3 Suffolk County Background Information

3.1. General Physical Data

The geographical extent of this DGEIS is all of Suffolk County. This includes the Orient Point Mosquito Control District, although the County has no responsibility for vector control activities there, and FINS, where NPS and the County are still determining the exact scope of mosquito control to be conducted. The concepts, approaches, choices, and conclusions made for the rest of the County appear to be applicable in these two areas. The County believes that the Orient Point District might wish to avail itself of the work conducted as part of this project, and consider revamping its approach to vector control. Similarly, although NPS has special restrictions regarding its ability to manage natural processes, the general conclusions regarding impacts associated with potential means of mosquito control drawn for the rest of the County will apply on the barrier beach and William Floyd Estate, as well.

Certain areas were used to determine the effects of the proposed action. This focused approach allowed for stronger conclusions to be drawn regarding potential impacts. The potential impacts and mitigations of those impacts were expanded to a County-wide extent as part of the impact assessment; nonetheless, most of the effort associated with the project was expended on the four "risk assessment" areas, the 21 "primary study" areas, and at the OMWM demonstration site at Wertheim National Wildlife Refuge. The effects described for these sites were assumed to be transferable to the remainder of the County.

This section briefly describes environmental and demographic attributes of the County as a whole. The pertinent aspects of the 26 study sites are described in Section 4 and Section 5, below, and the discussion of wetlands was particularly expanded in Section 5.

3.1.1. Long Island Geography

Long Island consists of unconsolidated sediments lying above the bedrock platform. The unconsolidated materials were laid down over essentially three time periods. Two basal layers were deposited in the Cretaceous Era (60 to 100 million years ago). These sediments consist primarily of sands and clays eroded and deposited along a continental margin. Beginning at an elevation of approximately 100 feet below mean sea level (msl), sands, gravels, clays and tills were deposited by the Pleistocene glaciations unconformably over the older materials (Nemickas et al., 1989).

Surface features on Long Island were demonstrably shaped by glacial forces, although the exact mechanisms that formed the overall topography are in dispute. One well-regarded theory is that the southern-most line of hills across Long Island marks a terminal moraine associated with the last (Wisconsinan) continental glacial advance and retreat (Sirkin, 1980). The glaciers arrived at Long Island less than 25,000 years ago, and left approximately 20,000 years ago (some dates are as late as 18,000 years ago, and some are as early as 22,000 years ago) (Schaefer et al., 2005).

The terminal moraine associated with the Wisconsinan glacier is commonly referred to as the Ronkonkoma moraine, and in Suffolk County it extends from West Hills Park in Huntington, southeasterly through Ronkonkoma, Manorville, Southampton and out to Montauk Point. The northern moraine, along the Long Island Sound shore line out through Plum Island and Fishers Island, is called the Harbor Hill moraine, and is thought to have been created as a recessional moraine after the Ronkonkoma moraine. There are at least two interlobate features (West Hills and Dix Hills), and other recessional moraines have been described along the north shore of the South Fork, and forming the islands found in the Peconic Bay system (Robins Island, Shelter Island, and Gardiners Island) (Sirkin, 1980). Use of a Digital Elevation Model (DEM) to assess small changes in elevation by researchers such as Bennington (Hofstra University) and Hanson (Stony Brook University) have resulted in some rethinking of the standard model. A DEM of Suffolk County is shown in Figure 3-1. Interpretation of the DEM suggests that multiple advances of the glacier from different directions may have been the cause of many of the moraines, and that the Ronkonkoma moraine appears to be much older than the more northern moraines (as they appear to overlie it).

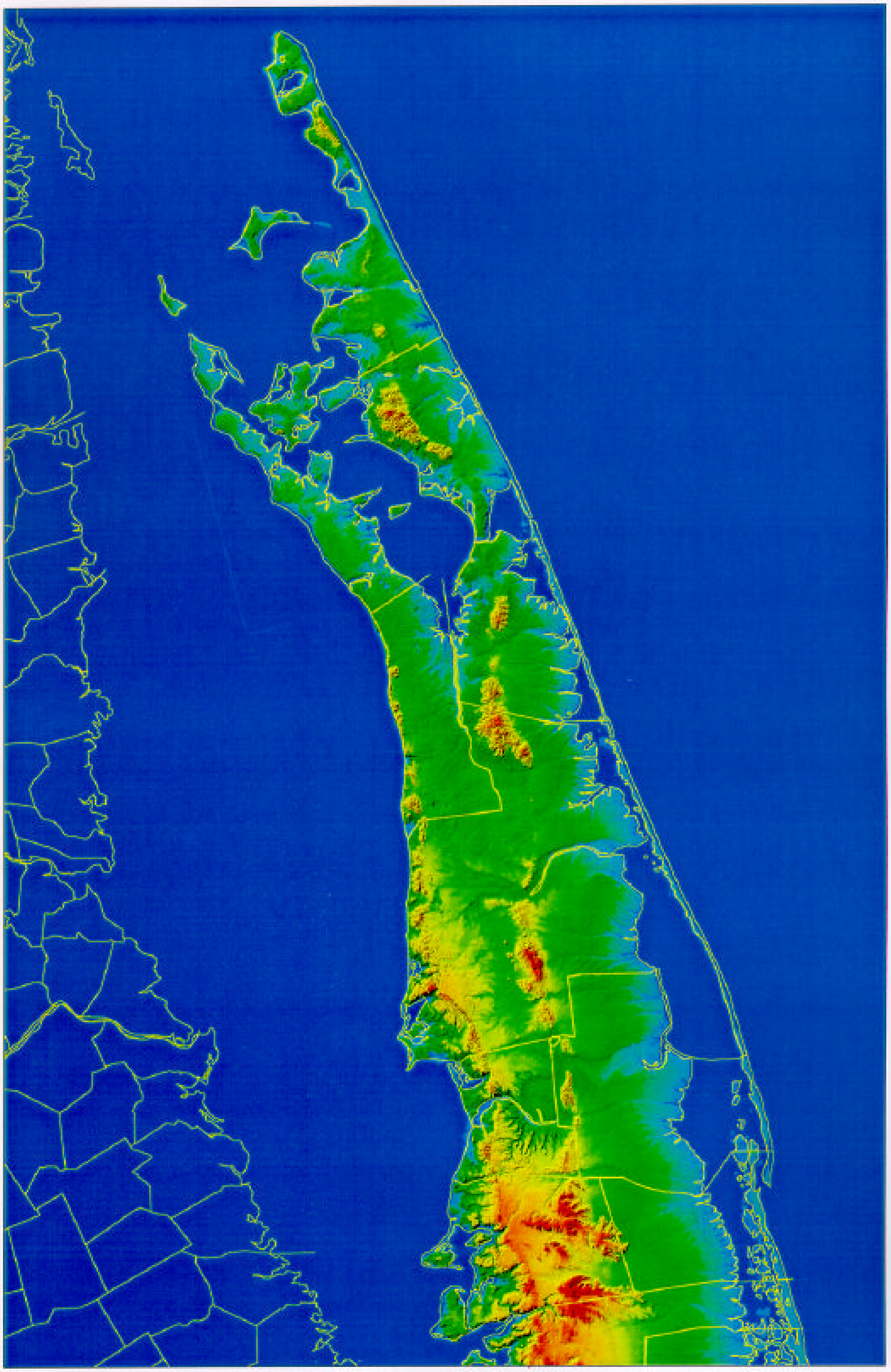


FIGURE 3-1
DRAFT GENERIC ENVIRONMENTAL IMPACT STATEMENT
SUFFOLK COUNTY
DIGITAL TERRAIN MODEL

Cashin Associates, P.C.

The areas between the moraines are largely composed of outwash sands and gravels, as is the portion of the Island south of the Ronkonkoma moraine. Outwash also tends to lie under the moraines themselves (Nemickas et al., 1989).

Long Island is approximately 120 miles long, and is 26 miles wide, at its widest point. A notable feature are the two narrow forks extending east from the main portion of the Island, creating the familiar fish shape that led Walt Whitman to call the area Paumonok. The north shore, especially in western Suffolk County and farther west into Nassau County, is incised with north-south trending harbors and bays. The south shore tends to be more regular, although a series of small, unbranched, north-south stream systems cuts across the outwash and creates small coastal crannies at the shoreline.

South of the Island proper lies a series of barrier beaches; the mechanisms that form such systems are obscure, with the prevalent notion being that they are controlled by rising sea levels, and so have been moving shoreward with increasing sea level over at least the past 5,000 years. Sea level was approximately 100 to 200 feet lower during the glacial period, and so was found far offshore of the current Long Island shoreline. As the continental glaciers melted, sea level rose. The rate of sea level rise has slowed considerably, stabilizing at a relatively modest rate approximately 5,000 years ago. Sea level rises are affected by many factors, including tectonic rebound or depression (continental scale reactions to the change in loadings from the glacial retreat) and other local tectonic effects (such as uplift) and so sea level increases or decreases need to be determined locally (Cronin et al., 1981; Dillon and Oldale, 1978). In the New York area, sea levels continue to rise, and estimates are that half relates to tectonic rebound and half to continued continental glacial melt and ocean expansion due to global warming. Generally, therefore, it is thought that, if unstablized, the barrier beaches will continue to retreat towards mainland Long Island across the South Shore Estuary (Williams and Meisburger, 1987).

Long Island's surrounding waters:

- Long Island Sound to the north
- Block Island Sound to the east
- the Atlantic Ocean to the south
- the East River tidal strait to the west.

The Peconic Estuary system lies between the North and South Forks of eastern Long Island. The South Shore Estuary system lies between the barrier islands and the south shore of the Island. The important populated islands associated with Long Island include Fire Island off the south shore, Shelter Island in the Peconic Estuary between the two forks, and Fishers Island well north and east of the North Fork. Figure 3-2 illustrates important geographical features of Long Island.

