5.4.5 Flood

This section provides a profile and vulnerability assessment for the flood hazard.

Hazard Profile

This section provides profile information including description, location, extent, previous occurrences and losses and the probability of future occurrences.

Description

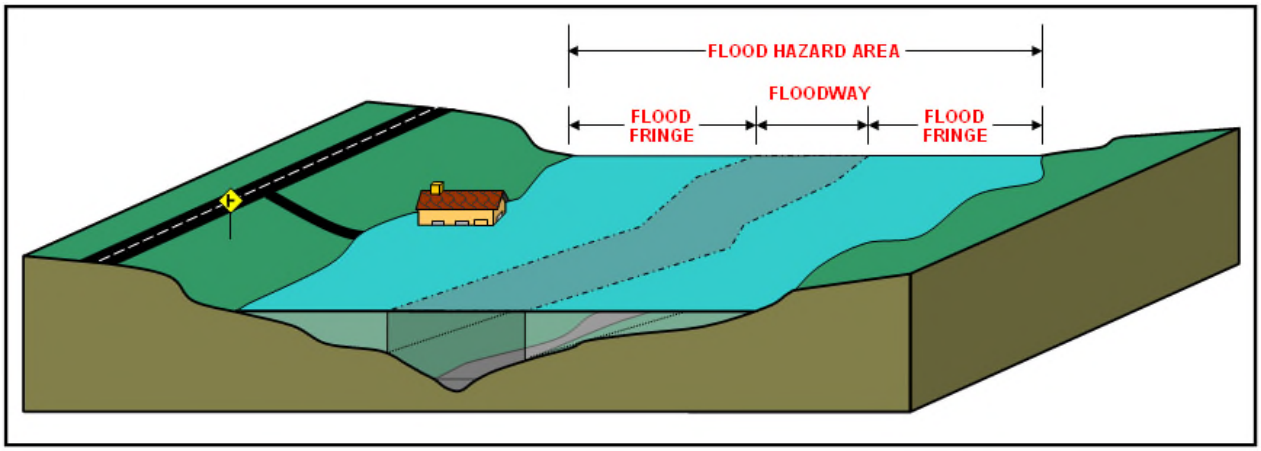
Floods are one of the most common natural hazards in the U.S. They can develop slowly over a period of days or develop quickly, with disastrous effects that can be local (impacting a neighborhood or community) or regional (affecting entire river basins, coastlines and multiple counties or states) (Federal Emergency Management Agency [FEMA], 2008). Most communities in the U.S. have experienced some kind of flooding, after spring rains, heavy thunderstorms, coastal storms, or winter snow thaws (George Washington University, 2001). Floods are the most frequent and costly natural hazards in New York State in terms of human hardship and economic loss, particularly to communities that lie within flood prone areas or flood plains of a major water source. As defined in the NYS HMP, flooding is a general and temporary condition of partial or complete inundation on normally dry land from the following:

- Riverine flooding, including overflow from a river channel, flash floods, alluvial fan floods, dam-break floods and ice jam floods;
- Local drainage or high groundwater levels;
- Fluctuating lake levels;
- Coastal flooding;
- Coastal erosion (NYS DHSES, 2011);
- Unusual and rapid accumulation or runoff of surface waters from any source;
- Mudflows (or mudslides);
- Collapse or subsidence of land along the shore of a lake or similar body of water caused by erosion, waves or currents of water exceeding anticipated cyclical levels that result in a flood as defined above (Floodsmart.gov, 2012);
- Sea Level Rise; or
- Climate Change (USEPA, 2013).

A floodplain is defined as the land adjoining the channel of a river, stream, ocean, lake, or other watercourse or water body that becomes inundated with water during a flood. Most often floodplains are referred to as 100-year floodplains. A 100-year floodplain is not the flood that will occur once every 100 years, rather it is the flood that has a one-percent chance of being equaled or exceeded each year. Thus, the 100-year flood could occur more than once in a relatively short period of time. With this term being misleading, FEMA has properly defined it as the one-percent annual chance flood. This one percent annual chance flood is now the standard used by most Federal and State agencies and by the National Flood Insurance Program (NFIP) (FEMA, 2003).

Figure 5.4.5-1 depicts the flood hazard area, the flood fringe, and the floodway areas of a floodplain.

Figure 5.4.5-1. Floodplain



Source: NJDEP, Date Unknown

Many floods fall into three categories: riverine, coastal and shallow (FEMA, 2005). Other types of floods may include ice-jam floods, alluvial fan floods, dam failure floods, and floods associated with local drainage or high groundwater (as indicated in the previous flood definition). For the purpose of this HMP and as deemed appropriate by the Suffolk County Planning Committee, coastal, and riverine/flash flooding are the main flood types of concern for the Planning Area. These types of flood or further discussed below.

Coastal Flooding

Coastal flooding generally occurs along the coasts of oceans, bays, estuaries, coastal rivers and large lakes. Coastal floods are the submersion of land areas along the ocean coast and other inland waters caused by seawater over and above normal tide action. Coastal flooding is a result of the storm surge where local sea levels rise often resulting in weakened or destroyed coastal structures. Hurricanes and tropical storms cause most of the coastal flooding in New York State. Coastal flooding has many of the same problems identified for riverine flooding but also has additional problems such as beach erosion; loss or submergence of wetlands and other coastal ecosystems; saltwater intrusion; high water tables; loss of coastal recreation areas, beaches, protective sand dunes, parks, and open space; and loss of coastal structures. Coastal structures can include sea walls, piers, bulkheads, bridges, or buildings (FEMA 2011).

There are several forces that occur with coastal flooding:

- *Hydrostatic forces* against a structure are created by standing or slowly moving water. Flooding can cause vertical hydrostatic forces, or flotation. These types of forces are one of the main causes of flood damage.
- *Hydrodynamic forces* on buildings are created when coastal floodwaters move at high velocities. These high-velocity flows are capable of destroying solid walls and dislodging buildings with inadequate foundations. High-velocity flows can also move large quantities of sediment and debris that can cause additional damage. In coastal areas, high-velocity flows are typically associated with one or more of the following:
    - Storm surge and wave run-up flowing landward through breaks in sand dunes or across low-lying areas
    - Tsunamis
    - Outflow of floodwaters driven into bay or upland areas

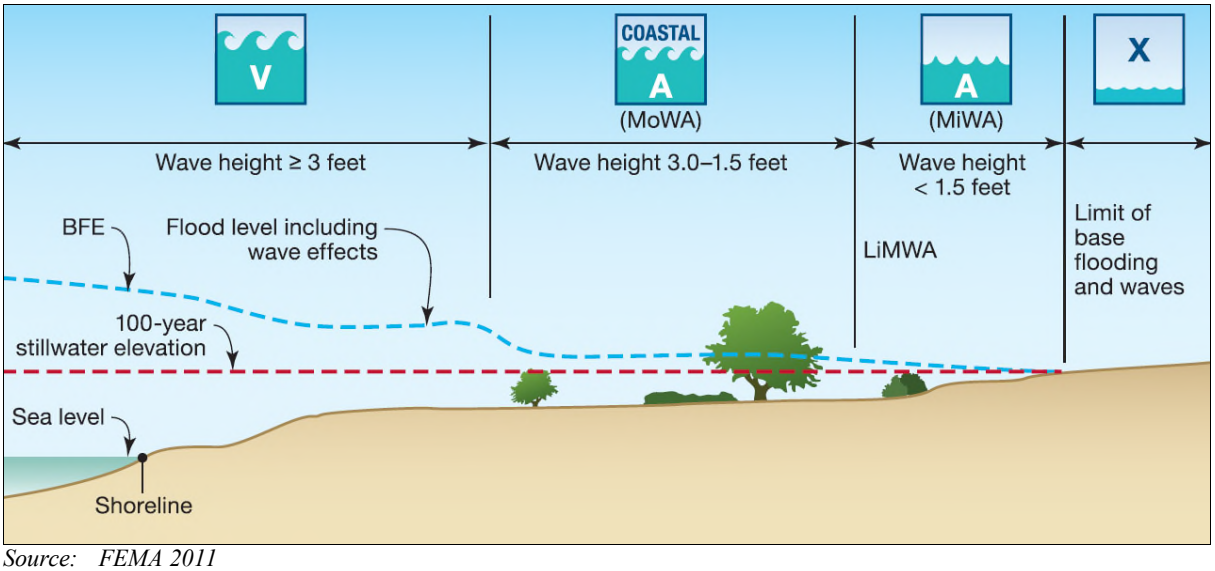
  - Strong currents parallel to the shoreline, driven by waves produced from a storm
  - High-velocity flows

  High-velocity flows can be created or exacerbated by the presence of manmade or natural obstructions along the shoreline and by weak points formed by roads and access paths that cross dunes, bridges or canals, channels, or drainage features.
- *Waves* can affect coastal buildings from breaking waves, wave run-up, wave reflection and deflection, and wave uplift. The most severe damage is caused by breaking waves. The force created by these types of waves breaking against a vertical surface is often at least 10 times higher than the force created by high winds during a coastal storm.
- *Flood-borne debris* produced by coastal flooding events and storms typically includes decks, steps, ramps, breakaway wall panels, portions of or entire houses, heating oil and propane tanks, cars, boats, decks and pilings from piers, fences, erosion control structures, and many other types of smaller objects. Debris from floods are capable of destroying unreinforced masonry walls, light wood-frame construction, and small-diameter posts and piles (FEMA 2011).

According to the 2011 Coastal Construction Manual, FEMA P-55, Zone V (including Zones VE, V1-30, and V) identifies the Coastal High Hazard Area. This is the portion of the special flood hazard area (SFHA) that extends from offshore to the inland limit of a primary frontal dune along an open coast and any other portion of the SFHA that is subject to high-velocity wave action from storms or seismic sources. The boundary of Zone V is generally based on wave heights (3 feet or greater) or wave run-up depths (3 feet or greater). Zone V can also be mapped based on the wave overtopping rate (when waves run up and over a dune or barrier). Zone A or AE, identify portions of the SFHA that are not within the Coastal High Hazard Area. These zones are used to designate both coastal and non-coastal SFHAs. Regulatory requirements of the NFIP for buildings located in Zone A are the same for both coastal and riverine flooding hazards. Zone AE in coastal areas is divided by the limit of moderate wave action (LiMWA). The LiMWA represents the landward limit of the 1.5-foot wave (FEMA 2011).

The area between the LiMWA and the Zone V limit is known as the Coastal A-zone (for building codes and standard purposes) and as the Moderate Wave Action area (by FEMA flood mappers). This area is subject to wave heights between 1.5 and 3 feet during the base flood. The area between the LiMWA and the landward limit of Zone A is known as the Minimal Wave Action area, and is subject to wave heights less than 1.5 feet during the base flood (FEMA P-55 2011). Figure 5.4.5-2 shows a typical transect illustrating Zone V, the Coastal A-zone and Zone A, and the effects of energy dissipation and regeneration of a wave as it moves inland. Wave elevations are decreased by obstructions such as vegetation and rising ground elevation (FEMA 2011).

Figure 5.4.5-2. Transect Schematic of Zone V, Coastal A-zone, and Zone A



Source: FEMA 2011
BFE Base Flood Elevation
LiMWA limit of moderate wave action
MiWA Minimal Wave Action area
MoWA Moderate Wave Action area

Sea Level Rise

Rising sea levels may have a negative impact on the process that leads to coastal erosion. Studies have shown that an increased sea level attributed to climate change can speed up the natural coastal processes that remove sand and vegetation from protective beaches, dunes, and bluffs. Erosion resulting from sea level rise will lead to more intensive coastal impacts from future storm events (NYS DHSES 2013).

Understanding trends in sea level, along with the relationship between global and local sea level, provides information about the impacts of the earth's climate on the oceans and atmosphere. Changes in global temperatures, hydrologic cycles, coverage of glaciers and ice sheets, and storm frequency and intensity are known effects of climate change. All of these changes are directly related to and captured in long-term sea level records. Sea levels provide a key to understanding the impact of climate change (NOAA 2013).

