one time, and they took only what they needed, leaving enough for the next generation.

Mid 17th Century thru 18th Century

European Settlers

The first European settlers in the Stony Brook Harbor area were farmers from the British colonies in New England and other parts of Long Island. In 1655 they purchased land from the Seatalcott Indians in what is now Setauket(27). They built their houses and established commons on land already cleared by the Indians(1). A year or two later, some of these settlers moved west into the present Stony Brook area(27).

In 1663, Richard Smith, a resident of Setauket by way of Southampton, Long Island, and one of the original proprietors of Brookhaven, bought much of what is now the Town of Smithtown, including most of Stony Brook Harbor, from Lyon Gardiner. Gardiner had received the land in 1659 as a reward from Wyandance, the Indian grand sachem of eastern Long Island, for retrieving his daughter who had been held captive by another group of Indians in Connecticut. In 1664 and 1665, Smith obtained title to the land from the two local sachems, Nassekege, on the east of the Nissequogue River and Nesatesconsett, on the west(57).

Colonial Patents

The patent from Richard Nicolls, British Governor of America, to Richard Smith, in 1665, roughly outlined the bounds of Smithtown (then called "Nesaquauke Lands")[4] and granted to Smith,

his heirs and "assigns" forever, this tract, "together with all the lands, woods, meadows, Pastures, Marshes, Waters, Lakes, fishings, Huntting and fowling, and all other profits, comodityes and Emoluments to the said parcell or tract of Land and Premises belonging, with their and every of their appurtenances, and of every part and parcell thereof"(57). Smith, in turn, was obliged to settle 10 families on the land in three years, or, if the controversy over the boundary with Huntington on the west was decided in Smith's favor, 20 families in five years time.

In 1666, Governor Nicolls issued a patent for Brookhaven Town. Five residents were designated as "patentees" acting for the freeholders and inhabitants of the town and their heirs, successors and assigns. The bounds of the town were roughly outlined and the entire tract of land was granted to the patentees, together with "all havens, harbors, Creeks, Quarries, woodlands, Meadows, pastures, Marshes, Waters, Rivers, Lakes, fishing, hawking, hunting and fowling; And all other profits, Commodityes, emoluments and hereaditaments ... forever"(5). Brookhaven was given all the privileges belonging to a town, including the payment of "dutyes and acknowledgements" to the British Crown(5).

In 1677, British Governor of America Edmund Andross issued the "second patent" of Smithtown. He established it as a township where the tenure of the land and premises would be "according to the custom of the manor of East Greenwich, in the County of Kent in England in free and common soccage and by fealty only"[5](57). The bounds of the township were clarified and Richard Smith, his heirs and assigns were, as in the Nicolls patent, granted forever this tract of land, with the addition of "soyles" and "hawking"(57).

Brookhaven's second patent, issued in 1686 by Thomas Dongan, British Governor of New York, confirmed the Nicolls patent and established a representative form of town government similar to that of present day Brookhaven. A board of "Trustees of the freeholders and commonality of the Towne" was established as an elected body of officials, with such powers as to make "acts and orders in writing for the more orderly doing [of] the premises", to levy "sums of money", and "to plead and be impleaded, answer and be answered unto, defend and be defended"(5).

The Trustees were granted, in the name of the freeholders and commonality, ownership of the Town.[6] Property already "taken up and appropriated" by patent or by division was to be for the use of the "present freeholders and inhabitants [the proprietors] and their heirs and assigns forever." The property "not taken up or appropriated to any particular person or persons" was to be used by all the proprietors "as tennants in common." The Trustees were given full power to sell, rent or dispose of this property, the revenue going to the proprietors in proportion to their shares(5).

Development of Harbor Area

The early settlers of the Stony Brook Harbor area were subsistence farmers, and they at once set about clearing the land for fields and pastures. Their farms encircled the harbor, all the way from Crane's Neck and Old Field(1), through "West Meadow Neck"(8) into "Sherawoug - the midway place" (Stony Brook)(57) in Brookhaven, and from Stony Brook Neck (Head of the Harbor), through Rassapeage (on the west shore, also called "Nissequoque Neck"), around onto Long Beach in Smithtown(57).

The soil in this area is only moderately productive when cultivated, and demand for fertilizer was great. One of the first places the farmers turned to for fertilizer was the wetlands, from which they gathered "thatch" (*Spartina alterniflora*) and fish which they applied to the soil. The wetlands also supplied food for farm animals which grazed on the salt hay (*Spartina patens*) of the high marsh. This hay was usually harvested in late summer

to supply fodder for the winter months ahead(75).

The importance of these marsh grasses to the farmers can be seen in the written records of that time. Many of the wills recorded made special note of the "thatch beds" and the "meadows" (the high marsh, as opposed to upland meadow), as they were called. In 1685, the residents of Brookhaven layed out "all west meadow and creek thatch beds"(8) in order to divide them among the local proprietors. Later, in 1804, the Brookhaven Town Trustees voted to build a fence to stop cattle from grazing on the grass at West Meadow Beach, because local residents complained that the loose sand was blowing back onto the meadows behind the beach and smothering the marsh grass[7](6).

In Smithtown, all land was originally owned by the Richard Smith family. In 1735, Smith and all of his sons having died, the grandchildren and heirs ("the proprietors")[8] agreed to a final division of the land. However, it was not until 1757 that ownership of the Stony Brook Harbor wetlands was settled. A survey was conducted of the "meadow on the Long Beach" and the "thatch beds in Stony Brook Harbor", which were then divided up into about 70 parcels and distributed among the Smith heirs[9](57). Provision was made for the owners of any "rafted or drifted thatch" that landed on another man's shore or beach to have the liberty of retrieving their property(57). This would be possible if the thatch was harvested and stacked up on platforms above the high water level on the marsh, with some identifying marker attached to the stacks, a common practice with salt hay (called "rafting")(75).

Stony Brook Harbor and West Meadow Creek also supplied food to supplement what the farmers and their families grew. Shellfish (especially hard and soft shell clams, mussels and oysters) flourished on the harbor and creek bottoms, and finfish and eels were plentiful. Shore birds and ducks lived among the grasses and sheltered waters of the wetlands.

The farmers, in search of the most convenient means of communication with the rest of the colonies, especially New York City, again looked to the harbor. Only a few primitive roads connected the city to the 'wilds' of 'uncivilized' Long Island, and these did not stretch all the way to the settlements on the shores of Stony Brook Harbor. Those were the days of sailing ships, and the shoreline and waters of the harbor provided a fine anchorage. The needs of the farmers were simple. Incoming ships carried fertilizers for the soil (manure from the stables and ashes from the fireplaces of New York City), finished products such as furniture and tools, and passengers and mail. Outgoing ships were loaded with cordwood (cut in the process of clearing the land), some farm and fishing produce (as the farmers became more prosperous and could harvest a small surplus), and passengers and mail.

Landings were located all around Stony Brook Harbor and outside in Smithtown Bay (at West Meadow Beach and Long Beach)(5,57). Cordwood Path, at the head of the harbor, used to lead to one of these landings where its namesake was loaded onto outgoing ships. Most of the shipping activity, however, took place on the Brookhaven side of the harbor. For, in Smithtown, the Nissequogue River was the main port and the site of the earliest development.

A related activity which developed along the shores of Stony Brook Harbor and West Meadow Creek was the building of wooden sailing ships like those that serviced the harbor area. The necessary ingredients were all there: a ready supply of timber from cleared land, a work force consisting of farmers with some spare time in the off-season, and protected shoreline space where construction could take place. The first boat recorded as built at Stony Brook (in fact, the first built on Long Island) was a 20 ton sloop finished in 1694[10](27). Aside from this one instance,

proper records were not kept before 1835. It is known, however, that other small boats like this sloop were being built in Wells' shipyard on West Meadow Creek as far back as 1750(27).

Some of the ship traffic in Stony Brook Harbor at this time consisted of shallow-draft, centerboard schooners carrying 50 to 200 tons, visiting the mill on Stony Brook Creek(27). Adam Smith dammed the creek to form a mill pond and built a grist mill in 1699(27,57). Grain from farms in the harbor area, as well as along the north shore of the island, was ground here(27). Later, after the first dam broke in 1751(27), a saw mill was added to the grist mill by Edmund Smith, grandson of Adam[11](57). There was also a mill on the west side of the harbor in Smithtown, at what was called "Pig Creek" (mentioned in the minutes of a 1747 Town Meeting)(57). This was most likely a mill for private use, for the town's major mills (built around 1725) were at the head of the Nissequoque River(57).

By the end of the 18th Century, the pattern of development of the Stony Brook Harbor area was set. The eastern shore, in Brookhaven Town, was the site of most of the shoreline development. Stony Brook village was becoming a population center of sorts,[12] and the area around it was dotted with farms. The remainder of the harbor, in Smithtown Town, was less densely populated. The center of development of Smithtown was to the west, on the Nissequogue River, and only the large farms and fine residences of the Smith family lined the harbor shores.

Boundary Dispute

The location of the northern section of the boundary line between Brookhaven and Smithtown Towns was a cause of disagreement between the two towns for almost 300 years.[13] The first line was established by the inhabitants of "Seatalcott" in 1664 to protect their land from encroachment by their new neighbor to the west, Richard Smith. The northern part of this line ran "from a brooke called Stony Brook, overthwart the Island southward..."(5).

The Nicolls patents for Smithtown (1665) and Brookhaven (1666), and the Dongan patent for Brookhaven, referred to this line in defining the bounds of the two towns. The Andross patent for Smithtown (1677) was somewhat more specific, designating as the northeast boundary of the Town "a certain runne of water called Stony Brook, stretching north to the Sound"(57).

There was so much controversy over the entire boundary line that in 1725 the two towns decided to settle things peacefully by themselves before the situation led to a court case. Seven men were "indifferently chosen" as arbitrators, and a surveyor hired. A stake was placed at the "head of the middle branch of Stony Brook"(57). The northern part of this boundary line ran "Northerly down ye creeke into the harbor, and so into the Sound"(57). A year later, in 1726, the section of the line through Stony Brook Harbor was located more specifically: down the "channel that now is as the water runs into the Sound"(5).

New York State did not help the situation when, in 1788, it divided Suffolk County into townships through a General Act of Legislature. The eastern boundary of Smithtown was given only as "the Patent of Brookhaven"(57).

In 1842, the dispute broke out again, this time only over the section of the boundary line from the mill dam at Stony Brook to Long Island Sound. The two towns again tried to reach a settlement, but could not agree, and were forced to obtain an outside arbitrator. The resulting line began "in the middle of the main channel of the middle branch of the said Stony Brook, at the said mill dam", ran down the "middle of the said main channel ... into the harbor; and so along the channel or deeper part thereof unto Long Island Sound"(57).

First 3/4 of 19th Century

By the 19th Century, farming, still the most important occupation in the Stony Brook Harbor area, was developed to the point where it was no longer a subsistence operation. Farmers had more surplus produce to be sent to the markets in New York City, and more money with which to buy finished goods and non-essentials. Water routes were still more practical than overland routes, and eastern Stony Brook Harbor continued its development as a port.

During this period, the first substantial docks were built to handle the increased ship traffic. In 1809, George Hallock received permission from the Brookhaven Town Trustees to build a commercial dock adjoining his land on Stony Brook Harbor(6). The dock stood on the Stony Brook village waterfront in the area between the present day Sand Street and the Town slip(27). It was 100 feet long and extended 50 feet from the "common high water mark"(5). Hallock received permission to extend the dock 200 feet northward in 1813, and his son Charles was allowed to extend it again (probably southward) in 1835(6). It was known locally as the 'Upper Dock'[14] (Figure 15).

Jonas Smith, the Hallocks' major competitor, received permission in 1831 to build a dock at the entrance to West Meadow Creek, adjacent to his land, "to be in range with the line of Charles D. Hallock" (6). This was known as the 'Lower Dock' (Figure 15). In 1844, Smith was granted a sand flat on which to build a dock(6) (probably near the entrance to the Stony Brook Creek).

Shipments handled by these docks were much the same as those of the 17th and 18th Centuries. Outgoing ships carried mostly farm produce and cordwood.[15] Incoming ships were loaded with fertilizer (manure and ashes), finished products and luxury items available only from a large city. A statement of rates which the Brookhaven Town Board authorized George Hallock to charge at his dock provides a representative list of major items which passed through the port of Stony Brook in 1836. They are: ox, steer, heifer, cow, flaxseed, liquor, provisions, flour, rice, "earthen", stone, lumber, ashes and other manure, and cordwood(6).

Passengers and mail still traveled by ship. At one time during this period, two sailing "packets" regularly ran between New York City and Stony Brook(27).

In his history of Long Island, written in the late 1830's(76), Benjamin F. Thompson noted that Stony Brook had 1 brig, 8 schooners and 15 sloops transporting more than 4,000 cords of oak and walnut wood annually and returning about 20,000 bushels of ashes, 1,000 bushels of bones and 300 loads of other manures. Records kept of vessels tying up to and using the Stony Brook dock[16] between 1868 and 1873 listed 34 sloops of from 25 to greater than 50 tons, 52 schooners of from 35 to over 445 tons, one steamer and 6 canal boats carrying ashes (7180 to 7600 bushels per boat) and bone (3730 bushels)(27).

During the early and mid 19th Century, the shipbuilding industry had its heyday on the shores of Stony Brook Harbor. It was still carried on during the farming off-season, but there were more men available and they could afford to spend more time away from their farms. As early as 1824, Stony Brook village was credited with having "several" ship yards(70). In the 33 year period between 1835 and 1868, records[17] show a total of 79 wooden sailing ships built: 59 schooners, 17 sloops, 1 brig and 2 unidentified. Proper records were not kept before 1835(27), so the total number of ships built at Stony Brook Harbor can only be estimated.

David T. Bayles, one of the major shipbuilders of Stony Brook (along with Jonas Smith and Company, and Charles Hallock), built the largest ship recorded, an 800 ton, three masted schooner.[18] Bayles also built the last commercial ship in Stony Brook, a 150 ton sloop, the "B.F.

From: U.S. Coast and Geodetic Survey, Topographic Survey T-31, 1837

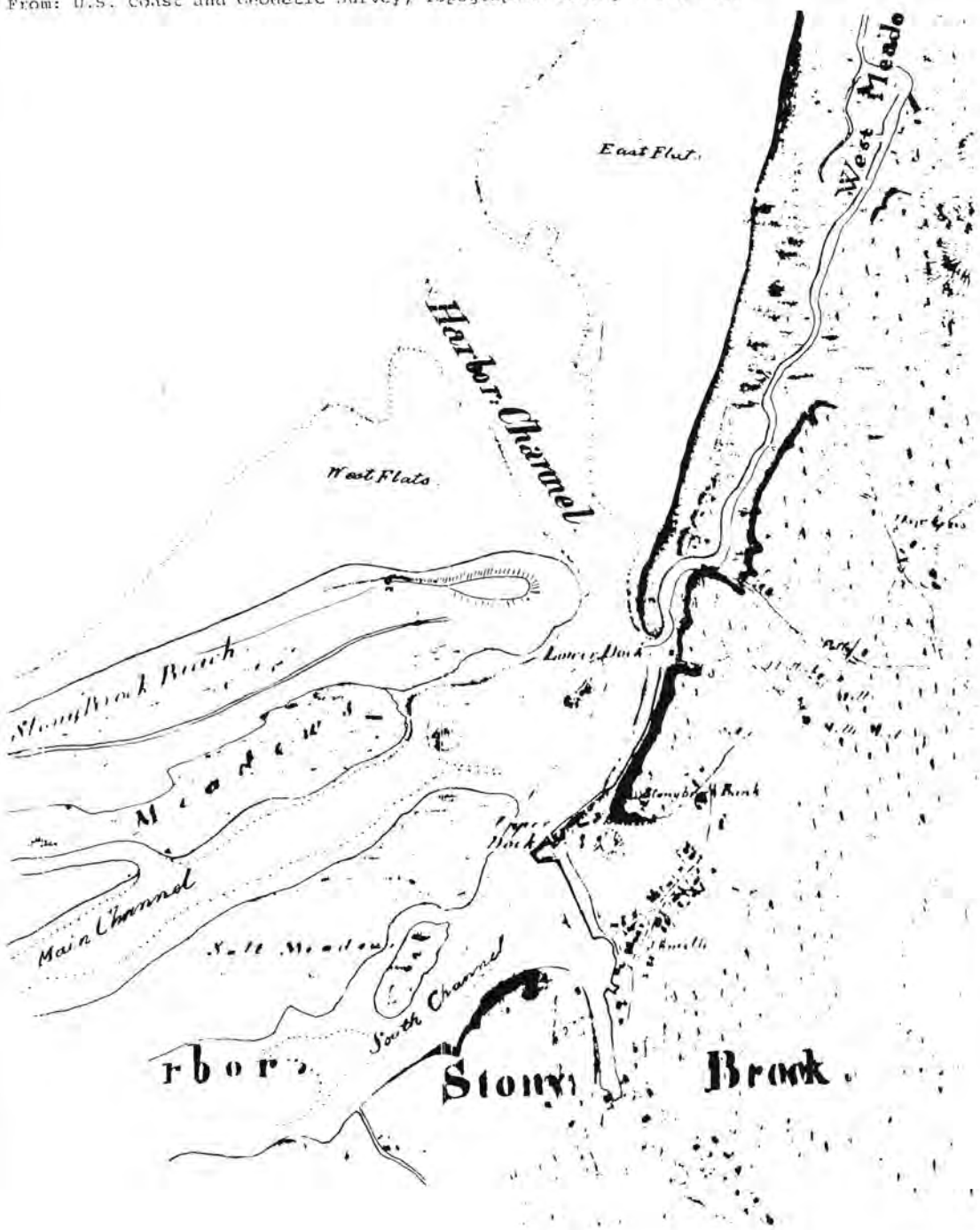


FIGURE 15 STONY BROOK VILLAGE WATERFRONT - 1837

Jayne"(27).

Most of these sailing ships were built along the Stony Brook village waterfront: on the shores of West Meadow Creek by the Wells family; at what is now the public dock, originally built by the Hallocks, by George and Charles Hallock and by David Bayles; behind the house that is now the 3-Village Inn by Jonas Smith; and in what is now the Town slip, and on the shores of the brook(27) (Figure 16).

By 1851, steamboats were stopping at Stony Brook(6), heralding the end of the days of commercial sailing ships, and the end of the shipbuilding industry in Stony Brook.

Throughout this time, Stony Brook Harbor continued to supply area residents with the fruits of its biolgical productivity. Farmers still harvested marsh grasses for animal feed and for fertilizer. Finfish, shellfish and eels were caught in the harbor waters and either consumed locally or shipped to the markets of New York City. An historian of the time(3) noted that soft shell clams abounded in the flats of Stony Brook Harbor.

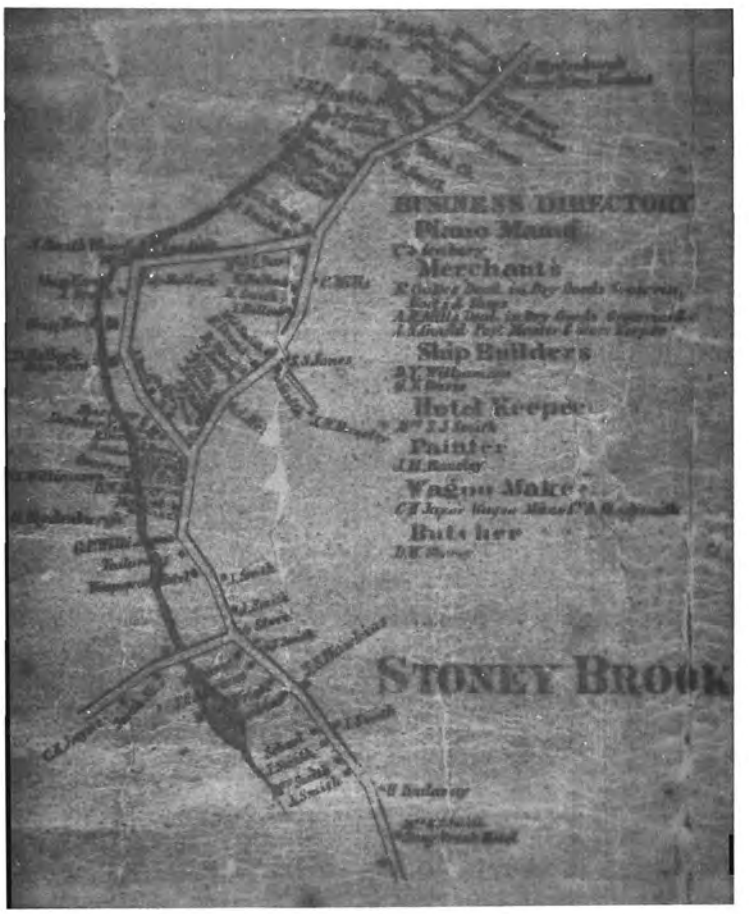
As the population in the harbor area grew, Stony Brook village developed into a commercial center. Farmers came to the village to sell their produce and cordwood, which was then put on outgoing ships, and to pick up supplies and fertilizer newly arrived from New York City. They also brought their grain and wood to the mill on the brook to be ground into flour and sawed into lumber. Other services were located in the village, such as the smithy, churches and schools, five stores, two hotels and a number of work shops(3) (Figure 16). Passengers and mail arrived from and departed for New York City at the Stony Brook docks. The shipbuilding industry was centered at the village waterfront and, for a short time, a clam bottling plant occupied a few large buildings near the docks (3,27). Many houses were built, and by 1874, the village population numbered about 700(3).

Meanwhile, the major part of the harbor area, in Smithtown, remained as farms and homesteads. In the mid 1870's, St. James was described as a pleasant rural village of 30 houses, three stores and an inn. The soil was "heavy" and fertile and the people mostly farmers. Mills Pond, about one mile northeast of St. James, had not more than a dozen houses and "extensive orchards." About 20 farm houses were scattered on Nissequogue Neck (between the Nissequogue River and Stony Brook Harbor). The northeast point of Nissequogue Neck, near the harbor, was "favored with a fine, rich soil and divided into large, well cultivated farms"(3). The center of activity in Smithtown remained to the south and west, on the Nissequogue River and in the village of the Branch.

Last Part of 19th Century

An important event in the history of Stony Brook Harbor was the arrival of the Long Island Railroad at Stony Brook in 1872(67). Coupled with increasing use of the steamship in waterborne commerce, it had a profound and lasting effect on the development of the harbor. The sailing ship was no longer the preferred mode of commercial transport. The railroad and steamships were quicker and could carry greater loads, and thus were cheaper than sailing ships. Passengers favored travel by rail or steamship because it was quicker, more comfortable and more reliable.

Business declined at the docks in Stony Brook Harbor and the building of commercial sailing ships had already stopped. The large steamers by-passed Stony Brook Harbor in favor of deeper and larger Port Jefferson Harbor to the east. Farmers took their produce and cordwood to the railroad station or to Port Jefferson. In 1882, a member of the U.S. Army Engineers examined Stony Brook Harbor to determine if it should be "improved" by the Federal government. Describing Stony Brook



From: Chace map of Long Island, 1858

FIGURE 16 STONY BROOK VILLAGE - 1858

village, he wrote: "The business portion of the village does not present a thriving appearance, and the commerce and navigation of the harbor have nearly all died away" (88). The Federal government decided that the commerce of the harbor was not sufficient to justify the expense of "improvements" (see discussion of dredging history in Appendix B).