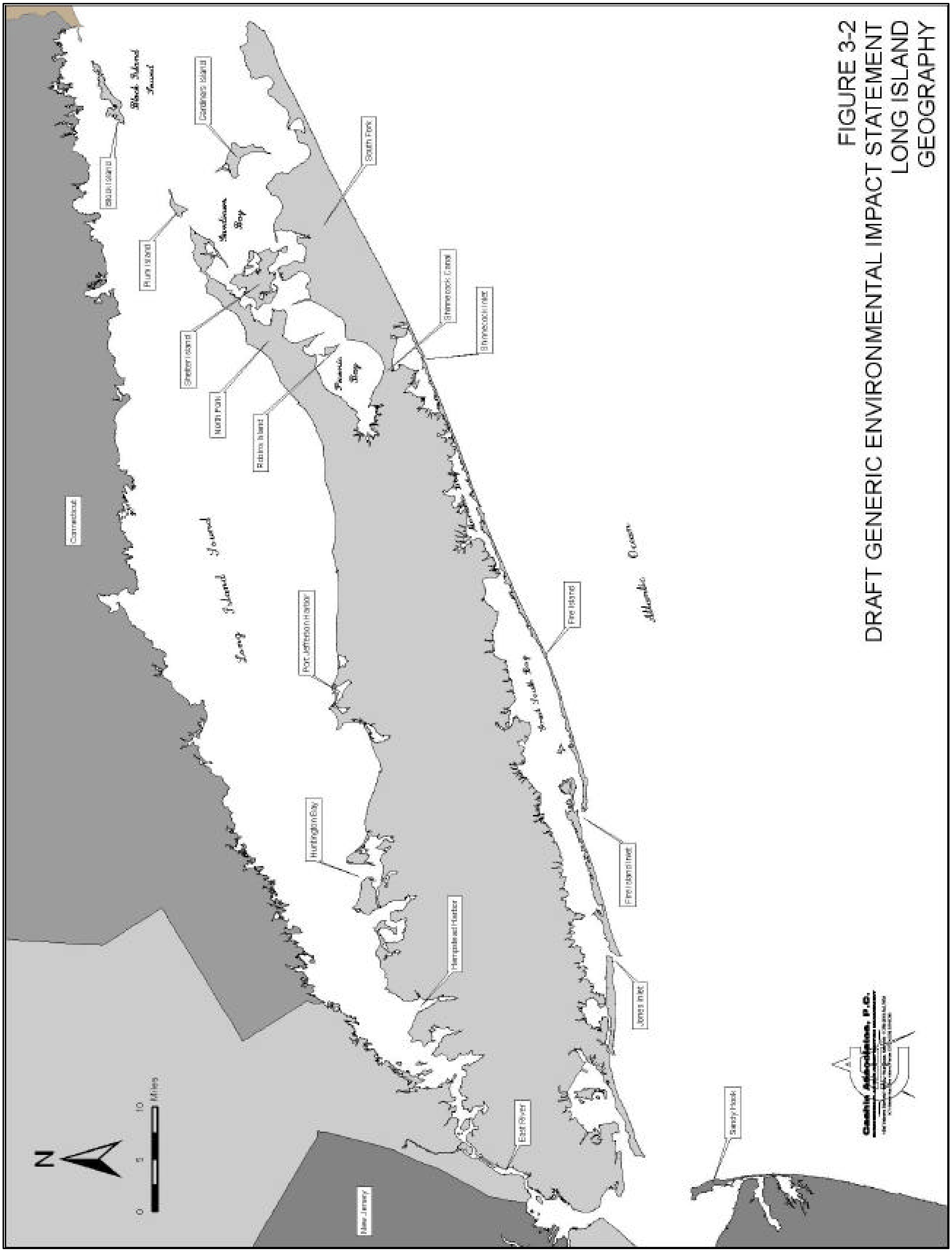


FIGURE 3-2
DRAFT GENERIC ENVIRONMENTAL IMPACT STATEMENT
LONG ISLAND
GEOGRAPHY

3.1.2. Suffolk County Geology

Paleozoic bedrock can only be found on the surface of Long Island on its extreme northwestern tip. The bedrock is thought to dip evenly to the southeast, and is overlain by 2,000 feet of unconsolidated material along the south shore of central Suffolk County (Nemickas et al., 1989).

The unconsolidated sediments that underlie Long Island were essentially laid down in three periods. Two occurred in the Cretaceous Era. The first formed the Raritan Formation. This is composed of several hundred feet of sand with clay lenses (the Lloyd Member), lying unconformably above the basement bedrock. The Lloyd Member is capped by several hundred feet of clay (an unnamed formation). The surface of the Raritan Formation is found up to a thousand feet below msl. It is generally approximately 500 feet thick (Nemickas et al., 1989).

The Magothy Formation lies unconformably above the Lloyd Formation. These Cretaceous Era sands and clays (with some gravels) can be found close to the ground surface in some areas of central Nassau County, and along the northwestern shoreline of Suffolk County into western Nassau County, but mostly the surface of this feature lies some 100 feet below msl. The surface of the Magothy Formation was eroded in places. It is usually 400 to 500 feet thick (Nemickas et al., 1989).

Several hundred feet of Pleistocene deposits lie above the Magothy formation unconformably, or else these sediments lie unconformably above other, older, usually Pleistocene, clay layers. The Pleistocene deposits are almost all outwash; tills and boulders mark morainal deposits. Holocene deposits of beaches, surface soils, marsh sediments, etc., lie above the glacial deposits (Nemickas et al., 1989). Maximum elevations on Long Island are found in West Hills, and cap out at 400 feet or so. Most of the south shore outwash plain is less than 50 feet above msl. Steep slopes are rare on the south shore, but are not uncommon on the hillier north shore, or on the two forks.

Long Island soils tend to be well-drained, although some poorer draining soils can be found associated with the moraines. The north shore is dominated by deep, well-drained, moderately coarse soils that formed in a mantle of sandy loam. Beaches along Long Island Sound contain gravel and cobble. In contrast, the beaches bordering the Atlantic Ocean are composed of sand and sand dunes, as they are composed of outwash materials from the glacier. Similarly, beaches along the Peconic Estuary tend to be sandy to the north and rockier on the south – again, relating to outwash/morainal material differences – although the distinction is not as clear cut as that between Long Island Sound and ocean beaches. Beaches furthest to the east on the ocean can be somewhat rockier or gravelly, due to erosion of materials from Montauk Point and other shoreline headlands. Soils south of the moraines tend to be much sandier and to be exceptionally well-drained. Figure 3-3 shows the general distribution of soil types on Long Island (Warner et al., 1975).

Table 3-1. Major Soil Types in Suffolk County

SOIL TYPES	SOIL QUALITIES
Beaches	Beaches are made up of sandy, gravelly, or cobbly areas between water at means sea level and dunes or escarpments.
Bridgehampton	Deep well drained to moderately well drained, medium textured soils that formed in thick silty deposits over coarse sand and gravel
Carver	Deep, excessively drained coarse textured soils
Dune Land	Mounds or small hills of sand that have been piled up by the wind
Escarp ments	Bluffs that have slopes greater than 35 percent
Haven	Deep, well drained, medium textured soils that have formed over stratified coarse sand and gravel
Ipswich	Very deep, very poorly drained soils formed in partially decomposed organic material fro m salt tolerant herbaceous plants.
Montauk	Deep, well drained to moderately well drained, moderately coarse textured to medium textured soils that formed in fine sandy loam or in a mantle of silt loam and loam
Pawtucket	Very deep, very poorly drained soils formed in partially decomposed organic material from salt tolerant herbaceous plants
Plymouth	Deep, excessively drained, coarse textured that formed in a mantle of loamy sand or sand over stratified coarse sand and gravel
Riverhead	Deep, well drained, moderately coarse textured soils that formed in a mantle of sandy loam or fine sandy loam over thick layers of coarse sand and gravel
Sudbury	Deep, moderately well drained, moderately coarse textured soils that formed in a mantle of fine sandy loam or sandy loam over coarse sand and gravel
Udipsammets	Very deep, excessively drained to moderately well drained acid soils
Udorthents	Very deep, excessively drained acid soils in areas of sanitary landfills
Urban Land	Areas that are more than 80 percent covered by buildings and pavements

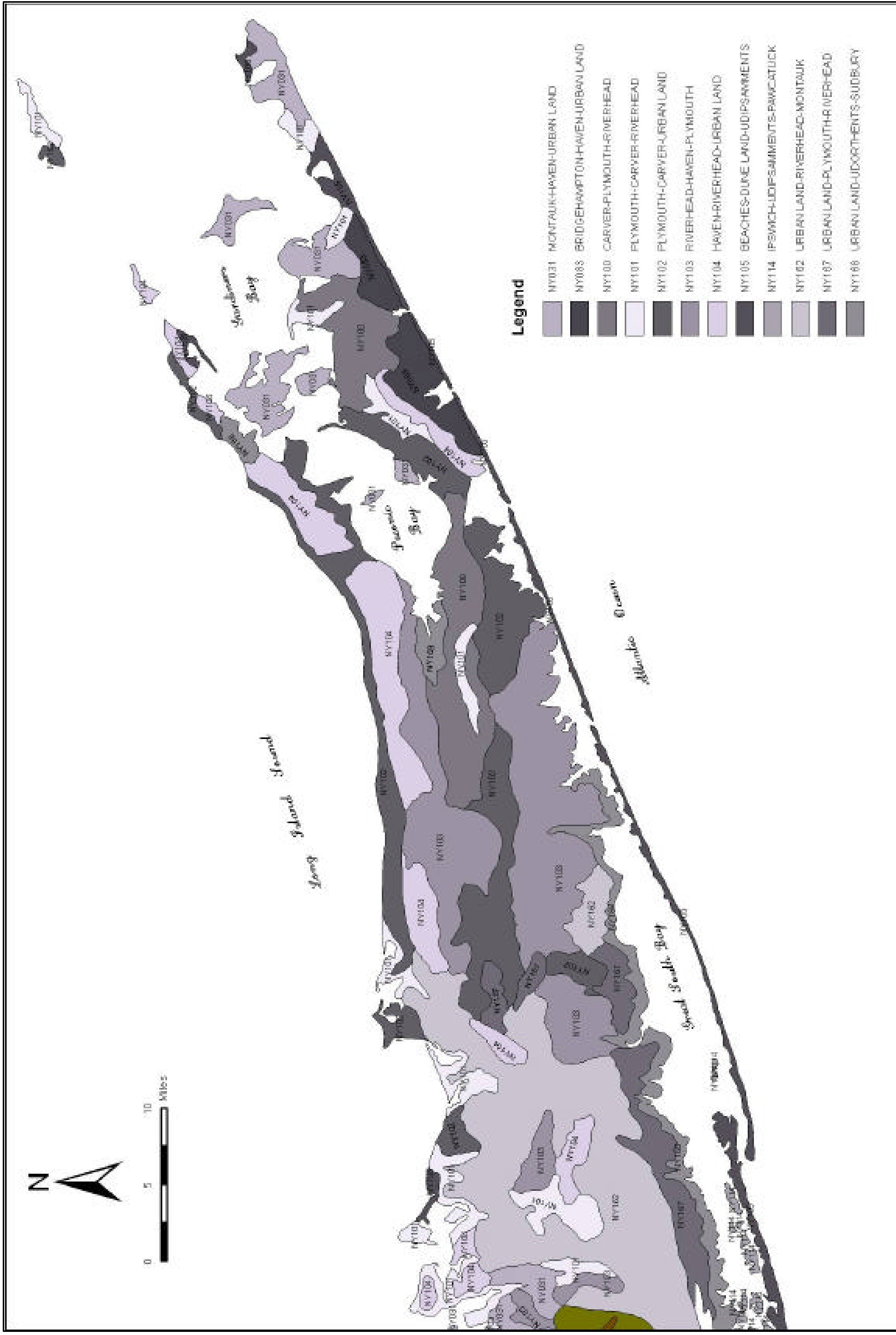


FIGURE 3-3
DRAFT GENERIC ENVIRONMENTAL IMPACT STATEMENT
SUFFOLK COUNTY
SOILS

3.1.3. Geohydrology of Suffolk County

All of Nassau and Suffolk Counties' water systems obtain water from groundwater. This makes the Long Island aquifer system a sole source aquifer, as defined by USEPA (Nemickas et al., 1989). This fact has driven much of local governments' environmental concerns and rule-making, as protection of the drinking water supply has been shown to be a function of land use and general environmental protection (Koppelman, 1978; Eckhardt and Stackelberg, 1995).