Sea level rise increases the risks coastal communities face from coastal hazards (floods, storm surges, and chronic erosion). It may also lead to the loss of important coastal habitats and public-access areas. Because of existing shoreline development and protective structures, wetlands, beaches, and other intertidal areas may not be able to migrate inland progressively as sea level rises. These areas could become completely inundated by the rising ocean. Higher mean sea levels increase the frequency, magnitude, and duration of flooding associated with any given storm (NOAA 2012).

In New York State, State Legislature created the Sea Level Rise Task Force in 2007. It was created to assess impacts to the State's coastlines from rising seas and recommend protective and adaptive measures. The Task Force had to evaluate ways to protect New York State's remaining coastal ecosystem and natural habitats and increase coastal community resilience in the face of sea level rise (NYSDEC 2013).

During the past 100 years, the rate of global mean sea level rise was approximately 1.7 millimeters per year (0.7 inches per decade) and observations show that the rate of global sea level rise is accelerating. In New York State, tide gauge observations indicate that rates of relative sea level rise in New York State were greater than the global mean, ranging from 2.41 to 2.77 millimeters per year (0.9 to 1.1 inches per decade) over the last 100 years. Sea level on Long Island is projected to rise two to five inches by the 2020s, seven to 12 inches by the 2050s, and 12 to 23 inches by the 2080s. Sea level rise will affect the State's coastal communities and natural resources. Areas beyond the immediate coastline will experience flooding and erosion associated with the increase in storm occurrences. It is projected that coastal erosion will be accelerated by rising sea levels.

Riverine/Flash Floods

Riverine floods are the most common flood type. They occur along a channel and include overbank and flash flooding. Channels are defined, ground features that carry water through and out of a watershed. They may be called rivers, creeks, streams, or ditches. When a channel receives too much water, the excess water flows over its banks and inundates low-lying areas (FEMA 2008; The Illinois Association for Floodplain and Stormwater Management 2006).

Flash floods are "a rapid and extreme flow of high water into a normally dry area, or a rapid water level rise in a stream or creek above a predetermined flood level, beginning within six hours of the causative event (e.g., intense rainfall, dam failure, ice jam). However, the actual time threshold may vary in different parts of the country. Ongoing flooding can intensify to flash flooding in cases where intense rainfall results in a rapid surge of rising flood waters" (National Weather Service [NWS] 2009).

Federal Flood Programs

National Flood Insurance Program

The NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. For most participating communities, FEMA has prepared a detailed Flood Insurance Study (FIS). The study presents water surface elevations for floods of various magnitudes, including the 1% annual chance flood and the 0.2% annual chance flood (the 500-year flood). Base flood elevations and the boundaries of the 100- floodplains are shown on Flood Insurance Rate Maps (FIRMs), which are the principle tool for identifying the extent and location of the flood hazard.

The FIRMs depict SFHAs - those areas subject to inundation from the 1% annual chance flood (also known as the Base Flood or the 100-Year Flood). Those areas are defined as follows:

- Zones A1-30 and AE: SFHAs that are subject to inundation by the base flood, determined using detailed hydraulic analysis. Base Flood Elevations are shown within these zones.
- Zone A (Also known as Unnumbered A-zones): SFHAs where no Base Flood Elevations or depths are shown because detailed hydraulic analyses have not been performed,.
- Zone AO: SFHAs subject to inundation by types of shallow flooding where average depths are between 1 and 3 feet. These are normally areas prone to shallow sheet flow flooding on sloping terrain.
- Zone VE, V1-30: SFHAs along coasts that is subject to inundation by the base flood with additional hazards due to waves with heights of 3 feet or greater. Base Flood Elevations derived from detailed hydraulic analysis are shown within these zones.
- Zone B and X (shaded): Zones where the land elevation as been determined to be above the Base Flood Elevation, but below the 500-year flood elevation. These zones are not SFHAs.

- Zones C and X (unshaded): Zones where the land elevation has been determined to be above both the Base Flood Elevation and the 500-year flood elevation. These zones are not SFHAs.

As of January 31, 2014, there are 38,165 NFIP policies in Suffolk County. Of those policies in Suffolk County, 2,848 are considered repetitive loss (RL) and 455 are considered severe repetitive loss (SRL). To be eligible for the NFIP, certain criteria must be met and claim payments must have occurred within 10 years of each other. If there are multiple losses at the same location within 10 days of each other, these claims are counted within one loss. NFIP information for Suffolk County, as of January 31, 2014 (FEMA, 2014), is shown in the Vulnerability Assessment portion of this profile.

Flood Insurance Studies (FIS)

In addition to FIRM and Digital Flood Insurance Rate Maps (DFIRM), FEMA also provides FISs for entire counties and individual jurisdictions. These studies aid in the administration of the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. They are narrative reports of countywide flood hazards, including descriptions of the flood areas studied, the engineered methods used, principal flood problems, flood protection measures, and graphic profiles of the flood sources.

Risk Mapping, Assessment, and Planning (Risk MAP)

Risk MAP is a FEMA program that provides communities with flood information and tools to enhance their mitigation plans and take action to protect their citizens. It builds on flood hazard data and maps produced during the Flood Map Modernization (Map Mod) program. Through more precise flood mapping products, risk assessment tools, and planning and outreach support, Risk MAP strengthens local ability to make informed decisions about reducing risk. It combines quality engineering with state-of-the-art flood hazard data to assist communities in planning and preventing risk using the most current information.

Risk MAP collaborates with state, tribal, and local governments and delivers quality data that increases public awareness and leads to action that reduces risk to property and life. Risk MAP focuses on products and services beyond the traditional FIRMs and works with officials to help put flood risk data and assessment tools to use. Risk MAP also helps effectively communicate risk to citizens and enable communities to enhance their mitigation plans and actions (FEMA 2012).

The goals of Risk MAP are as follows:

- Flood Hazard Data – addresses gaps in flood hazard data to form a solid foundation for risk assessment, floodplain management, and actuarial soundness of the NFIP.
- Public Awareness/Outreach – ensures that a measurable increase of the public's awareness and understanding of risk results in a measurable reduction of current and future vulnerability.
- Hazard Mitigation Planning – leads and supports states, local, and tribal communities to effectively engage in risk-based mitigation planning resulting in sustainable actions that reduce or eliminate risks to life and property from natural hazards.
- Enhanced Digital Platform – provides an enhanced digital platform that improves management of Risk MAP, conserves information produced by Risk MAP, and improves communication and sharing of risk data and related products to all levels of government and the public.
- Alignment and Synergies – aligns risk analysis programs and develops synergies to enhance decision-making capabilities through effective risk communication and management.

FEMA headquarters and regional offices lead a team of contractors and stakeholders to deliver its Risk MAP program. The team is made up of the following:

- FEMA Headquarters – responsible for overall program implementation
- FEMA Regions – manage regional flood map production and help implement the Risk MAP outreach strategy
- State, Local, and Tribal entities – help ensure that updated mapping information is used to make informed decisions regarding risk
- Program Management Contractor – provide general oversight for Risk MAP including integration of activities, development and implementation of a national outreach strategy, and stakeholder relations
- Production and Technical Services Contractors – update flood hazard data and maps
- Customer and Data Services Contractor – provide the digital platform for sharing flood mapping products and information

Biggert-Water Flood Insurance Reform Act of 2012 and Homeowner Flood Insurance Affordability Act of 2014

In July 2012, the U.S. Congress passed the Biggert-Water Flood Insurance Reform Act of 2012 (BW-12) which called on FEMA and other agencies to make a number of changes to the way the NFIP is run. Key provisions of the legislation will require the NFIP to raise rates to reflect true flood risk, make the program more financially stable, and change how FIRM updates impact policyholders. BW-12 also eliminated the Repetitive Flood Claims and Severe Repetitive Loss programs and made significant changes to the Flood Mitigation Assistance (FMA) program.

On March 21, 2014, subsequent to substantial implementation of BW-12, President Obama signed the Homeowner Flood Insurance Affordability Act (HFIAA) of 2014 into law. HFIAA of 2014 repeals certain provisions of BW-12 that eliminated eligibility for Pre-Flood Insurance Rate Map (FIRM) subsidies for buildings newly purchased or newly insured on or after July 6, 2012, as well as reinstatements of lapsed policies effective on or after October 4, 2012. FEMA's initial priority is to restore Pre-FIRM subsidies for policyholders covered by section 3 of the HFIAA (FEMA 2014a).

While FEMA actively works to implement the new law, policyholders are encouraged to maintain and keep current flood insurance policies. FEMA will continue working with Congress, the private Write Your Own Insurance Companies, and other stakeholders to implement these Congressionally-mandated reforms and to working toward our shared goals of helping families maintain affordable flood insurance, ensuring the financial stability of the NFIP and reducing the risks and consequences of flooding nationwide. FEMA will continue to identify and publish special flood hazards and flood risk zones as authorized and required by Congress (FEMA 2014b). The following provides information regarding this new Act:

- The new law lowers the recent rate increases on some policies, prevents some future rate increases, and implements a surcharge on all policyholders. The Act also repeals certain rate increases that have already gone into effect and provides for refunds to those policyholders. The Act also authorizes additional resources for the National Academy of Sciences (NAS) to complete the affordability study.
- FEMA has actively begun analyzing and prioritizing implementation of the new law. We will be working with the private Write Your Own insurance companies in the next few weeks to seek their input and expertise prior to issuing business practice bulletins.

- It is not possible for changes to happen immediately. While the new law does require some changes to be made retroactively, applying to certain policies written after July 6, 2012, other changes require establishment of new programs, processes and procedures.
- FEMA's initial priority is assessing potential changes to the NFIP's business processes to stop policy increases for certain subsidized policyholders as outlined in the Act.
- FEMA also plans to issue guidance in the months ahead for the Write Your Own insurance companies to begin issuing refunds as outlined in the law for some policyholders who were previously impacted by subsidy phase outs.
- More information on the new law and its impacts on the NFIP will be forthcoming (FEMA 2014b).

Refunds

For certain flood insurance policies affected by the Pre-Flood Insurance Rate Map (Pre-FIRM) subsidy elimination required by BW-12, the new law mandates refunds of the excess premiums that those policyholders were charged pursuant to the requirements of BW-12. Refunds will not affect all subsidized policyholders who received rate increases as directed by Congress in BW-12, only policyholders for whom the rate increases under BW-12 were revoked by the new law. Refunds will affect only a small percentage of the overall NFIP policy base (FEMA 2014b).

Prior to restoring and refunding premiums, FEMA is required by the Homeowner Flood Insurance Affordability Act to consult with its partner insurers (Write-Your-Own insurance companies or WYOs) to develop guidance and rate tables. In accordance with the new law, FEMA will work to develop and finalize its guidance and rate tables within eight months. The law provides WYO insurance companies between six and eight months to implement the changes and update systems to implement the guidance (FEMA 2014b).

FEMA is working closely with the WYO insurance companies to develop a timetable for processing refunds expediently. Refunds apply to policyholders in high-risk areas who were required to pay their full-risk rate after purchasing a new flood insurance policy on or after July 6, 2012. Refunds may apply to policyholders who renewed their policy after HFIAA was enacted on March 21, 2014 and whose premium increased more than 18% (FEMA 2014b). Refunds do not apply to the following:

- Policyholders paying the 25 percent annual rate increases, as required by Congress in BW12, for a Pre-FIRM subsidized non-primary residence, business, Severe Repetitive Loss property, or building that was substantially damaged or improved (FEMA 2014b).
- Policyholders whose full-risk premium is less than the Pre-FIRM subsidized premium, or who were not overcharged according to any retroactive revisions to the Pre-FIRM subsidized rates required by the new law (FEMA 2014b).