Stony Brook village, however, retained its importance as a community center. People still came from the surrounding area to shop in its stores, attend school and church; and guest houses provided lodgings for visitors. By the 1890's, the population of the village probably was around 700 to 800.

A few land based commercial ventures, the C.S. Seabury piano factory in Stony Brook, a clam-bottling plant at the village waterfront(27), and the Long Island Rubber Company factory in Setauket(1), employed people full-time. But these did not last more than a few decades. Farming was still the backbone of the local economy. Many people who had left farming to work in these industries, at the docks or building ships returned to farming at the end of the 19th Century(1).

Some idea of the size of the fishing industry based in Stony Brook is given by an 1880 review of New York State fisheries (30), which included a study of Smithtown Bay. In that year, 80 men from the Stony Brook area, with 300 persons dependent on them, made their living by fishing in Smithtown Bay. They used 16 small sloops, aggregating 110 tons. $10,000 was invested in boats and tools, $20,000 in oyster beds (most likely for leases and cultivation). The year before, 20,000 bushels of hard clams, 30,000 bushels of soft clams and 18,000 bushels of oysters were sold. About 20,000 pounds of fish, including flounders, bluefish and other species found in the Sound were caught, the entire quantity being consumed locally. Fishing was carried on inside Stony Brook Harbor at this time, but it is not known what quantities of fish and shellfish were harvested.

During this time, New York City was becoming a crowded metropolis and people were looking for a place in the country to "get away from it all." The Long Island Railroad was a direct connection between Long Island and New York City. The railroad company, already in financial difficulties, tried to increase the volume of traffic on its passenger lines by promoting Long Island as a resort(29). People began to come to the Stony Brook Harbor area for rest and recreation. The beauty of the harbor was a great attraction and a small tourist industry developed.

20th Century - Pre-World War II

With the opening of the American West in the latter part of the 19th Century, a new kind of agriculture was developed in the fertile, easily-worked lands of America's central plains. Midwest farmers, with the help of quick rail and water transportation, could supply the big cities of the East with the basic foods, especially grains. Traditional agriculture in the Stony Brook Harbor area could not compete with the more productive farms of the midwest, so local farmers began to specialize in one or a few crops. They grew potatoes, cauliflower and other vegetables, and fruits like strawberries which they delivered fresh to the New York City market. Poultry was raised for the city and local markets, and dairy farms supplied fresh milk and milk products to local residents(71).

Gradually, the residents of the Stony Brook Harbor area began to depend less on the land for their living. The service industries became more important employers, and the recreational industry grew rapidly. Summer colonies were established around the harbor and West Meadow Creek, especially on the Brookhaven side.

In 1907, a Presbyterian retreat organization called "The Stony Brook

Association" came to Stony Brook. As stated in their prospectus, they wished to form, within easy reach of New York City, "A clean, wholesome, desirable summer resort having educational features that are giving it not only national but world-wide interest and are already attracting a large number of intelligent, cultured people who want summer homes amid congenial surroundings"(87). The Association constructed bungalows on the village waterfront (still standing behind the 3-Village Inn) to house its members, and held open-air meetings during the summer. (Some years later, they started the Stony Brook School on Route 25A opposite the Stony Brook railroad station which remains to this day a private, religion-oriented preparatory school.)

During the 1920's, beach houses were built along West Meadow Beach and the northerly end of West Meadow Creek was dredged, supposedly to construct a marina. Instead, the North Shore Horse Show Grounds and the Old Field Club were built on the former wetlands (which had been filled with dredge spoil). A private summer colony called "Sound View" was developed on the east shore of the creek, just south of the dredged area.

Beaches for Smithtown and Brookhaven residents were built along Smithtown Bay at Long Beach and West Meadow Beach, respectively. Local residents and summer visitors came out in numbers to fish for flounders, snappers, eels, soft and hard clams and crabs, and to swim, boat and hunt(17). Recreational boating replaced commercial shipping within the harbor. There was no commercial use of the Stony Brook dock after the 1920's, except by fishermen and party boats(21,33). By 1930, the Stony Brook Yacht Club, located on the southern end of the Stony Brook waterfront, had a membership numbering 235, with 67 shallow-draft boats and launches(71).

In the early 1940's, the commercial section of Stony Brook village adjacent to the waterfront was completely redesigned. An Early Republic style shopping center was built on a hillside facing the harbor and several buildings were either moved or razed, to open up the waterfront area. The project was conceived and funded by Ward Melville, a prominent local citizen. Upon their completion, the shopping center and a new village green were donated to the Stony Brook Community Fund, a local non-profit organization.

The harbor area in Smithtown stayed in agriculture longer than in Brookhaven. The old Smith family farms and homesteads remained as farms or were converted to large estates and exclusive summer homes.[19] Only a small public beach at the foot of Cordwood Path interrupted the residential shoreline.

It was during the 1920's that residents of that part of Smithtown adjacent to Stony Brook Harbor decided to incorporate the area into two villages: Nissequogue (1926) and Head-of-the-Harbor (1928). Incorporation gave the villages power to preserve their affluent, low-density character through the enactment of zoning ordinances to guide future growth and development.

The year-round population of the Stony Brook Harbor area increased slowly during the first third of this century. In 1930, Stony Brook village had a population of approximately 790(29). The Villages of Head-of-the-Harbor and Nissequogue combined had only 414(81). The summer population of West Meadow Beach and Sound View numbered around 500(29), almost half as much as the total year-round population.

20th Century - Post-World War II

Suburban expansion on Long Island, which began in western Nassau County in the 1920's, reached the Stony Brook Harbor area in the years after World War II. It was in the mid-1950's that construction of housing developments began. Many people who moved into the developments commuted to jobs elsewhere on Long Island or in New

York City, and the harbor area became an affluent "bedroom community." In the early 1960's, the State University of New York moved onto its 1100 acre campus south of Route 25A in Stony Brook. Along with the University came faculty, staff and students who swelled the population in the surrounding communities. Few probably moved into Nissequogue and Head-of-the-Harbor, but many bought and rented houses in Stony Brook. The University, along with the accessory services necessary to the functioning of its community (stores, offices, etc.), provided employment for many local residents.[20]

Tables 4 and 5 show the rapid increase in population which began in the 1950's and continued through the 1960's in the Stony Brook Harbor area, as well as throughout the Towns of Smithtown and Brookhaven. The population of the Village of Nissequogue underwent a phenomenal rise, more than tripling during the decade 1960 to 1970. No data are available for Stony Brook before 1960 (at which time it was designated an unincorporated community by the U.S. Census Bureau), but it probably had a population increase similar to those of the Villages of Nissequogue and Head-of-the-Harbor, about 50 percent during the decade 1950 to 1960.

During this time, the recreation industry in Stony Brook Harbor grew along with the population. Summer residents continued to return each year. Recreational opportunities offered by the harbor probably also attracted many of the permanent residents to the area. Joining the summer residents, they swelled the numbers of people swimming, fishing, clamming, boating and just relaxing in the harbor and creek.

Although the activities of man have always had an effect on the harbor, it was not until after World War II, the time of most rapid development in the harbor area, that any projects which would substantially affect the harbor were undertaken.[21] During the 1950's and the first half of the 1960's, navigation channels and a mooring basin were dredged and marinas were constructed and/or enlarged for the benefit of recreational boaters.[22] These projects were, for the most part, modifications of the basic configuration of the harbor: existing channels were made deeper, wider and straighter and indentations in the shoreline were enlarged or filled. Probably the most important impact on the harbor was the destruction of wetlands through both dredging and spoiling.[23]

Today, Stony Brook Harbor is a major recreational center for residents of Smithtown and northern Brookhaven. The Stony Brook dock, scene of much commercial shipping activity in the past, is now part of the Town of Brookhaven's system of public recreational facilities. Stony Brook village remains a center of commercial and social activity, but the area that it serves is no longer covered with farms, but with residential developments. In Smithtown, most of the old Smith family farms have also been replaced by residential communities or have been converted into estates. One aspect of the harbor area that has remained largely unchanged through time is its natural beauty. The same rolling wooded hills and peaceful harbor that attracted the first human settlers to the Stony Brook Harbor area, today make it a very desirable place in which to live and to enjoy the pleasures of the natural environment.

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[1]Investigations of an archeological site on the north shore of Aunt Amy's Creek, about 850 ft east of where it joins West Meadow Creek, revealed the remains of a group of primitive hunter-gatherer inhabitants, radiocarbon dated at an age of app. 3,000 years Before Present (app. 1,000 B. C.)(62). A second site, on the western shore of the head of the harbor, in the Village of Nissequogue, has not been excavated (J. Guenther, personal communication).

Table 4. Population Figures for the Years 1930 through 1970*

	1930	1940	1950	1960	1970
Village of Head-of-the-Harbor	244	255	334	524	943
Village of Nissequogue	174	188	219	332	1,120
Stony Brook (unincorporated)	---	---	---	3,548	6,391
Town of Smithtown	11,855	13,970	20,993	50,347	114,004
Town of Brookhaven	28,291	32,117	44,522	109,900	245,260

*Data for 1930 through 1950 from (81), for 1960 and 1970 from (82).

Table 5. Percent Increase in Population per Decade for the Years 1930 through 1970*

	1930-1940	1940-1950	1950-1960	1960-1970
Village of Head-of-the-Harbor	5	31	57	80
Village of Nissequogue	8	16	52	237
Stony Brook (unincorporated)	--	--	--	80
Town of Smithtown	18	50	139	126
Town of Brookhaven	14	39	147	123

*Data for 1930 through 1950 from (81), for 1960 and 1970 from (82).

[2]The long held belief that use of fish fertilizer was a native North American practice which the Indians taught the European settlers is being challenged. Some anthropologists now believe that, on the contrary, the Europeans themselves introduced this practice to the New World, and that the native method of cultivation relied on shifting the site of planting as the soil became depleted(11).

[3]Sixty-five percent of the debris unearthed at the Stony Brook site described in footnote 1 consisted on shellfish remains. In descending order of abundance they were: oyster (*Ostrea virginica*), bay scallop (*Pecten irradians*), hard-shelled clam (*Mercenaria mercenaria*), soft-shelled clam (*Mya arenaria*), a gastropod of the genus Littorina (commonly called the periwinkle), channeled whelk (*Busycon canaliculatum*), and ark (*Arca* sp.?)(62).

[4]The vagueness of the eastern boundary led to a series of disputes between the Towns of Brookhaven and Smithtown, which will be discussed later.

[5]The Manor of East Greenwich was the private estate of the British monarch. In medieval English law, socage was a free system of land tenure, as opposed to servile, and fealty was fidelity to a lord (in this case, the British monarch).

[6]This included everything in the Nicolls patent plus "all ...the houses, messuages, tenements, buildings, Mills, Milldams, fencings, enclosures, Gardens, Orchards, fields, ..., underwoods, trees, timber, feedings, comon of pasture, ..., Swamps, plaines, ..., rivoletts, waters, ..., ponds, brooks, streams, beaches, ..., mines, mineralls, ..., highways and easements, ..., (silver and gold mines excepted)"(5).

[7]It appears that the residents of Smithtown had a similar problem, for, in 1747 and again in 1793, they built fences to keep cattle and horses off Long Beach (57).

[8]As early as 1702, 10 years after Richard Smith's death, there were 50 of his children and grandchildren living(57).

[9]It should be noted here that the Smith family never divided up the bottom of Stony Brook Harbor or the bottom of the Nissequogue River below the mill. These lands were left in possession of all the descendants of Richard Smith (the proprietors)(57). (see *Ownership*, p. 66)

[10]The builder of this ship is unknown, but it probably was a Hawkins or a Hallock. The Hallock family were very important merchants and shipbuilders of 18th and 19th Century Stony Brook(27).

[11]The mill dam broke again in 1856(27). These and other mill dam breaks could have been largely responsible for the alteration of the Stony Brook Creek from an open waterway, deep and wide enough to allow coastal schooners as far up as the mill, into a marsh area with only a narrow, shallow channel winding through the Spartina grass. With each dam break, sediment which had accumulated in the mill pond probably was swept out with the water, to settle on the creek bottom.

[12]There probably were less than 150 people living in Stony Brook village at the end of the 18th Century. The U.S. Census of 1790 recorded only 3,224 inhabitants in the Town of Brookhaven and 1,022 in Smithtown. There could not have been more than about 300 people in the entire harbor area.

[13]As late as the 1950's, a dispute between the two Towns over the section of the boundary through Stony Brook Harbor led to a court case. (see Appendix B)

[14]This dock still exists today, as the Town of Brookhaven dock and boat slip, and as part of the Stony Brook Yacht Club dock.

[15]Cordwood cutting was an important industry in the Stony Brook Harbor area until about 1900. During the War of 1812, the Town of Brookhaven exported 100,000 cords of wood annually to help fight the British(1). Virtually all of the virgin stands of hardwood on Long Island were cut for cordwood and/or to clear the land.

[16]This was probably the dock built by the Hallocks, which, by the 1860's, they had sold to Jonas Smith.

[17]A list of sailing ships built at Stony Brook, from a record of the celebration of the bi-centennial of Suffolk County, November 15, 1883, edited by Stephen A. Titus, 1855(5, Appendix One).

[18]Construction of large ships such as this was timed so they could be launched at Spring Tide. Normally, most ship traffic in and out of the harbor had to wait for high tide, lying on the bottom at low tide when berthed at the docks.

[19]Ownership of much of the property along the harbor in Smithtown has, until very recently, remained in the original Smith family (J. Guenther, personal communication).

[20]The State University at Stony Brook is the single largest employer in the Town of Brookhaven (A. Kunz, personal communication).

[21]See Appendix B for a discussion of the projects proposed earlier in the Century, and the controversy surrounding them.

[22]See Appendix C for a listing and description of each project.

[23]The extent and location of wetlands destroyed are discussed in Appendix C.

USES OF THE HARBOR

The relatively undeveloped state of the shoreline and the surrounding upland, and the high quality of its water and plant and animal life make Stony Brook Harbor an attractive location for many of man's activities. Most people who use the harbor do so for recreation, including boating, fishing, shellfishing, swimming and hunting (roughly in decreasing order of importance). A few people harvest shellfish commercially. Two areas of the harbor have been set aside as wildlife preserves, to remain in their natural state for posterity, and teachers and students use the harbor as an outdoor classroom. The shoreline provides an exceptional location for both summer and year-round housing.

Each use mentioned above makes certain demands on the harbor and the shoreline. They all require space, either on the shore or on the water, or both. And most of them require good environmental quality, especially water quality, and access to the water.

Recreation

A decrease in working hours and rise in prosperity have given the population of this country more spare time and more money to spend on recreation. Undoubtedly, many people moved into the Stony Brook Harbor area to be near the harbor and the many recreational opportunities it offers.

Boating

Probably the most popular recreational activity in Stony Brook Harbor is boating. There are about 10,000 boats registered in the Towns of Smithtown and Brookhaven which could use Stony Brook Harbor. It is not known how many of these boats actually use the harbor, or how often, but it is a very busy place on a fair summer weekend. The boats using the harbor range in size from about 8 ft to over 40 ft in length, the majority being about 17 to 18 ft long. Approximately 30 percent are sail and 70 percent power boats (L. Czapliski, personal communication).

Space and Access. Recreational boaters require shoreline space for facilities such as launching ramps, marinas, parking lots and access roads, marine supply stores and repair and storage yards, and pump-out stations for holding tanks, and space on the water for mooring and/or operation.

In the harbor, at the two private yacht clubs (Smithtown Bay and Stony Brook) and at the Town of Smithtown marina at Little Africa, there are permanent

berths for approximately 300 boats. The Town of Smithtown mooring area on Long Beach provides space for about 130 boats to be anchored. Another 130 boats are moored by shoreline residents, offshore from their houses, and by other Town residents in the two mooring areas located at the head of the harbor and at the end of Smith Lane in Nissequogue (next to the Nissequogue Golf Club). A total of about 560 boats are moored or berthed in Stony Brook Harbor and West Meadow Creek (L. Czapliski, personal communication). The vast majority of boaters who want to use the harbor must bring their boats on trailers and launch them from one of the two Smithtown ramps on Long Beach or from the Brookhaven ramp at Stony Brook. There are also three public access points to the head of the harbor (two small unpaved roads, in the Village of Head-of-the-Harbor, and one at the end of Smith Lane in Nissequogue Village) from which small, trailered boats can be launched. Use of Town-owned marinas, mooring basins, launching ramps and parking lots is restricted to Town residents and/or owners of taxable real property in the Town. Use of private yacht club facilities is restricted to members; nonmembers can use the facilities for a short period of time, as visitors (Figure 17).

The demand for berths and launching ramps appears to greatly exceed the supply. As of August 1974, there were 660 persons on the waiting list for a berth at the Smithtown marina at Little Africa. But only 12 people were relinquishing their berths each year (S. Resler, personal communication). The two private yacht clubs also have long waiting lists. Congestion at the two Smithtown launching ramps on Long Beach has prompted the Town to enlarge the ramp at the mooring basin. The Brookhaven ramp at Stony Brook is similarly overloaded, but there is little space to enlarge it.

Smithtown has two large parking lots on Long Beach with space for several hundred cars, serving boaters as well as people using Town beaches. Brookhaven has a much smaller parking lot on the Stony Brook waterfront, and Stony Brook Yacht Club has private parking facilities for its members (Figure 17).

Access to public and major private shorefront boating facilities is provided by public roads (Figure 18). The Stony Brook waterfront is serviced by New York State Route 25A and Suffolk County Road 68 (Main St.). The facilities on Long Beach are more difficult to reach. Two very narrow and winding roads, Moriches and Long Beach Roads, together constitute the only access route to Long Beach. (See Conflicts Arising from Competition for Sensate Space, p. 62 and *Smithtown*, p. 81 for a discussion of the conflict generated by use of these two roads by Town residents driving to the Smithtown boating facilities on Long Beach.)

Marine supplies such as gasoline and water are available at the Smithtown marina at Little Africa. These commodities, along with commercial boat repair and winter storage facilities, are available at Stony Brook Yacht Club, Stony Brook Marine and Wells Shipyard at the Stony Brook waterfront. Holding tank pump-out facilities are provided by the Town of Smithtown at the Little Africa marina.

Environmental Quality. Recreational boaters do not necessarily require the harbor to have a high level of environmental quality in order to pursue their pastime. In the interest of safety and for the protection of boats, there should be no floating debris which could interfere with navigation, or damage hulls or propellers. There should also be no substances in the water which could cause deterioration of the paint on a boat's hull.

The quality of the water in the harbor and the creek more than meets the needs of recreational boaters.

Navigation. Boaters require channels inside the harbor, especially to the

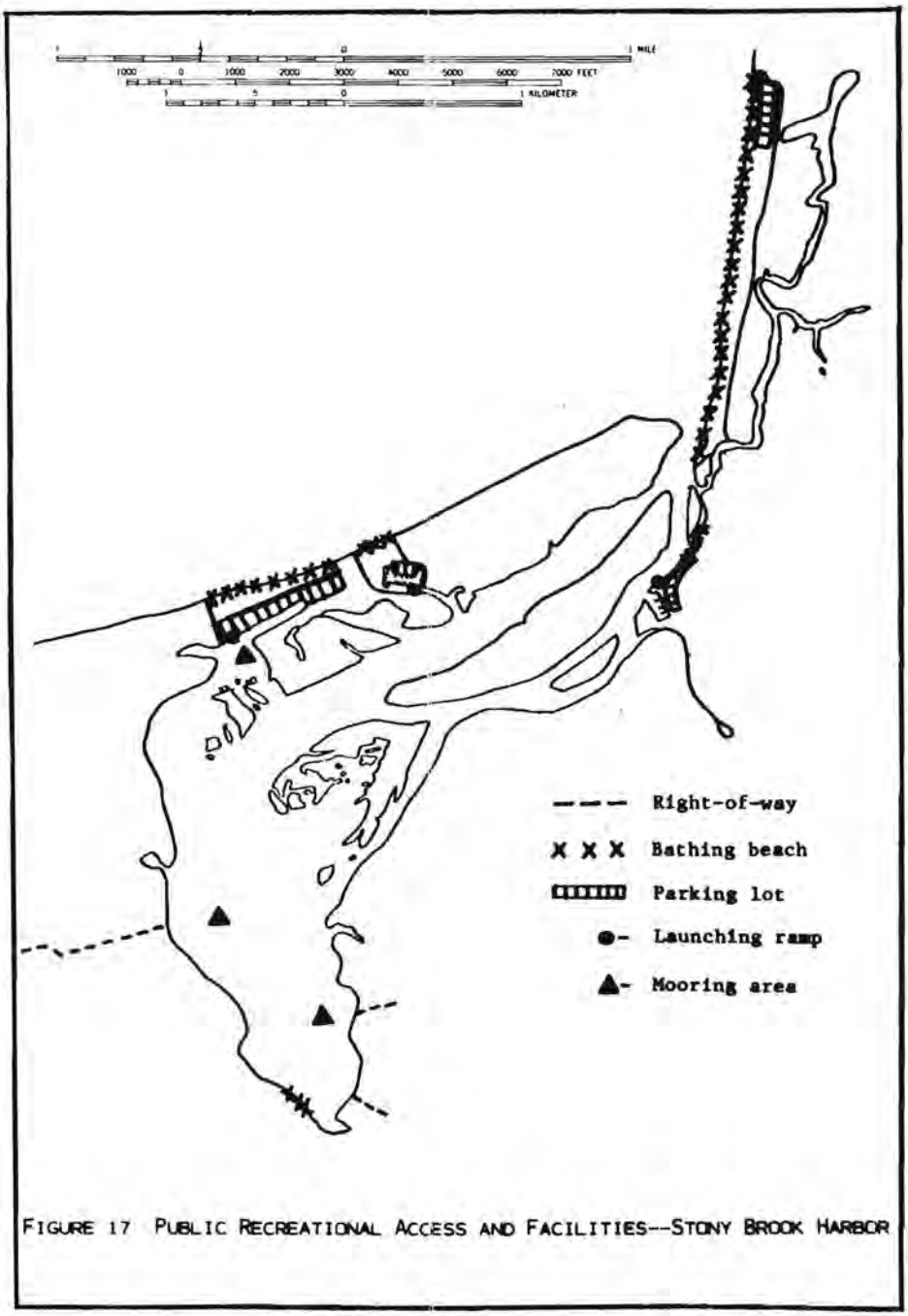

FIGURE 17 PUBLIC RECREATIONAL ACCESS AND FACILITIES--STONY BROOK HARBOR

marinas and mooring areas, and out to Smithtown Bay which are deep enough for them to use safely. Most boats using Stony Brook Harbor have shallow drafts, drawing three feet of water or less (L. Czapliski, personal communication). Porpoise Channel, leading to the Smithtown facilities at Long Beach, and the "main" channel, leading to Stony Brook Yacht Club and the Town of Brookhaven launching ramp, are presently adequate for most boats, except for some spots at "dead" low tide. The channel through the inlet and into Smithtown Bay is also adequate, except for a few spots on the flats outside the inlet at "dead" low tide. A few large boats using the harbor draw five to six feet of water and cannot enter or leave the harbor for about one and one-half hours before and after low tide (L. Czapliski, personal communication).