The elevation of the water table tends to follow the overall topography of the ground surface. Highest water elevations tend to be found beneath the central Ronkonkoma moraine, which therefore establishes a ground water divide. That is, horizontal water flow tends to be to the north northwards of the Ronkonkoma moraine, and to the south southwards of the moraine (Buxton and Modica, 1992). The groundwater beneath the island forms a fresh water lens. The lens is generally bounded by salt water interfaces with the Long Island Sound to the north, and the South Shore Estuary-Atlantic Ocean complex to the south, and by bedrock below. In essence, on the North Fork the salt water interfaces are with the Sound to the north and the Peconic Estuary to the south; salt water lies above the bedrock, and bounds the fresh water lens from below. The South Fork fresh water groundwater system is essentially similar. Surface water on Long Island occurs where the water table of the groundwater system intersects the ground surface (Nemickas et al., 1989).

Approximately 50 percent of the precipitation reaching the ground surface in Suffolk County (on the order of 24 inches a year) recharges one of three aquifers:

- the Upper Glacial, which is the water table aquifer in Suffolk County
- the Magothy aquifer, which underlies the Upper Glacial aquifer, and which tends to be confined, especially to the south
- the Lloyd aquifer, which is beneath the Magothy aquifer, and extends to bedrock. The Lloyd aquifer is confined.

Modeling of the groundwater system has determined that approximately 60 percent of recharge remains within the Upper Glacial aquifer. The horizontal movement of water within the aquifers ranges from a maximum of one to one and a half feet per day (300 to 500 feet per year) to inches per year. The rate is determined by the nature of the material the water is flowing through, and the pressure (head) on the water. The water that is retained within the Upper Glacial aquifer discharges to streams, at the shoreline, or generally within a hundred feet or so of the shoreline at the salt water interface. Some 40 percent of recharge moves vertically through the Upper Glacial aquifer into the deeper two aquifers. This happens in the central portion of Long Island. The area where this tends to occur is called the Deep Recharge zones (Buxton and Modica, 1992). These zones are of special environmental concern, because recent land use has generally had negative impacts on the water quality of the Upper Glacial aquifer (Koppelman, 1978). Because water in the deeper aquifers flows more slowly, it is older, and so generally has better water quality. A Long Island environmental principle is that protecting the quality of the water recharging to the deeper two aquifers will ensure there is an adequate supply of good quality water for future use (Koppelman, 1978; Eckhardt and Stackelberg, 1995; Nemickas et al., 1989).

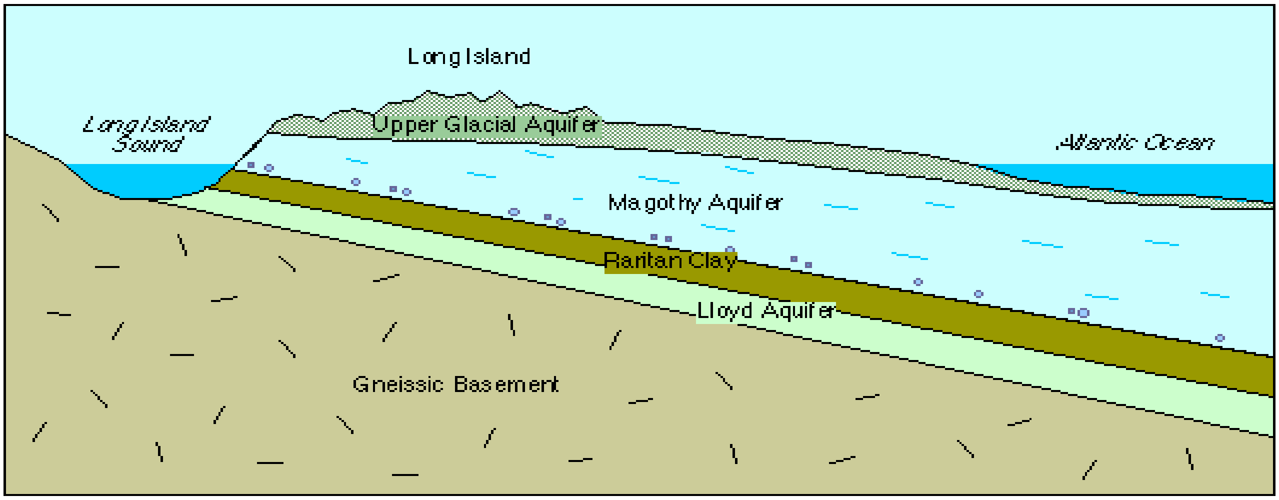
Water entering the deeper two aquifers can be retained within them for several hundred to several thousand years. Some of the water in the shallow Magothy flow discharges again to the basal Upper Glacial aquifer, but most of the deeper two aquifer discharges occur offshore to either Long Island Sound or the Atlantic Ocean (Buxton and Modica, 1992).

The barrier islands and islands in the Peconic Estuary all have shallow fresh water lenses, fed by recharge, that sit above salt water aquifers. On the barrier islands, drinking water can be obtained by drilling deeper into the confined Magothy or Lloyd aquifers, and tapping these fresh water systems.

For most of Long Island, obtaining enough water is generally not an issue (having adequate quality of the available water may be a problem). However, on the North and South Forks, and for the islands of the Peconic Estuary (specifically, Shelter Island), because the deeper aquifers are saline, sufficient quantities of water of acceptable quality can be problematic (Nemickas et al., 1989).

Figure 3-4 is a generalized cross section of the Long Island aquifer system.

Figure 3-4. Long Island Aquifers (after Buxton and Modica, 1992)



3.1.4. Suffolk County Surface Waters

Long Island's permanent surface waters are replenished by groundwater discharges. USGS describes stream baseflow on Long Island as 95 percent groundwater (Nemickas et al., 1989). This appears to be an underestimate of the baseflow relationship. The porous nature of Long Island's soils means that not only does precipitation generally percolate through the surface, but that retaining water in natural features to supply draining streams is not common.

There are four major streams in Suffolk County that are generally classified as rivers. Three flow north-south:

- The Nissequogue River, which flows north to Long Island Sound in the central-western part of the County
- The Connetquot River, which flows south to the Great South Bay in the central-western part of the County
- The Carmans River, which flows south into Great South bay in the central part of the County

The Peconic River flows east to Riverhead, its terminus at Flanders Bay. The headwaters of the Nissequogue and Connetquot Rivers are relatively close to each other, in the Hauppauge-Islandia area. Both the Carmans and Peconic Rivers have headwaters just west of Brookhaven National Laboratory, in Upton. Variations in flow in these waterbodies tend to follow the relatively slow changes in aquifer water levels, although precipitation-driven run-off can increase flows quickly. Nonetheless, compared to streams where snowmelt or seasonal rainfall controls flow rates, flows in Long Island streams tend to be more constant. Although precipitation does lead to increased flows, extensive flooding is unusual, partly due to many dams, and partially because run-off is generally minimized by the nature of Long Island soils (Cashin Associates, 2004). The highly permeable soils also tend to result is quick absorption of floodwaters should any County stream or river overtop its banks, unless the elevation of the local water table exceeds the elevation of the ground surface.

There are many smaller stream systems. Most flow north-south. Most harbors on the north shore have a small stream draining into their southern end. The proximity of the Harbor Hill moraine to the shore makes most of these stream courses short. On the south shore, many streams arise south of the Ronkonkoma moraine. There appear to be residual stream beds from when the water tables on Long Island were much higher, perhaps due to a trapped meltwater lake behind the Ronkonkoma moraine. This may have resulted in many groundwater fed streams flowing from the moraine south to the ocean, streams that had much greater flow than the streams currently occupying the water courses, as noted through DEM analyses by Bennington and Hanson. This means the valleys associated with the current streams are over-large for their current tenants, and tend to be dry in their northern reaches.

Long Island has one moderate-sized lake, Lake Ronkonkoma. As with most ponds on Long Island, it appears to be a kettle pond. That is, it was formed when a chunk of ice fell from the glacier. Either the fall of the ice caused a depression in the ground surface, or its presence prevented outwash from occupying the space. When the ice melted, it left a layer of relatively impermeable till behind. Those kettle holes intercept either the general water table or a perched water table filled with water. Nearly all of these are landlocked. There are some ponds and lakes in conjunction with streams and rivers. However, almost all of these are man-made through weirs and dams (Tarr, 1899).

Figure 3-5 locates the major surface water bodies of Suffolk County.