Policyholders who saw usual, annual rate increases in 2013 or 2014, or policyholders who paid the 5 percent fee, as required by BW-12, for the NFIP Reserve Fund, will only see a refund if their premium renewal was after March 21, 2014 and their total premium, including the reserve fund, exceeded 18% (FEMA 2014b).

Premium Rates for Subsidized Policies

The new law requires gradual rate increases to properties now receiving artificially low (or subsidized) rates instead of immediate increases to full-risk rates required in certain cases under BW-12. FEMA is required to increase premiums for most subsidized properties by no less than 5% annually until the class

premium reaches its full-risk rate. It is important to note that close to 80% of NFIP policyholders paid a full-risk rate prior to either BW-12 or HFIAA, and are minimally impacted by either law (FEMA 2014b).

With limited exceptions flood insurance premiums cannot increase more than 18 percent annually. There are some exceptions to these general rules and limitations. The most important of these exceptions is that policies for the following properties will continue to see up to 25% annual increases as required by BW-12 until they reach their full-risk rate (FEMA 2014b). Other exceptions include:

- Older business properties insured with subsidized rates
- Older non-primary residences insured with subsidized rates
- Severe Repetitive Loss Properties insured with subsidized rates; and
- Buildings that have been substantially damaged or improved built before the local adoption of a Flood Insurance Rate Map (known as Pre-FIRM properties) (FEMA 2014b).

In order to enable new purchasers of property to retain Pre-FIRM rates while FEMA is developing its guidelines, a new purchaser will be allowed to assume the prior owner's flood insurance policy and retain the same rates until the guidance is finalized. Also, lapsed policies receiving Pre-FIRM subsidized rates may be reinstated with Pre-FIRM subsidized rates pending FEMA's implementation of the rate increases required by HFIAA (FEMA 2014b).

New Surcharge on All Policies

A new surcharge will be added to all policies to offset the subsidized policies and achieve the financial sustainability goals of BW-12. A policy for a primary residence will include a $25 surcharge. All other policies will include a $250 surcharge. The fee will be included on all policies, including full-risk rated policies, until all Pre-FIRM subsidies are eliminated (FEMA 2014b).

Grandfathering

The new law repeals a provision of BW-12 that required FEMA, upon the effective date of a new or updated FIRM, to phase in premium increases over five years by 20%a year to reflect the current risk of flood to a property, effectively eliminating FEMA's ability to grandfather properties into lower risk classes (FEMA 2014b).

Also for newly mapped in properties, the new law sets first year premiums at the same rate offered to properties located outside the Special Flood Hazard Area (preferred risk policy rates). With limited exceptions, flood insurance premiums cannot increase more than 18% annually (FEMA 2014b).

Flood Insurance Advocate

The new law requires FEMA to designate a Flood Insurance Advocate to advocate for the fair treatment of NFIP policy holders (FEMA 2014b). The Advocate will:

- Educate property owners and policyholders on individual flood risks; flood mitigation; measures to reduce flood insurance rates through effective mitigation; the flood insurance rate map review and amendment process; and any changes in the flood insurance program as a result of any newly enacted laws;
- Assist policy holders and property owners to understand the procedural requirements related to appealing preliminary flood insurance rate maps and implementing measures to mitigate evolving flood risks;

- Assist in the development of regional capacity to respond to individual constituent concerns about flood insurance rate map amendments and revisions;
- Coordinate outreach and education with local officials and community leaders in areas impacted by proposed flood insurance rate map amendments and revisions; and Aid potential policy holders in obtaining and verifying accurate and reliable flood insurance rate information when purchasing or renewing a flood insurance policy (FEMA 2014b).

Other Provisions

The new law permits FEMA to account for property specific flood mitigation that is not part of the insured structure in determining a full-risk rate. The law requires that residential basement floodproofing be considered when developing full-risk rates after a map changes increasing the Base Flood Elevation in an area where residential basement floodproofing is permitted (FEMA 2014b).

The law mandates that FEMA develop an installment plan for non-escrowed flood insurance premiums, which will require changes to regulations and the Standard Flood Insurance Policy contract. The law increases maximum deductibles. The law encourages FEMA to minimize the number of policies where premiums exceed 1-percent of the coverage amount, and requires FEMA to report such premiums to Congress (FEMA 2014b).

Draft Affordability Framework

The new law requires FEMA to prepare a draft affordability framework, which is due to Congress 18 months after completion of the affordability study required by BW-12. The Affordability Study required by BW-12 is underway and is being conducted by the National Academies of Sciences, as specified in the BW-12 law (FEMA 2014b). In developing the affordability framework, FEMA must consider:

- Accurate communication to customers of the flood risk,
- Targeted assistance based on financial ability to pay,
- Individual and community actions to mitigate flood risk or lower cost of flood insurance,
- The impact of increases in premium rates on participation in NFIP, and
- The impact of mapping update on affordability of flood insurance (FEMA 2014b).

The affordability framework will include proposals and proposed regulations for ensuring flood insurance affordability among low-income populations (FEMA 2014b).

Mapping

The HFIAA requires the Technical Mapping Advisory Council (TMAC) to review the new national flood mapping program authorized under the 2012 and 2014 flood insurance reform laws. The law requires the Administrator to certify in writing to Congress that FEMA is utilizing "technically credible" data and mapping approaches. The law also requires FEMA to submit the TMAC review report to Congress (FEMA 2014b).

FEMA will be looking to the TMAC for recommendations on how best to meet the legislatively mandated mapping requirements for the new mapping program including the identification of residual risk areas, coastal flooding information, land subsidence, erosion, expected changes in flood hazards with time, and others (FEMA 2014b).

As the new national flood mapping program is being established, FEMA expects there will be opportunities to make incremental improvements to current procedures as it provides flood hazard data and information under the NFIP. FEMA will make those improvements where necessary to ensure all

ongoing changes to flood hazards continue to be effectively communicated, mitigated, and properly insured against (FEMA 2014b).

The law lifts the $250,000 limit on the amount that FEMA can spend to reimburse homeowners for successful map appeals based on a scientific or technical error. Federal rulemaking is required in order to implement this provision (FEMA 2014b).

FEMA is authorized to account for reconstruction or improvements of flood protection, not just new construction. It authorizes FEMA to consider the existing present value of a levee when assessing adequate progress for the reconstruction of an existing flood protection system. The law extends certain provisions related to NFIP requirements in areas restoring disaccredited flood protection systems to coastal levees and clarifies that the levee needs to be considered without regard to the level of federal funding for the original construction or the restoration (FEMA 2014b).

The law exempts mapping fees for flood map changes due to habitat restoration projects, dam removal, culvert re-design or installation, or the installation of fish passages. It also requires FEMA to consider the effects of non-structural flood control features, such as dunes, and beach and wetland restoration when it maps the special flood hazard area (FEMA 2014b).

The law requires FEMA to enhance coordination with communities before and during mapping activities and requires FEMA to report certain information to members of Congress for each State and congressional district affected by preliminary maps (FEMA 2014b).

Implementation of Section 3 - Repeal of Certain Rate Increases

As part of the implementation of HFIAA and provide relief to qualifying policyholders who received rate increases under earlier legislative program changes, on April 15, 2014, FEMA issued a National Flood Insurance Program bulletin to its private sector, Write Your Own insurance company partners on how to adjust rates for certain Pre-Flood Insurance Rate Map properties as described by Section 3 of the Act. This action begins to implement FEMA's first priority to stop policy increases for certain subsidized policyholders as outlined in the Act (FEMA 2014a).

Beginning May 1, 2014, for all new applications for flood insurance and renewal of flood insurance policies for properties covered by Section 3, FEMA will require its Direct Servicing Agent and Write Your Own companies to use the October 1, 2013 Pre-FIRM subsidized rates when more favorable for properties covered by Section 3 (FEMA 2014a).

Implementation of Section 5 – October 1, 2014 Program Rate Changes

On March 29, 2014, FEMA issued a NFIP bulletin (linked below) to its private sector, Write Your Own insurance company partners, which included the October 1, 2014 program rate changes that revise premium rate tables to comply with Section 5 of the HFIAA of 2014. Section (5) of the Act prohibits FEMA from increasing premiums more than 15 percent a year within a single risk class and not more than 18 percent for an individual policy. In every case, these rates are the same or lower than the October 1, 2013 premium rates. The HFIAA Section 5 premium rates are to be used for all new and renewal policies effective on or after October 1, 2014 (FEMA 2014a).

FEMA will also use these rate tables to calculate premium refunds required under Section (3) of HFIAA. Additionally, to the extent a policyholder was charged a premium in excess of the premium increase caps mandated under Section 5 of HFIAA, FEMA will use these rate tables to calculate the refund. FEMA will continue consulting with WYO companies to finalize refund guidance for facilitating refunds under Sections 3 and 5 of HFIAA. FEMA anticipates finalizing its guidance by July 2014 with refunds beginning in fall 2014 (FEMA 2014a).

Community Rating System (CRS) Program

The CRS is a voluntary program within the NFIP encouraging floodplain management activities that exceed the minimum NFIP requirements. Flood insurance premiums are discounted to reflect the reduced flood risk to meet the CRS goals of reducing flood losses, facilitating accurate insurance rating, and promoting awareness of flood insurance in the community.

For participating communities, flood insurance premium rates are discounted in increments of 5%. For example, a Class 1 community receives a 45% premium discount, and a Class 9 community receives a 5% discount. Class 10 communities do not participate in the CRS and therefore do not receive a discount. The CRS classes for local communities are based on 18 creditable activities in the following categories:

- Public information
- Mapping and regulations
- Flood damage reduction
- Flood preparedness

CRS activities (discussed below) can help save lives and reduce property damage. Communities participating in the CRS represent a significant portion of the nation's flood risk; over 66% of the NFIP's policy base is located in these communities. Small and large communities participate in and receive premium discounts through the CRS. These communities represent a mixture of flood risks, including both coastal and riverine flood risks. The Insurance Services Office (ISO) administers the CRS program under contract to FEMA.

As of October 2013, there were 39 communities within New York State participating in the CRS program. Of these CRS communities, five are located within Suffolk County. All five communities have a Class of 10; however, all have had their CRS classifications rescinded due to failure to meet annual participation requirements. These communities receive no CRS discount.

Extent

In the case of riverine or flash flooding, once a river reaches flood stage, the flood extent or severity categories used by the NWS include minor flooding, moderate flooding, and major flooding. Each category has a definition based on property damage and public threat:

- Minor Flooding - minimal or no property damage, but possibly some public threat or inconvenience.
- Moderate Flooding - some inundation of structures and roads near streams. Some evacuations of people and/or transfer of property to higher elevations are necessary.
- Major Flooding - extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevations (NWS, 2011).

The severity of a flood depends not only on the amount of water that accumulates in a period of time, but also on the land's ability to manage this water. One element is the size of rivers and streams in an area; but an equally important factor is the land's absorbency. When it rains, soil acts as a sponge. When the land is saturated or frozen, infiltration into the ground slows and any more water that accumulates must flow as runoff (Harris, 2001).

The most severe consequences of coastal floods is loss of life. Flood-related deaths are the largest cause of natural hazard-related deaths in the U.S. NOAA forecasts coastal flood conditions so communities can take action. The NWS monitors coastal flooding conditions 24 hours a day, seven days a week. The NWS issues forecasts, watches, and warnings, similar to hurricane local statements. These forecasts, watches and warnings provide details on a storm's impact to an area. NOAA's National Ocean Service monitors and distributes real-time water levels, which are used to assess storm surge conditions at stations throughout the U.S. NOAA issues website alerts on high water conditions caused by severe weather (NOAA, Date Unknown).