Channels are marked with buoys to help the boaters follow them. Porpoise Channel is marked every year by the Smithtown Bay Constable. Stony Brook Yacht Club marks the "main" channel from its own dock, through the inlet and out into Smithtown Bay each year, at its own expense. In addition, a lighted buoy marks the outer end of the flats in Smithtown Bay, and a stationary light is located on the east side of the inlet (on the southern tip of the West Meadow Beach bar). Both of these lights are maintained by the Stony Brook Yacht Club. These channels are naturally shifting and shoal areas tend to develop, so it is important that they are accurately marked. The "U.S. Coast Pilot" cautions: "The channels [in the harbor] are not well defined, as the buoys do not always mark the best water; local knowledge is required"(90).

Fishing

Sport fishing is probably second only to boating in popularity in Stony Brook Harbor. In fact, many boaters use their craft for fishing in the harbor and West Meadow Creek. In summer, sport fishermen can be observed bouncing sinkers for flounder (*Pseudopleuronectes americanus*) or an occasional summer flounder (or fluke, *Paralichthys dentatus*), drifting for striped bass (*Morone saxatilis*), or surf casting for bass (*Centropristis striata*) and snapper blues (juvenile *Pomatomus saltatrix*)(46). Weakfish (*Cynoscion regalis*), porgy (or scup, *Stenotomus chrysops*) and eels are also popular with some fishermen.

Finfish Environment. Sport fishermen require an adequate supply of fish in order to pursue their pastime. Fish, in turn, must have the proper environmental conditions, especially a food supply, to attract them into the harbor.

The temperature and salinity ranges and the good quality of the water in the harbor and West Meadow Creek provide a very suitable environment for fish. (See Appendix A for quality standards for Class SC waters, whose best usage is fishing.) The most important environmental factor affecting the finfish population probably is the availability of food. Their diet includes small "bait fish", such as killifish and sand eels, small crustaceans and annelids, shellfish (especially mussels) and various kinds of marine plants.

Space and Access. Sport fishermen who fish from boats need shoreline space to launch or store their boats or, if they fish from shore, space to stand or sit, as well as parking space. The launching ramps, mooring areas and berths in the harbor and West Meadow Creek provide the boating fishermen access to the water, if he is a Town resident or member of a private yacht club. Most of the space suitable for fishing from shore is in private ownership (e.g. bulkheads, beaches), available for use by only a few people. There is one fishing platform, on the bulkhead (dock) at the Stony Brook village waterfront, open to use by Town of Brookhaven residents. Smithtown residents can fish from shore in the Town parks at Cordwood Path beach (except during the bathing season) and on Long Beach (Figure 17).

Shellfishing

Shellfishing is another recreational activity popular in Stony Brook Harbor and West Meadow Creek. No statistics are available on numbers of "mess diggers", as they are called, or the amount of shellfish they harvest. Knowledgeable local residents estimate that a few hundred diggers regularly harvest clams and mussels from the harbor and creek.

Shellfish Environment. Recreational shellfishermen require an adequate and edible supply of shellfish in order to pursue their pastime. The quantity and quality of a shellfish population depend on a number of interrelated environmental factors, none of which is completely understood. There are five key factors in the shellfish cycle(72):

1) Type of bottom - Mussels need solid objects to attach themselves to through life. Clam larvae need sand grains to attach themselves to if they are to set, while the more mature clams can survive in bottom types ranging from soft mud to gravel. Oysters need hard surfaces such as shells to set and grow on. Most of the bottom of Stony Brook Harbor and West Meadow Creek is covered with sand and gravel, providing a good substrate for shellfish growth.

2) Water temperature - The 0 to 26° C annual temperature range of Stony Brook Harbor and West Meadow Creek is well within the tolerance range of adult shellfish. Most shellfish larvae require a temperature of between 17 and 30° C to develop normally (42). During the summer spawning months, temperatures in the harbor and the creek are suitable for the larvae, usually ranging from 20 to 26° C.

3) Salinity - The small salinity range in most of Stony Brook Harbor and West Meadow Creek, 24 to 28 ppt, is well suited to adult shellfish, which have about a 20 ppt tolerance range (e.g. oysters - about 3 to 35 ppt; hard clams - about 15 to 40 ppt[42]). As with temperature, the salinity tolerance range of shellfish larvae is smaller than that of adults (e.g. hard clam larvae - 20 to 35 ppt[42]), but is still much larger than the salinity range of the harbor and creek.

4) Water quality and 5) Food - Water quality factors such as dissolved oxygen level and presence of pathogens can affect the survival of shellfish, which are filter feeders. The chemical composition of the water (principally nitrogen and phosphorus levels) helps to determine the availability of phytoplankton, the major food supply of shellfish. If the water is over-enriched, however, the resultant proliferation of certain kinds of phytoplankton can clog the gills with which shellfish filter water for food and oxygen. Gill-clogging turbidity can also be caused by stirring up the bottom, which puts particulate materials into suspension in the water column.

The minimum dissolved oxygen concentration required by New York State for a body of water to be certified for shellfishing, 5.0 ppm (5.0 mg per liter) (Appendix A), is well below the concentration found in Stony Brook Harbor (see Physical and Chemical, p. 28). The bacteriological quality of harbor and West Meadow Creek waters, based on coliform counts, is good (see also Bacteriological, p. 25). There is little likelihood that shellfish would be infected with pathogens. The nutrients necessary for phytoplankton growth are present and acceptably high phytoplankton counts are consistently found in water samples taken from West Meadow Creek (E. Ernst, personal communication). An overabundance of food is more likely a problem than is a scarcity of food. And the turbidity of the water in Stony Brook Harbor is unusually low, as evidenced by Secchi Disc measurements (see Physical and Chemical, p. 28).

Access. Access to the shellfish beds can be either by boat or on foot. Boating access has already been discussed (see *Space and Access*, p. 51). A mess digger can enter the harbor or creek (or

bay) on foot from any public shoreline, if he is a resident of that Town (Figure 17), or if he is a shoreline resident, from his own property. Only Smithtown and Brookhaven residents are allowed to take shellfish from bottom lands within the jurisdiction of their respective Towns (see Town, p. 78).

Swimming

Another recreational use of Stony Brook Harbor and West Meadow Creek is swimming. The number of people swimming in the harbor and creek is not known, but it appears that many more people go to the beaches on Long Beach and West Meadow Beach to swim in Smithtown Bay. Most of the people swimming in the harbor and creek are probably shoreline residents who have easy access to the water.

Water Quality. In order for water to be fit for swimming, it must be clean from a public health standpoint, and look, feel and smell clean from an aesthetic standpoint. The quality of the water in Stony Brook Harbor and West Meadow Creek more than meets the New York State standards for bathing water (see Appendix A - Class SB). In addition, Suffolk County Department of Health Services, which samples for coliform organisms at the two Town beaches in the harbor (as well as at the large Town beaches on Smithtown Bay) during the ten week summer swimming season, has consistently certified the water at all of the beaches as fit for bathing. (The Health Services Department's standard for coliform levels in bathing water is a maximum median Most Probable Number value of 240 per 100 ml.)

New York State law also requires toilet facilities at all public beaches (see *Department of Health*, p. 74), not only as a convenience to swimmers but to protect local water quality.

Access and Safety. Two small public beaches in Stony Brook Harbor, at the Stony Brook village waterfront in Brookhaven and Cordwood Path Beach at the head of the harbor in Smithtown, are open to Town residents. Parking space is available at Town owned parking lots (Figures 9 and 17). A few private beaches in the harbor and along West Meadow Creek are used by local residents.

Boat traffic is confined mostly to the two major channels in the outer harbor. There is little traffic near the two Town beaches and near most of the private beaches. In West Meadow Creek, which is narrow in spots, boat traffic sometimes interferes with swimming. (Heavy boat traffic in the entrance channel to the harbor can make the southern portion of West Meadow Beach very hazardous for swimming.)

Hunting

During the fall and winter waterfowl hunting season, a few people (approximately 30, according to a knowledgeable local hunter) hunt in Stony Brook Harbor. The number of hunters using the harbor and creek depends upon whether there is an adequate supply of waterfowl to spark the hunters' interest and to make it worth their while.

Waterfowl Population. The numbers of waterfowl frequenting Stony Brook Harbor and West Meadow Creek during the fall and winter depends on the harshness of the weather and the availability of food and cover. During rugged winters, more waterfowl seek the shelter of the harbor than during mild ones, and the hunting is better. The availability of food depends on the level of environmental quality in the harbor and creek. Waterfowl feed on small fish, crustaceans and shellfish, insects and various kinds of marine plants, which are ususally available in abundance. Large marine wetland areas in the harbor and creek provide the necessary cover in which waterfowl can rest.

Access and Space. Individuals can hunt from privately owned shoreline, as long as they are the legal distance of 500 ft from a dwelling. Only local residents have the opportunity to hunt this way. The public parks and the wildlife

preserves are off-limits to hunters. Most hunting is done in the harbor itself, among the thatch islands, from small boats ("duck boats"). Hunters can use the same access points to the harbor as boaters (see *Space and Access*, p. 51) or, if their boat is small enough, simply launch it from publicly-owned shoreline (or from private shoreline, if they have permission).

Shellfish Industry

There is a small commercial fishery for hard and soft clams and mussels in Stony Brook Harbor and West Meadow Creek. The exact number of commercial clammers and mussel diggers who operate in these waters is not known. In the part of the harbor and Smithtown Bay in the Town of Smithtown, there are an estimated 3 part-time clammers digging hard clams and 13 mussel diggers (9 part-time; 4 full-time, or year-round[1]). In Brookhaven, including the harbor, West Meadow Creek and the sand flats off of West Meadow Beach, there are an estimated 6 full-time clammers digging mostly soft clams and 7 full-time mussel diggers. During the summer, an estimated two dozen part-time clammers and mussel diggers, mostly young people such as college students, work the bottom in each of the two Towns. The number of mussel diggers working at any one time further depends on whether there is a "set" of mussels ready for harvesting.

The yearly production of shellfish in Stony Brook Harbor and West Meadow Creek is probably on the order of several hundred to a few thousand bushels each of hard and soft clams and a few thousand bushels of blue mussels (which have been heavily harvested in recent years). Records of shellfish production on Long Island, kept by New York State Department of Environmental Conservation, list production for the Town of Smithtown as a whole, while the Town of Brookhaven is divided into one north shore and two south shore areas.

Stony Brook Harbor is probably the major shellfish producing area in the Town of Smithtown at present, due to the closure of much of the mouth of the Nissequogue River for sanitary reasons. Soft clam production has not been recorded for Smithtown since 1972, at which time it was only 524 bushels. Mussel production was first recorded in 1974 at 6,978 bushels. Hard clam production has not been recorded for Smithtown for at least the last four years, but they are harvested, especially in the inner part of Stony Brook Harbor.

Stony Brook Harbor is only a small part of the area covered by the Town of Brookhaven north shore production figures. Little information can be gained from them.

Shellfish Environment

Commercial shellfishermen, like mess diggers, require an adequate supply of edible shellfish and the level of environmental quality necessary to support it (see *Shellfish Environment*, p. 55). One hundred percent of the harbor and West Meadow Creek is certified for shellfishing. The only problem commercial shellfishermen seem to have is one of quantity, which is more important to them than it is to the mess digger, who is fishing for fun and food rather than for profit.

Access

Access to the shellfish beds can be either by boat or on foot (see *Space and Access*, p. 54, for discussion). Commercial shellfishermen harvesting shellfish from Stony Brook Harbor must be residents of either Smithtown or Brookhaven and must obtain permits from their respective Towns as well as from New York State Department of Environmental Conservation. They are allowed to take shellfish only from areas within their Town of residence (see Town, p. 78).

Conservation and Education

Two shoreline areas along Stony Brook

Harbor and West Meadow Creek are set aside for conservation purposes: Nissequogue Wildlife Preserve at the tip of Long Beach and West Meadow Wetlands Wildlife Preserve. The preserves are important in that they protect specialized and valuable environments which might otherwise be utilized for recreational or residential development. An educational program offered by the Three Village School District (Town of Brookhaven) utilizes the West Meadow wetlands as an outdoor classroom and laboratory in which to study marine biology and ecology.

Environmental Quality

The major requirement of both these uses is preservation of good environmental quality in the harbor area, especially ecological diversity and good water quality. The ecosystem is composed of many highly interrelated parts; if any one part is disturbed or removed, the whole system suffers. The good water quality of the harbor and creek is the basis of the ecosystem. On it depend all forms of life, from the algae and *Spartina* grasses of the wetlands, which are the producers, to birds and fish, which are the consumers.

Space and Access

The beach, dune and woodland environments of the Nissequogue preserve and the wetland environment at the West Meadow preserve must be maintained if the areas are to remain in their natural state. Dredging, filling and bulldozing, etc. must remain restricted and access limited.

Housing

An important use of the Stony Brook Harbor area is as a location for shorefront housing. The land surrounding Stony Brook Harbor and West Meadow Creek provides a very attractive location for low-density residential development. Large lot developments and estates now occupy most of the shoreline, except for West Meadow Beach, which is covered with small summer cottages. Waterfront property, or even land which is at all near the water, brings a very high price. The private harborfront property in the Villages of Head-of-the-Harbor and Nissequogue has an assessed valuation of approximately $10,000,000.

Space and Access

Residential use of the shoreline requires, most of all, space on which to build, as well as access from inland and provision of utilities (water, electricity, waste disposal, etc.).

Most of the shoreline of the harbor and creek now in private ownership could conceivably be used for housing. (See Land Use, p. 13, for a description of local zoning.) There are two areas where construction could be hazardous: on the coastal flood plains, i.e. those areas subject to tidal flooding during storms, and on unstable bluffs subject to shoreline erosion (see Soil and Topography, p. 11 and *Shoreline Stability*, p. 23). If structures are to be built in either of these areas, precautions should be taken. On the coastal flood plain, the lowest floor should be elevated at least one foot above the 100 year flood level (which is 3.3 m [10.9 ft] above mean sea level for the Stony Brook Harbor area) (see *Shoreline Stability*, p. 23 and *Department of Housing and Urban Development*, p. 69). A structure built on an unstable bluff should be set back far enough from the bluff edge to allow for possible natural erosion, as well as to prevent any additional (man-induced) erosion.

These two problem areas are identified in Figure 10. At present, 18 private houses are located on the flood plain at Long Beach, 80 at West Meadow Beach (all on publicly-owned land)[2], 10 on the eastern shore of West Meadow Creek, and another 10 along Stony Brook Creek. Fifteen private houses are built on unstable bluffs (10 in Stony Brook and 5 in Head-of-the-Harbor).

The system of access roads around Stony Brook Harbor and West Meadow Creek, an important requirement for residential use of the area, is shown in Figure 18.

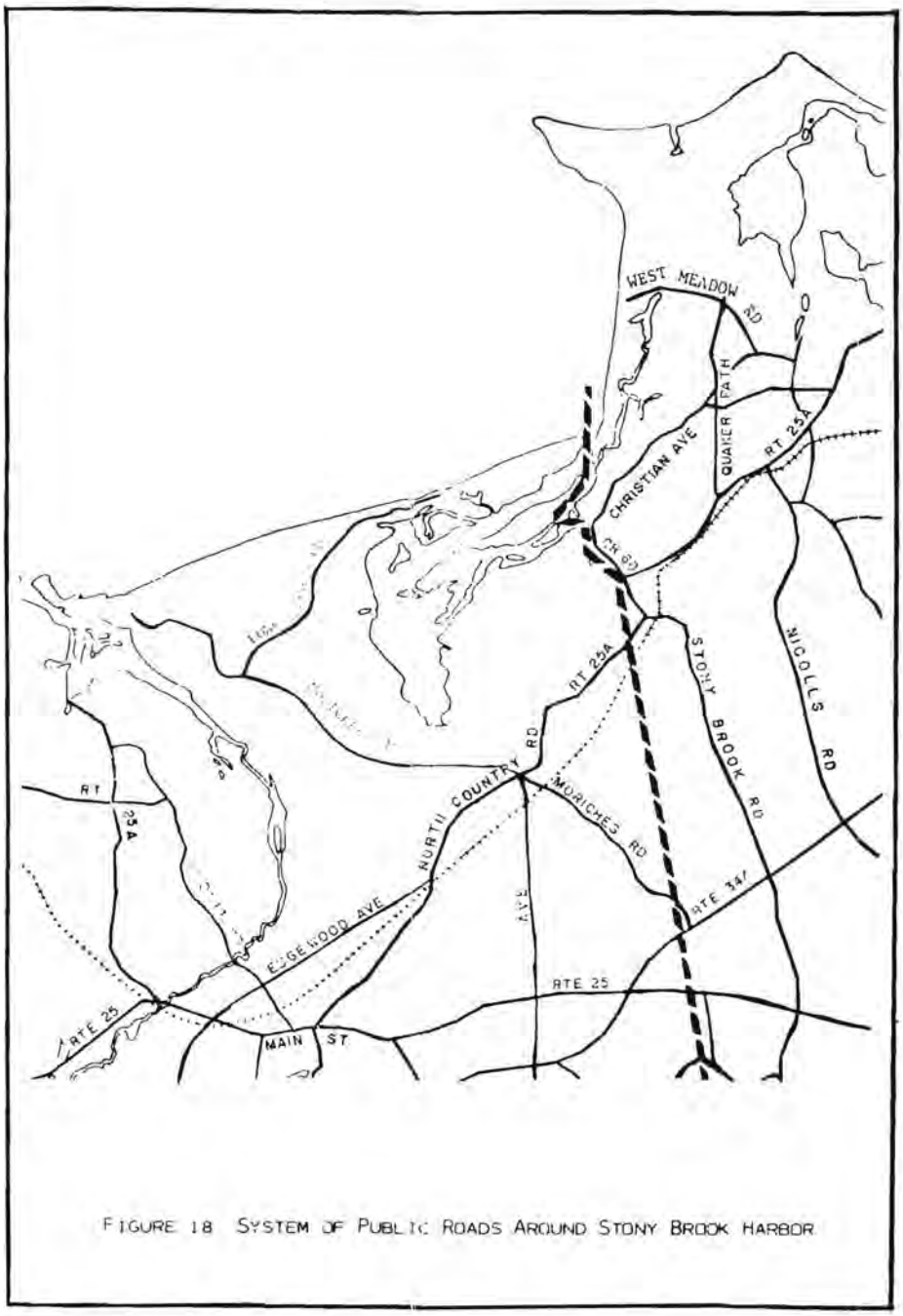

FIGURE 18 SYSTEM OF PUBLIC ROADS AROUND STONY BROOK HARBOR

The water supply in the area is provided by individual wells throughout most of Nissequogue and Head-of-the-Harbor; by a municipal supplier, Stony Brook Water District, in the Stony Brook area; and by private groups in a small area of eastern Head-of-the-Harbor (Suffolk Development Company), on West Meadow Beach (West Meadow Beach Corporation) and at Sound View, at the head of West Meadow Creek (Sound View Association, Inc.). Sewage disposal is handled by individual systems (cesspools and septic tanks), throughout the harbor shoreline.

Alternatives to Current Uses

Stony Brook Harbor and West Meadow Creek and the surrounding shoreline are suited to a number of uses other than those described above, such as: high density residential development, sewage treatment plant and/or outfall location, sand and gravel mining, electricity generation, commercial development and waterborne commerce. These are possible rather than probable future uses of the resource, considering the residential-recreational character of development in the area, and local zoning ordinances and other regulations governing further development.

High Density Residential Development

A high density residential development, such as a multi-story apartment or condominium complex, could be built along Stony Brook Harbor if the zoning were changed. Suitable space is available, mostly in the Town of Smithtown, but provision of utilities and access from inland pose problems. Water supply wells have to be sunk and a sewage treatment plant built to handle the large volume of wastewater, in accordance with applicable public health regulations. Additional access roads have to be built, and existing ones enlarged, to handle the increase in traffic which would accompany such development.

The Pollution Susceptibility model described in Circulation, p. 33, could be used to determine where more intense residential use of the shoreline should be located in order to have the least detrimental effect on harbor water quality. In general, the closer a pollution source is to the harbor entrance, the less effect it will have.

Sewage Treatment Plant and/or Outfall

A sewage treatment plant constructed either in the vicinity of Stony Brook Harbor or right on the harbor could have an outfall terminating in the harbor, discharging effluent into harbor waters. If a treatment plant is built on the shoreline, space and access are necessary. Construction of an outfall requires space on land for a right-of-way and space on the harbor bottom along which to lay the pipe. The harbor water itself is used to dilute and disperse the effluent.

The above-mentioned Pollution Susceptibility model could also be employed to determine the best location for a sewage treatment plant outfall. Effluent discharged into the outer harbor would be flushed out of the harbor more quickly than that discharged into the inner harbor. An even better location for an outfall would be along the Smithtown Bay shoreline, where the Pollution Susceptibility is much less than anywhere in the harbor.

Sand and Gravel Mining

Stony Brook Harbor and adjacent areas of Smithtown Bay are underlain by valuable deposits of high quality, marketable sand and gravel. If permission could be obtained from the appropriate (and numerous) government agencies, sand and gravel mining could probably be a viable industry in Stony Brook Harbor. The dredge, which functions as a floating factory, would require access to the harbor from Smithtown Bay, which it could provide itself by excavating a channel as it goes. It also requires surface space in which to operate, and space on the bottom for dredging up the sand and gravel.

Once the saleable material has been

extracted, water transport by barge probably provides the most economical means of transporting it to the market location (principally New York City)(49). Shoreline space is needed for loading and storage facilities associated with transport by barge, and surface space for navigation of the barges. If some of the sand and gravel is trucked to its destination, access roads are also needed.

Electricity Generation

An electrical generating facility could be constructed on Stony Brook Harbor, but only if present zoning ordinances were revised. The plant requires shoreline space. Access roads or a pipeline right-of-way are necessary for overland transport of fuel to power the plant, or space on the water surface and dredged channels (or space on the bottom for a pipeline) to bring fuel in by ship. And transmission lines from the plant need a right-of-way. Cooling water would be drawn from the harbor and discharged back into it. The limited depth of the harbor, however, would make once-through cooling difficult because of recirculation of heated water.

Commercial Development

Development of more of the shoreline for such commercial enterprises as marinas, marine supply stores and restaurants is another possible use of the Stony Brook Harbor shoreline. Shoreline space zoned for commerce is the major requirement for this kind of development. Access roads are also important, as is the provision of utilities, especially water supply and waste disposal.

Waterborne Commerce

Industrial development of Stony Brook Harbor as a port is a possible, but unlikely, alternate use. The major requirements for the establishment of waterborne commerce are shoreline space and access from both inland and the water. Space is also needed on the water surface and bottom for dock facilities and navigation. Stony Brook Harbor has shoreline space for port development, but the land is zoned residential. The harbor is much too shallow and small to accomodate the ships used today, and permits would have to be obtained for channel dredging and dock construction. (Extensive sand and gravel mining operations could, however, create deep water in parts of the harbor.)

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[1]None of the commercial shellfishermen are thought to make their entire living from this occupation.