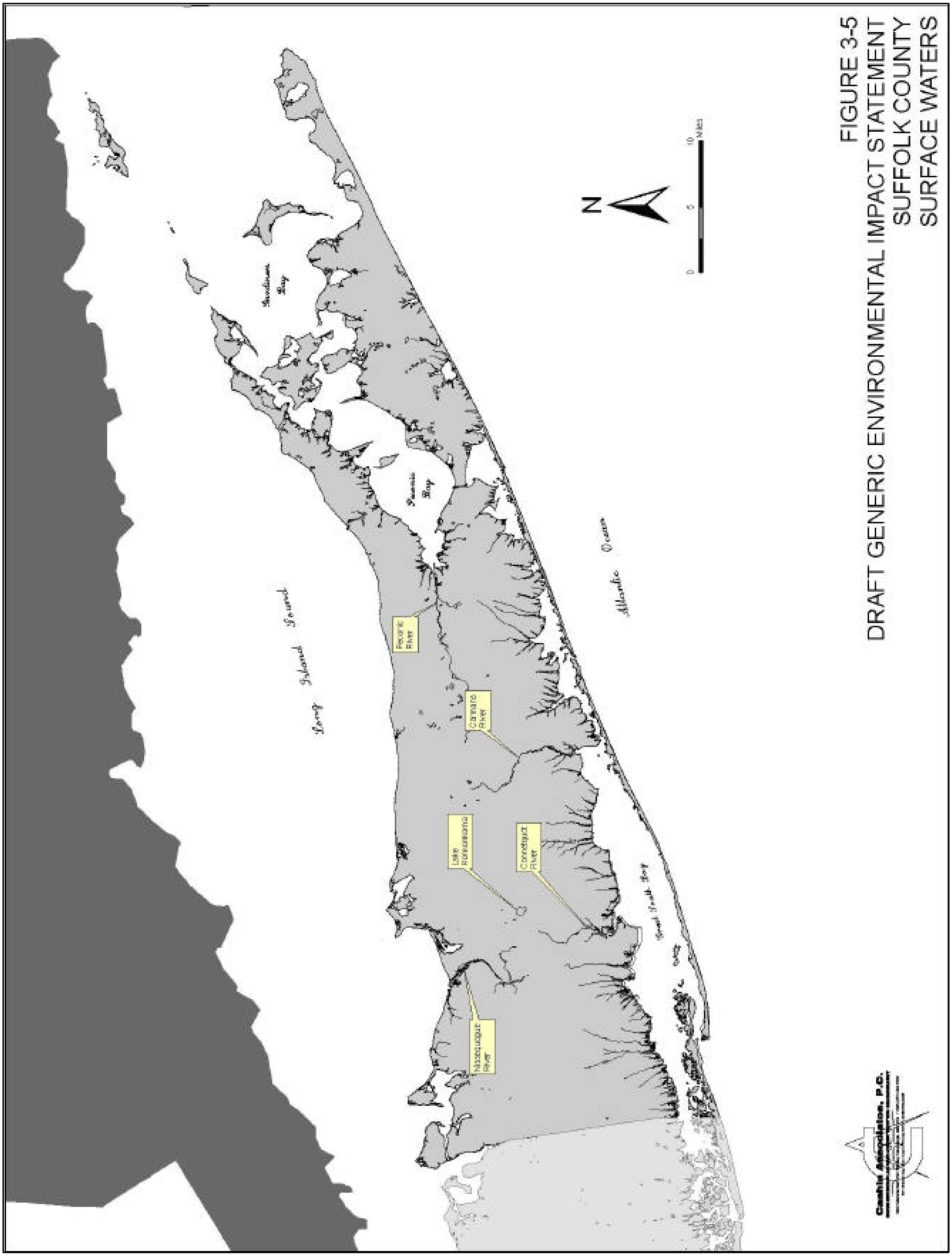


FIGURE 3-5
DRAFT GENERIC ENVIRONMENTAL IMPACT STATEMENT
SUFFOLK COUNTY
SURFACE WATERS

Water quality in fresh water systems in Suffolk County is somewhat impacted. This is because fresh surface waters on Long Island generally receive all their water from ground water discharge. Groundwater quality is generally a function of land use, and so increasing development has had measurable impacts to overall groundwater and surface water quality (Eckhardt and Stackelberg, 1995).

SCDHS tests water at sites that are used for bathing purposes, such as beaches along Lake Ronkonkoma. Coliform is the primary concern, and fresh water bodies sometimes have elevated levels that require beach closures. SCDHS does not do genetic testing to determine the source of the coliform, and so avian sources are often thought to be among the major contributors to elevated levels (R. Waters, SCDHS, personal communication, 2005).

SCDHS, under contract to USGS, also conducts routine water quality sampling for certain Federal surface water quality programs. SCDHS also has its own water quality programs, which are generally linked to the estuary programs. NYSDEC, through its Rotating Intensive Basin Sampling (RIBS) program, tests certain streams and rivers in the County periodically. CA conducted extensive reviews of water quality in two of Suffolk County's four major rivers (the Carmans and Peconic Rivers) recently. Although water quality in those rivers was not found to be pristine, neither could the conditions be considered to be impaired (Cashin Associates, 2002; Cashin Associates, 2004).

As is discussed below, water quality sampling conducted by SCDHS sometimes has included pesticides used by SCVC as analytical parameters. SCDHS has never detected these pesticides in any routinely collected fresh water samples (K. Hill, SCDHS, personal communication, 2004).

Estuarine water quality is also tested by various organizations. Three estuary programs address nearly all salt water bodies in the vicinity of Suffolk County.

The Long Island Sound Study CCMP (1994) has identified three primary water quality problems. These are:

- Low dissolved oxygen concentrations (hypoxia). Hypoxia is primarily a problem in western Long Island Sound, although low concentrations are sometimes measured as far east as Mattituck. Hypoxia is also a problem in certain areas of the north shore embayments. The primary cause for hypoxia identified by LISS is nutrient enrichment, which causes phytoplankton blooms, leading to organic enrichment of bottom waters, increased metabolic activity there, and, because of water column stratification, depletion of dissolved oxygen on a seasonal basis.

- Toxic substances. These include six metals, persistent first generation organic pesticides (such as DDT), polychlorinated biphenyls (PCBs), and pesticides and polyaromatic hydrocarbons (PAHs), generally. Inputs of these contaminants to Long Island Sound appear to be linked primarily to historical uses, although non-point sources and sewage treatment plants continue to introduce modern pesticides and PAHs into the system. It is noted that water quality generally is good, but that sediment quality can be degraded. More problems exist closer to New York City and Connecticut tributaries than along the Suffolk County shore.

- Pathogens. Pathogen contamination is generally measured by indicators, primarily coliform and fecal coliform. High levels of coliform lead to beach closures and prohibition on shellfishing. Again, although these problems do not exclusively occur in western Long Island Sound and near Connecticut tributaries, they tend to be exacerbated there. In Suffolk County, beach and shellfishing closures tend to be restricted to the harbors, not the open waters of the Sound.

Water quality impairments are described as the leading cause of natural resource impacts, so these water quality issues are of greatest importance (LISS, 1994). LISS-related sampling does not include testing for mosquito control pesticides.

The South Shore Estuary Reserve CMP (SSER Council, 2001) has identified stormwater runoff as the primary source of water quality impairments. Coliform bacteria and nutrients are the primary concerns. Coliform leads to shellfish bed and bathing beach closures because it is an indicator of human pathogens. Nutrients support blooms of brown tide, and together with sediments threaten fish and shellfish survival, especially in tributaries. Other inputs to the system that affect these parameters include human waste discharges from vessels, excrement from waterfowl, discharges from municipal wastewater treatment plant outfalls, and inputs from agriculture. In addition, modifications to the overall hydrological regime of the estuary, leading to alterations of water level and stream flow, and associated lowering of water table levels also have had significant effects on fishery resources in tributaries.

According to the PEP CCMP (SCDHS, 2002a), the water quality issue of greatest concern for the estuary is Brown Tide. Research has not absolutely determined the cause of the initial outbreak and subsequent reoccurrence of the Brown Tide, but the leading hypothesis involves fluctuations in nutrients due to interannual changes in groundwater inputs, and a decline in grazing control by suspension feeders (Gobler et al., 2005). Brown tide has destroyed the historical shellfishing industry of the Peconics. Other important, developing water quality issues include:

- Pathogens, which have caused the closure of shellfish beds
- Nutrient enrichment causing lower DO levels in Flanders Bay
- Concerns regarding the potential for impacts due to low concentrations of toxic substances

Finfish abundance has declined, and important aquatic habitats are disappearing or becoming fragmented, and the role of water quality changes in these problems is not clear (SCDHS, 2002a).

SCDHS plays important roles in the collection and analysis of environmental data in these systems. Water quality sampling conducted by SCDHS sometimes has included pesticides used by SCVC as analytical parameters. SCDHS has never detected these pesticides in any routinely collected salt water samples (K. Hill, SCDHS, personal communication, 2004).

3.1.5. Suffolk County Wetlands

Salt marshes and fresh water wetlands constitute important environmental resources. NYSDEC has mapped 18,084 acres of fresh water wetlands. NYSDEC has a state-wide limit of 12.4 acres (five hectares) for mapping wetlands, except for those areas of regional interest that are nominated to it. Long Islanders have been very diligent in nominating local wetlands so that the NYSDEC mapping here includes many parcels below the five hectare limit. Most of these wetlands are found along streams or at ponds or lakes. Wetlands that are not normally included in the NYSDEC mapping include smaller, man-made sites (recharge basins and the like). These can generally be found through the Federal NWI mapping.

Fresh water wetlands, and, in particular, three fresh water systems that were part of the primary study areas, are discussed in some detail in the Section 5. The discussion of the four risk assessment areas also includes an abundance of information of fresh water wetland-linked resources (see Section 4).

Salt marshes can be found all along the coast of Suffolk County. CA quantified Suffolk County's salt marshes at 16,839 acres, based on the NWI mapping. Typically, these systems are classified as either North Shore, Peconic Estuary, South Shore fringing, South Shore barrier island, or South Shore island systems. Section 5 discusses salt marshes in general, and 18 examples of these systems in some detail.

Figure 3-6 shows the NWI-classified wetlands areas of Suffolk County.

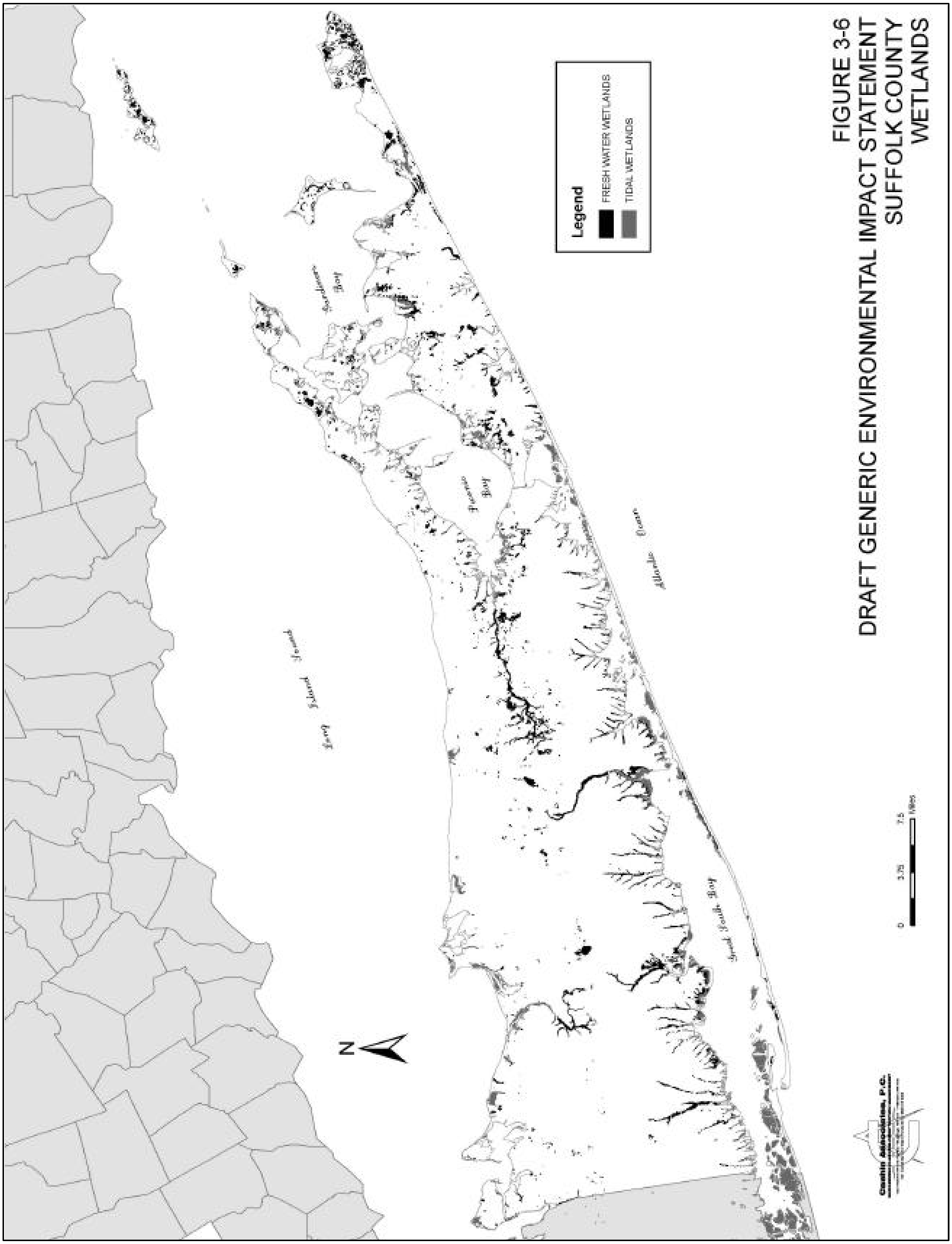


FIGURE 3-6
DRAFT GENERIC ENVIRONMENTAL IMPACT STATEMENT
SUFFOLK COUNTY
WETLANDS
Legend
FRESH WATER WETLANDS
TIDAL WETLANDS
Long Island Sound
Atlantic Ocean
Great South Bay
Peconic Bay
N