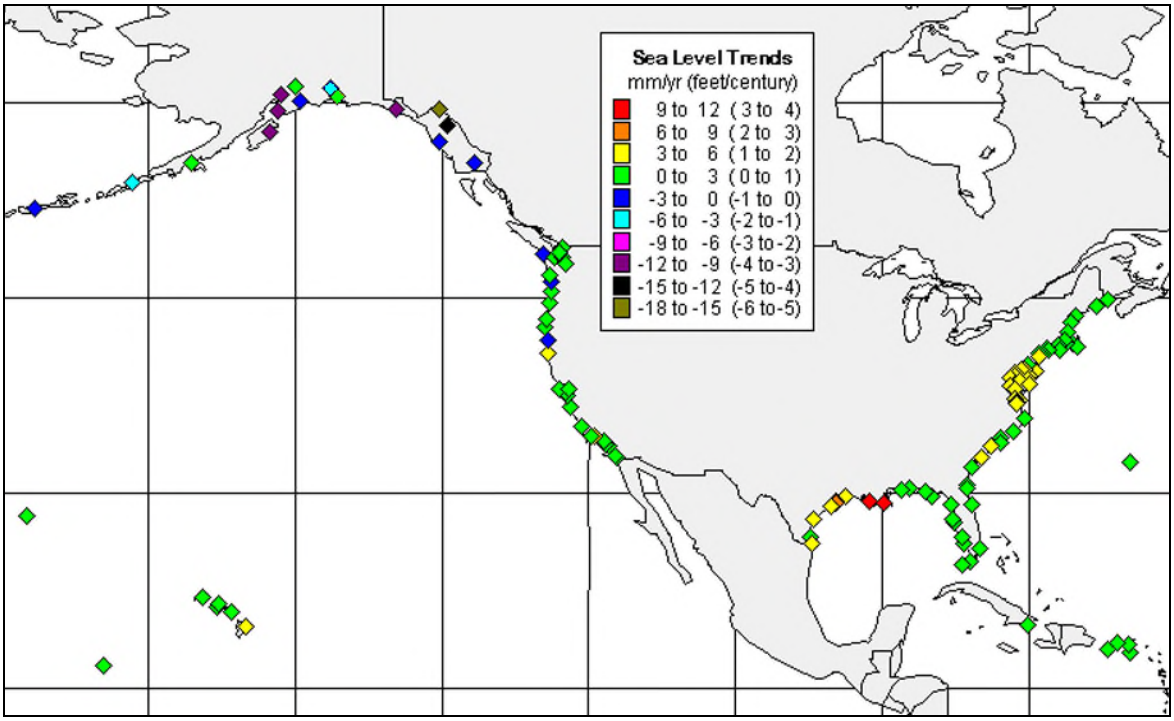
Sea Level Rise

According to the USGS, the coastal vulnerability index (CVI) provides a preliminary overview, at a National scale, of the relative susceptibility of the Nation's coast to sea-level rise. This initial classification is based upon variables including geomorphology, regional coastal slope, tide range, wave height, relative sea-level rise, and shoreline erosion and accretion rates. The combination of these variables and the association of these variables to each other furnish a broad overview of coastal regions where physical changes are likely to occur due to sea-level rise.

The Center for Operational Oceanographic Products and Services has been measuring sea level for over 150 years, with tide stations of the National Water Level Observation Network operating on all coastlines of the United States. Changes in mean sea level (MSL), either a sea level rise or sea level fall has been computed at128 long-term water level stations using a minimum span of 30 years of observations at each location. The measurements have been averaged by month to remove the effect of higher frequency phenomena (storm surge) in order to compute an accurate linear sea level trend (NOAA 2013).

Figure 5.4.5-3 is a map of regional MSL in the United States. This map provides an overview of variations in the rates of relative local MSL at long-term tide stations. The variations in sea level trends primarily reflect differences in rates and sources of vertical land motion. Areas that experienced little-to-no change in MSL are shown in green, including stations consistent with average global sea level rise rate of 1.7 to 1.8 mm/year. These stations do not experience significant vertical land motion. Stations that experienced positive sea level trends (yellow to red) experience both global sea level rise and lowering or sinking of the local land, causing an apparent exaggerated rate of relative sea level rise. Stations that are blue to brown have experienced global sea level rise and a greater vertical rise in local land, causing an apparent decrease in relative sea level. The rates of relative sea level rise reflect actual observations and must be accounted for in any coastal planning or engineering applications (NOAA, 2013).

Figure 5.4.5-3. Relative Sea Level Variations of the United States



Source: NOAA, 2013

Figure 5.4.5-4 presents the most recent NOAA relative sea level variations along the Mid-Atlantic coast. Two NOAA tide gauge stations are located on the Suffolk County coastline, where tide gauge measurements are made with respect to a local fixed reference level on land. Table 5.4.5-1 presents the history and MSL trends at the two Suffolk County stations, which show the result of a combination of the global sea level rate and the local vertical land motion.

Figure 5.4.5-4. Sea Level Trends in Suffolk County

Source: NOAA, 2013

Table 5.4.5-1. Linear MSL Trends and 95% Confidence Intervals

Station Name	First Year	Year Range	For all data to 2006		Previously Published Trends	
			MSL Trend (mm/year)	+/- 95% Confidence Interval	MSL Trend (mm/year)	+/- 95% Confidence Interval
Montauk	1947	60	2.78	0.32	2.58	0.38
Port Jefferson	1957	36	2.44	0.76	2.44	0.76

Source: NOAA, 2013
mm/year millimeter per year
MSL Mean Sea Level

As more information is collected at water level stations, the linear MSL trends can be recalculated each year. Table 5.4.5-2 below shows the MSL trends calculated from the beginning of the station record to recent years (2006 to 2012). The values do not indicate the trend in each year, but the trend of the entire data period up to that year.

Table 5.4.5-2. Update Mean Sea Level Trends

Station Name	2006	2007	2008	2009	2010	2011	2012
Montauk	2.78 mm/yr	2.78 mm/yr	2.81 mm/yr	2.91 mm/yr	3.04 mm/yr	3.12 mm/yr	3.20 mm/yr

Source: NOAA, 2013
mm/yr millimeter per year

Location

New York State has significant exposure to water and is a major casual element of the flood hazard. Water exposure in the State includes the following:

- Over 52,000 miles of rivers and streams
- Nearly 8,000 acres of reservoirs, ponds, and lakes (excluding the Great Lakes)
- Over 1,600 square miles of inland water (excluding the boundary water areas of Long Island Sound and New York Harbor)
- 577 miles of Great Lakes shoreline, and
- Over 117 miles of Atlantic Ocean shoreline (NYS DHSES 2013).

Flooding is the primary natural hazard in New York State because the State exhibits a unique blend of climatological and meteorological features that influence the potential for flooding. These factors include topography, elevations, latitude and water bodies and waterways. Flooding is the primary natural hazard in New York State and they occur in every part of the State. Some areas are more flood-prone than others, but no area is exempt, including Suffolk County. It is estimated that approximately 700,000 people live in these floodprone areas, while millions more work, travel through, or use recreational facilities located in areas subject to flooding (NYS DHSES 2013).

Coastal Flooding

Areas most at risk for coastal flooding and storm surge are coastal areas and barrier islands. Barrier islands are especially vulnerable to hurricanes and flooding because they have few evacuation routes. Low-lying inland areas are also more susceptible to coastal flooding and storm surge because those areas may be near a waterway and a higher risk than assumed (NOAA, Date Unknown).

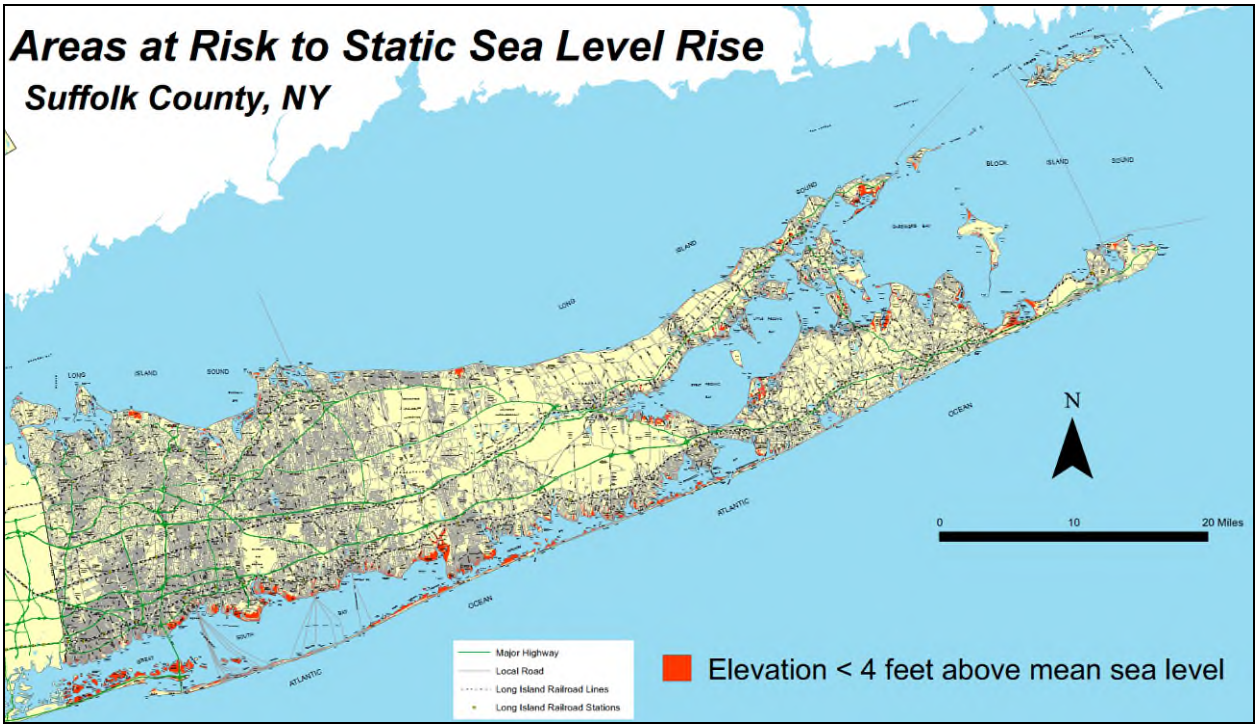
New York State has more than 3,000 miles of marine and lacustrine coastline that can cause flooding. It includes the lands adjacent to Lake Erie, Lake Ontario, the St. Lawrence and Niagara Rivers, the Hudson River estuary, the Kill van Kull and Arthur Kill, Long Island Sound, and the Atlantic Ocean, including their connecting bays, harbors, shallows and marshes. Long Island, which includes Suffolk County, has over 1,200 miles of coastline. In total, there are 25 cities, 112 towns, and 103 villages in New York State that are located on these shorelines and vulnerable to the flood hazard (NYS DHSES 2013).

Coastal storms originate in the warm waters of the South Atlantic and their usual south to north path puts Long Island's south shore at great risk (NYS DHSES 2013). The barrier islands of Suffolk County are ecologically fragile and quite vulnerable to storms and erosion. The impacts of flooding and erosion along these barrier islands make them extremely vulnerable to sea level rise, hurricanes and storms, and human use and development. In the early 1990s, severe storm activity, combined with natural coastal geological processes, caused extensive flooding and erosion of the County's south coast. This caused significant damage to oceanfront property, municipal infrastructure, commercial fishing docks, and recreational beaches (Town of Southampton, 1999).

Sea Level Rise

Figure 5.4.5-5 illustrates areas at risk to static sea level rise in Suffolk County. This figure shows the approximately areas at risk to sea level rise up to four feet. The map was designed to outline areas that are potentially highly vulnerable to flooding from sea level rise.

Figure 5.4.5-5. Areas of Suffolk County At Risk to Static Sea Level Rise



Source: NYSDEC 2013

Figure 5.4.5-6 shows the approximate areas at risk from sea level rise up to four feet at one-foot intervals for the Ocean Beach section of Fire Island. This map was designed to outline areas that are potentially highly vulnerable to flooding from sea level rise.