[2]A number of houses along West Meadow Beach were destroyed by the hurricane of 1944, according to a lifelong local resident(32). This hurricane was one of five major hurricanes to hit Long Island during the 20th Century(15).

CONFLICTS BETWEEN USERS OF THE HARBOR

When groups of people with varying interests make use of and place demands upon a natural resource such as Stony Brook Harbor, they tend to come into conflict with one another. Even if they are not competing for the same aspect of the resource (a "direct" conflict), the secondary effects generated by one use can cause problems for one or more other users ("indirect""conflicts). Stony Brook Harbor - West Meadow Creek is a complex natural system composed of a number of highly interrelated parts, and, as such, any use which alters the marine environment is likely to have an effect on other uses, especially those which are highly dependant on the environment (e.g. clamming and swimming). Because the major requirement of most users of the harbor is a high quality environment, indirect conflicts are numerous (see Table 6, p. 65).

Direct Conflicts

The major source of direct conflict

between users of Stony Brook Harbor is competition for space: physical space on the shoreline, and, to a lesser extent, on the water surface and harbor bottom, and most importantly, sensate space, the aesthetic satisfaction afforded by scenic, open areas. There is little competition for the harbor's living resources (Table 6).

Conflicts Arising from Competition for Space

On the Shoreline. Conflicting uses:

- boating
- swimming
- hunting
- conservation and education
- housing

Boaters, swimmers and shoreline residents need space on the shore to construct marinas, launching ramps, beaches, parking lots and houses. Hunters and conservation and education users need the shoreline in its natural state to help preserve the environmental quality of the harbor area.

On the Water Surface. Conflicting uses:

- boating
- fishing
- recreational shellfishing
- swimming
- hunting
- commercial shellfishing

Boating, especially the operation of power boats at high speeds, interferes with other uses of the harbor surface.

On the Harbor Bottom. Conflicting uses:

- boating
- recreational shellfishing
- swimming
- commercial shellfishing

Boaters need to have channels dredged, which can disturb shellfish beds and encroach on swimming areas.

Conflicts Arising from Competition for Sensate Space

Conflicting uses: all

Residents of the harbor area who feel they are entitled to the scenic vistas and natural open space it offers often resent (and try to prevent) intrusion by non-resident users of the harbor, who themselves probably visit the harbor to enjoy these same qualities. Noise from power boat and automobile engines, and crowding on access roads, at shoreline recreational facilities and on the water surface are probably the most unattractive aspects of recreational use of the harbor.

On the other hand, residential use of the harbor shoreline (construction of houses) blocks the view of the harbor for other users.

Conflicts Arising from Competition for Living Resources

Conflicting uses:

- fishing
- recreational shellfishing
- hunting
- commercial shellfishing
- conservation and education

The potential exists for conflict between these users, especially between recreational and commercial shellfishermen, but there do not appear to be any problems at present.

Indirect Conflicts

The major source of indirect conflict in Stony Brook Harbor is the alteration of the marine environment by two users, boaters and shoreline residents. Secondary effects of these alterations can cause problems for all other users, interfering with their ability to pursue their own interests. Another source of indirect conflict is the heavy use of local roads by recreational users of the harbor, especially boaters, which causes traffic congestion and hazardous driving conditions.

Alteration: Filling in the Shoreline

By boaters: to construct marinas, launching ramps, and parking lots.

By shoreline residents: to build houses and accessory facilities.

Side Effect: Destruction of Wetlands.

Conflicting uses	Problem
fishing recreational shellfishing hunting commercial shellfishing	Destruction of prey species' habitat and reduction of its food supply
conservation and education	Destruction of an important segment of the marine ecosystem

Alteration: Dredging and Spoiling

By boaters: to excavate marinas and navigation channels.

By shoreline residents: to "improve" their property.

Side Effect: Destruction of Wetlands. See same section above.

Side Effect: Bottom Disturbance.

Conflicting uses	Problem
fishing hunting	Reduction of prey species' food supply (especially benthic invertebrates)
recreational and commercial shellfishing	Direct removal of shellfish and destruction of shellfish habitat
conservation and education	Interference with harbor ecosystem

Side Effect: Increase in Turbidity in the Water Column and Rate of Sediment Deposition.

Conflicting uses	Problem
fishing hunting	Reduction of prey species' food supply (suspension feeding benthic invertebrates)
recreational and commercial shellfishing	Reduction of shellfish population (as a result of clogged gills) and disruption of shellfish habitat (by deposition of sediment)

Alteration: Waste Disposal

By boaters: discharge of holding tanks into harbor waters, and gasoline and oil leaks and spills.

By shoreline residents: runoff from paved surfaces and lawns, leaching of cesspool contents.

Most of the problems listed below are only potential, i.e. the rate of waste disposal in Stony Brook Harbor has not reached the point at which the secondary effects are severe enough to cause all of the possible problems.

Side Effect: Increased Level of Pathogens and Toxic Substances in the Water.

Conflicting uses	Problem
fishing recreational and commercial shellfishing	Reduction of prey species population through disease, and closing of areas to fishing and shellfishing for public health considerations
swimming	Reduction of aesthetic and sanitary quality of the water and closing of areas to swimming
hunting	Reduction of food supply of prey species
conservation and education	Reduction of water quality and resultant disruption of the ecosystem

Side Effect: Algal Blooms and Lowered Dissolved Oxygen Levels. See Section *Side Effect: Increased Level of Pathogens and Toxic Substances in the Water* above. The introduction of excess nutrients into harbor waters through waste disposal can contribute to the occurrence

of algal blooms which, if not effectively utilized by organisms higher in the food chain, may accumulate and decompose, resulting in lowered dissolved oxygen levels. (The relatively shallow depth of the harbor, however, causes the water column to remain well-mixed, and thus unlikely to develop dissolved oxygen problems.)

Side Effect: Increased Turbidity and Sedimentation Rate. See Section *Side Effect: Increase in Turbidity in the Water Column and Rate of Sediment Deposition.* Runoff from developed shoreline areas, carrying fine-grain sediment, can increase both turbidity in the water column and the rate of sediment deposition ("silting") on the harbor bottom.

Alteration: Boat Wake Generation

The operation of a power boat creates a wake which, if its height exceeds normal wave heights that occur in an area, tends to exacerbate erosion of the adjacent shoreline, especially wetlands(63). A salt marsh bank exposed to large wakes at low tide is particularly susceptible to erosion.

Side Effect: Destruction of Wetlands. See previous section *Side Effect: Destruction of Wetlands.*

Traffic Volume

Conflicting uses:

boating
fishing
shellfishing
swimming
housing

Most recreational users of the harbor require access roads in order to reach public or private recreational facilities on the shoreline. During the summer recreational season, the volume of automobile traffic, especially cars pulling boat trailers, can cause congestion and hazardous driving conditions. This conflict is especially acute in the Village of Nissequogue, where very narrow and winding roads lead to the recreational facilities on Long Beach. Nissequoque Village residents are inconvenienced by this traffic, to the point of attempting to ban all trailers from Village roads.

Discussion

The longest standing and still most important source of conflict between users of Stony Brook Harbor is the dredging issue. Dredging projects have been proposed for the excavation of navigation channels into and inside the harbor since the 1880's. Behind many of these projects, especially the earlier ones, were plans to establish commercial sand and gravel operations in Smithtown Bay or in the harbor, a prospect which aroused some harbor area residents to join forces in opposition to these projects. Today, although generally performed by government agencies for the benefit of recreational boaters, dredging in Stony Brook Harbor is still the subject of much heated debate, for ecological as well as economic reasons.

A history of the dredging issue, including a listing of proposed projects and a discussion of the controversies surrounding them, is presented in Appendix B. The way in which these controversies were (and are being) settled (i.e. the dredging actually performed) has had a considerable effect on the development of the harbor and how it is used today.

MANAGEMENT AND PLANNING

The resolution of the conflicts described in the preceding Section, i.e. how it is decided who will get to use Stony Brook Harbor and for what purpose, is explored in the following discussion.

Government agencies have the duty to protect the health, safety and welfare of the public, and authority to control man's utilization of Stony Brook Harbor and the surrounding land, in the short term by exercising their management powers, and over the long term through planning. Private citizens, acting as landowners,

Table 6. Summary of Conflicts Between Users of the Harbor

EFFECT / ON OF	RECREATION							
	Boating	Fishing	Shell-fishing	Swimming	Hunting	Housing	Conserv. & Education	Commer. Shellfish.
RECREATION — Boating	S1,2	S2 F D W	S2,3 F D W	S1,2,3 W	S1,2 F D W	S1 T	S1,2,3 F D W	S2,3 F D W
RECREATION — Fishing	S2	R				T	R	
RECREATION — Shell-fishing	S2,3		R			T	R	R
RECREATION — Swimming	S1,2					S1 T	S1	
RECREATION — Hunting	S1,2					S1	R	
Housing	S1	F D W	F D W	S1 W	S1 F D W	S1	S1 F D W	F D W
Conserv. & Education	S1,2,3	R	R	S1	S1 R	S1		R
Commer. Shellfish.	S2,3		R				R	R

Explanation of notation:

Direct Conflicts

Competition for space = S1 shoreline
S2 water surface
S3 bottom

Competition for living resource = R

Indirect Conflicts

Resulting from alteration of the environment by:
F = filling in shoreline
D = dredging and spoiling
W = waste disposal

Resulting from recreational auto traffic = T

voters or as members of interest groups and community organizations can influence government management and planning decisions, especially on the local level, if they are sufficiently vocal or influential.

The term management, as used in this discussion, refers to regulation of the use of a resource, involving research (data gathering and analysis), enactment of laws and regulations and their administration and enforcement. All of this, ideally, is part of a continuing program based on a rational policy for the best use of a resource, and in pursuit of objectives subject to change. Planning refers to the development of a long-range policy for the use of a resource. It involves integration of scientific information on the resource and the social, political and economic realities of the present situation, development of alternatives for managing the resource, as well as feasible management schemes for implementation of recommended alternatives. Planning is a way of balancing human use conflicts to achieve "optimal" use of a resource while preserving its environmental attributes.

Ownership

The bottom lands of the part of Stony Brook Harbor within the Town of Brookhaven and of West Meadow Creek, up to the mean high water line, are owned by the Town under a grant made to the Trustees of the Freeholders and Commonality of Brookhaven in the Colonial Dongan Patent (see Colonial Patents, p. 38). Ownership of the harbor bottom lying within the Town of Smithtown is not clear. In the past, the Town of Smithtown claimed the bottom lands and the marsh islands in the harbor under a Colonial patent given to Richard Smith, the original owner of the area that is now Smithtown (see Colonial Patents, p. 38). Recently, the State of New York, in conjunction with its wetlands acquisition program, is claiming title to these lands. The basis of the State's claim is that the Colonial patent granting ownership of Smithtown to Richard Smith did not specifically include these lands, as did the Dongan Patent to Brookhaven, and thus they belonged to the British Crown, whose interests were given to New York State after the Revolution. The Town of Smithtown is not challenging New York State's claim at present (F. Meyer, personal communication).

The bottom lands of Smithtown Bay adjacent to Stony Brook Harbor, and of Long Island Sound to the New York - Connecticut border, are owned by the State below the mean high water line.

Jurisdiction

The Federal government has limited authority over the use of coastal waters and adjacent lands, principally in regard to navigation and water quality. For the most part, the Federal government establishes policies and sets standards and guidelines to be administered by State and local governments.

New York State has the authority to regulate most uses of its coastal waters, such as Stony Brook Harbor, and the power to enforce such regulations. The State, in general, has the responsibility to develop management programs for the use of its coastal resources. It also has the exclusive responsibility to enforce the rights of the public (e.g. access to water for fishing, swimming and other lawful purposes).

Most direct control over the use of coastal waters, and especially over the use of coastal lands, lies with local governments, i.e. County, Town and Village. Town jurisdiction over coastal waters extends 1500 ft from shore. In the Town of Smithtown, the Villages of Head-of-the-Harbor and Nissequogue have jurisdiction over the waters of Stony Brook Harbor within 1500 ft of their shores (which, between the two Villages, covers the entire harbor surface within the Town of

Smithtown). Local municipalities, in accordance with State and some Federal guidelines, can enact local laws regulating the use of coastal waters within their jurisdictions.

Local municipalities, including Towns and Villages, control land use within their boundaries through zoning (the primary mechanism of home rule in New York State) and planning, adoption of local laws, tax assessment, exercise of eminent domain and enforcement.

The overlap in jurisdictions as described above has led, not surprisingly, to a confusing and sometimes conflicting body of ordinances, regulations and guidelines covering use of the Stony Brook Harbor area. The following discussion will attempt to sort out and summarize them.

Federal

Department of Defense.

Army Corps of Engineers Civil Works Program

The Corps is generally responsible for maintenance of the Nation's navigable waters and regulation of their use, including improvement of rivers and harbors, and granting of permits for structures or operations, such as the discharge of dredged and fill materials, in navigable waters. It also maintains research programs in support of this responsibility (e.g. Dredged Material Research Program and Coastal Engineering Research Center).

The Rivers and Harbors Act of 1899 (33 USC 403), the principal act governing dredging and spoiling in the shore zone, directs the Corps to implement a permit system for dredging, filling, building piers and other such activities in navigable waters of the United States. Any private party or government agency wishing to dredge or deposit spoil, or construct a dock, bulkhead or other such structure in or adjacent to Stony Brook Harbor and West Meadow Creek must first obtain a permit from the New York District Office of the Corps of Engineers.

The decision to grant or deny a permit is based on an evaluation of the impact of the work on the public interest. The Corps' primary responsibility is to ensure the integrity of navigable waters, and it is this factor which has generally been given greatest weight in the evaluation of permit applications(54). Before an application is approved, the Corps must consult with other government agencies, i.e. U.S. Fish and Wildlife Service, National Marine Fisheries Service and New York State Department of Environmental Conservation, and NYDEC must certify that the proposed activity will not violate water quality standards of the waterbody involved (see *Department of Environmental Conservation*, p. 71).

In the area of water quality, the Corps operates a permit program, under the Water Pollution Control Act Amendments of 1972 (PL 92-500, Section 404[e]), for the review of applications to the U.S. Environmental Protection Agency for permits to discharge dredged or fill material into navigable waters.

The Corps conducts a beach erosion control and hurricane protection program, which involves identification and study of sections of the Nation's coastline subject to erosion and hurricane damage, and recommendation of shore protection measures to be taken. Such a study was done for the north shore of Long Island(80). No plans of improvement were recommended for the Stony Brook Harbor area, because it was not found to be one of the "most seriously affected" areas and/or there did not appear to be a sufficient public interest.

The Corps conducted a flood insurance study of the Town of Brookhaven in 1972 for the Federal Insurance Administration of the U.S. Department of Housing and Urban Development(79), to identify those areas subject to coastal flooding. The study designated areas of risk based on their elevations above mean sea level (MSL). In the Stony Brook Harbor-West Meadow Creek area, the base flood elevation (areas below which are subject to

tidal flooding) was determined to be 3.3 m (10.9 ft) above MSL for a tide with 100 year frequency in Long Island Sound, 2.9 m (9.4 ft) for a 25 year tide and 2.6 m (8.5 ft) for a 10 year tide. Data from this study were used by the Federal Insurance Administration to prepare official flood hazard maps for Brookhaven Town (see *Shoreline Stability*, p. 23).

Department of Commerce.

National Oceanic and Atmospheric Administration (NOAA):

National Ocean Survey - NOS, formerly the Coast and Geodetic Survey, conducts a coastal zone mapping program, prepares and issues nautical charts and predicts tides and tidal currents for all of the Nation's marine waters. The Survey also archives historical hydrographic and topographic surveys.

National Marine Fisheries Service - Under the Fish and Wildlife Coordination Act (16 USC 661 et seq.), NMFS reviews environmental impact statements regarding the possible impact of the proposed action on fishery resources.

National Sea Grant Program - Administered and directed by NOAA, the Program provides funds for and guides marine research, education and advisory services operating on the State level, which are designed to achieve the "gainful use of marine resources" (National Sea Grant College and Program Act, 33 USC 1121). (See *Sea Grant Institute*, p. 74).

Office of Coastal Zone Management - This agency administers the Coastal Zone Management Act of 1972 (PL 92-583) and provides Federal leadership in promoting the wise and balanced management of the Nation's coastal zone, especially through the awarding of grants to States for developing and implementing plans for the management of their coastal zones. (See *Department of State*, p. 74 and *Nassau-Suffolk Regional Planning Board*, p. 75 for a description of the coastal zone management program covering Stony Brook Harbor.)

Department of the Interior.

Fish and Wildlife Service

The objective of F&W is to assure maximum opportunity for the American people to benefit from fish and wildlife resources as part of their natural environment(92). As part of its resource management responsibility, the Service reviews environmental impact statements, such as those prepared by Suffolk County Department of Public Works for County dredging projects in Stony Brook Harbor (Fish and Wildlife Coordination Act, 16 USC 661 et seq.).

A F&WS wildlife resource program which affects Stony Brook Harbor is the bird management program, regulating waterfowl hunting (Migratory Bird Treaty Act of 1918, 16 USC 703 et seq.). Each year the Secretary of the Interior sets up a framework of proposed hunting regulations (pertaining to catch limits), within which the New York State Department of Environmental Conservation must set up its own regulations for that year (see *Department of Environmental Conservation*, p. 71).

National Park Service

In addition to its major responsibility of preserving, managing and interpreting to the public the lands and resources under its administration, NPS sponsors programs to identify and recognize natural and historic landmarks(92). Stony Brook Harbor is under consideration for designation as a natural landmark, based on its physical characteristics, biological and/or ecological features, potential use and vulnerability to destruction or deterioration (B. Van Liew, personal communication). If placed on the National Register, Stony Brook Harbor would be protected from Federally financed projects which would have an adverse impact on it, and would be eligible for Federal acquisition and preservation

grants (Historic Sites Act of 1935, 16 USC 461 et seq.).

Geological Survey

As part of its water resources responsibility, the Survey determines the source, quantity, quality, distribution, movement and availability of the Nation's surface and ground waters. The Survey has been monitoring Long Island's groundwater resources for several decades, and has published reports on the groundwater resources and hydrogeology of the Stony Brook Harbor area and on the influence of recharge basins on local hydrology. The Survey's water supply research in Suffolk County is cooperatively funded by Federal, State and County (Suffolk County Water Authority and Department of Environmental Control) governments.

Geological surveys are conducted throughout the Nation and topographic and geological maps published. The major study of Long Island's geology(16) was published in 1914. Topographic and geological maps of the St. James quadrangle, which includes Stony Brook Harbor and its drainage basin, are published by the Survey. The most recent topographic map was published in 1967 (Figure B-4).

Department of Transportation.

Coast Guard

The Coast Guard is responsible for enforcing Federal navigation and vessel inspection laws in the navigable waters of the United States, and, in cooperation with other agencies in their enforcement responsibilities, enforces conservation and marine environmental laws. It also conducts and coordinates search and rescue operations. The Coast Guard station nearest to Stony Brook Harbor is at Eaton's Neck, 20 km (12.5 mi) to the west.

The Coast Guard administers a marine environmental protection program aimed at the prevention, detection and control of oil pollution on and adjacent to the navigable waters of the United States. It supervises clean-up operations in and maintains surveillance of Long Island waters. The Coast Guard also administers a boating safety program and sponsors the Coast Guard Auxiliary, an organization composed of private boat owners and radio operators who conduct safety courses, perform courtesy inspections of pleasure boats and assist in search and rescue efforts. There is an active Coast Guard Auxiliary in Stony Brook Harbor.

Department of Health, Education and Welfare.

Food and Drug Administration

As part of its duty to protect the health of the Nation against unsafe foods and communicable diseases, FDA administers the National Shellfish Sanitation Program, to which New York State belongs. The Program develops standards for growing, harvesting and processing shellfish, which the States must meet in order for their control programs to be certified by FDA. FDA, however, makes the final decisions on matters relating to public health.

Department of Housing and Urban Development.

Federal Insurance Administration

The National Flood Insurance Program of FIA makes Federally subsidized flood insurance available to property owners in flood or flood-related erosion-prone areas. To establish elegibility, local communities must adopt and administer flood plain management regulations, usually zoning or building regulations, that protect new construction from future flooding. The Flood Disaster Protection Act of 1973 (PL 93-234) requires communities to have a flood insurance program if they are to receive Federal financial assistance for projects (e.g. land acquisition or construction) in flood hazard areas.

FIA has published maps identifying areas of special flood hazard around Stony Brook Harbor and West Meadow Creek (see *Shoreline Stability*, p. 23). The Towns of Brookhaven and Smithtown and the Village of Nissequogue have established

eligibility under the program.

Environmental Protection Agency. EPA is the primary Federal agency given responsibility for the restoration and preservation of the Nation's environmental quality. This involves research, monitoring, standard setting and enforcement. The EPA Water Quality Program includes: development of water quality standards and effluent guidelines, and approval of States' water quality standards; monitoring of environmental quality, either directly (such as the 1969 survey of Long Island Sound water quality[86]) or through local agencies; funding and supervision of research, including the areawide wastewater management planning ("208") program being conducted for Nassau and Suffolk Counties by the Nassau-Suffolk Regional Planning Board (see *Nassau-Suffolk Regional Planning Board*, p. 75).

Department of Agriculture.

Soil Conservation Service

SCS is responsible for developing and carrying out a rational soil and water conservation program in cooperation with land owners and users, community planning agencies and other government agencies. Technical help is provided to locally organized and operated conservation districts, such as the Suffolk County Soil and Water Conservation District. SCS has compiled a detailed soil survey of Suffolk County(83) which includes a description of the soils, discussions of suitable uses, and management possibilities for the soils (e.g. for crops, or wildlife) (see Soil and Topography, p. 11). The information provided for judging the suitability of the land for various uses is helpful to community planners, engineers, farmers, game managers, etc.

Interstate

Interstate Sanitation Commission. ISC was created by a 1941 compact between the States of New York, New Jersey and Connecticut for the abatement of existing water pollution and the control of future water pollution in the tidal waters of the New York metropolitan area(25). The area of ISC jurisdiction, the Interstate Sanitation District (ISD), includes western Long Island Sound and its estuaries and tidal waters as far east as Port Jefferson Harbor.

ISC functions chiefly as a coordinator of interstate problems. Its duties include: classification of waters by expected use, setting of standards for sewage discharges, review of effluent discharge permit applications, water quality monitoring, and planning and promoting construction of water pollution control projects within the ISD. The waters of Stony Brook Harbor are classified by ISC as Class "A": expected to be used primarily for recreational purposes, shellfish culture or the development of fish life (25).

ISC has the power to make rules, regulations and orders regarding the pollution of coastal, estuarine and tidal waters, including determining the adequacy of sewage treatment plants. It will help decide when and if the Stony Brook Harbor area will need a sewage treatment plant and, if a plant is ever constructed, would oversee its operation.

New England River Basin Commission. NERBC is a joint Federal-State agency (including Connecticut, Rhode Island, Massachusetts, Vermont, New Hampshire and Maine) concerned with development of the region's natural resources through coordinated planning of water and related land resources. Established in 1967 under the Water Resources Planning Act of 1965 (PL 89-80), NERBC is authorized to perform regional assessments of water and related land problems, assist in the implementation of flood plain management programs, and support the coastal zone management programs of the States(43).