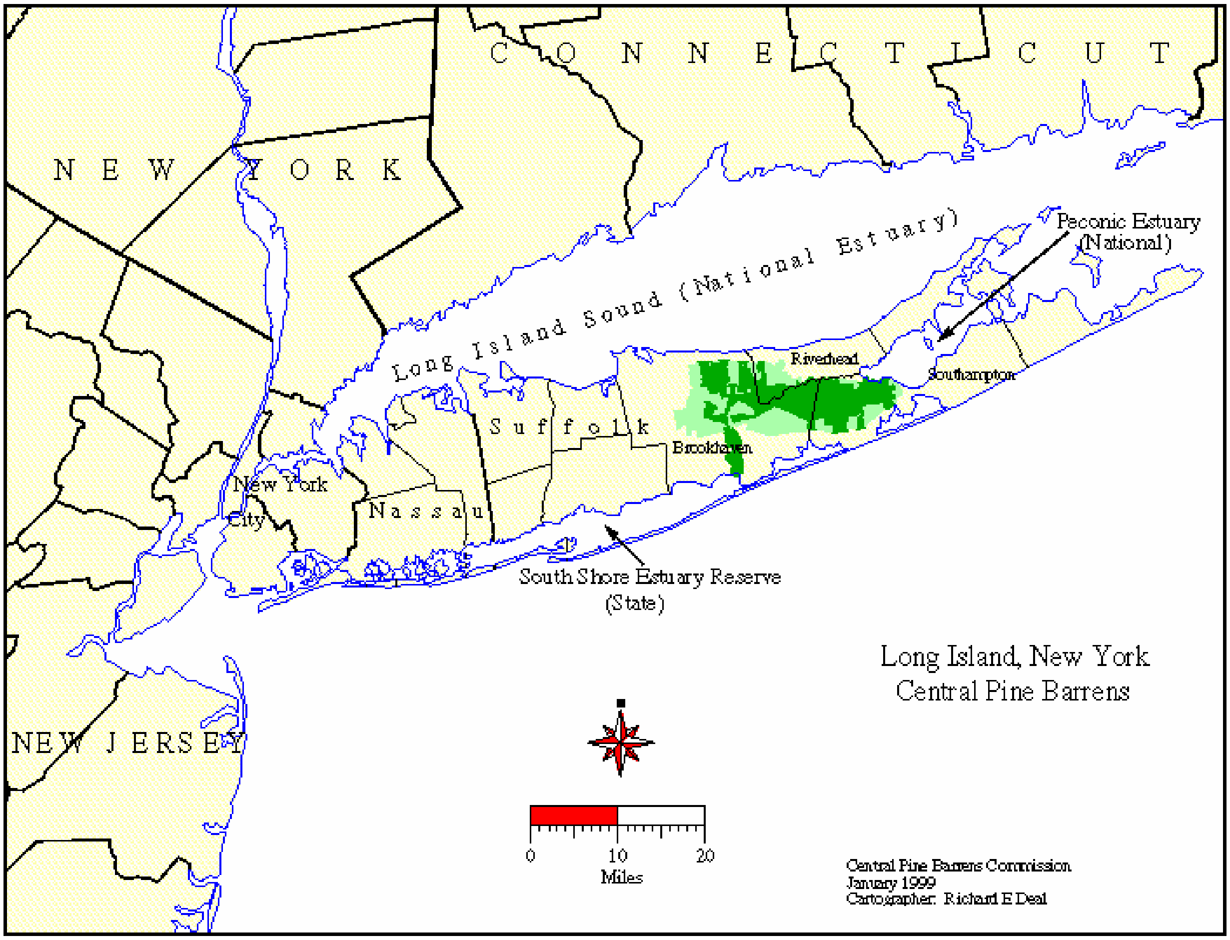
3.1.6. Suffolk County Natural Systems

Suffolk County was settled by people some 2,000 to 4,000 years ago. The indigenous people of Long Island appear to have manipulated the natural environment to a certain extent, as most northeast US tribes set fires to improve habitat for deer, in particular. However, the Long Island settlements and farms of these people do not seem to have greatly impacted the environment, although forest management with fire to enhance deer populations has been cited by some (Strong, 1997).

Europeans began settling on Long Island in the 1640s. Three hundred years of agriculture, fire wood harvesting, and, finally, suburban development have changed the nature of Suffolk County greatly from how it used to be. Pristine natural settings do not exist any more. However, certain areas retain vestiges of natural values, mostly due to their lack of value for agriculture or other economic exploitation. Other large tracts were later preserved as parkland or through other environmental protections. Examples include the major river corridors, marsh lands, beaches, and the Pine Barrens. Some large estates also retained some element of the natural world that used to exist prior to European settlement (USFWS, 1997).

The Pine Barrens have been made the third State Forest Preserve (after the Catskills and Adirondacks Preserves). They constitute a large portion of central and eastern Suffolk County, extending out onto the South Fork. Approximately 100,000 acres have been specially designated as the Central Pine Barrens. The Central Pine Barrens is divided into two regions: the 55,000 acre Core Preservation Area and the 47,500 acre Compatible Growth Area. This area is subject to special land use and development rules, and much of the core area of this acreage has been preserved (see Figure 3-7) (CPBJPPC, 1995).

Figure 3-7. Central Pine Barrens



The Pine Barrens are a complex of undeveloped pitch pine forest and wetlands that contain regionally rare wetland and upland communities, along with the highest diversity of rare species in New York State. Areas of significance include: the Peconic River and its associated coastal plain ponds, dwarf pine plains, Flanders Bay wetlands, and cranberry bogs (CPBJPPC, 1995).

3.1.7. Rare, Threatened, and Endangered Species of Suffolk County

Despite its long history of use, Suffolk County does retain many areas where wildlife is found. These include certain rare, threatened, and endangered species. Table 3-2 lists the species of special concern that have been tabulated by the Natural Heritage Program of NYSDEC.

Table 3-2. Species of Special Concern Found in Suffolk County

GROUP	SCIENTIFIC NAME	COMMON NAME	NY LISTING
Dragon-/Damselfly	Enallagma minusculum	Little Bluet	Threatened
Dragon-/Damselfly	Enallagma pictum	Scarlet Bluet	Threatened

GROUP	SCIENTIFIC NAME	COMMON NAME	NY LISTING
Dragon-/Damselfly	Enallagma recurvatum	Pine Barrens Bluet	Threatened
Dragon-/Damselfly	Nehalennia integricollis	Southern Sprite	Special Concern
Dragon-/Damselfly	Anax longipes	Comet Darner	Unlisted
Dragon-/Damselfly	Enallagma laterale	New England Bluet	Unlisted
Dragon-/Damselfly	Libellula needhami	Needham's Skimmer	Unlisted
Dragon-/Damselfly	Ischnura ramburii	Rambur's Forktail	Unlisted
Butterfly	Callophrys hesseli	Hessel's Hairstreak	Endangered
Butterfly	Speyeria idalia	Regal Fritillary	Endangered
Butterfly	Callophrys irus	Frosted Elfin	Threatened
Butterfly	Atrytonopsis hianna	Dusted Skipper	Unlisted
Butterfly	Satyrium edwardsii	Edwards' Hairstreak	Unlisted
Butterfly	Calycopis cecrops	Red-banded Hairstreak	Unlisted
Butterfly	Parrhasius m-album	White-m Hairstreak	Unlisted
Moth	Catocala herodias gerhardi	Herodias or Pine Barrens Underwing	Special Concern
Moth	Catocala jair ssp. 2	Jersey Jair Underwing	Special Concern
Moth	Hemileuca maia ssp. 5	Coastal Barrens Buckmoth	Special Concern
Moth	Heterocampa varia	A Notodontid Moth	Special Concern
Moth	Anisota stigma	Spiny Oakworm Moth	Unlisted
Moth	Apharetra dentata	Toothed Apharetra	Unlisted
Moth	Chaetaglaea cerata	A Noctuid Moth	Unlisted
Moth	Chytonix sensilis	A Noctuid Moth	Unlisted
Moth	Cisthene packardii	Packard's Lichen Moth	Unlisted
Moth	Eucoptocnemis fimbriaris	A Noctuid Moth	Unlisted
Moth	Euxoa pleuritica	A Noctuid Moth	Unlisted
Moth	Euxoa violaris	Violet Dart	Unlisted
Moth	Hyperstrotia flaviguttata	Yellow-spotted Graylet	Unlisted
Moth	Itame sp. 1	Barrens Itame	Unlisted
Moth	Metalectra richardsi	Richard's Fungus Moth	Unlisted
Moth	Monoleuca semifascia	A Slug Moth	Unlisted
Moth	Morrisonia mucens	Gray Woodgrain	Unlisted
Moth	Psectraglaea carnosa	Pink Sallow	Unlisted
Moth	Zale sp. 1 nr. lunifera	Pine Barrens Zale	Unlisted
Moth	Apamea burgessi	A Noctuid Moth	Unlisted
Moth	Faronta rubripennis	The Pink Streak	Unlisted
Moth	Euchlaena madusaria	A Geometrid Moth	Unlisted
Moth	Citheronia sepulcralis	Pine Devil	Unlisted
Moth	Apamea inordinata	A Noctuid Moth	Unlisted
Moth	Hydraecia stramentosa	A Noctuid Moth	Unlisted
Moth	Lepipolys perscripta	A Moth	Unlisted
Moth	Oncocnemis riparia	A Noctuid Moth	Unlisted
Moth	Rhodoecia aurantiago	Aureolaria Seed Borer	Unlisted
Moth	Richia acclivis	A Noctuid Moth	Unlisted
Moth	Abagrotis crumbi benjamini	Coastal Heathland Cutworm	Unlisted
Moth	Papaipema appassionata	Pitcher Plant Borer Moth	Unlisted
Moth	Papaipema stenocelis	Chain Fern Borer Moth	Unlisted
Moth	Schinia bifascia	A Noctuid Moth	Unlisted
Amphibian	Ambystoma tigrinum	Tiger Salamander	Endangered
Amphibian	Rana sphenocephala	Southern Leopard Frog	Special Concern