Figure 5.4.5-6. Areas of Ocean Beach At Risk to Sea Level Rise

Source: NYSDEC 2013

Riverine/Flash Flooding

In some parts of New York State, annual spring floods result from snowmelt, and the extent of flooding depends on the depth of winter snowpack and spring weather patterns. In the northeast portions of the State, winter thaws, sometimes combined with rain, can also cause significant flooding. Riverine flooding is most severe in the Delaware, Susquehanna, Chemung, Erie-Niagara, Genesee, Allegany, Hudson, Mohawk, and Lake Champlain river basins (NYS DHSES 2013). Suffolk County is not located within these river basins. However, river basins are not the only areas of the State exposed to flood hazards. New York State has over 3,000 miles of marine and lacustrine coastline that are often causes of flooding. This includes the areas adjacent to Lake Erie, Lake Ontario, the St. Lawrence and Niagra Rivers, Hudson River estuary, the Kill van Kull and Arthur Kill, Long Island Sound and the Atlantic Ocean and their connecting bays, harbors, shallows and marshes. Long Island alone has over 1,200 miles of coastline, including that within Suffolk County (NYS DHSES, 2011).

Flash flooding can occur throughout any region of New York State; however, the distinctive flash flood event that is characterized by fast moving water and damaging impacts requires a steep topography. Areas of steep topography are found in the Allegany-Catskill plateau, which runs the entire width of New York State's Southern Tier, and the Adirondack Mountains to the north (NYS DHSES 2013).

Advisory Base Flood Elevation Maps

Prior to Hurricane Sandy, FEMA had begun a coastal flood study to update FIRMs for portions of New York and New Jersey using improved methods and data to better reflect coastal flood risk. The studies included data that were collected and analyzed over a number of years. After Hurricane Sandy in order to

help in rebuilding and recovery efforts, FEMA released Advisory Base Flood Elevation (ABFE) maps which were based on best available data and the partially completed coastal flood study for the Atlantic coastal communities. FEMA is currently in the process of releasing preliminary work maps that include full results of the coastal flood study (FEMA Region II, Date Unknown).

ABFEs provide a better picture of current flood risk than the existing FIRMs. The new ABFEs are the recommended elevation of the lowest floor of a building. Some communities may require that the lowest floor be built above the ABFE. ABFEs more accurately reflect the true 1% annual chance flood hazard elevations in a given area. Following large storms, FEMA performs an assessment to determine whether the 1% annual chance flood event, shown on the effective FIRMs, adequately reflects the current flood hazard. In some cases, FEMA determines that ABFEs need to be produced, based on the age of the analysis and the science used to develop the effective FIRMs. ABFEs are provided to communities as a tool to support in the recovery process. ABFEs will aide in making those communities more resilient to future events (FEMA Region II Date Unknown).

The ABFE maps included delineated advisory flood hazard zones (Advisory Zone V, Advisory Zone A, and Advisory Zone X). The maps also included ABFE elevations for 1% and 0.2% annual chance flood elevations and the areas of Limit of Moderate Wave Action (LiMWA). Area and limit of structurally damaging wave action, and preliminary Hurricane Sandy high water marks will also be listed on the ABFE maps, along with coastal barrier resource areas (RiskMAP Date Unknown).

The ABFE maps are not available for Suffolk County (RiskMAP Date Unknown).

Previous Occurrences and Losses

Many sources provided historical information regarding previous occurrences and losses associated with flooding events throughout New York State and areas within Suffolk County. With so many sources reviewed for the purpose of this HMP, loss and impact information for many events could vary depending on the source. Therefore, the accuracy of monetary figures discussed is based only on the available information identified during research for this HMP.

The NYS HMP indicated that New York State experienced 52 major flood events that resulted in a FEMA disaster declaration between 1954 and 2013. The State also experienced 101 undeclared flood occurrences dating back to 1635 (NYS DHSES 2013).

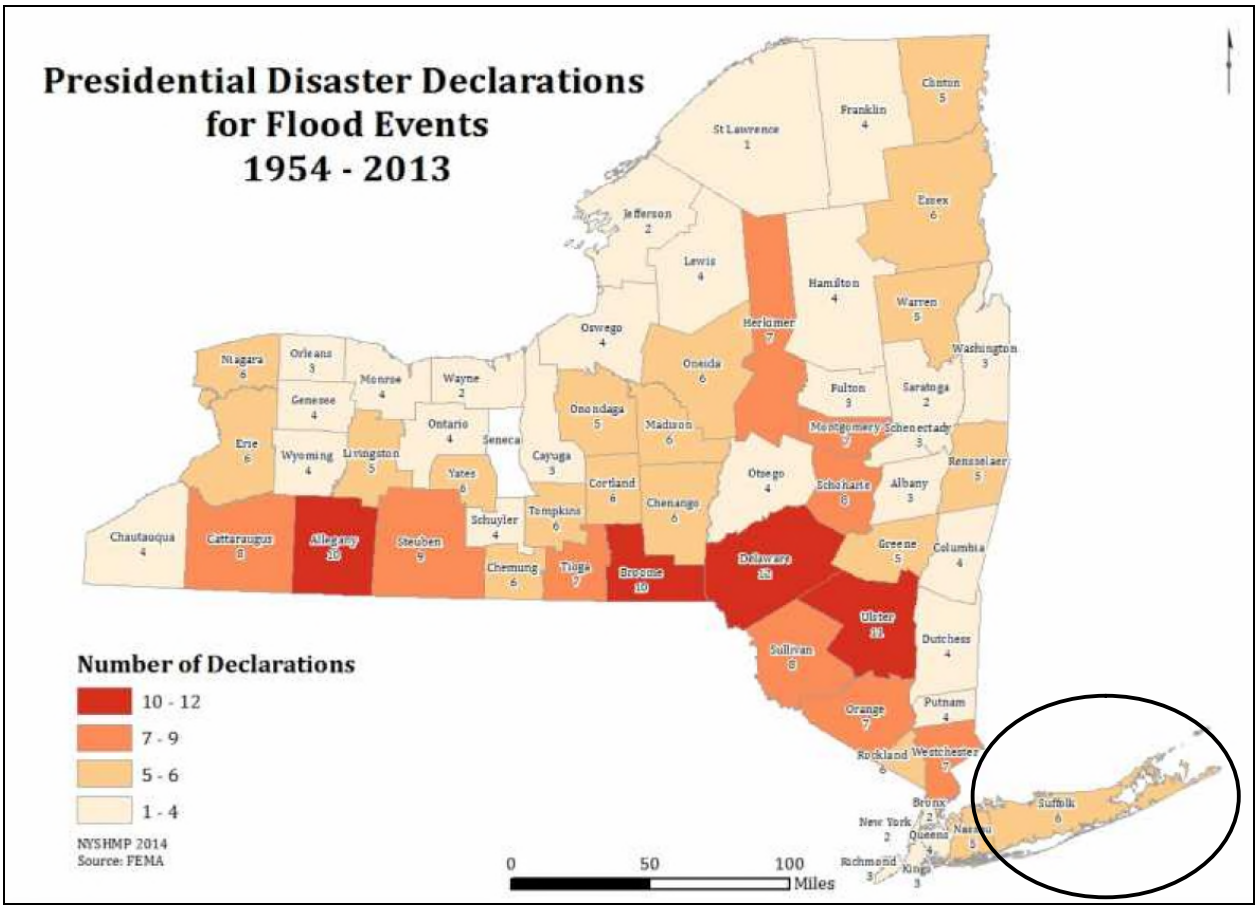
According to NOAA-NCDC storm events database, Suffolk County experienced 76 flooding events (flash flood, flood, and coastal flood) between 2008 and 2013. However, total damages, deaths and injuries were not reported for these events.

The Hazard Research Lab at the University of South Carolina's Spatial Hazard Events and Losses Database for the U.S. (SHELDUS) is a county-level hazard data set for the U.S. for 18 different natural hazard event types (avalanche, coastal, drought, earthquake, flooding, fog, hail, heat, hurricane/tropical storm, landslide, lightning, severe storm/thunderstorm, tornado, tsunami/seiche, volcano, wildfire, wind, and winter weather). Currently, the database includes every loss causing and/or deadly event between 1960 and 1992 and from 1995 onward. Between 1993 and 1995, SHELDUS reflects only events that caused at least one fatality or more than $50,000 in property or crop damages. Therefore, the numbers provided by SHELDUS do not represent all severe storm weather events that occurred in Suffolk County. According to SHELDUS, between 2008 and 2013, six events occurred within the County. These events resulted in one fatality and over $17.6 million in property damage.

Between 1953 and 2013, New York State was included in 41 flood major disaster (DR) or emergency (EM) declaration. These declarations were classified as one or a combination of the following: coastal storms, high tides, heavy rain, flash flooding, flood, flooding, hurricane, wave action, ice storm, Nor'Easter, inland flooding, tornadoes, landslides, and winds. Generally, these disasters cover a wide region of the State; therefore, they may have impacted many counties. However, not all counties were included in the disaster declarations and emergencies. Of those events, the NYS HMP and other sources indicate that Suffolk County has been declared as a disaster or emergency area as a result of nine flood events (FEMA 2013).

Figure 5.4.5-7 shows the FEMA disaster declarations (DR) (and does not indicate emergency (EM) declarations) for flooding events in New York State, from 1954 to 2013. This figure indicates that Suffolk County was included in six disaster declarations. However, this differs from information obtained from FEMA, which indicated Suffolk County was included in nine declarations.

Figure 5.4.5-7. Presidential Disaster Declarations for Flooding Events, 1954 to 2013



Source: NYS DHSES 2013
Note: The black circle indicates the approximate location of Suffolk County.

For this 2014 Plan Update, known flooding events that have impacted Suffolk County between 2008 and 2013 are identified in Table 5.4.5-3. Events identified in the 2007 Plan are included in Appendix H. With flooding documentation for New York State and Suffolk County being so extensive, not all sources have been identified or researched. Therefore, Table 5.4.5-3 may not include all events that have occurred in the County.

Table 5.4.5-3. Flooding Events in Suffolk County Between 2008 and 2013

Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts	Source(s)
August 2, 2008	Flash Flood	N/A	N/A	Thunderstorms produced torrential rainfall that lead to flash flooding. In the Town of Southampton, many of the secondary roads were flooded. Windmill Lane was covered by approximately two feet of water.	NOAA-NCDC
November 12-14, 2009	Severe Storms and Flooding (Remnants of Tropical Storm Ida and a Nor'Easter)	DR-1869	Yes	Severe storms and coastal flooding caused an estimated $17 M in damages. Severe beach erosion and cuts into the dunes occurred along the Atlantic Ocean facing beaches.	FEMA
March 13-31, 2010	Severe Storms and Flooding	DR-1899	Yes	Between March 12th and 15th, rainfall totals in Suffolk County ranged between 2.26 inches and 4.93 inches. Wind gusts ranged between 47 mph and 69 mph. Tidal departures of 3 to 5 feet were recorded, with many places seeing water levels reaching their highest levels in almost 20 years. The Hamptons experienced waves as high as 20 feet, which caused at least $31 M in property damages. Trees and wires were down throughout the County. The town of Huntington had to dump 1,000 tons of stone to bolster a compromised sea wall. The hamlet of Eaton's Neck was isolated from the mainland once the Asharoken Causeway was flooded and closed. A tree fell and killed a woman in the hamlet of Bay Shore. Between March 22nd and 23rd, rainfall totals in Suffolk County ranged between 0.85 inches and 1.82 inches. Between March 29th and 31st, rainfall totals for Suffolk County ranged between 4.33 inches and 8.83 inches. This resulted in several road closures and flooded basements throughout the county. FEMA issued a disaster declaration for this event and Suffolk County was included in this declaration. Suffolk County was approved for PA. FEMA approved $86,529,838.16 in PA grant assistance.	FEMA; NWS; NOAA-NCDC

Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts	Source(s)
August 26 – September 5, 2011	Hurricane Irene	DR-4020	Yes	As Hurricane Irene moved north along the Atlantic coast, it weakened and made its second landfall as a Tropical Storm near Little Egg Inlet along the southeast New Jersey coast. The storm made its third landfall in New York City on August 28th. This storm brought sustained winds, heavy rain, destructive storm surge and two confirmed tornadoes. Seven deaths resulted from Irene. At least 600,000 people were ordered to evacuate their homes from storm surge and inland flooding. Widespread power outages of up to one week followed the storm. In Suffolk County, the maximum sustained winds measured at 39 knots, with gusts of 53 knots. According to the NWS, peak wind gusts in Suffolk County ranged between 28 mph to 91 mph. FEMA issued a disaster declaration for several counties in New York State, including Suffolk County. Suffolk County was approved for IA and PA. FEMA approved $102,884,828.74 in total IA and $459,751,510.20 and total PA grants.	FEMA, The Patch, NOAA-NCDC, NWS
August 10, 2012	Severe Storm, Hail, Flash Flood	N/A	N/A	A severe storm event brought heavy rain, hail, strong winds and flash flooding to Nassau and Suffolk Counties. Several roads were closed throughout the county.	NWS
September 28-29, 2012	Flash Flood	N/A	N/A	Heavy rains caused flooding in many parts of southeastern New York State and Connecticut. Rainfall totals in Suffolk County ranged between 2.46 inches in the hamlet of Setauket to 3.41 inches in the village of Northport.	NWS
October 29, 2012	Hurricane Sandy	DR-4085 EM-3351	Yes	Hurricane Sandy was the 19th named tropical cyclone of the 2012 Atlantic hurricane season. The track of Hurricane Sandy resulted in a worse-case scenario for storm surge for coastal regions from New Jersey north to Connecticut, including New York City and Long Island. In Suffolk County, maximum wind gusts ranged between 66 mph (town of East Hampton) to 96 mph (hamlet of Eatons Neck). A high surf advisory was issued prior to the storm for the south shore of Long Island and a coastal flood warning was issued. Evacuations were ordered throughout the County. Storm surge surpassed all documented high water marks, destroyed sand dunes, and eroded beaches along the coasts. Communities in and along the Great South Bay, Atlantic Ocean and Peconic and Gardiners Bay. were inundated with 2 to 5 feet	NWS; NOAA-NCDC; FEMA

Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Losses / Impacts	Source(s)
				of water. On Fire Island, up to 30 ocean front homes and other ocean facing structures, such as boardwalks and piers, were completely destroyed by the storm tide and battering waves. Widespread flooding, power outages, fuel shortages, and downed utility poles and trees were reported. Three fatalities were reported in Suffolk County, all due to falling trees or tree limbs. FEMA issued a disaster declaration for several counties in New York State, including Suffolk County. Suffolk County was approved for IA and PA. FEMA approved $944,478,644.95 in IA for the State and $816,955,000.39 in total PA grants.	
November 7-8, 2012	Coastal Flooding	N/A	N/A	A Nor'easter caused moderate coastal flooding. $400 K in property damages were recorded.	NOAA-NCDC
December 26-27, 2012	Coastal Flooding	N/A	N/A	A Nor'easter caused moderate coastal flooding. No damages were recorded.	NOAA-NCDC
February 8, 2013	Coastal Flooding	N/A	N/A	A Nor'easter caused moderate coastal flooding. No damages were recorded.	NOAA-NCDC
February 27, 2013	Coastal Flooding	N/A	N/A	A Nor'easter caused moderate coastal flooding. No damages were recorded.	NOAA-NCDC
March 7, 2013	Coastal Flooding	N/A	N/A	A Nor'easter caused moderate coastal flooding. No damages were recorded.	NOAA-NCDC
March 9, 2013	Coastal Flooding	N/A	N/A	A Nor'easter caused moderate coastal flooding. No damages were recorded.	NOAA-NCDC
June 7, 2013	Flash Flooding	N/A	N/A	The remnants of Tropical Storm Andrea tracked up the eastern seaboard in early June, resulting in a prolonged period of heavy rain, which caused flash flooding in portions of Southeast New York. Roads were closed throughout the County.	NOAA-NCDC

Note (1): Monetary figures within this table were U.S. Dollar (USD) figures calculated during or within the approximate time of the event. If such an event would occur in the present day, monetary losses would be considerably higher in USDs as a result of increased U.S. Inflation Rates.

DR *Federal Disaster Declaration*
EM *Federal Emergency Declaration*
FEMA *Federal Emergency Management Agency*
IA *Individual Assistance*
K *Thousand ($)*
M *Million ($)*
N/A *Not applicable*
NCDC *National Climate Data Center*
NOAA *National Oceanic Atmospheric Administration*
NWS *National Weather Service*
PA *Public Assistance*
SHELDUS *Spatial Hazard Events and Losses Database for the U.S.*

Probability of Future Events

Given the history of flood events that have impacted Suffolk County, it is apparent that future flooding of varying degrees will occur. Based on the previous occurrences of flooding events and the fact that the elements required for flooding exist in the vicinity of the Planning Area, many people and properties are at risk from flood hazards in the future.

In Section 5.3, the identified hazards of concern for Suffolk County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for hazard rankings. Based on historical records and input from the Planning Committee, the probability of occurrence for flood in the county is considered 'frequent' (likely to occur within 25 years).

It is estimated that the county will continue to experience direct and indirect impacts of floods annually. Some of the flooding events may induce secondary hazards such as: water quality and supply concerns and experience evacuations, infrastructure deterioration and failure, utility failures, power outages, transportation delays/accidents/inconveniences and public health concerns.

The NYSDEC conducted a vulnerability assessment that depicted how vulnerable a county may be to flood hazards. This was determined by a rating score; each county accumulated points based on the value of each vulnerability indicator. The higher the indication for flood exposure, the more points assigned, resulting in a final rating score. The result of this assessment presented an indication of a county's vulnerability to the flood hazard. Suffolk County's rating is 32, out of a possible 35. The rating was based on number of NFIP insurance policies, number of NFIP claims, total amount of NFIP claims, total amount of NFIP policy coverage, number of repetitive flood loss properties, and number of flood disasters (NYS DHSES, 2011).

Climate Change Impacts

Climate change is beginning to affect both people and resources in New York State, and these impacts are projected to continue growing. Impacts related to increasing temperatures and sea level rise are already being felt in the State. ClimAID: the Integrated Assessment for Effective Climate Change in New York State (ClimAID) was undertaken to provide decision-makers with information on the State's vulnerability to climate change and to facilitate the development of adaptation strategies informed by both local experience and scientific knowledge (New York State Energy Research and Development Authority [NYSERDA], 2011).

Each region in New York State, as defined by ClimAID, has attributes that will be affected by climate change. Suffolk County is part of Region 4, New York City and Long Island. Some of the issues in this region, affected by climate change, include: the area contains the highest population density in the State; sea level rise and storm surge increase coastal flooding, erosion, and wetland loss; challenges for water supply and wastewater treatment; increase in heat-related deaths; illnesses related to air quality increase; and higher summer energy demand stresses the energy system (NYSERDA, 2011).

Temperatures and precipitation amounts are expected to increase throughout the State, as well as in Region 4. It is anticipated that by the 2020s, the State's temperature will rise between 1.5 and 3ºF; 3 to 5.5ºF by the 2050s; and 4 to 9ºF by the 2080s. The lower ends of these ranges are for lower greenhouse gas emissions scenarios and the higher ends for higher emission scenarios (NYSERDA, 2011).

Annual average precipitation is projected to increase by up to 5% by the 2020s, up to 10% by the 2050s and up to 15% by the 2080s. This increase will not be distributed evenly over the course of the year.

During the winter months is when this additional precipitation will most likely occur, in the form of rain, and with the possibility of slightly reduced precipitation projected for the late summer and early fall.

Sea level rise projects that do not include significant melting of polar ice sheets suggest one to five inches of rise by the 2020s; five to 12 inches by the 2050s; and eight to 23 inches by the 2080s. Scenarios that include rapid melting of polar ice projects four to 10 inches by the 2020s; 17 to 29 inches by the 2050s; and 37 to 55 inches by the 2080s (NYSERDA, 2011).

In Region 4, it is estimated that temperatures will increase by 3ºF to 5ºF by the 2050s and 4ºF to 7.5ºF by the 2080s (baseline of 53ºF). Precipitation totals will increase between 0 and 10% by the 2050s and 5 to 10% by the 2080s (baseline of 43 inches). Table 5.4.5-4 displays the projected seasonal precipitation change for the New York City and Long Island ClimAID Region (NYSERDA, 2011).

Table 5.4.5-4. Projected Seasonal Precipitation Change in Region 4, 2050s (% change)

Winter	Spring	Summer	Fall
0 to +15	0 to +10	-5 to +10	-5 to +10

Source: NYSERDA, 2011

The projected increase in precipitation is expected to fall in heavy downpours and less in light rains. The increase in heavy downpours has the potential to affect drinking water; heighten the risk of riverine flooding; flood key rail lines, roadways and transportation hugs; and increase delays and hazards related to extreme weather events (NYSERDA, 2011).

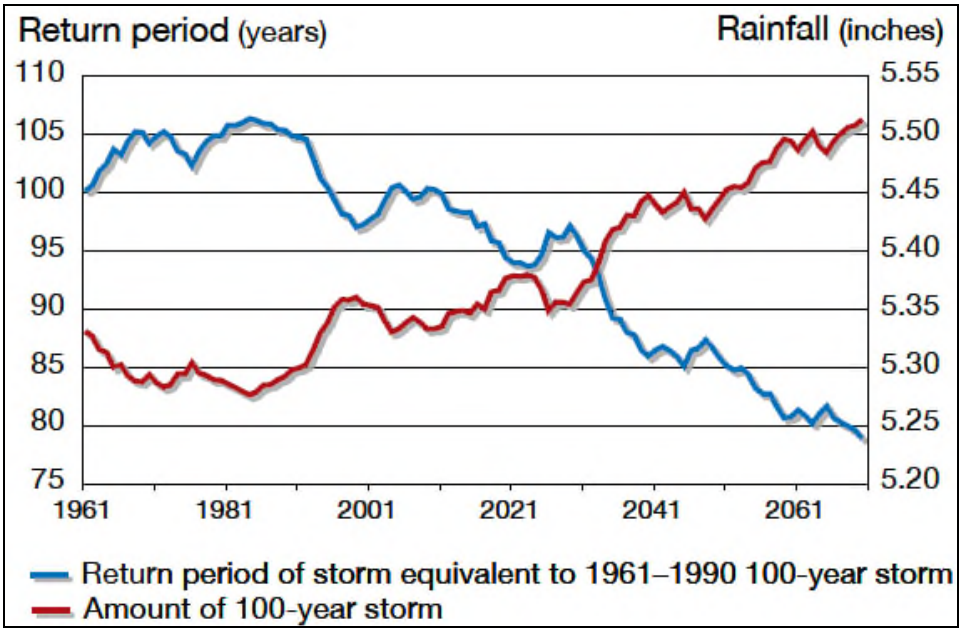
The projected increase in sea level rise has the potential to increase risk of storm surge-related flooding along the coast; expand areas at-risk of coastal flooding; increase vulnerability of energy facilities located in coastal areas; flood transportation and telecommunication facilities; and cause saltwater intrusion into some freshwater supplies near the coasts. High water levels, strong winds, and heavy precipitation resulting from severe coastal storms already cause billions of dollars in damages and disrupt transportation and utility distribution systems. Sea level rise will lead to more frequent and extensive coastal flooding. Warming ocean waters raise sea level through thermal expansion and have the potential to strengthen the most power storms (NYSERDA, 2011).