Although New York State is not a member of NERBC, the Commission has undertaken projects involving New York waters, in particular the Long Island Sound Study, a Federally funded planning program

designed to produce a comprehensive plan for Long Island Sound and its shoreline. The Study examines water quality and supply, flood plain management, outdoor recreation, land use, marine transportation, biological and mineral resources, erosion and sedimentation, hydropower, shoreline appearance and the regional economy, and recommends management alternatives in each of these categories.

Implementation of the plan has to be a cooperative effort of State and local governments, who share authority over the use of the region's resources. The Study recommends that local governments develop plans and regulations based on guidelines developed by the States within the framework of their own coastal zone management plans(44).

Specific land use recommendations for the Stony Brook Harbor area include: 1) development of a public marina on Smithtown Bay, 2) construction of an artificial fishing reef in Smithtown Bay, and 3) use of the entire length of West Meadow Beach for public recreation. Most of the harbor shoreline is designated a "critical water-related land" area, in which future growth should be severely restricted. Most of the Stony Brook Harbor drainage basin is designated critical natural resource land offering a "scenic viewshed", which should be preserved(44).

Tri-State Regional Planning Commission. The T-SRPC was designated a comprehensive planning agency by interstate compact (New York, New Jersey and Connecticut) in 1971. As the official regional planning and coordinating agency for the New York Metropolitan Planning and Development Region in New York State (including Suffolk County) and for the parts of New Jersey and Connecticut lying within the greater New York metropolitan area, the Commission provides regional guidance, based on a generalized land use plan, for public decisions in the areas of housing, parks and recreation, and environmental management facilities.

T-SRPC recently conducted a study of coastal zone management perspectives for the tri-state region(77). The Commission studied the region's shoreline and made recommendations in the areas of marine environment, recreation, power generation, shipping, waste disposal and land resources, the goal being "to accomodate the economic, cultural and leisure needs of the Region's people requiring location in the coastal zone and guard, restore or enhance the natural character and functions of the coastal zone"(77). The study is very generalized, and specific locations such as Stony Brook Harbor are not considered. Recommended policy for the north shore of Long Island includes: limiting most residential and commercial development to non-shore areas; conservation of dunes, bluffs and wetlands; curtailment of shoreline filling; and expansion of swimming and boating within the tolerance of the natural environment.

Regional Plan Association. RPA is a non-profit citizens' planning organization serving the New York metropolitan area. RPA produced its first plan for the New York-New Jersey-Connecticut metropolitan region in 1929; the Second Regional Plan was completed in 1968. RPA has no official designation, such as that held by T-SRPC, and therefore must influence decision-makers through persuasion.

In a supplement to the Second Regional Plan, "The Future of Suffolk County"(59), RPA proposes the development of a "Suffolk Center" at the Stony Brook-Smithhaven Mall corridor, which would concentrate there most of the additional large offices and major shopping facilities and services the County will need.

New York State

Department of Environmental Conservation. The New York State Department of Environmental Conservation (NYDEC) is responsible for the protection and management of the State's water, land and air resources. Of interest to this discussion are the Department's duties

concerning marine and coastal resources, fish and wildlife, and water quality and supply.

Division of Marine and Coastal Resources

It is the duty of the Division to protect, manage and enhance the resources of the State's coastal zone, particularly the marine fish, shellfish, crustacean and algae resources, and tidal wetlands.

Bureau of Shellfish and Algae - The Bureau is authorized by the New York State Environmental Conservation Law (Sections 13-0301 to 13-0331) to regulate all phases of the shellfish industry, including: 1) conducting sanitary surveys of growing areas and designating areas certified or uncertified, 2) marking lands prohibited, 3) restricting the taking, handling and importation of shellfish, 4) issuing permits for commercial diggers, growers, shippers and processors, and 5) setting size limits and harvesting times and methods allowed for specific species. These regulations are enforced by Conservation Officers, State law enforcement officers responsible for enforcement of the Environmental Conservation Law.

All of Stony Brook Harbor and West Meadow Creek and adjacent areas of Smithtown Bay are certified and open for shellfishing. No State permit is required for clamming for personal use (up to 2 pecks per day). Anyone harvesting shellfish for commercial purposes must obtain a Digger's Permit.

The Bureau also conducts research in support of its shellfish management responsibilities.

Bureau of Finfish and Crustaceans - This Bureau has the responsibility of managing Long Island's finfish and crustacean resources. The management program includes the conducting of fisheries research and the regulation of salt water fishing and taking of crustaceans.

There are relatively few restrictions on fishing in Stony Brook Harbor. No license is required for sport fishing in marine waters. Minimum size limits have been set for a number of finfish species, but, with the exception of striped bass and summer flounder, they pertain only to commercial fishermen (ECL Sections 13-0333 to 13-0343). There is a minimum size limit for lobster, and neither lobster nor crab carrying eggs can be taken (ECL Sections 13-0329 and 13-0331). There is no commercial fishery for finfish or crustaceans in Stony Brook Harbor or immediately adjacent waters.

Division of Fish and Wildlife

Bureau of Wildlife - One of the duties of the Bureau is the regulation of all aspects of hunting, including the setting of: open seasons and bag limits for individual game species, hunting hours, restrictions on the use of firearms in hunting (location and type), and eligibility requirements for hunters (residency and age). The Bureau issues licenses for different types of hunting (ECL Sections 11-0701 to 11-0719, 11-0901 to 11-0931).

Waterfowl, considered migratory game birds, are the type of game hunted in the Stony Brook Harbor area. The State's management program is based on proposed species quotas developed by the U.S. Fish and Wildlife Service, based on data from the previous hunting season and from population surveys.

Division of Pure Waters

The Division enforces water pollution laws and administers water quality programs of the Federal and State governments. It issues permits for sewage disposal facilities for subdivisions of five lots or more, approves plans for municipal sewage treatment systems, and reviews and approves new or extended large volume water supply systems. Under the State Pollutant Discharge Elimination System (SPDES), the Division issues SPDES

permits, for the discharge of pollutants to surface and ground waters, which specify effluent limitations designed to meet water quality standards developed for that particular water body or supply. Suffolk County is unique, however, in that its Department of Health Services issues SPDES permits for the State (see *Department of Health Services*, p. 76). The Division also gives grants to municipalities for partial funding of sewage treatment plant construction.

The Division's planning function entails deciding which municipalities receive funding (under the Federal Water Pollution Control Act Amendments of 1972, Section 201) for facilities planning studies, which analyze the need for a publicly owned treatment facility and evaluate alternatives.

Office of Program Development, Planning and Research

The Water Quality Planning group of this Office handles most of the water quality planning performed by New York State. It is responsible for a number of programs required by the FWPCAA of 1972, such as the development of "basin plans" (Section 303) which identify water quality problems of a basin (in the case of Stony Brook Harbor, the Atlantic Ocean-Long Island Sound basin) and detail programs to alleviate those problems. It also funds comprehensive studies of wastewater disposal, e.g. the engineering study of sewage collection and treatment in the five western Towns of Suffolk County(4).

The Water Quality Planning group also helps local governments develop the legislation necessary to establish eligibility for Federal flood insurance under the National Flood Insurance Program.

Tidal Wetlands Program

Responsibility for administration of the New York State "Tidal Wetlands Act" (ECL Sections 25-0101 et seq.) is shared by three NYDEC units: Marine and Coastal Resources, Environmental Analysis and Fish and Wildlife. The Act requires NYDEC to make a detailed inventory of all tidal wetlands in the State, develop and administer land use regulations for inventoried wetlands, and enforce a moratorium on alteration of any tidal wetland or immediately adjacent area until the regulations become effective.

Any activity within or immediately adjacent to inventoried wetlands which may substantially impair or alter the natural condition of the tidal wetland area is subject to regulation. This includes, for example, any form of dredging, excavation, dumping or filling, and construction of any structure or road. At present, the inventory is nearing completion and draft land use regulations (issued in June 1976) are under review. These regulations specify which activities are compatible (or incompatible) with the different classifications of tidal wetlands and specify restrictions on new development in a wetland.

Any person proposing to alter the wetlands or adjacent areas of Stony Brook Harbor at the present time must show a hardship caused by the moratorium, and apply to NYDEC for a "moratorium permit. A hearing is then held, and if the proposed alteration is found not to be contrary to the policy of the Act, the Commissioner of NYDEC may permit it.

The permit procedure for any regulated activity will be much the same after the land use regulations have become effective. Any person aggrieved by the Commissioner's decision may seek judicial review in the Supreme Court of the county in which the tidal wetlands in question are located. The Commissioner and the State Attorney General are also empowered to take "all appropriate action" to abate the pollution of any tidal wetland (ECL Section 25-0503). The NYDEC Regional Offices may provide assistance to local governments in the development and implementation of management and protective

programs.

State Environmental Quality Review

The New York State Environmental Quality Review Act of 1975 (ECL Section 8-0101 et seq.) requires all public agencies in New York State (on State and local levels) to prepare an environmental impact statement for any action they propose or approve which may have a significant effect on the environment. The NYDEC Office of Environmental Analysis is required to adopt rules and regulations for implementing the provisions of the Act. The other government agencies must then adopt their own procedures, based on those developed by NYDEC.

The basic purpose of the Act is to give full consideration to protection of the environment in the early stages of the decision-making process. Opposition from many quarters has delayed implementation of the Act. A phased implementation schedule was developed: for actions directly undertaken by State agencies, a September 1, 1976 effective date; actions undertaken by local governments or funded by State agencies, June 1, 1977; all actions requiring permits or licenses from State or local agencies, September 1, 1977.

Department of Health. The Department of Health, under provisions of the New York State Public Health Law, supervises and regulates the sanitary aspects of water supplies and sewage disposal systems. As part of its duty to protect public water supply sources from contamination, the Department approves drinking water supply and sewage disposal facilities for subdivisions of five lots or more.

In order to protect the sanitary quality of the State's marine waters, the Department of Health requires the installation of toilet facilities at all public beaches (Public Health Law, Title 10, Chapter II, Section 6.15).

Department of State.

Division of State Planning

The Division is the New York State Office designated by U.S. NOAA to receive funds under the Coastal Zone Management Act of 1972 (PL 92-583), and is responsible for administration of the State's coastal zone management program. The first phase of the program includes the identification of policies and regulations to carry out the restoration, protection and preservation of New York State's coastal resources. The second phase involves development of implementation methods for the plan (i.e. the establishment of a regulatory program with respect to compatible land and water uses).

The Division has contracted with NYDEC and Nassau-Suffolk Regional Planning Board for technical assistance. The emphasis so far has been on identification of "critical" areas in the coastal zone, examination of water quality and supply, and provision for citizen participation.

Sea Grant Institute. The Institute is a consortium of SUNY and Cornell University, guided and funded by the National Sea Grant Program. It conducts research, and educational and advisory service work in order to resolve marine-related problems facing communities, the marine industry or the general public. An example of Sea Grant activities conducted on Long Island is the organization of a Citizen's Participation Committee which is making recommendations to governments involved in flood plain management and erosion protection for private property.

Office of General Services. This office is the trustee of tidal and submerged lands owned by New York State. It grants easements for their use and issues licenses for the removal of minerals, sand or gravel from them. Most of the bottom of Stony Brook Harbor and Smithtown Bay appears to be under the jurisdiction of this office (see *Ownership* and *Jurisdiction*, p. 66). The bottom land of the Harbor situated in the Town of Brookhaven is owned and controlled by the Town.

Sub-State

Nassau-Suffolk Regional Planning

Board. N-SRPB was established in 1965 to develop a comprehensive plan which could address the problems stemming from the area's rapid and almost uncontrolled development(26). The Comprehensive Development Plan (completed in 1970) emphasizes broad planning goals in the areas of: pace of development, employment opportunities, transportation systems, housing stock, and open space and the natural environment. Under the plan, the Stony Brook Harbor area is seen to continue supporting residential and recreational use, much the same as at present. Low density zoning (app. 1 housing unit per acre) is recommended for the Villages of Nissequogue and Head-of-the-Harbor; intermediate density (app. 2-4 housing units per acre) for Stony Brook. Clustering of future development is seen as a way to preserve open space, woods and scenic views. All of West Meadow Beach and Creek, Long Beach and the marsh islands in the harbor are set aside to be parks or conservation areas(37). The Plan, however, is only an advisory tool which must be implemented by local governments if the goals it has set are to be achieved.

N-SRPB is presently involved in two planning efforts which will have a direct impact on the future of Stony Brook Harbor, i.e. "208" and Coastal Zone Management(CZM) Planning. The Board is the coordinating agency for an Areawide Waste Treatment Management Study ("208" Study) funded at $5.2 million by U.S. EPA, under Section 208 of the Federal Water Pollution Control Act Amendments of 1972 (PL 92-500). The study area includes Nassau and Suffolk Counties, and work on the project is supposed to be completed within a two year time span (by the end of 1977).

The primary objective of the study is to determine how to achieve surface water quality standards through structural (e.g. sewage treatment plants) and non-structural (e.g. land use) solutions while preserving groundwater quality. This involves: 1) identification of point sources (e.g. sewage treatment plants, stormwater outfalls) and non-point sources (e.g. runoff, groundwater underflow) of pollution, and 2) economic, social and environmental analyses of alternative structural and non-structural solutions. The output of the "208" Study will be a twenty-year facilities plan for sewage treatment systems and recommendations for laws and legislation that would help the bi-county region meet the water quality standards set for its marine waters (mostly classified 'SA', to be fit for shellfishing and swimming).

Sophisticated computer models will be developed for a number of north shore harbors and bays. Stony Brook Harbor will not be modeled, because no identifiable water quality problems were found to exist there. The need for sanitary sewers and stormwater runoff control within the Stony Brook Harbor drainage basin will be examined, however (S. Robbins, personal communication).

N-SRPB is also participating in the CZM Program for Nassau and Suffolk Counties. The program is funded by U.S. NOAA under Section 305 of the Coastal Zone Management Act of 1972 (PL 92-583) through New York State Department of State, Offi of Planning Services, which subcontracts to N-SRPB and NYDEC. The first task undertaken by the Board was the definition of the coastal zone. The Board has defined the primary coastal zone as extending landward 1000 ft from Mean High Water or to the 10 ft contour, whichever is greater, and including contiguous freshwater wetlands, as defined by NYDEC. The secondary coastal zone for north shore harbors such as Stony Brook Harbor includes their drainage basins, approximated by a cultural feature, which for Stony Brook Harbor is the Long Island Railroad right-of-way. The second task, now underway, is the analysis of land and water uses having an impact on the marine environment, and the designation of priorities of uses in designated areas (34).

As part of the CZM Program, the Regional Marine Resources Council of N-SRPB (see below) is performing systematic analysis and coordination of dredging plans for Nassau and Suffolk Counties. The Council's Dredging Advisory Subcommittee, including representatives from the U.S. Army Corps of Engineers, NYDEC, Suffolk County Department of Public Works and the environmental departments of each Town, is examining past dredging performed, facilities presently available and their use, and possible future development and use based on the needs and resources of the area, for each marine water body in the two Counties (S. Robbins, personal communication).

The final CZM plan, including the dredging plan, will require approval of the Federal and State agencies also involved in the program. Implementation of the plan will depend on the cooperation of the State and local governments.

Regional Marine Resources Council

The Council was established by N-SRPB to advise it on matters of marine environmental concern, such as coastal erosion, dredging and spoiling, and wetlands management, and to design a research program aimed at organizing knowledge and data into a planning framework that would permit both rational and efficient decision-making. The Council's long range goal is to develop a planning model for the optimal utilization of Long Island's marine resources(41).

Suffolk County

Department of Environmental Control. Suffolk County DEC, created in 1971 by Suffolk County Local Law #3, is the County agency chiefly responsible for water pollution control. It is also authorized to develop and implement comprehensive solid waste disposal and water supply programs, to prevent and abate air pollution, and to assist local governments, institutions and industries in various environmental responsibilities, as requested by the County Executive.

SCDEC has jurisdiction over sanitary waste collection, treatment and disposal in the County. This includes responsibility for the planning, design, construction and maintenance of sewage disposal systems for County sewer districts, on behalf of the Suffolk County Sewer Agency, and for the inspection of public and private sewage treatment facilities. (The types of sewage disposal systems found in the Stony Brook Harbor area, i.e. cesspools and septic tanks, are not inspected.) Plans for water supply and sewage disposal systems for all new construction with a flow of under 30,000 gallons per day must be filed with SCDEC. (NYDEC and Department of Health handle those with greater flows. See *Department of Environmental Conservation*, p. 71 and *Dept. of Health*, p. 74).

Part of the Department's resource monitoring effort is the collection and analysis of marine water quality data. The bays and harbors of Suffolk County, including Stony Brook Harbor, are routinely sampled and the results compiled and distributed to other environmental agencies (see Physical and Chemical, p. 28).

Department of Health Services.

Division of Public Health

The Division of Public Health enforces the Suffolk County Sanitary Code and sections of the New York State Public Health and Environmental Conservation Laws. The Division has the power to act to safeguard life and health in the areas of sanitation and waste disposal.

Responsibilities of the Division include: review and approval of water supply and waste disposal systems for all new construction with a flow of under 30,000 gallons per day (NYDEC and Department of Health handle those with greater flows); approval of disposal systems for industrial and other wastes not discharged into municipal systems; issuance of SPDES (pollution discharge) permits for NYDEC (see *Department of Environmental Conservation*, p. 71); inspection of water quality at bathing beaches (both salt and fresh

water) and fresh water streams and lakes, drinking water supplies and private sewage disposal facilities; monitoring of municipal sewage treatment plants placed under the jurisdiction of SCDEC.

In areas adjacent to surface waters, such as the Stony Brook Harbor and West Meadow Creek shorelines, the Division enforces regulations requiring on-site stormwater recharge systems capable of handling 2-inch rainfalls before allowing overflow to waterways, treatment facilities for buildings in marshy or filled areas, and a 100 ft setback of buildings from surface waters.

Water quality at the Town beaches around Stony Brook Harbor is inspected by the Division each week during the swimming season, and the private beaches are sampled occasionally (see *Water Quality*, p. 25). The water quality of Stony Brook Creek at the Grist Mill is sampled periodically (once or twice per year).

Department of Public Works. Suffolk County DPW supervises the design, construction and alteration of docks, marinas, parks, preserves, beach erosion control projects and other such projects under the jurisdiction of the County. DPW also builds and maintains roads and drainage structures which are under County jurisdiction.

The DPW Division of Waterways is responsible for maintenance of County waterways, including the design and execution (or supervision) of navigational dredging projects, such as the one proposed for the entrance to Stony Brook Harbor (see Appendix B).

Planning Commission. The Suffolk Planning Commission is an advisory body to the County Executive and Legislature, and serves as a governing body of the Suffolk County Planning Department, setting policy and guiding studies undertaken by its staff. The Commission is responsible for developing a comprehensive plan for Suffolk County, and has adopted the Nassau-Suffolk Comprehensive Development Plan, with two minor exceptions (concerning tax structure and housing policy), for this purpose.

The Commission has zoning and subdivision review powers which enable it to strongly influence local development. Section 1304 of the Suffolk County Charter provides for review by the Commission of any municipal zoning actions, variances or special permits as well as subdivision plats: 1) within 500 ft of municipal boundaries, or of Federal, State or County lands, 2) within 500 ft of the shoreline (the Mean High Water line defining the shoreline boundary), or 3) within one mile of a nuclear power plant or airport. A denial of approval by the Commission can only be set aside by the courts.

Under the New York State General Municipal Law (Sections 239[k],[l],[m]), the Commission reviews all zoning actions and subdivision plats affecting property within 500 ft of State and County roads, parks, municipal boundaries and public properties. Disapproval by the Commission can be overridden by a majority plus one vote of the governing body of the originating municipality.

The Planning Commission also provides assistance to local governments (especially Conservation Advisory Councils) and the Nassau-Suffolk Regional Planning Board (e.g. input to the Areawide Waste Treatment Management, or "208", Study), and reviews and approves drainage plans and projects based on Suffolk County regulations concerning stormwater runoff.

Planning Department. The Planning Department staff conducts studies and performs administrative duties for the Planning Commission and the Regional Planning Board.

Council on Environmental Quality. The Suffolk County CEQ, part of the Office of the County Executive, is an advisory body which reports to the County Executive and Legislature on trends, projects and activities likely to have a significant impact on the quality of the environment

in Suffolk County. Any County agency planning a project or activity which will significantly affect the environment must submit a detailed statement, on the action's probable environmental effect, to CEQ for review. The agency contemplating action must wait until it receives a report from CEQ before proceeding (unless directed otherwise by the County Executive). CEQ submits comments on the statement to the County Legislature and Executive, as well as to the agency involved (Suffolk County Charter, Sections 115-117). CEQ has reviewed and commented on the statement prepared by the County Department of Public Works for its proposed dredging project for the entrance to Stony Brook Harbor (see Appendix B).

CEQ also makes recommendations for properties to be dedicated as a County nature preserve or historic trust.

Water Authority. The Suffolk County Water Authority constructs water supply facilities and conducts research on groundwater levels and quality in the County. In the Stony Brook Harbor area, drinking water is provided by a municipal supplier, private companies and individual household wells (see Space and Access, p. 58).

Department of Land Management. The Department of Land Management is responsible for land taken over by the County, such as parcels lost by their owners because of unpaid taxes. The Division of Farm Acquisition and Management helps select farms to be included in the County's Farmland Preservation Program. When the Program gets underway, the Division will also manage the County's interest in the farms.

Town

Brookhaven.

Town Board

Under New York State Town Law and Municipal Home Rule Law, the executive and legislative powers of the Town of Brookhaven lie with the Town Board, which is an elected body of officials. The Board's executive powers include the appointment of various Town officials (e.g. department heads), setting of fiscal policy and appropriation of funds. Its legislative powers, to adopt and amend ordinances and local laws and to promulgate rules and regulations for administering them, give the Town Board the ability to control present and future land use and a wide range of activities within the Town.

The Town Board regulates the use of land through enactment of zoning ordinances developed in accordance with a comprehensive plan, and divides the Town into districts, with uniform zoning regulations within each (Town Law Sections 261-265). Development of a comprehensive plan is the responsibility of the Town Planning Board (see below). The designated zoning districts for the Stony Brook Harbor area and the zoning regulations assigned to them are presented in Section *Stony Brook* (p. 13).

The enactment of local laws and rules and regulations, which become part of the Town Code, allows the Town Board to control many aspects of the uses of Stony Brook Harbor and the surrounding area (within the Town of Brookhaven) discussed in USES OF THE HARBOR (p. 51). The Town Boat Control Ordinance (Chapter 13, Code of the Town of Brookhaven) regulates the operation and mooring of boats in Town waters, i.e. sets speed limits (12 miles per hour in channels, 6 miles per hour in boat basins, anchorages and bathing areas, or as posted), designates acceptable mooring areas (e.g. outside of a channel), and requires observance of Federal requirements for marine sanitation devices for some boats. (Town Bay Constables and Harbor Masters enforce local, State and Federal regulations in marine waters. Due to a manpower shortage, however, enforcement in the Stony Brook Harbor area must be performed mostly by Suffolk County Police.)