GROUP	SCIENTIFIC NAME	COMMON NAME	NY LISTING
Reptile	Kinosternon subrubrum	Eastern Mud Turtle	Endangered
Bird	Laterallus jamaicensis	Black Rail	Endangered
Bird	Asio flammeus	Short-eared Owl	Endangered
Bird	Charadrius melodus	Piping Plover	Endangered
Bird	Sterna dougallii	Roseate Tern	Endangered
Bird	Sterna antillarum	Least Tern	Threatened
Bird	Sterna hirundo	Common Tern	Threatened
Bird	Bartramia longicauda	Upland Sandpiper	Threatened
Bird	Circus cyaneus	Northern Harrier	Threatened
Bird	Podilymbus podiceps	Pied-billed Grebe	Threatened
Bird	Protonotaria citrea	Prothonotary Warbler	Protected
Bird	Caprimulgus carolinensis	Chuck-will's-widow	Protected
Bird	Oporornis formosus	Kentucky Warbler	Protected
Bird	Tyto alba	Barn Owl	Protected
Bird	Ammodramus maritimus	Seaside Sparrow	Special Concern
Bird	Rynchops niger	Black Skimmer	Special Concern
Bird	Ardea alba	Great Egret	Protected
Bird	Egretta thula	Snowy Egret	Protected
Bird	Egretta tricolor	Tricolored Heron	Protected
Bird	Plegadis falcinellus	Glossy Ibis	Protected
Bird	Colonial Waterbird Nesting Area		Unlisted
Bird	Gull Nesting Colony		Unlisted
Fish	Enneacanthus obesus	Banded Sunfish	Threatened
Fish	Etheostoma fusiforme	Swamp Darter	Threatened
Fish	Aphredoderus sayanus	Pirate Perch	Unlisted
Fish	Menidia beryllina	Inland Silverside	Unlisted
Fish	Menidia menidia	Atlantic Silverside	Unlisted
Vascular Plant	Agalinis acuta	Sandplain Gerardia	Endangered
Vascular Plant	Agalinis maritima var. maritima	Seaside Gerardia	Unlisted
Vascular Plant	Ageratina aromatica var. aromatica	Small White Snakeroot	Endangered
Vascular Plant	Aletris farinosa	Stargrass	Threatened
Vascular Plant	Amaranthus pumilus	Seabeach Amaranth	Endangered
Vascular Plant	Amelanchier nantucketensis	Nantucket Juneberry	Endangered
Vascular Plant	Angelica lucida	Seacoast Angelica	Endangered
Vascular Plant	Asclepias variegata	White Milkweed	Endangered
Vascular Plant	Atriplex glabriuscula	Seaside Orach	Endangered
Vascular Plant	Bartonia paniculata	Screw-stem	Endangered
Vascular Plant	Bolboschoenus maritimus ssp. paludosus	Seaside Bulrush	Endangered
Vascular Plant	Bolboschoenus novae-angliae	Saltmarsh Bulrush	Endangered
Vascular Plant	Botrychium oneidense	Blunt-lobe Grape Fern	Endangered
Vascular Plant	Callitriche terrestris	Terrestrial Starwort	Threatened
Vascular Plant	Cardamine longii	Long's Bittercress	Threatened
Vascular Plant	Carex barrattii	Barratt's Sedge	Endangered
Vascular Plant	Carex bullata	Button Sedge	Endangered
Vascular Plant	Carex buxbaumii	Brown Bog Sedge	Threatened
Vascular Plant	Carex collinsii	Collins' Sedge	Endangered
Vascular Plant	Carex hormathodes	Marsh Straw Sedge	Threatened
Vascular Plant	Carex merritt-fernaldii	Fernald's Sedge	Threatened
Vascular Plant	Carex mesochorea	Midland Sedge	Endangered
Vascular Plant	Carex mitchelliana	Mitchell's Sedge	Threatened
Vascular Plant	Carex straminea	Straw Sedge	Endangered
Vascular Plant	Carex styloflexa	Bent Sedge	Endangered

GROUP	SCIENTIFIC NAME	COMMON NAME	NY LISTING
Vascular Plant	Carex typhina	Cat-tail Sedge	Threatened
Vascular Plant	Carex venusta var. minor	Graceful Sedge	Endangered
Vascular Plant	Chamaecyparis thyoides	Atlantic White Cedar	Rare
Vascular Plant	Chasmanthium laxum	Slender Spikegrass	Endangered
Vascular Plant	Chenopodium berlandieri var. macrocalycium	Large Calyx Goosefoot	Endangered
Vascular Plant	Chenopodium rubrum	Red Pigweed	Threatened
Vascular Plant	Coreopsis rosea	Rose Coreopsis	Rare
Vascular Plant	Crassula aquatica	Water Pigmyweed	Endangered
Vascular Plant	Cyperus flavescens	Yellow Flatsedge	Endangered
Vascular Plant	Cyperus polystachyos var. texensis	Coast Flatsedge	Endangered
Vascular Plant	Cyperus retrorsus	Retrorse Flatsedge	Endangered
Vascular Plant	Desmodium ciliare	Little-leaf Tick-trefoil	Threatened
Vascular Plant	Desmodium obtusum	Stiff Tick-trefoil	Endangered
Vascular Plant	Dichanthelium wrightianum	Wright's Panic Grass	Endangered
Vascular Plant	Digitaria filiformis	Slender Crabgrass	Threatened
Vascular Plant	Diospyros virginiana	Persimmon	Threatened
Vascular Plant	Eleocharis engelmannii	Engelmann's Spikerush	Endangered
Vascular Plant	Eleocharis equisetoides	Knotted Spikerush	Threatened
Vascular Plant	Eleocharis fallax	Creeping Spikerush	Endangered
Vascular Plant	Eleocharis halophila	Salt-marsh Spikerush	Threatened
Vascular Plant	Eleocharis obtusa var. ovata	Blunt Spikerush	Endangered
Vascular Plant	Eleocharis quadrangulata	Angled Spikerush	Endangered
Vascular Plant	Eleocharis tenuis var. pseudoptera	Slender Spikerush	Endangered
Vascular Plant	Eleocharis tricostata	Three-ribbed Spikerush	Endangered
Vascular Plant	Eleocharis tuberculosa	Long-tubercled Spikerush	Threatened
Vascular Plant	Erechtites hieraciifolia var. megalocarpa	Fireweed	Endangered
Vascular Plant	Eupatorium album var. subvenosum	White Boneset	Threatened
Vascular Plant	Eupatorium hyssopifolium var. laciniatum	Fringed Boneset	Threatened
Vascular Plant	Eupatorium leucolepis var. leucolepis	White Boneset	Endangered
Vascular Plant	Eupatorium rotundifolium var. ovatum	Round-leaf Boneset	Endangered
Vascular Plant	Euphorbia ipecacuanhae	American Ipecac	Endangered
Vascular Plant	Eurybia spectabilis	Showy Aster	Threatened
Vascular Plant	Fimbristylis castanea	Marsh Fimbry	Threatened
Vascular Plant	Gamochaeta purpurea	Purple Everlasting	Endangered
Vascular Plant	Gaylussacia dumosa var. bigeloviana	Dwarf Huckleberry	Endangered
Vascular Plant	Helianthemum dumosum	Bushy Rockrose	Threatened
Vascular Plant	Helianthus angustifolius	Swamp Sunflower	Threatened
Vascular Plant	Hottonia inflata	Featherfoil	Threatened
Vascular Plant	Hydrocotyle verticillata	Whorled-pennywort	Endangered
Vascular Plant	Hypericum adpressum	Creeping St. John's-wort	Endangered
Vascular Plant	Hypericum densiflorum	Bushy St. John's-wort	Endangered
Vascular Plant	Hypericum denticulatum	Coppery St. John's-wort	Endangered
Vascular Plant	Hypericum hypericoides ssp. multicaule	St. Andrew's Cross	Endangered
Vascular Plant	Hypericum prolificum	Shrubby St. John's-wort	Threatened
Vascular Plant	Iris prismatica	Slender Blue Flag	Threatened
Vascular Plant	Juncus marginatus var. biflorus	Large Grass-leaved Rush	Endangered
Vascular Plant	Juncus scirpoides	Scirpus-like Rush	Endangered
Vascular Plant	Juncus subcaudatus	Woods-rush	Endangered
Vascular Plant	Lachnanthes caroliniana	Carolina Redroot	Endangered
Vascular Plant	Lechea pulchella var. moniliformis	Bead Pinweed	Endangered