Increasing air temperatures intensify the water cycle by increasing evaporation and precipitation. This can cause an increase in rain totals during events with longer dry periods in between those events. These changes can have a variety of effects on the State's water resources (NYSERDA, 2011).

Over the past 50 years, heavy downpours have increased and this trend is projected to continue. This can cause an increase in localized flash flooding in urban areas and hilly regions. Flooding has the potential to increase pollutants in the water supply and inundate wastewater treatment plants and other vulnerable facilities located within floodplains. Less frequent rainfall during the summer months may impact the ability of water supply systems. Increasing water temperatures in rivers and streams will affect aquatic health and reduce the capacity of streams to assimilate effluent wastewater treatment plants (NYSERDA, 2011).

Figure 5.4.5-8 displays the project rainfall and frequency of extreme storms in New York State. The amount of rain fall in a 100-year event is projected to increase, while the number of years between such storms (return period) is projected to decrease. Rainstorms will become more severe and more frequent (NYSERDA, 2011).

Figure 5.4.5-8. Projected Rainfall and Frequency of Extreme Storms



Source: NYSERDA, 2011

Total precipitation amounts have slightly increased in the Northeast U.S., by approximately 3.3 inches over the last 100 years. There has also been an increase in the number of two-inch rainfall events over a 48-hour period since the 1950s (a 67-percent increase). The number and intensity of extreme precipitation events are increasing in New York State as well. More rain heightens the danger of localized flash flooding, streambank erosion and storm damage (Cornell University College of Agriculture and Life Sciences, 2011).

Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed or vulnerable in the identified hazard area. For the flood hazard, areas identified as hazard areas include the 1-percent and 0.2-percent annual chance flood event boundaries (Figure 5.4.5-9 through Figure 5.4.5-11). In addition, projected sea level rise scenarios were evaluated. The following text evaluates and estimates the potential impact of flooding for Suffolk County including:

- Overview of vulnerability
- Data and methodology used for the evaluation
- Impact on: (1) life, health and safety of residents, (2) general building stock, (3) critical facilities, (4) economy, and (5) future growth and development
- Effect of climate change on vulnerability
- Change of vulnerability as compared to that presented in the 2008 Suffolk County Hazard Mitigation Plan
- Further data collections that will assist understanding this hazard over time

Overview of Vulnerability

Flood is a significant concern for Suffolk County. To assess vulnerability, potential losses were calculated for the riverine and coastal flood hazard areas for the 1- and 0.2-percent annual chance flood events. In addition, projected sea level rise scenarios were evaluated in terms of exposure. The flood hazard exposure and loss estimate analysis is presented below.

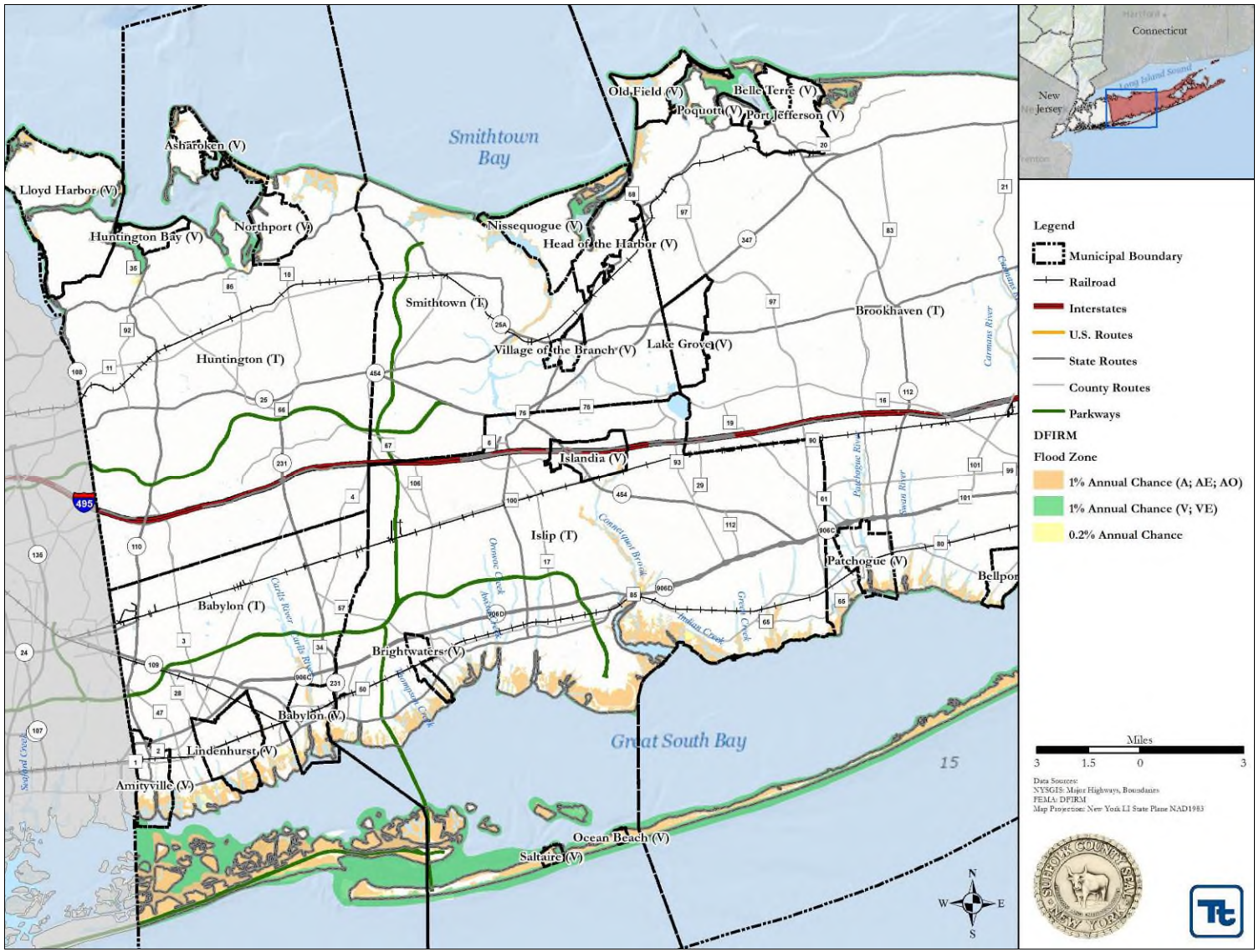
Data and Methodology

The 1- and 0.2-percent annual chance flood events were examined to evaluate the County's risk and vulnerability to the flood hazard. These flood events are generally those considered by planners and evaluated under federal programs such as the NFIP.

The FEMA DFIRM was used to evaluate exposure and determine potential future losses. A five-foot Digital Elevation Model (DEM) provided by the County was used as the terrain. The coastal flood depth grids was developed using the Flood Information Tool (FIT) HAZUS-MH coastal model for the V zones and coastal A zones. The riverine depth grid was developed using the enhanced quick look for the A zones. The depth grids were integrated into HAZUS-MH and the model was run to estimate potential losses at the structure level using the County's custom structural building inventory.

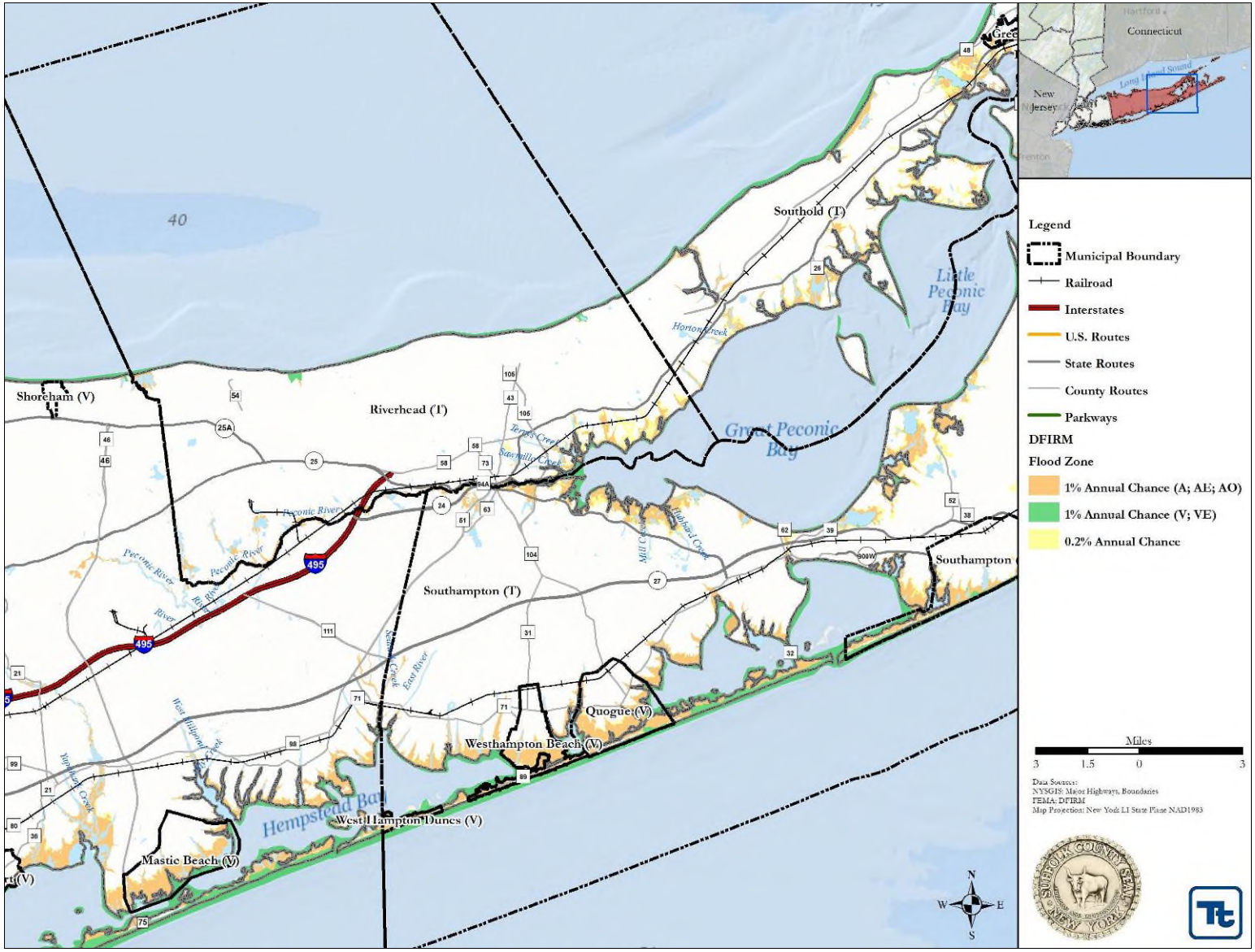
The HAZUS-MH model uses 2000 U.S. Census demographic data. This data was not updated for this analysis; however, the 2010 U.S. Census data was used to estimate population exposure to provide the best available output. In addition, to estimate exposure, the DFIRM flood boundaries were used. HAZUS-MH 2.1 calculated the estimated damages to the general building stock and critical facilities based on the depth grid generated and the default HAZUS damage functions in the flood model. Figure 5.4.5-9 through Figure 5.4.5-11 illustrates the FEMA DFIRM flood boundaries used for this vulnerability assessment.