Fishing and shellfishing are regulated by Chapters 10, 32, 57 and 105 of the Town Code. Only Town residents (and

some Islip Town residents) can harvest shellfish from Town-owned lands; a permit is required when taking shellfish for commercial purposes. Acceptable methods and times of harvesting, size of shellfish taken and amount of catch allowed are stipulated. Fishing in bays and harbors by means of nets is restricted to bait fish, taken with small nets, and fishing is prohibited in any Town park during bathing season.

Swimming is allowed only in waters certified by Suffolk County Department of Health Services (Chapter 62, Town Code). Hunting (i.e. the discharge of firearms or weapons) is prohibited in Town parks (Chapter 10), as well as within 500 ft of a dwelling (as stipulated by the State Environmental Conservation Law).

The structural aspects of building construction are regulated by Chapters 15, 35 and 40 of the Town Code. (The type and size of a building and lot area are specified in the zoning regulations.)

Board of Trustees

The members of the Town Board also serve as Trustees of the Town. They are technically responsible for the administration of publicly-owned Town lands, including bay bottoms, which they hold in trust for Town residents.

Zoning Board of Appeals

The Zoning Board of Appeals, appointed by the Town Board, hears and decides appeals to provisions of the Town zoning code (Town Law Section 267). In the presence of a hardship imposed by a zoning regulation, the Board is empowered to grant a variance (an authorization to use property for a purpose prohibited by the zoning ordinance) as long as it does not violate the spirit of the zoning ordinance. The decision of the Appeals Board is final and can only be changed in court.

Board of Waterways and Natural Resources/ Director of Environmental Protection

The Brookhaven Town agency responsible for management of the Town's environmental resources is presently undergoing reorganization. The Town Board has approved the formation of a Department of Environmental Protection (DEP), which will incorporate the duties of the Board of Waterways and Natural Resources (B of W&NR), the agency which has been handling most of the Town's environmental affairs. The B of W&NR was created in 1967 by local Law #3, and given responsibility for: 1) administering the Town's Marine Law (Local Law #2, 1967), which regulates dredging, removal and construction operations in the watercourses and wetlands of the Town; 2) maintaining an inventory of significant land and water resources of particular geologic, ecological or aesthetic interest; 3) advising the Town Board as to the best policies for the use, protection or development of the natural and aesthetic resources of the Town; 4) cooperating with other public and private agencies concerned with conservation of natural resources; and 5) promoting public understanding of Town policies in conserving natural resources. In 1975, the Town Board appointed a Director of Environmental Protection, who has been acting as the Executive Director of the B of W&NR.

The Town Board adopted a Wetlands Act in 1976, in compliance with the New York State Freshwater Wetlands Act (ECL, Chapter 24), and repealed the Town Marine Law, transferring many of the B of W&NR's duties to the Director of Environmental Protection. The Wetlands Act (Local Law #4, 1976), styled after the State Freshwater and Tidal Wetlands Acts, requires that a permit be obtained from the Town Board for any alteration of Town wetlands or adjacent areas, or for any other activity which substantially impairs any of the functions performed by wetlands, as listed in the Act. The DEP reviews permit applications and makes recommendations to the

Town Board. All of the marine wetlands of Stony Brook Harbor (in the Town of Brookhaven) and West Meadow Creek are covered by this Act. Individual freshwater wetlands have not yet been identified (NYDEC is conducting an inventory), but it is unlikely that any will be located ih the Stony Brook Harbor drainage basin. The Stony Brook Mill Pond and adjacent marsh areas probably are not large enough (a minimum of 12.4 acres is required) and are not of sufficiently unusual local importance for flood protection, wildlife habitat, erosion control, etc. to be covered by the Act.

The Director of Environmental Protection has also assumed the responsibility of the B of W&NR to prepare an environmental inventory of the Town, which can be used by the Town Planning Board.

A Shellfish Advisory Committee was recently appointed to help the DEP and the Town Board develop a comprehensive bay management program. The Committee is evaluating the utility of various management practices, such as transplanting clams from closed to open shellfishing areas in the Town's south shore waters, and licensing shellfish buyers and increasing the fee for a Digger's Permit. The Committee's attention is understandably focused on the extensive shellfish growing area on the Town's south shore, which includes Moriches Bay and much of Great South Bay, rather than on the relatively small growing areas on the north shore (G. Proios, personal communication).

Planning Board

The Planning Board, an appointed body, is chiefly an advisory agency to the Town Board. The major duties of the Planning Board are the development of a comprehensive plan for unincorporated areas of the Town, and preparation of zoning ordinances for the approval of the Town Board (Town Law, Sections 271-275). The Town Board has empowered the Planning Board to review and approve plats for proposed subdivision.

The Brookhaven Master Plan, adopted in 1975, presents objectives which the Planning and Town Boards found to be most desirable for the future development of the Town. Two of these objectives pertain specifically to the Stony Brook Harbor area: 1) preservation of significant and unique environmental features, especially those important to the maintenance of a potable water supply, and 2) preservation of sufficient open space in its natural state to maintain the Town's present high standard of environmental quality. Accordingly, the entire West Meadow Creek area presently undeveloped and the Stony Brook village waterfront and Mill Pond area south almost to Route 25A are proposed for use as parkland or open space, either through acquisition or cluster zoning(9). Most of this land was recently upzoned to "A-1" Residential, with a density of less than 1 1/2 houses per acre (see *Stony Brook*, p. 13).

The Planning Board often conducts studies of particular areas or topics in connection with preparation of a comprehensive plan or zoning ordinances. A 1962 study of Mt. Sinai Harbor and West Meadow Creek recommended acquisition of 92 acres of upland, wetlands and water at West Meadow Creek (approximately the area that is now the West Meadow Wetlands Wildlife Preserve)(10). A study of historic preservation conducted for the Planning Board (58) helped to lay the groundwork for the development of a Town Historic Districts Law, now under consideration by the Town Board, which would allow Town residents to apply for designation of their area as an historic district. Stony Brook village is one of the localities earmarked for possible official historic designation. (The only private house in the Town of Brookhaven which is a National Historic Landmark, the Mount House on Route 25A, is in Stony Brook.)

Building Department

The Chief Building Inspector enforces the zoning and housing ordinances of the

Town of Brookhaven and the New York State Building Construction Code, and issues building permits and certificates of occupancy.

Parks Department

The Parks Supervisor and the department staff are responsible for the operation and maintenance of Town-owned parkland, such as West Meadow Beach and Stony Brook Beach. Parks Department employees enforce a number of Town laws covering the use of parks.

Department of Culture and Recreation

The Recreation director supervises activities for Town residents, such as the swimming and water safety lessons offered at Town beaches.

Highway Department

The Superintendent of Highways, who is an elected official, is responsible for the maintenance and repair of highways controlled by the Town, and the installation and maintenance of associated drainage facilities. All of the recharge basins within the Stony Brook Harbor drainage basin are Town-owned and maintained.

Smithtown.

Town Board

The executive and legislative powers of the Town of Smithtown, as in the Town of Brookhaven, are vested in the Town Board, whose members are elected by the residents of Smithtown. The Smithtown Town Board's area of jurisdiction, however, does not extend to that part of the Town directly surrounding Stony Brook Harbor, which is within the incorporated Villages of Head-of-the-Harbor and Nissequogue. In New York State, an incorporated village is an autonomous governmental unit with a Village Board of Trustees that has much the same powers (including zoning) and duties as a Town Board. A Village's jurisdiction over adjacent surface waters extends 1500 ft from its shore (New York State Navigation Law, Section 46[9]). The entire water surface of Stony Brook Harbor is within the jurisdiction of the Villages. New York State Town Law, however, gives Towns the right to adopt and enforce regulations governing the taking of shellfish from Town waters and the use of Town beaches within 1500 ft of a Village's shore. In addition, Town-owned parks within the Village of Nissequogue come under the jurisdiction of Smithtown.

The Smithtown Shellfish Ordinance (Chapter 38 of the Town Code) specifies who may take shellfish and worms from Town waters, time of day and seasons during which they may be harvested, minimum size to be taken and the amount of catch allowed in one day. Only residents of Smithtown (including the Villages) are eligible to obtain shellfishing permits under this ordinance.

The Town-owned parks and beaches at Long Beach and Cordwood Path and the boat basin and mooring area at Long Beach, although within the Village of Nissequogue, are under the jurisdiction of the Town of Smithtown. Chapter 5 of the Smithtown Town Code regulates the use of Town parks, e.g. designates swimming areas within which no boat traffic or fishing are allowed, and bans hunting. Chapter 25 of the Code specifies how Town boat basins and mooring areas are to be used during the boating season (May 15 to November 15), i.e. designates where boats may be moored and specific types of moorings to be used, and prohibits flushing of toilets or dumping of refuse, and swimming, fishing and clamming in those areas.

The Town of Smithtown has adopted a Waterways Ordinance (Chapter 52, Town Code) and a Marine Law (Local Law #1, 1970) regulating, respectively, the mooring and operation of boats, and dredging, filling and construction operations in Town waterways. Although these, or equivalent, ordinances have not been adopted by the Villages, and thus do not officially apply to the waters of Stony Brook Harbor, the Villages generally abide by them (F.

Meyer, personal communication). The Waterways Ordinance specifies where, how and for how long boats may be moored, sets a speed limit of 5 miles per hour and prohibits water skiing completely and operation of boats near beaches. The Marine Law requires a permit for the removal or deposition of any material in a Town watercourse or wetland, and that a public hearing be held before a permit is issued.

Conservation Department/Conservation Advisory Council

The Conservation Department is the administrative and research arm of the Conservation Advisory Council (CAC). CAC was created by the Town Board in 1967 (Local Law #1, 1967) under provisions of the New York State General Municipal Law (Article 12F), to provide advice on the development, management and protection of the Town's natural resources. CAC must prepare an inventory of open space in the Town, including information on soil, topography and plant and animal life. The Conservation Department staff is conducting the inventory which includes biological and geological sampling in Stony Brook Harbor. When the inventory is complete and accepted, the Town Board can designate the Conservation Advisory Council a Conservation Board, giving it power to review applications for development which would have an effect on areas listed in the open space inventory. The CAC is also responsible, at present, for keeping an inventory of all wetlands within the Town and may recommend a management program for these lands to the Town Board.

Planning Board/Planning Department

The Planning Board and its staff (the Planning Department) act in an advisory capacity to the Town Board. The Planning Board is empowered to prepare a comprehensive plan and zoning ordinances, which must be approved by the Town Board, and to approve subdivision plats.

The Smithtown Master Plan, published in 1961, excludes the incorporated Villages, but does include Town-owned parkland in the Village of Nissequogue. Smithtown's Long Island Sound beaches are considered the Town's most important recreational asset and the plan anticipates a need for expansion of beach facilities at Long Beach, possibly through acquisition of the entire peninsula(68). The plan has not been updated, and the Town continues to make full use of its parkland at Stony Brook Harbor.

Department of Parks and Beaches

Three Town beaches within the Village of Nissequogue, at Long Beach, Little Africa and Cordwood Path Town parks, come under the jurisdiction of the Town of Smithtown. The Parks and Beaches Department is responsible for maintenance of Town parks and beaches, administration and operation of the Town-owned boat basins and mooring areas, and enforcement of Town laws concerning the use of parks.

Highway Department

The Highway Department is responsible for the maintenance and repair of highways controlled by the Town. Moriches and Long Beach Roads, two Nissequogue Village roads leading to Town parks and beaches on Long Island Sound and Stony Brook Harbor, are heavily travelled during the summer by Smithtown residents. The Village recently threatened to close Long Beach Road to boat trailers if the Town did not contribute to the maintenance of the road, which the Village claims is the Town's responsibility (Newsday, 7/7/76).

Village

Head-of-the-Harbor. The Village and Municipal Home Rule Laws of New York State give effect to the constitutional grant of home rule powers to Village governments. An incorporated village has the same basic home rule power as a Town, i.e. to assess and collect taxes, institute zoning ordinances, adopt local laws and promulgate rules and regulations for administering

them. Village residents must obey Town ordinances in areas not legislated by the Village. The Board of Trustees of the Village of Head-of-the-Harbor, elected by Village residents, controls land use within the Village through the adoption and enforcement of zoning, building and housing ordinances. The Village Trustees also have jurisdiction over mooring and operation of boats within 1500 ft of the Village shore (New York State Navigational Law Section 46[9]). Together, the Villages of Head-of-the-Harbor and Nissequogue control land use throughout that part of the Stony Brook Harbor drainage basin within the Town of Smithtown, and control surface water use for all of Stony Brook Harbor within Smithtown.

The zoning districts designated for Head-of-the-Harbor and zoning regulations assigned to them by the Board of Trustees are presented in *Head-of-the-Harbor*, p. 16. Local laws and regulations adopted by the Board of Trustees regulate housing, navigation and hunting. The Board adopted the New York State building construction and housing codes as the Village's codes. The speed limit for boating on waters within the Village's jurisdiction is 5 miles per hour. (The Village hires a policeman, together with the Village of Nissequogue, during the summer to enforce the speed limit and generally promote the safety of the people using the harbor.) Hunting is prohibited within the Village, except on private property and over 500 ft from a dwelling.

The Zoning Board of Appeals performs the same duties as a Town Board of Appeals, i.e. hears and decides appeals to the municipal zoning code (Village Law, Section 7-712). The Planning Board is empowered to review and approve subdivision plats (Section 7-728) and prepare a comprehensive plan (Sections 7-718 to 7-722). The Village has not adopted a master plan as of yet.

The Village has an environmentalist, one of its residents, serving voluntarily, who advises the Board of Trustees on environmental issues as they arise. The Building Inspector enforces the Village building construction and housing codes and issues permits and certificates of occupancy. The Board of Architectural Review advises persons intending to erect a structure in the Village on matters of architectural design and aesthetics.

Nissequogue. The Village of Nissequogue, like Head-of-the-Harbor, is most concerned with controlling land use within the Village. The Board of Trustees has adopted a zoning ordinance and divided the Village into zoning districts (see *Nissequogue*, p. 16). The Board has also adopted local laws and regulations regarding navigation, hunting, dune vegetation and beach vehicles. Nissequogue joined Head-of-the-Harbor in instituting a boating speed limit of 5 miles per hour for Stony Brook Harbor and in prohibiting hunting within the Village. In order to deal with the erosion problem along its Long Island Sound shoreline, the Village prohibits use of beach vehicles and destruction of dune and bluff vegetation.

The Zoning Board of Appeals and Planning Board perform the same functions as those of Head-of-the-Harbor. Nissequogue has also not yet developed a comprehensive plan.

The Board of Trustees has appointed a Committee on Conservation and Recreation, which manages the Nissequogue Wildlife Preserve on Long Beach and advises the Board on environmental matters. The Building Inspector enforces pertinent sections of the Village zoning ordinance, and issues permits and certificates of occupancy. The Highway Commissioner oversees the maintenance of Village roads.

Private Interest Groups

There are a number of citizens groups in the Stony Brook Harbor area, most of which are organized to represent or promote a particular constituency or activity.

There are several recreational

boaters' groups, the Stony Brook Yacht Club, Smithtown Bay Yacht Club, Smithtown Boating Association and Citizen's Committee for Improvement and Maintenance of Stony Brook Harbor, which represent the power boat owners' interests. These groups have initiated dredging proposals for Stony Brook Harbor, and have promoted them at Town Board meetings and in local newspapers.

The Stony Brook Harbor Association, a group of Smithtown residents (mostly from the Village of Head-of-the-Harbor), was formed, about 40 years ago, for the purpose of conserving and promoting the residential and recreational uses of Stony Brook Harbor; in particular, to prevent commercial sand and gravel mining in the immediate area. This group has been extremely active in the permit application stages of Suffolk County dredging projects.

The West Meadow Beach Association is composed of owners of summer cottages on West Meadow Beach. They organized in order to finance the construction and operation of a private water supply, and to negotiate with Brookhaven Town, their landlord. Sound View Association is a private homeowners group, located on the eastern shore of West Meadow Creek, which maintains a private beach and launching ramp on the creek and a private water supply. These two groups rarely take stands on any issues.

The Stony Brook Community Fund is a publicly supported charity which manages land and buildings given to it in trust (e.g. West Meadow Wetlands Wildlife Preserve, the village shopping center and the Grist Mill), and promotes and finances community development projects. The Fund's opinions probably command considerable respect from the Brookhaven Town government.

The Civic Association of the Setaukets, a group of citizens living just to the east of the Stony Brook Harbor area, represents the interests of private homeowners to local government agencies. It is a large and influential group. The Association spoke out against the proposed dredging of the Stony Brook Harbor entrance channel to a depth of 12 ft, which probably was a factor in the Brookhaven Town Board's rejection of the proposal (see Appendix B).

Conclusion

From the preceding discussion it can be seen that jurisdiction over use of the coastal zone is discontinuous. The bulk of decisions on land use around the harbor, principally zoning decisions, as well as many decisions concerning use of marine waters, are made at the local level. Federal and State governments exercise broad powers over the use of marine waters, but little over the use of land.

Communication and cooperation among the different levels of government is lacking. The Federal government provides leadership by developing national policies. Those policies must be implemented on the State and local levels, however, and these governments often resent what they consider intrusion by a "Big Brother". New York State regulates the use of resources held in the public trust, such as fish, shellfish, wetlands and clean water, for the benefit of all State residents. Under the constitutional grant of home rule, local municipalities are sometimes given power to regulate some of these same resources. Local municipalities are directly responsible to their electorate and consequently tend to look after their own interests. For example, the Towns and Villages continue to restrict access to the water, for recreational purposes, to local residents.

As a result of the problems briefly described above, there is no one official plan or policy to guide the present or future use of the Stony Brook Harbor resource as a whole. Any agency on a particular level of government wishing to

develop a management plan for the harbor would have to compile an inventory of government agencies' jurisdictions, powers and policies similar to the one presented here before it could accomplish its task.

SUMMARY

This paper has examined Stony Brook Harbor in order to illustrate one way in which information on a resource can be organized and evaluated so that it is in a form useful to environmental managers and planners. Acquisition of an information base should be the first step in the development of a management and planning program for any such resource.

Information was collected and organized under the following categories: definition of the resource; past, present and alternative patterns of use; compatibility of present uses; existing distribution of authority and responsibility; and present management and planning policies.

The image obtained of the Stony Brook Harbor resource is one of an environmentally well-endowed system, well suited to recreational and residential usage, which are the two major forms of human activity carried on there. A history of the harbor provides an understanding of how development in the area influenced the development of the harbor, and vice versa, with special emphasis placed on the dredging issue, the greatest source of past and present conflicts between users of the harbor. Governmental agencies, on Federal through local levels, have been given authority to regulate all uses of the resource and to plan its future development. There is no agreement on purpose or method, however, and the harbor is being managed piecemeal. Greater cooperation among governments and private interests involved is necessary before a comprehensive management plan can be developed.

An information base such as this would be useful in the development of management plans for other Long Island harbors and bays; it can be used to generate guidelines for making management and planning decisions at all levels of government.

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APPENDIX A: Salient Features of Water Quality Standards for Tidal Waters

Class	Floating solids; oil setteable solids; sludge deposits.	Garbage cinders ashes, oils, sludge or other refuse.	Sewage or waste effluents.	Dissolved oxygen.	Toxic wastes, colored wastes heated liquids.*	Organisms of coliform group.
SA Shellfishing for market purposes	None attributable to sewage, industrial wastes or other wastes.	None in any waters of the marine district as defined by State Conservation Law.	None which is not effectively disinfected.	Not less than 5.0 ppm.	None adversely affecting edible fish or shellfish or best usage.*	Median MPN not more than 70/100 ml. in shellfish growing areas.*
SB Bathing but no shellfishing	"	"	"	"	None adversely affecting edible fish, shellfish or bathing or best usage.*	N.A.
SC Fishing, but no shellfishing or bathing	None readily visible & attributable to waste; None which deleteriously increases amounts after reasonable dilution.*	"	N.A.**	"	None adversely affecting edible fish and shellfish or best usage.*	N.A.
SD Any use except shellfishing bathing fishing	"	"	N.A.	Not less than 3.0 ppm.	None adversely affecting survival of fish life or best usage.*	N.A.
I Fishing, but no shellfishing or bathing	"	"	Effective disinfection if required by Int. San. Comm.	Ave. not less than 50% sat. in any week; but not less than 3.0 ppm any time.*	None affecting edible fish or shellfish or best usage.*	N.A.

*Summary statement
**"N.A." is read "Not applicable".

From: Ortolano, Leonard. 1970. Quality standards for the coastal waters of Long Island, New York. The Center for the Environment and Man, Inc., Hartford, Conn. p. 14.

APPENDIX B

A HISTORY OF THE STONY BROOK HARBOR DREDGING ISSUE

Summary

Dredging was first proposed for Stony Brook Harbor nearly 100 years ago, in the early 1880's, when a few residents of Stony Brook asked the Federal government to dredge the harbor entrance to revitalize commerce in their community.

During the first half of this Century, sand and gravel companies which were then operating in several harbors along the north shore of Long Island attempted to secure permission to mine the valuable mineral resources that underlie Stony Brook Harbor and Smithtown Bay. In return for this privilege, these companies planned to pay a nominal royalty on the material removed to local governments, and to leave improved navigation channels when their mining operations were completed. Local opposition to the proposed projects was strong. A citizens group composed of area residents was organized for the purpose of preventing all commercial sand and gravel mining in Stony Brook Harbor and adjacent waters. The group exerted considerable influence through action in the political arena on the Town level, and apparently was instrumental in preventing the granting of permission for the projects.

In the years following World War II, dredging again became an issue in Stony Brook Harbor. Sand and gravel companies, however, were no longer in the forefront. Most dredging proposals originated with or were backed by local governments and recreational boating groups. The stated intent of most of the proposed projects was the construction of navigation channels and other recreational boating facilities. The harbor was dredged for the first time, to the benefit of recreational boaters, in the early 1950's. The final dredging project performed was completed in the mid 1960's.

In the late 1960's, a commercial sand and gravel company sought permission to set up mining operations at the entrance to Stony Brook Harbor. The local citizens group which had previously opposed similar projects was reactivated. Government environmental agencies also expressed opposition to the project, and the company ultimately withdrew its proposal.

During the 1970's, citizen groups and local governments challenged, on environmental and economic grounds, navigational dredging projects proposed by Suffolk County.

Discussion

Over the years, several dredging projects have been proposed for Stony Brook Harbor and Smithtown Bay. A discussion of the more important or interesting projects is presented below.

1860's

The first mention of a commercial sand and gravel operation in the Stony Brook Harbor area is for the year 1868, at which time "large quantities of gravel were taken from the beach at Crane's Neck and shipped to New York and other cities where it was used in smelting iron, in gravel roofs, and in the manufacture of sandpaper and glass. Fifteen to twenty thousand tons [9,900 to 13,000 m^3] were removed each season, which usually lasted from May to October. The gravel was valued at one dollar a ton on board ship at Setauket and brought two dollars or more in New York"(1). The exact location and extent of this operation could not be determined.