GROUP	SCIENTIFIC NAME	COMMON NAME	NY LISTING
Vascular Plant	Lechea tenuifolia	Slender Pinweed	Threatened
Vascular Plant	Lemna perpusilla	Minute Duckweed	Endangered
Vascular Plant	Leptochloa fusca ssp. fascicularis	Salt-meadow Grass	Endangered
Vascular Plant	Lespedeza stuevei	Velvety Bush-clover	Threatened
Vascular Plant	Liatris scariosa var. novae-angliae	Northern Blazing-star	Threatened
Vascular Plant	Ligusticum scothicum ssp. scothicum	Scotch Lovage	Endangered
Vascular Plant	Lilaeopsis chinensis	Eastern Grasswort	Threatened
Vascular Plant	Linum intercursum	Sandplain Wild Flax	Threatened
Vascular Plant	Linum medium var. texanum	Southern Yellow Flax	Threatened
Vascular Plant	Lipocarpha micrantha	Dwarf Bulrush	Endangered
Vascular Plant	Listera australis	Southern Twayblade	Endangered
Vascular Plant	Ludwigia sphaerocarpa	Globe-fruited Ludwigia	Threatened
Vascular Plant	Lycopodiella caroliniana var. caroliniana	Carolina Clubmoss	Endangered
Vascular Plant	Lycopus rubellus	Gypsy-wort	Endangered
Vascular Plant	Lysimachia hybrida	Lance-leaved Loosestrife	Endangered
Vascular Plant	Lythrum lineare	Saltmarsh Loosestrife	Endangered
Vascular Plant	Magnolia virginiana	Sweetbay Magnolia	Endangered
Vascular Plant	Myriophyllum pinnatum	Green Parrot's-feather	Endangered
Vascular Plant	Oenothera laciniata	Cut-leaved Evening-primrose	Endangered
Vascular Plant	Oenothera oakesiana	Evening Primrose	Threatened
Vascular Plant	Oldenlandia uniflora	Clustered Bluets	Endangered
Vascular Plant	Orontium aquaticum	Golden Club	Threatened
Vascular Plant	Paspalum laeve	Field Beadgrass	Endangered
Vascular Plant	Paspalum setaceum var. psammophilum	Slender Beadgrass	Endangered
Vascular Plant	Paspalum setaceum var. setaceum	Slender Beadgrass	Threatened
Vascular Plant	Plantago maritima var. juncoides	Seaside Plantain	Threatened
Vascular Plant	Platanthera ciliaris	Orange Fringed Orchid	Endangered
Vascular Plant	Platanthera cristata	Crested Fringed Orchis	Endangered
Vascular Plant	Polygala lutea	Orange Milkwort	Endangered
Vascular Plant	Polygonum buxiforme	Small's Knotweed	Endangered
Vascular Plant	Polygonum careyi	Carey's Smartweed	Threatened
Vascular Plant	Polygonum glaucum	Seabeach Knotweed	Rare
Vascular Plant	Polygonum hydropiperoides var. opelousanum	Opelousa Smartweed	Threatened
Vascular Plant	Polygonum setaceum var. interjectum	Swamp Smartweed	Endangered
Vascular Plant	Populus heterophylla	Swamp Cottonwood	Threatened
Vascular Plant	Potamogeton pulcher	Spotted Pondweed	Threatened
Vascular Plant	Potentilla anserina ssp. egedii	Silverweed	Threatened
Vascular Plant	Proserpinaca pectinata	Comb-leaved Mermaid-weed	Threatened
Vascular Plant	Pycnanthemum muticum	Blunt Mountain-mint	Threatened
Vascular Plant	Pyxidanthera barbulata	Flowering Pixiemoss	Endangered
Vascular Plant	Rhynchospora inundata	Drowned Horned Rush	Threatened
Vascular Plant	Rhynchospora nitens	Short-beaked Bald-rush	Threatened
Vascular Plant	Rhynchospora scirpoides	Long-beaked Bald-rush	Rare
Vascular Plant	Rotala ramosior	Tooth-cup	Threatened
Vascular Plant	Rumex hastatulus	Heart Sorrel	Endangered
Vascular Plant	Rumex maritimus var. fueginus	Golden Dock	Endangered
Vascular Plant	Sabatia campanulata	Slender Marsh-pink	Endangered
Vascular Plant	Sabatia stellaris	Sea-pink	Threatened
Vascular Plant	Sagina decumbens ssp. decumbens	Small-flowered	Endangered

GROUP	SCIENTIFIC NAME	COMMON NAME	NY LISTING
		Pearlwort	
Vascular Plant	Sagittaria teres	Quill-leaf Arrowhead	Endangered
Vascular Plant	Salicornia bigelovii	Dwarf Glasswort	Threatened
Vascular Plant	Schizaea pusilla	Curlygrass Fern	Endangered
Vascular Plant	Scleria minor	Slender Nutrush	Endangered
Vascular Plant	Scleria pauciflora var. caroliniana	Few-flowered Nutrush	Endangered
Vascular Plant	Scleria triglomerata	Whip Nutrush	Threatened
Vascular Plant	Sericocarpus linifolius	Flax-leaf Whitetop	Threatened
Vascular Plant	Sesuvium maritimum	Sea Purslane	Endangered
Vascular Plant	Sisyrinchium mucronatum	Michaux's Blue-eyed-grass	Endangered
Vascular Plant	Solidago latissimifolia	Coastal Goldenrod	Endangered
Vascular Plant	Solidago sempervirens var. mexicana	Seaside Goldenrod	Endangered
Vascular Plant	Sphenopholis pensylvanica	Swamp Oats	Endangered
Vascular Plant	Spiranthes vernalis	Spring Ladies'-tresses	Endangered
Vascular Plant	Sporobolus clandestinus	Rough Rush-grass	Endangered
Vascular Plant	Stachys hyssopifolia	Rough Hedge-nettle	Threatened
Vascular Plant	Suaeda linearis	Narrow-leaf Sea-blite	Endangered
Vascular Plant	Suaeda rolandii	Roland's Sea-blite	Endangered
Vascular Plant	Symphyotrichum concolor	Silvery Aster	Endangered
Vascular Plant	Symphyotrichum subulatum	Saltmarsh Aster	Threatened
Vascular Plant	Tipularia discolor	Cranefly Orchid	Endangered
Vascular Plant	Tripsacum dactyloides	Northern Gamma Grass	Threatened
Vascular Plant	Utricularia juncea	Rush Bladderwort	Threatened
Vascular Plant	Utricularia radiata	Small Floating Bladderwort	Threatened
Vascular Plant	Utricularia striata	Fibrous Bladderwort	Threatened
Vascular Plant	Uvularia puberula var. nitida	Mountain Bellwort	Endangered
Vascular Plant	Viburnum dentatum var. venosum	Southern Arrowwood	Threatened
Vascular Plant	Viburnum nudum var. nudum	Possum-haw	Endangered
Vascular Plant	Viola brittoniana	Coast Violet	Endangered
Vascular Plant	Viola primulifolia	Primrose-leaf Violet	Threatened

3.1.8. Suffolk County Meteorology and Air Quality

Meteorology

The Long Island climate is broadly classified as temperate-humid-continental. This is because the area has an extended period of frost-free temperatures, four defined seasons, significant levels of moisture measured in the air, and the weather systems that affect Long Island generally have paths including the mass of North America (Long Island.com, undated). Seasonality is impacted by temperature variations (discussed below) and by differences in solar radiation. The difference in hours of sunlight potentially received each day from the minimum amount on December 21 (9.25 hours) and the maximum amount on June 21 (15.1 hours) is approximately six hours (www.bnl.gov/weather).

Suffolk County has a strong maritime influence to its weather. This means temperatures, especially summer highs and winter lows, should be moderated by the heat buffering of the ocean, daily wind patterns that are strongly affected by the water, and rainfall distribution that tends to be even. The highest temperature recorded at Brookhaven National Laboratory since 1949 has been 100.5ºF, and the low was –23.0ºF. Mean precipitation is 48.49 inches per year (which includes the water equivalent of the mean snowfall of 29.8 inches per season). Regional wind patterns are dominated by winds from the west. The most common wind in winter is from the northwest and the most common wind in summer is from the southwest (www.bnl.gov/weather).

Major storms that can impact Suffolk County include hurricanes and nor'easters. Only two hurricanes have struck Long Island over the past twenty years: Gloria (1985) and Bob (1991) (TRC Environmental, 2001).

Nor'easters, which are extra-tropical cyclones, are much more frequent than hurricanes. Half a dozen nor'easters may strike Long Island in an average year, generally from October through April. These storms, although wind velocities are less than those found in hurricanes, can cause more storm damage (especially beach erosion) because they tend to be more sustained, sometimes influencing local weather for several days (TRC Environmental, 2001).

Table 3-3 illustrates temperature trends from 1949 to 2003. Table 3-4 presents precipitation data. Generally, rainfall is evenly distributed across the year (although there is slightly more precipitation in winter and early spring as opposed to late spring through the fall).

Table 3-3. Temperatures, Brookhaven National Laboratory, Upton, New York 1949-2003

Month	Mean	Average Maximum	Average Minimum
January	29.2	38.1	20.2
February	30.5	39.8	21.3
March	37.5	47.2	27.9
April	46.9	58.2	36.0
May	56.7	68.2	45.3
June	66.0	76.9	55.2
July	71.6	81.9	61.4
August	70.1	80.5	59.9
September	62.6	73.6	51.9
October	52.6	63.7	41.0
November	43.0	52.9	33.2
December	33.6	42.5	24.6

Table 3-4. Precipitation, Brookhaven National Laboratory, Upton, New York, 1949-2003

Month	Total Precipitation (inches)			Snowfall (inches)		
	Mean	Maximum	Minimum	Mean	Maximum	Minimum
January	4.22	13.01	0.62	8.0	26.0	trace
February	3.82	6.45	1.16	9.3	32.5	0
March	4.91	10.37	1.53	5.8	31.5	0
April	4.24	11.09	1.56	0.9	16.0	0
May	3.87	10.47	0.63			
June	3.43	12.85	0.42			
July	3.26	8.62	0.50			
August	4.45	11.98	0.54			
September	3.65	10.47	0.86			
October	3.71	11.43	0.18	0.0	1.0	0
November	4.45	9.05	0.54	0.5	7.5	0
December	4.62	8.66	0.82	5.2	23.6	0
Total	48.49	68.66	34.35	29.8	90.8	4.5

Regional Air Quality

New York State monitors air quality at several Long Island stations. This includes a sampling station at Babylon. Some parameters not measured at Babylon are sampled for at Eisenhower Park (Hempstead). Lead is sampled for in Greenpoint (Brooklyn) (TRC Environmental, 2001).

Ozone is sampled for at Babylon. The data collected show that the region exceeds the federal standard for ozone. This means that Long Island is classified as a “non-attainment area” as regards the ozone standard. Sources of nitrogen oxides and VOCs, since they are precursors of ozone, are subjected to extra regulatory scrutiny (TRC Environmental, 2001).

PM_{10}, small inhalable particles in the air that are smaller than 10 microns in size, is sampled for at Babylon, as is sulfur dioxide. Neither parameter has exceeded the established standard (TRC Environmental, 2001).

Carbon monoxide, total suspended particles (TSP – the particles smaller than 75 microns), and nitrogen oxides are measured for at Eisenhower Park. All of these data meet Federal standards (TRC Environmental, 2001).

Lead is now only sampled for at Greenpoint, although formerly it was measured at Eisenhower Park. These Brooklyn data meet Federal standards (TRC Environmental, 2001).

Pesticides are generally not sampled for in air, except in association with particular applications. Most pesticides are classified as semi-volatile organic compounds (SVOCs). SVOCs are a class of compounds that are defined by the analytical technique used to measure them. However, as a rule, these compounds somewhat readily partition from the liquid phase into a gaseous phase (volatilize). Most pesticides tend to not dissolve well into water, and to have very strong affinities for particulate matter. This tends to be true for the mosquito control compounds of concern in the assessment. As discussed in Cashin Associates (2005c and 2005d), it is very difficult to measure these pesticides either in the atmosphere or as deposition products, even in association with a particular application. One effort involving indoor air sampling did not find pesticides to be a problem (Koutrakis and Briggs, 1992), but another study found that permethrin and PBO were the most commonly detected pesticides measured in indoor air and dust samples (Rudel et al., 2003). It was noted that indoor applications seem to be the source of the permethrin and PBO, unlike DDT and other persistent pollutants that were detected, and may have been brought into the households from outside applications. Permethrin and PBO concentrations did not exceed government-issued risk evaluations.