1878

The first mention of any dredging performed inside Stony Brook Harbor is found in the Town of Brookhaven records of 1878(7). In that year, the Brookhaven Trustees gave Floyd Stevens of New York sole privilege of removing and selling sand in Stony Brook Harbor from the westerly boundary of Smithtown to Crane Neck

Point for one year (for $10) plus the right to renew for 10 years (at $15 per year), which he did in 1879. Stevens was warned not to injure clam beds, uplands or the channel, and his privilege extended to the "medium high water mark." The latest mention of this agreement in the Town Records was in 1882, when Stevens paid the $15 fee for that year(7). No mention could be found of how much sand was removed, or from where and by what method it was taken.

1882

The U.S. Army Engineers made a preliminary examination of Stony Brook Harbor in 1882 as required by the River and Harbor Act of 1882. Some local residents were anxious to have the government halt "the filling up of the harbor and the shoaling of the entrance" by stabilizing the bluffs at Crane Neck and Nissequogue, and dredging the entrance channel. They felt the harbor would be "totally useless" in a short time if no action were taken(88).

An examiner from the U.S. Army Engineers concluded that the cost of "improvement" would be too great because it would benefit the commerce of a small community only. He recommended that a survey be made including an examination of currents and tides, and that a less expensive improvement program might be developed(88). No record could be found of any further action taken.

1909

The U.S. Army Engineers again made a preliminary examination of Stony Brook Harbor, as authorized by the River and Harbor Act of 1909. At that time, some Stony Brook residents petitioned the Federal government to "deepen" the harbor, offering to expend "a large sum" (app. $10,000) on harbor improvements if the entrance channel were dredged.

The examiner found the harbor not worthy of improvement at that time. His reasons were: 1) other harbors with well established waterborne commerce had more need, 2) the lack of commercial facilities in Stony Brook Harbor, and 3) the great cost of improving the entrance channel (because of protective works needed)(87).

It should be noted here that local residents in favor of harbor improvement cited the "filling up of the harbor" as the cause of the decline of commercial shipping at Stony Brook(87,88). They refer to the deep water harbor of earlier years that allowed the entrance of vessels of deep draft and made possible the vigorous trade of the first part of the 19th Century.

An examination of a hydrographic survey of the entrance channel performed by the U.S. Coast and Geodetic Survey in 1837 (Figure B-1) shows that the channel from Smithtown Bay to the Stony Brook dock was then much the same as it was in the late 1800's, or as it is today. B.F. Thompson, in his 1839 history of Long Island, said that Stony Brook Harbor could "afford shelter only to vessels of small burden on account of sand bars which extend from the extreme point of the sand spit across the channel"(76). The ship captains of the early 1800's handled the shallow channel by entering and leaving the harbor with the tide(27). When the shipbuilding industry was active in Stony Brook, wooden sailing ships of considerable size (e.g. an 800 ton three masted schooner) were built there. The shipbuilders also waited for proper conditions, such as the occurrence of a spring tide, to launch their larger ships(27).

1918

The Trustees of the Freeholders and Commonality of the Town of Brookhaven had signed a contract with McClellan Dredging Company of Brooklyn for removing sand and gravel from Stony Brook Harbor(64). The harbor was to be dredged to a depth of 12 ft, and the people of Stony Brook would be left a channel for "deep sea commerce"(2). According to an engineer hired by the Town of Smithtown to examine the contract, it was "loosely drawn and with practically all the benefits accruing to the ... Dredging Company." No minimum depth was

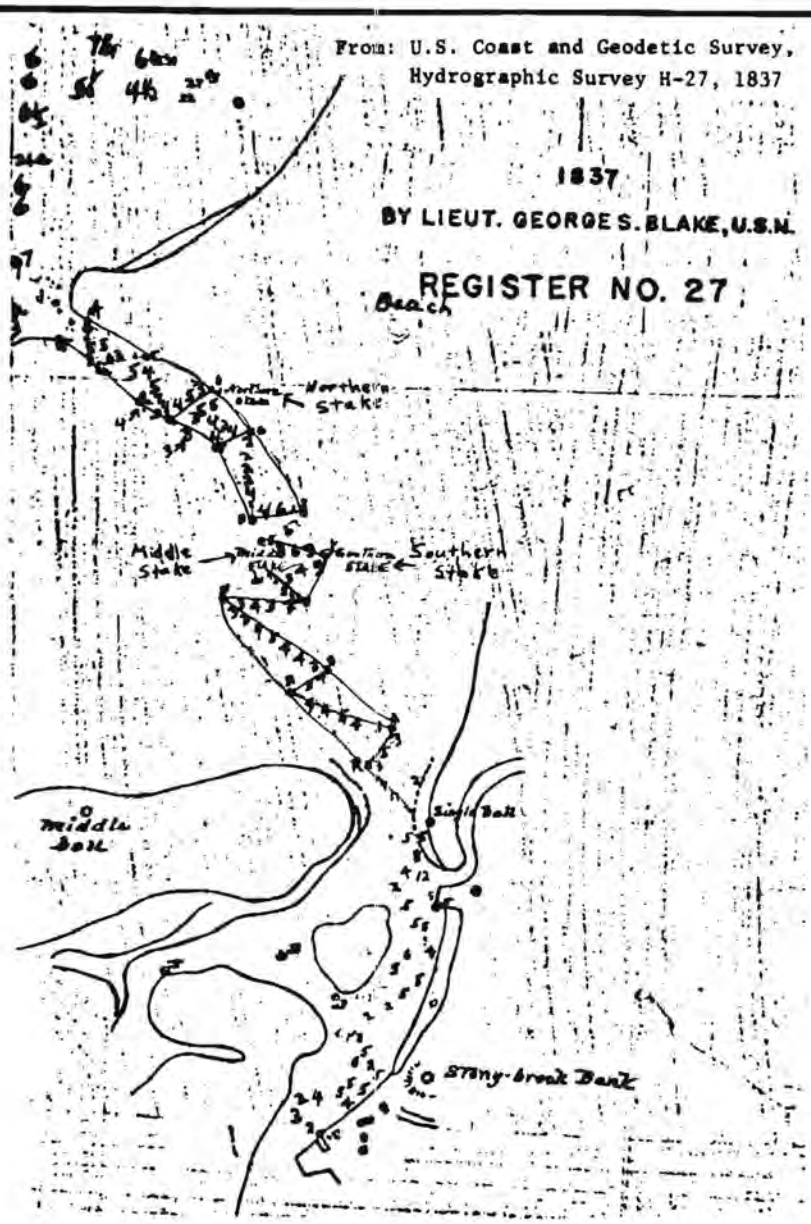

FIGURE B-1 HYDROGRAPHIC SURVEY OF STONY BROOK HARBOR ENTRANCE-1837

specified for the channel, no basin provided at the Stony Brook dock, and no bond required to guarantee performance. The dredging company was given the privilege of extracting an unlimited amount of sand and gravel from anywhere within the harbor, for a period of five years(64).

After an extensive public hearing, the U.S. Army Engineers denied the McClellan application for a permit because they found it too expensive ($1.5 million) to construct a bulkhead, and maintain the necessary channel into the harbor. Subsequently, the Town Board of Smithtown denied the application and plans for dredging were dropped(2).

1927-30

The Trustees of the Town of Brookhaven and the Supervisor of the Town of Smithtown had granted Robert F. Wells, Commodore of the Stony Brook Yacht Club, a license to "repair and excavate the channel in Stony Brook Harbor" for the purpose of improved navigation(23). In 1927, the Brookhaven Trustees renewed Wells' license, which he intended to assign to O'Brien Brothers Sand and Gravel Corporation of New York, who were operating in Port Jefferson Harbor at that time. This license allowed Wells to dredge a channel 42 ft deep and 300 ft wide (at the bottom), from the Stony Brook dock, through the harbor inlet, and into the Sound, a distance of over 7,000 ft. The dredging could be carried on for 5 years (17).

The Army Corps of Engineers issued Mr. Wells a permit to dredge as a matter of routine, without a hearing(17), noting that "It merely expresses the assent of the Federal government so far as concerns the public rights of navigation"(23). Wells then made application to the Town of Smithtown to renew his dredging license in the form approved by Brookhaven. He also circulated a petition to extend the dredging to the head of the harbor(2).

Smithtown held a public hearing on the matter in the summer of 1929(17). A group of local residents, led by a number of wealthy and influential individuals who owned property along the harbor, hastily formed "The General Committee of Six Hundred Residents and/or Taxpayers of Smithtown Township and Stony Brook and Environs organized in opposition to the granting of a license for the conducting of commercial sand and gravel dredging operations in Stony Brook Harbor"(71). "The General Committee of 600" filed an 18 page protest with the Smithtown Town Board, citing Stony Brook Harbor's value as a recreational and natural resource and warning against allowing sand and gravel companies to freely exploit the harbor's mineral resources(17). The Town Board denied Wells' application unanimously(2).

The General Committee of 600 then suggested to the Town Board that there be established a "Stony Brook Harbor and Nissequogue River Waterways Improvement Commission" consisting of local citizens, serving voluntarily, who would investigate conditions in Stony Brook Harbor and the Nissequogue River, with the help of engineers, and make recommendations on how the two waterways could be improved to safely accommodate light draft boats. The Smithtown Town Board accepted the offer. The Commission was formed mostly of original members of the Executive Committee of The General Committee of 600.

Late in 1930, the Commission submitted their report, the preparation of which had been financed by over $20,000 in contributions(2). This impressive, 2 volume report was both comprehensive and detailed, evaluating possible uses of Stony Brook Harbor in the framework of environmental, economic and social considerations. It would probably meet present day standards for an environmental impact statement.

The Commission had hired a retired Army Corps of Engineers Brigadier General, formerly head of the First New York Engineer District (among numerous other impressive positions) to examine the entrance to Stony Brook Harbor (and the

Nissequogue River). He recommended no more than a 4 ft channel into the harbor, believing that a deeper channel would require the construction of jetties(71). A local engineer surveyed the harbor from 700 ft south of the Stony Brook Yacht Club out to the 6 ft contour (MLW) in Smithtown Bay. He proposed the construction of a low maintenance channel 4 ft deep (MLW) and 200 ft wide from the Stony Brook Yacht Club to Smithtown Bay, app. 6100 ft in length, with a mooring basin at the yacht club. These harbor improvements, costing app. $52,000, were to be financed jointly by the Towns of Brookhaven and Smithtown(71).

No action was taken by the Smithtown Town Board on this proposal, and the matter of dredging the harbor was dropped for a few years.

1938

The Great Eastern Gravel Corporation applied to the Town Board of Smithtown in 1938 for a permit to dredge the entire mean low water surface of Stony Brook Harbor to a depth of 45 ft (a minimum of 12 ft) over a period of up to 20 years. In return for this exclusive privilege, they proposed to pay the Town of Smithtown 5¢ per cubic yard of gravel removed, app. $20,000 per year, with which the Town could dredge a channel in the Nissequogue River(2).

This proposal elicited quick and strong opposition from a group of Town residents, most of whom had actively opposed commercial dredging proposed for the harbor, about 10 years before, as members of The General Committee of 600. The citizens formed a new organization, which was incorporated in August of 1939 as the Stony Brook Harbor Association. The Association defined its purpose as: "to conserve and promote the residential, recreational and fishing uses of Stony Brook Harbor and adjacent waters in the Town of Smithtown and in connection therewith to prevent excavating or dredging in Stony Brook Harbor and in such adjacent waters by commercial sand and gravel companies"(2).

The Chairman of the Association prepared a two volume report, entitled "Smithtown's Waterways and its Residential Lands: Their Values and their Preservation", in opposition to Great Eastern Gravel Corporation's dredging proposal. The report related the fate of other North Shore harbors in which sand and gravel companies were operating, reviewed the sand and gravel industry on Long Island and presented the ecological, social and economic arguments against sand and gravel mining previously presented to the Smithtown Town Board in 1929 by The General Committee of 600.

The Great Eastern Gravel Corporation's application for a permit to dredge the harbor was denied by the Smithtown Town Board, and the company had to abandon its proposed project.

1940 to Present

During the 1940's, Suffolk County and the Towns of Brookhaven and Smithtown were anxious to have the Federal government help finance the dredging of the entrance to Stony Brook Harbor, which they considered desirable for navigation. As authorized by the River and Harbor Act of 1945, the U.S. Army Corps of Engineers made a preliminary examination of Stony Brook Harbor and in 1946 they issued desired plans of improvement (a 4-6 ft channel to the Stony Brook Yacht Club and a branch extending to an anchorage at Little Africa). In 1948, the National Rivers and Harbors Congress recommended that Stony Brook Harbor be surveyed by the Federal government(91), to determine if it warranted improvement. The U.S. Army Corps of Engineers surveyed the harbor that year and in 1950 issued plans of improvement almost identical to those of 1946. Despite letters of support for the project from prominent Stony Brook businessmen(32), the Supervisors of Brookhaven and Smithtown(22), and the Suffolk County Board of Supervisors(24), the improvement plans were not approved.

It was during the 1950's that Stony Brook Harbor was dredged for the first

time. (See Appendix C for an account of the projects performed.) Several dredging projects were proposed for the harbor during that decade, by local governments and private yacht clubs. These projects were, for the most part, on a smaller scale than those proposed by the sand and gravel companies in earlier years; they were designed chiefly to provide navigation channels, mooring basins and to construct marinas.

The Stony Brook Harbor Association remained active during this time and opposed those projects it thought would be detrimental to the harbor or were disguised commercial ventures (with the sand and gravel companies using local groups as a "front").

Around 1952, the Town of Brookhaven began negotiations with the Town of Smithtown to alter the section of the Town boundary that runs through Stony Brook Harbor out into Smithtown Bay. This part of the boundary had been disputed during Colonial times, until the two Towns reached a settlement in 1842 (see Boundary Dispute, p. 41). Late in 1953, the Town of Brookhaven started an action against the Town of Smithtown in Suffolk County Court to relocate judicially that part of the boundary line between the two Towns in and about the entrance to Stony Brook Harbor. Brookhaven claimed that the Town boundary could no longer be located because of changes in the harbor since the 1942 decision which settled the last dispute(51). If successful in its suit, Brookhaven would acquire jurisdiction over the entire water area at the mouth of the harbor between Long Beach and West Meadow Beach, and to a considerable area lying inside the harbor and off the Stony Brook Yacht Club, about 25 acres in all(14).

The Stony Brook Harbor Association believed that the Town of Brookhaven brought this action in order to put itself in a position to grant a license to a sand and gravel company for the exploitation of the mineral resources of the disputed area (from which they would receive a royalty) without the necessity of obtaining the concurrence of the Town of Smithtown.[1] The Association urged Smithtown officials to oppose the Brookhaven action, which they did. When the Town Board of Smithtown later considered a compromise with Brookhaven, the Stony Brook Harbor Association notified the Villages of Nissequogue and Head-of-the-Harbor, whose residents would be directly affected by a boundary relocation, of what they saw as a dangerous situation. The Villages received permission to intervene in the action as parties defendant after taking their request to the Appellate Division of the State Supreme Court(14).

The Brookhaven suit never came to court. The two Towns must have either settled quietly out of court, or let the entire matter drop. It appears that Brookhaven may have gained a small amount of territory, for the boundary line, as presented on topographic maps prepared by the Federal government, was shifted to the west between 1947 and 1967 (Figures B-2 through B-4), giving Brookhaven the right to dredge in front of the Stony Brook Yacht Club and through Hart Island.[2] No commercial sand and gravel operation was formally proposed for the harbor by Brookhaven.

During the years between 1952 and the early 1960's, despite the fact that the Towns and the Villages were arguing over the Town boundary, several navigational dredging projects were performed in the harbor by the two Towns and Suffolk County. (See Appendix C for a listing of them.) These projects appear to have been carried on without much controversy. However, some local residents expressed dissatisfaction with the way in which dredge spoil had been placed on the marsh islands near the harbor inlet during the 1958 and 1965 projects, creating a large and unsightly sand pile opposite the Brookhaven Town dock (Young's Island).

Several local residents claimed that the deeper, wider channels constructed in

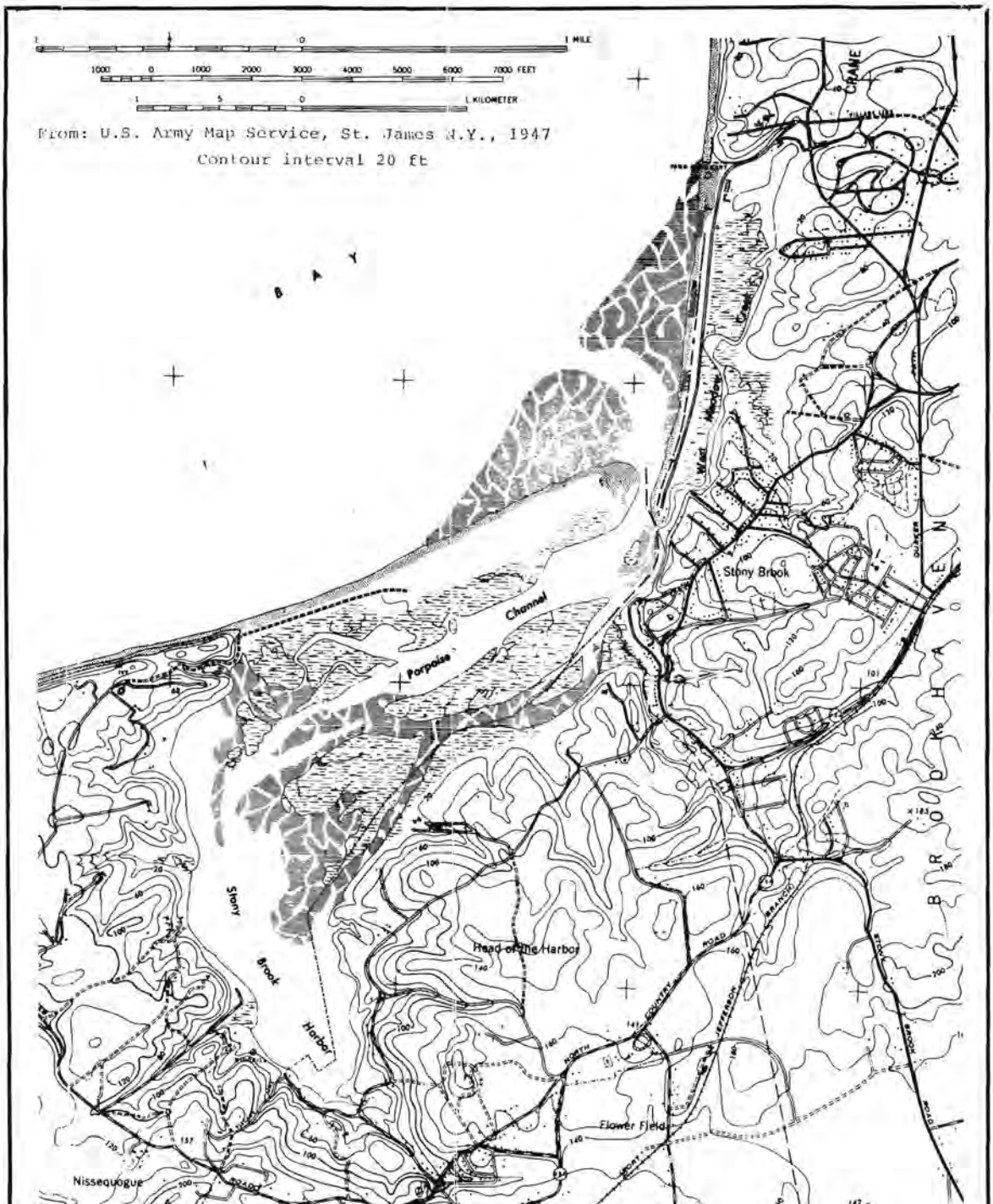

FIGURE B-2 TOPOGRAPHIC MAP--STONY BROOK HARBOR 1947

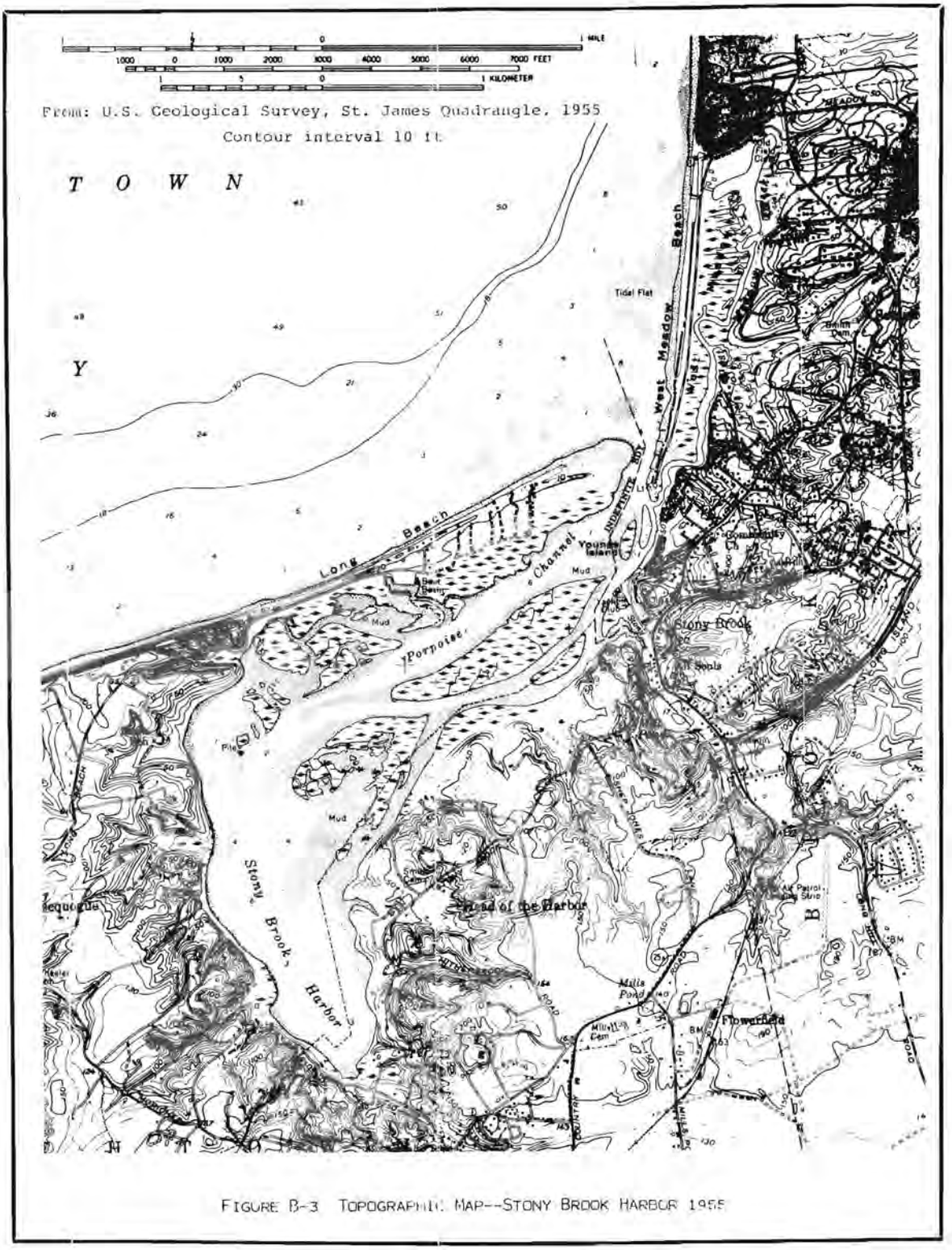

FIGURE B-3 TOPOGRAPHIC MAP--STONY BROOK HARBOR 1955

FIGURE B-4 TOPOGRAPHIC MAP--STONY BROOK HARBOR 1967

1965 allowed more water to drain from the harbor at low tide which, combined with deposition of silt during the dredging operation, created low water mudflats and shallow water conditions where they did not exist before(19).

In 1967, a commercial sand and gravel company, the Suffolk Dredging Corporation, petitioned the U.S. Army Corps of Engineers for permission to operate in Smithtown Bay. This firm had recently finished approximately two years of extremely controversial dredging in Mt. Sinai Harbor. Their proposal was for a 4500 ft channel leading from deep water in Smithtown Bay to the Stony Brook Harbor inlet, 400 ft wide and 40 ft deep MLW (backfilled to 14 ft MLW).

The Stony Brook Harbor Association, still active on the local scene, led a letter-writing campaign to the U.S. Army Corps of Engineers in opposition to the project, and also sent an 18-page formal protest. The U.S. Bureau of Sport Fisheries and Wildlife(84), New York State Conservation Department (Water Resources Commission), Town of Brookhaven, Village of Old Field(53) and Town of Smithtown(45) all went on record as opposed to the dredging project. The issue was dropped in 1968 when the Suffolk Dredging Corporation requested that further action be withheld on its application to the U.S. Army Corps of Engineers for a permit.

The most recent controversy over dredging in Stony Brook Harbor, which has not as yet been resolved, began in the summer of 1973. A group of boaters had requested earlier in the year that Suffolk County deepen the entrance channel to the harbor for easier access to Smithtown Bay. The Suffolk County Department of Public Works (SCDPW) proposed to dredge a channel app. 5000 ft long, 150 ft wide and 8 ft deep (MLW) from outside the harbor inlet across the flats to deep water in Smithtown Bay. The spoil was to be placed on nearby areas of Long Beach and West Meadow Beach.

The Stony Brook Harbor Association and the Villages of Nissequogue and Head-of-the-Harbor asked to be listed as "Parties in Interest" by NYDEC, which had to issue a Water Quality Certificate for the project (in accordance with the Federal Water Pollution Control Act Amendments of 1972). The New York State Tidal Wetlands Act went into effect on September 1, 1973, and the SCDPW was required to apply to NYDEC for a moratorium permit (see *Department of Environmental Conservation*, p. 71), which they did in November of that year. They also had to prepare an environmental impact statement for the project, to be submitted to the Suffolk County CEQ, in accordance with Article I of the County Charter.

Early in 1974, SCDPW altered its dredging plans by increasing the depth of the proposed channel to 12 ft. The 250,000 yd^3 of spoil expected to be produced was to be placed along the Town of Brookhaven's West Meadow Beach, to nourish it.

Opposition to the revised project was voiced by citizens and local governments, including the Stony Brook Harbor Association, the Villages of Nissequogue, Head-of-the-Harbor and Old Field, Crane's Neck Association, and the Civic Association of the Setaukets. Their opposition was based on both environmental and economic grounds. There was fear that: a larger entrance channel would increase the tidal range inside the harbor, creating mud flats at low tide; the harbor would "silt in", upsetting the ecological systems the harbor supports; and, there would be increased pollution from greater boat traffic. Some opponents believed that the project, at an estimated cost of $250,000, favored a few boaters with very large boats, and was not required by the majority of harbor users (19).

Boaters who supported the proposed dredging felt that the condition of the entrance channel, which had shoaled in spots to less than 3 ft deep at low tide, posed a hazard to navigation and made access to the harbor at low tide virtually impossible for all but the smallest

(shallowest draft) boats.

Suffolk County DPW applied to the Towns of Brookhaven and Smithtown and the U.S. Army Corps of Engineers for permits to perform the 12 ft version of the project. The Brookhaven Board of Waterways and Natural Resources, the Town's environmental advisory agency, believed that the probability of environmental damage outweighed the "vanishing small benefits" to be obtained from the project, and they recommended that the Brookhaven Town Board disapprove the dredging proposal(69). This recommendation, along with the considerable amount of opposition to the project, prompted the Town Board to approve only maintenance dredging of the existing entrance channel to a depth not to exceed 6 ft MLW.

Smithtown's environmental advisory group, the Conservation Advisory Council, after conducting their own investigations in the area to be dredged, advised their Town Board that only spot dredging should be done, to a maximum depth of 4 to 5 ft in three shallow areas(31). At that time, late in 1974, the Town Board did not make a decision.[3]

The Smithtown CAC reviewed the project again the following year and made the same recommendation as before. The Smithtown Town Board, however, apparently believed that the extra foot (the difference between a 5 ft and a 6 ft deep channel) did not make that much difference, for, early in 1976, they voted to allow maintenance dredging to a depth of 6 ft, in concurrence with the Town of Brookhaven.

A number of steps still have to be taken before the dredging project can be performed. The U.S. Army Corps of Engineers has yet to make their decision (probably preferring to wait until the lower levels of government have made theirs). And Suffolk County DPW has not yet arranged with NYDEC to hold a Tidal Wetlands Act moratorium hearing on their permit application. (The hearing had been scheduled three times, but SCDPW cancelled it each time.) When, and if, the Federal, State and County governments approve the dredging, there is still the matter of funding; Suffolk County must include the necessary funds in its capital budget. Considering the present depressed state of the economy, it will probably be very difficult to obtain funding for projects such as this in the foreseeable future.

Conclusion

The dredging issue has been an important factor in the development of the Stony Brook Harbor area. Over the years, there have been a number of proposals to alter the harbor in order to make it more accessible to larger, deeper draft boats, and to mine the valuable sand and gravel from the harbor bottom. The way in which controversies surrounding these dredging proposals were settled, that is, the decisions made by local governments as to whether the harbor should be dredged and, if so, how much, by whom and for what purpose, has been largely responsible for the continued use of the harbor for exclusively recreational and residential purposes.

Recommendations

Before any new dredging projects are performed, either at the entrance channel or inside the harbor, in order to facilitate limited recreational use of the harbor by shallow draft boats, the following steps should be taken: 1) investigate the exact cause of problems with the channel; 2) take soundings of the area in question, over the course of a year, to observe the movements of the channel; 3) see if improvement of navigational aids will remedy the problem (e.g. do channel markers always, or ever, mark the deepest water?); 4) if dredging is necessary, perform spot dredging (removal of shoals), to minimize environmental disruption; 5) if spot dredging is not sufficient to solve

the problem, perform a detailed impact statement, specifically including a study of the tidal ranges in the harbor system, with an estimate of the impact dredging will have on them, and determination of the best location to deposit the spoil (e.g. on the eroding Bay beaches of Long Beach, above mean high water).

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[1]In 1952, the Town of Brookhaven had Suffolk County prepare a map of Stony Brook Harbor which showed how much the estimated gravel deposits in the disputed area were worth(14). In 1953, a member of the Stony Brook Yacht Club, who was influential in Brookhaven Town affairs, brought the president and the chief engineer of a sand and gravel company to speak to members of the yacht club. These two people said that if their company were allowed to set up operations in Stony Brook Harbor, they would expect to be there at least five years(74).

[2]If the U.S. Coast and Geodetic Survey 1837 hydrographic survey of Stony Brook Harbor were used to locate the boundary between Brookhaven and Smithtown decided upon in 1842, that boundary would hug the eastern shore of the harbor all the way from in front of the Stony Brook dock into the inlet, swinging westward over the flats of Smithtown Bay. This is roughly the boundary shown on the 1947 quadrangle sheet (Figure B-2).

The southern part of the boundary, following Stony Brook Creek as it drains into the harbor, has been altered over time also. Old time residents of Stony Brook (born there in 1877 and 1885) had testified that the creek used to enter the harbor where the Stony Brook Yacht Club now stands (and as shown in Figure B-2), and that it was diverted to the southwest by shoreline excavations and fills(74).

[3]Late in the summer of 1973, soon after Suffolk County DPW announced its plans for dredging the entrance to 8 ft, the Smithtown Town Board passed a resolution approving the project. This action, however, was in direct violation of the Town's Local Law #1, 1970 regulating dredging and filling operations in Town watercourses and wetlands (see *Brookhaven*, p. 78), and therefore was not valid.

APPENDIX C

DREDGING AND SPOILING PERFORMED IN STONY BROOK HARBOR AND WEST MEADOW CREEK AND ITS EFFECT ON THE WETLANDS

During the 1950's and 60's, several dredging projects were performed in Stony Brook Harbor for the benefit of recreational boaters. The following is a listing of the projects with a description of each, including performing organization, location and specifications, and location of spoil disposal. The effect of each project on the wetlands, i.e. acreage destroyed through dredging and/or spoiling, is also presented.

1. 1953 - Town of Smithtown Boat Basin and Approach Channel at Long Beach

Suffolk County excavated and constructed a boat basin on the southern shore of Long Beach (128 m [420 ft] long, 40 m [130 ft] wide, 1.5 m [5 ft] deep at Mean Low Water), and dredged an approach channel from Porpoise Channel (412 m [1350 ft] long, 15 m [50 ft] wide, 1.5 m [5 ft] deep at MLW) (Figure C-1). Approximately 5 acres of salt marsh were removed in the process. The spoil was deposited on app. 15 acres of adjacent wetlands, between the MHW and MLW lines[1] (Figure C-2).

2. 1953 - Channel From Harbor Inlet to Town of Brookhaven Dock

The Town of Brookhaven dredged a channel from the harbor inlet, south to the northern end of the Town dock at Stony

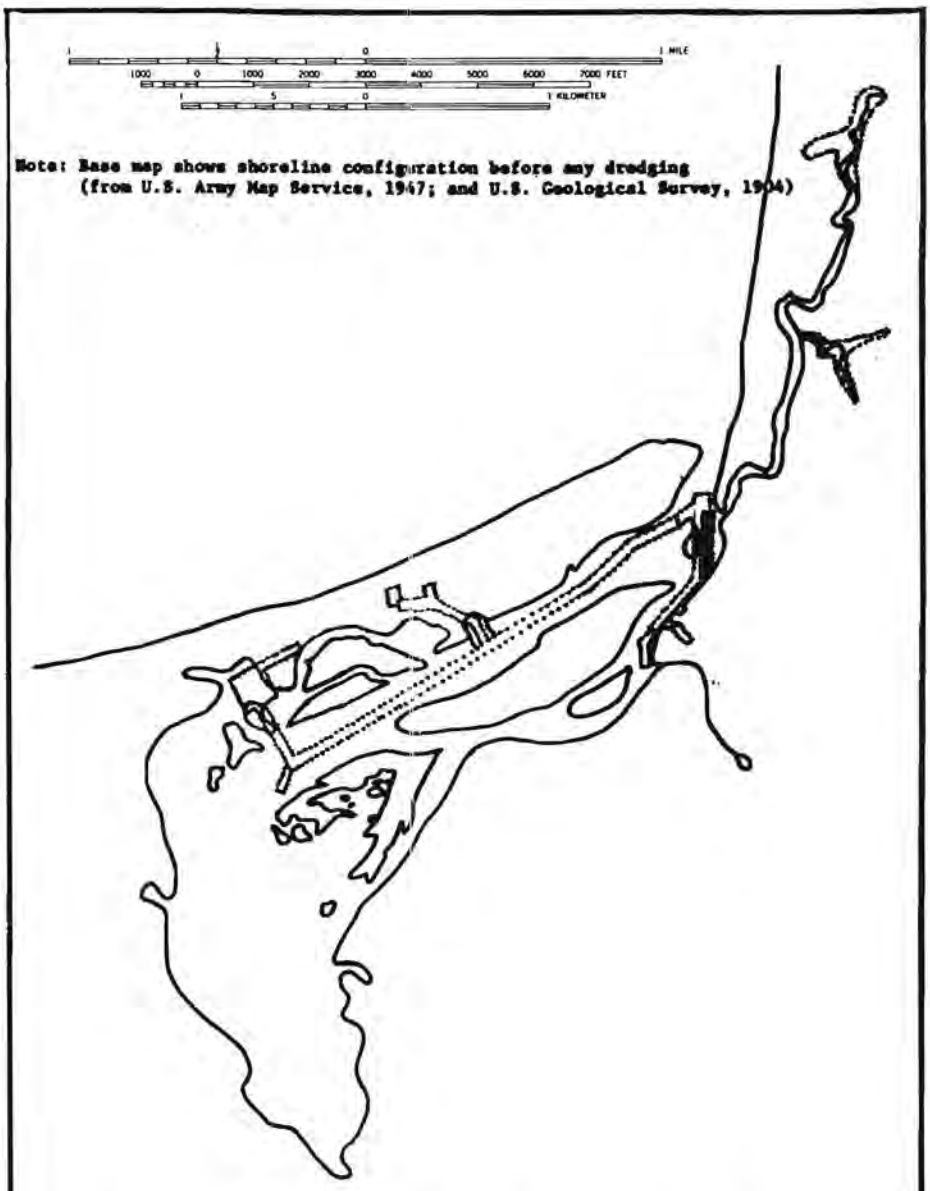

FIGURE C-1 LOCATION OF DREDGING PROJECTS--STONY BROOK HARBOR AND WEST MEADOW CREEK

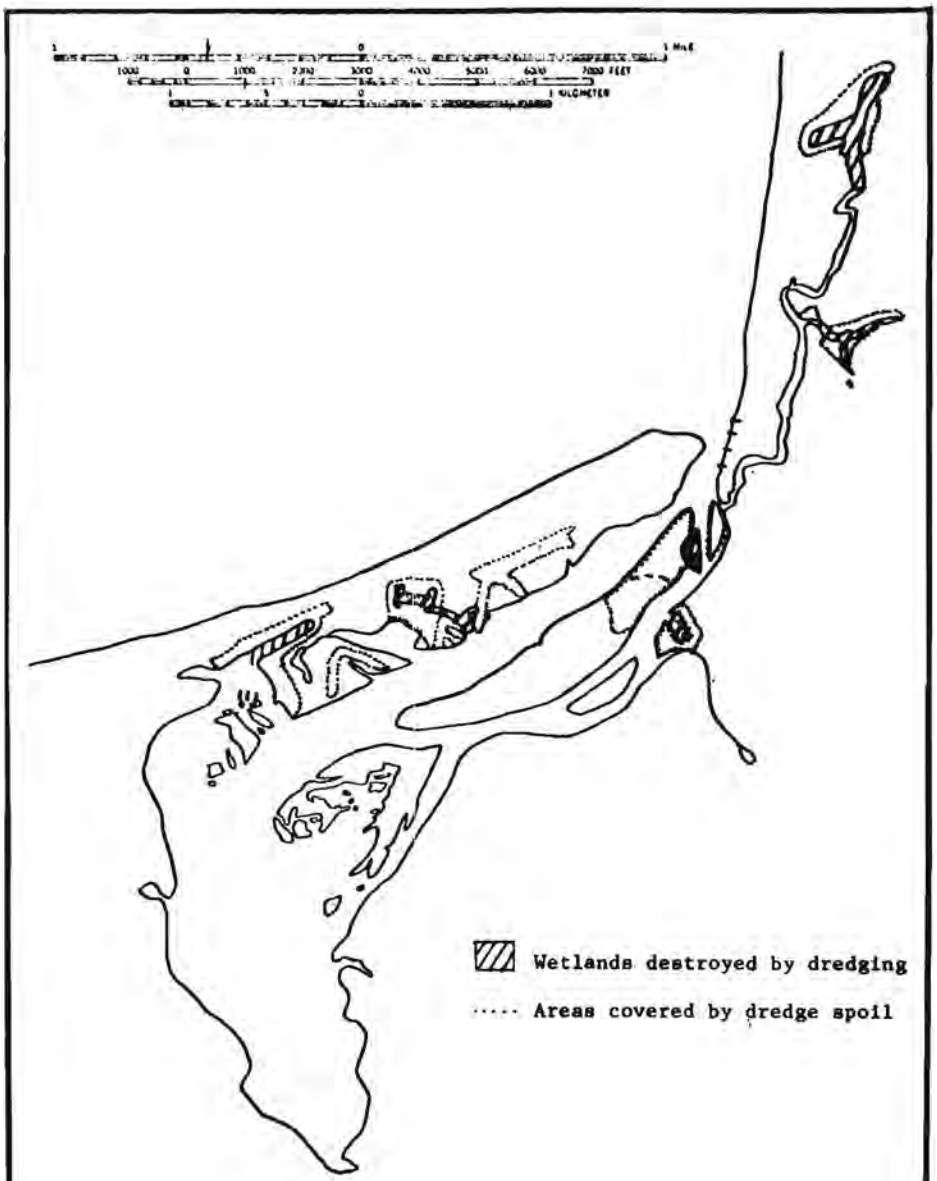

FIGURE C-2 WETLANDS DESTROYED BY DREDGING AND FILLING
--STONY BROOK HARBOR AND WEST MEADOW CREEK

Brook (366 m [1200 ft] long, 12 m [40 ft] wide and 1.5 m [5 ft] deep at MLW). The spoil was placed on the Town of Brookhaven beach at Stony Brook, on app. 1.5 acres of the marsh island directly south of the inlet (Hart Island) and on almost 3 acres of the shoal area between Hart Island and the beach.

3. 1958 - Porpoise Channel and Town of Smithtown Mooring Basin

Suffolk County dredged Porpoise Channel for almost its entire length (2440 m [8000 ft] long, 31 m [100 ft] wide, and 1.8 m [6 ft] deep at MLW), and a lateral channel (397 m [1300 ft] long, 46 m [150 ft] wide and 1.8 m [6 ft] deep at MLW) was dredged. About 4 acres of salt marsh were removed to make the mooring basin and the lateral channel. The spoil was deposited on app. 15 acres of the Long Beach wetlands north of the channel and app. 20 acres around the mooring basin and lateral channel.

4. 1958 - Channel From Harbor Inlet to Stony Brook Yacht Club

Suffolk County dredged a channel for the Town of Brookhaven from the harbor inlet south to Stony Brook Yacht Club (824 m [2700 ft] long, 46 m [150 ft] wide, and 3.7 m [12 ft] deep at MLW, and 76 m [250 ft] wide for its northernmost 92 m [300 ft]). About 2 acres of salt marsh on Hart Island were removed. The spoil was put on the westerly side of the channel on 3 acres of Hart Island and on 10 acres of the large marsh island, and on 7 acres of harbor bottom between the two, as well as to the east of the channel on a shoal area.

5. 1958 - Approach Channel to Town of Smithtown Boat Basin on Long Beach (Maintenance)

Suffolk County re-dredged a portion of this approach channel, off of Porpoise Channel, to a depth of 1.5 m (5 ft) at MLW. The spoil was deposited on 3 acres of the adjacent wetlands.

6. 1961 - Smithtown Bay Yacht Club at Long Beach

Smithtown Bay Yacht Club constructed a private marina adjacent to the Town of Smithtown marina on Long Beach. They dredged an irregular area (app. 107 m [350 ft] long and 15 to 31 m [50 to 100 ft] wide) to a depth of 1.2 m (4 ft) at MLW. The spoil as deposited on 3 acres of the adjacent wetlands.

7. 1965 - Channel From Harbor Inlet to Stony Brook Yacht Club, Porpoise Channel and Approach Channel to Town of Smithtown Boat Basin on Long Beach (Maintenance, Nominally)

Suffolk County re-dredged five areas of the harbor:

a. the channel from the inlet to the Town of Brookhaven dock to a depth of 4 m (13 ft) at MLW. The spoil was deposited to the west of the channel, forming the 15 acre mound of sand called Young's Island.

b. Stony Brook Yacht Club basin (183 m [600 ft] long, 22.9 m [75 ft] wide and 2.8 m [9 ft] deep), the channel in front of the Yacht Club and further south (275 m [900 ft] long, 31 to 46 m [100 to 150 ft] wide and 2.4 to 2.8 m [8 to 9 ft] deep at MLW). The spoil was placed on 4 acres of wetlands southwest of the Yacht Club.

c. Porpoise Channel near the inlet (519 m [1700 ft] long, 31 m [100 ft] wide, 2.8 to 3.1 m [9 to 10 ft] deep at MLW). The spoil was deposited on Young's Island.

d. Porpoise Channel and the approach to the Town of Smithtown marina. The spoil was added to older spoil piles on the wetlands at Long Beach.

e. south of the Town of Smithtown mooring basin (336 m [1100 ft] long, 31 m [100 ft] wide, 2.1 to 2.8 m [7 to 9 ft] deep at MLW). The spoil was put on areas of the

surrounding marsh islands already covered by spoil.

The dredging history of West Meadow Creek is slightly different than that of Stony Brook Harbor. The major modification of the creek took place earlier in the 20th Century, and considerably altered the configuration of the creek. The dredging and filling were not done by local governments but by private citizens for private use. But as in the harbor, probably the most important impact of this alteration was the reduction of wetland acreage in the creek.

The following is a list of dredging and filling projects undertaken in West Meadow Creek:

1. 1920's - The Northern End

A local development concern, owned by Ward Melville, dredged the northern 400 m (1312 ft) of the creek to form an irregularly shaped basin app. 550 m (1800 ft) long, 100 m (328 ft) wide and up to 6.1 m (20 ft) deep in spots, and to enlarge the creek for 250 m (820 ft) below the basin to a width of 80 m (260 ft) and a depth of over 3.1 m (10 ft) (Figure C-1). About 35 acres of salt marsh were either dredged out or covered with spoil (Figure C-2). The purpose of this project was to form a boat basin (which would have been connected to Smithtown Bay by a cut through West Meadow Beach) and to provide fill for the marshland surrounding the basin.

2. 1950's - Aunt Amy's Creek

About 500 m (1640 ft) of the Aunt Amy's Creek section of West Meadow Creek was dredged by the builders of the Stony Brook Shores development, to a width of app. 50 m (164 ft) and to a depth of from 0.9 to 2.4 m (3 to 8 ft). The spoil was utilized as fill for the section of the housing development adjacent to the creek and some was left in a pile at the point where the creek meets West Meadow Creek. Approximately 7 acres of salt marsh were removed by the dredging.

A total of about 0.5 km^2 (120 acres) of the close to 2.3 km^2 (560 acres) of wetlands originally in Stony Brook Harbor and West Meadow Creek were destroyed by the dredging and filling projects and spoiling practices outlined above. In the harbor, app. 0.3 km^2 (70 acres) were covered by spoil and another 0.05 km^2 (10 acres) were dredged out. In the creek, app. 0.15 km^2 (40 acres) were either dredged or covered with fill.

This may seem like a lot of wetlands destroyed, but Stony Brook Harbor and West Meadow Creek have fared better than most other north shore harbors. Mt. Sinai Harbor, for example, lost 60 percent of its wetlands to sand and gravel companies between 1955 and 1968(52). Stony Brook Harbor and West Meadow Creek still have substantial tracts of healthy, undisturbed wetlands which help to make the area the beautiful and biologically productive place it is.

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[1]It is not possible to determine the exact acreage of wetlands affected by each project because it is difficult to tell when each spoil pile was placed on the wetlands and how often spoil has been put on the same spot.