3.1.9. Suffolk County Political Divisions

Suffolk County is composed of ten constituent towns (Figure 3-8):

- Babylon
- Brookhaven
- East Hampton
- Huntington
- Islip
- Riverhead
- Shelter Island
- Smithtown
- Southampton
- Southold

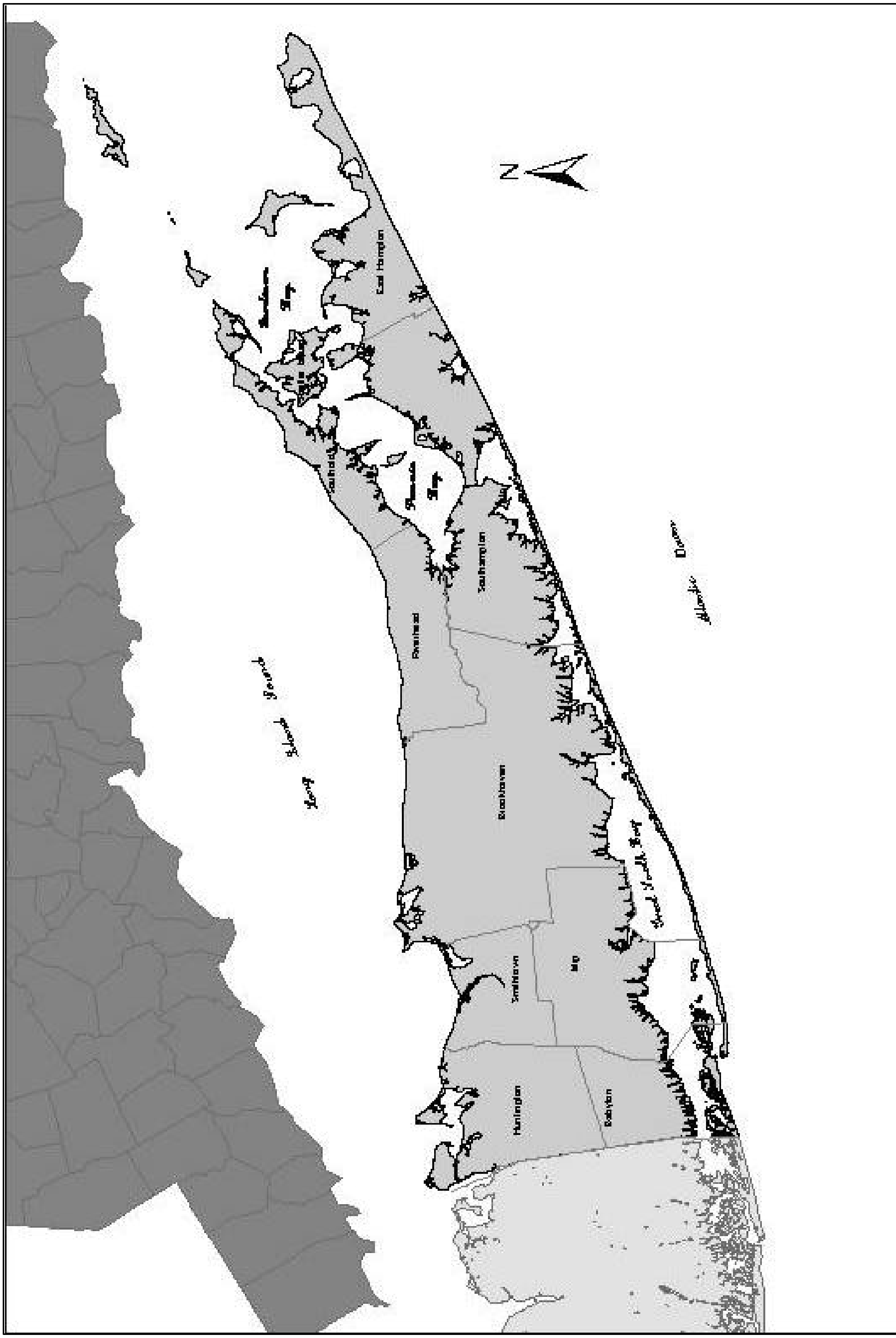


FIGURE 3-8
DRAFT GENERIC ENVIRONMENTAL IMPACT STATEMENT
SUFFOLK COUNTY
TOWNS

Towns that were formed prior to the establishment of the United States also have, besides Town government, separate Boards of Trustees. The Trustees are often synonymous with elected Town government – but not in every case. Trustees have responsibilities for governmental rights and responsibilities associated with the colonial era patents granted by the English monarchy that predate the Constitution (Kavanagh, 1980).

Within nine of the Towns are 32 separate villages:

- Three in Babylon (Amityville, Babylon, and Lindenhurst)
- Eight in Brookhaven (Belle Terre, Bellport, Lake Grove, Old Field, Patchogue, Poquott, Port Jefferson, and Shoreham)
- Two in East Hampton (East Hampton and Sag Harbor – also in Southampton)
- Four in Huntington (Asharoken, Huntington Bay, Lloyd Harbor, and Northport)
- Four in Islip (Brightwaters, Islandia, Ocean Beach, and Saltaire)
- One in Shelter Island (Dering Harbor)
- Three in Smithtown (Head of the Harbor, Nissequogue, and Village of the Branch)
- Seven in Southampton (North Haven, Quogue, Sag Harbor – also in East Hampton, Sagaponack, Southampton, Westhampton Beach, and Westhampton Dunes)
- One in Southold (Greenport)

Some of these governments believe they have the right and responsibility to regulate activities associated with wetlands management and/or vector control. With this Plan, Suffolk County has made a clear commitment to work with each municipality that expresses an interest in wetlands management and vector control, and to determine mutually acceptable means for the necessary activities described in the Plan to be conducted without unnecessary reviews and regulations.

Of the important, populated islands off Long Island, Shelter Island constitutes its own Town, Fishers Island is part of Southold, and Fire Island communities are part of either Islip or Brookhaven.

3.2. General Demographic Data

Since World War II, Long Island has epitomized the phenomenon of growth into suburbia. The County's population in 1950, for example, was 276,129. The population in 2000 was 1,419,369 (LIPA, 2005). Some basic characteristics of the Suffolk County population are that it is 51.0 percent female, and the median age is 36.5, according to the 2000 US Census website. For the country as a whole, the percent female was 50.9 percent, and the median age was 35.3. Other basic demographic data are given in Tables 3-5 and 3-6.

Table 3-5. Age Distribution

Age Range	Number	Percent	US Percent
<5	100,304	7.1	6.8
5 – 14	213,620	15.0	14.6
15 – 24	164,223	11.5	14.5
25 – 34	191,695	13.5	14.2
35 – 44	251,600	17.7	16.0
45 – 54	197,563	13.9	13.4
55 – 64	132,776	9.3	8.6
65 – 74	91,906	6.5	6.5
75 – 84	55,650	3.9	4.4
85+	20,002	1.4	1.5

Table 3-6. Racial Characteristics

Category[1]	Number	Percent	US Percent
White	1,221,929	86.1	77.1
Black	108,870	7.7	12.9
Native American	9,122	0.6	1.5
Asian	40,884	2.9	4.2
Pacific Islander	1,252	0.1	0.3
Other	68,469	4.8	6.6
Hispanic or Latino	149,411	10.5	12.5

[1] Categories are not exclusive, and so the percent listed exceeds 100 percent.

The Long Island Power Authority (LIPA) produces population surveys each year, based on its intimate knowledge of electrical connections and using general Census information. Table 3-7 shows population information for each Town, from the 2000 Census, and from the 2004 LIPA estimate.

Table 3-7. Population by Town

Township	2000 Census	2004 LIPA Estimate
Babylon	211,471	214,340
Brookhaven	448,020	472,425
East Hampton	19,647	20,945
Huntington	195,289	199,368
Islip	315,940	329,257
Riverhead	27,680	30,909
Shelter Island	2,228	2,396
Smithtown	115,715	118,132
Southampton	55,216	57,659
Southold	20,599	21,994
TOTAL	**1,419,369**	**1,467,425**

Although Long Island has long had a close economic relationship with New York City, it has always had some independence from the city as well. This is especially so for Suffolk County. Much economic energy is now contained within the bicounty area, as "edge" communities have been created. Notable areas of Suffolk County that epitomize the intra-suburb economy include Melville and Hauppauge. A measure of the economic vitality that has been experienced in Suffolk County is the median household income for the County in 1999, $65,228, compared to the US national median household income of $41,994. Per capita income in the County was $26,577 (the US per capita income was $21,587). The distribution of household incomes is shown in Table 3-8, and skews to the higher brackets compared to the country as a whole. However, it is surprising to see that, in general, people in Suffolk County do not have much higher levels of educational achievement than other Americans do, although there is a much lower percentage of people without high school diplomas, and a higher percentage of those with graduate and/or professional degrees (Table 3-9) (all data from the 2000 US Census).

Table 3-8. 1999 Household Income Distribution

Income Range	Number	Percent	US Percent
<$10,000	21,180	4.5	9.5
$10,000 – $14,999	16,421	3.5	6.3
$15,000 – $24,999	34,146	7.3	12.9
$25,000 – $34,999	37,991	8.1	12.8
$35,000 – $49,999	60,667	12.9	16.6
$50,000 – $74,999	101,668	21.7	19.4
$75,000 – $99,999	77,601	16.5	10.2
$100,000 – $149,999	75,831	16.2	7.7
$150,000 – $199,999	24,686	5.3	2.2
$200,000+	19,334	4.1	2.4

Table 3-9. Education Achievement (persons 25+ years old)

	Number	Suffolk Percent	US Percent
No high school diploma	140,174	13.9	19.6
High school diploma	294,953	31.3	28.6
Some college	183,330	19.5	21.1
Associate degree	75,080	8.0	6.3
Bachelor's degree	147,323	15.6	15.5
Graduate and/or professional degree	111,541	11.8	8.9

Suffolk County is similar in many ways with other suburban communities around the nation. It is predominantly white (although minorities are becoming more prevalent), and affluent (although not all share in the wealth), and one third of the adults have college degrees.

In Suffolk County, western and northern areas tend to be better-off (see Table 3-10). A characteristic of the South Fork is a large proportion of its houses are either second homes-summer homes, or that are seasonal rentals. It is a well-known resort area for wealthy New York City residents. Median house prices in many of these communities exceed $1 million, as has been recently and commonly reported in local newspapers. Other areas affected by similar house ownership patterns include Fire Island, Shelter Island, and, increasingly, the North Fork.

Table 3-10. 1999 Median Household Income by Town

Township	
Babylon	$60,064
Brookhaven	$62,475
East Hampton	$52,201
Huntington	$82,528
Islip	$65,359
Riverhead	$46,195
Shelter Island	$53,011
Smithtown	$80,421
Southampton	$53,887
Southold	$49,896
Suffolk Median	**$65,228**
US Median	**$41,994**