Figure 5.4.5-9. Suffolk County DFIRM 1-Percent and 0.2-Percent Flood Zones - West



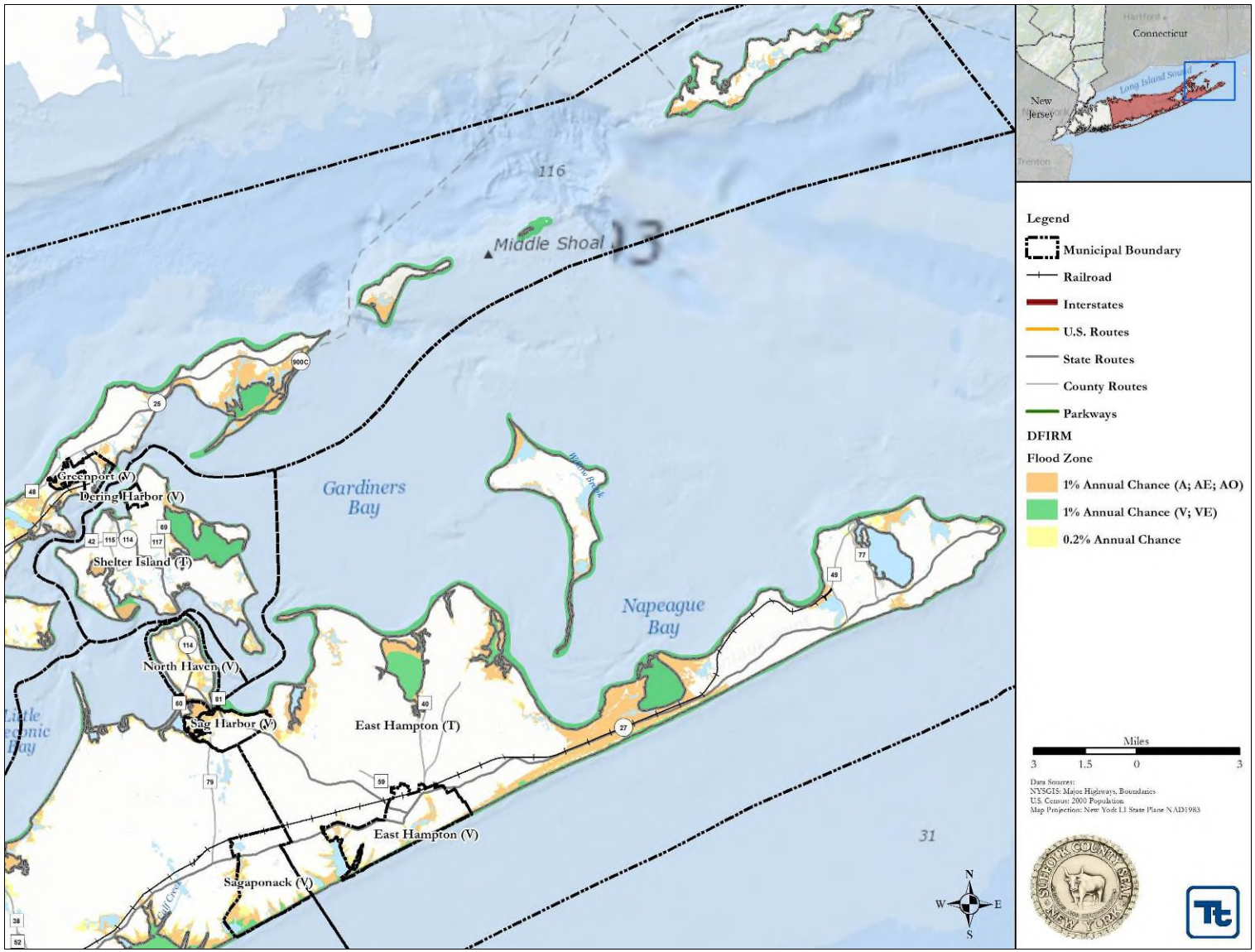
Source: FEMA, 2009

Figure 5.4.5-10. Suffolk County DFIRM 1-Percent and 0.2-Percent Flood Zones - Central



Source: FEMA, 2009

Figure 5.4.5-11. Suffolk County DFIRM 1-Percent and 0.2-Percent Flood Zones - East



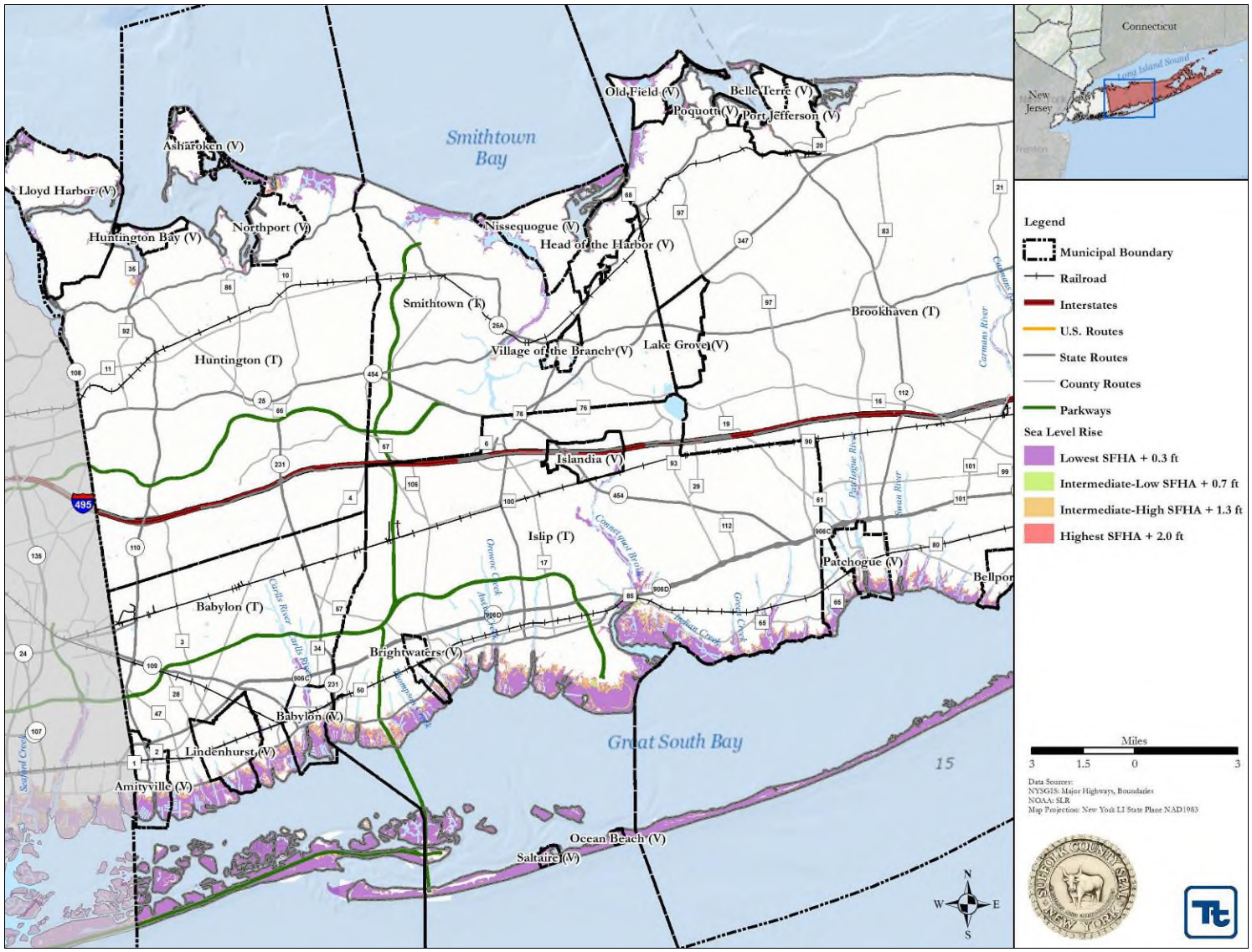
Source: FEMA, 2009

To assess the County's vulnerability of population, buildings and critical facilities to sea level rise, a spatial analysis was conducted with the NOAA sea level rise scenario polygon data. To assess vulnerability to sea level rise, the lowest and the highest NOAA sea level rise scenarios were used to account for the full range of impacts.

- Lowest [Best Available Special Flood Hazard Area (SFHA) + 0.3 feet]
- Highest (Best Available SFHA + 2.0 feet)

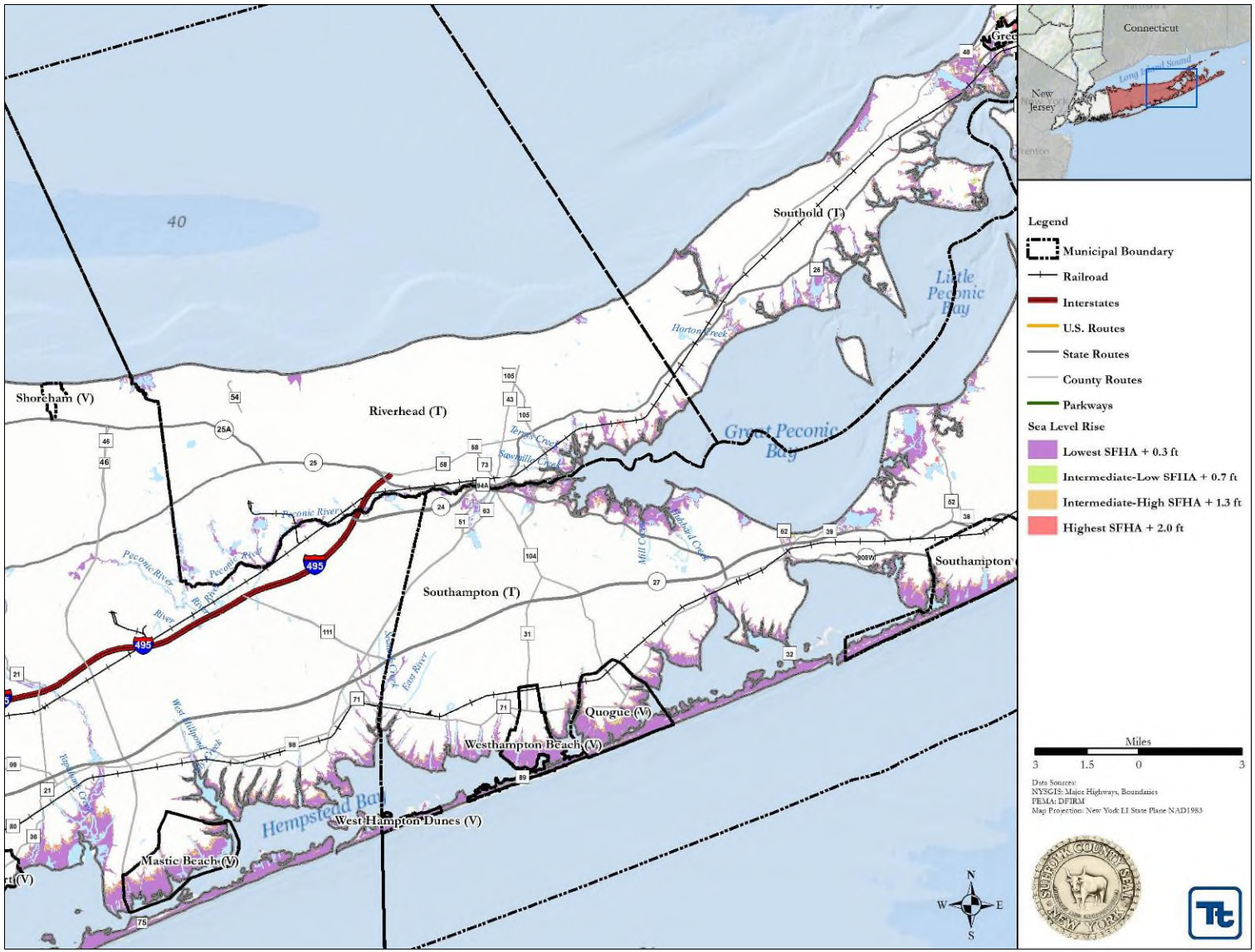
Figure 5.4.5-12 through Figure 5.4.5-14 illustrate the NOAA sea level rise scenarios boundaries used for this vulnerability assessment.

Figure 5.4.5-12. Sea Level Rise Scenarios for Suffolk - West



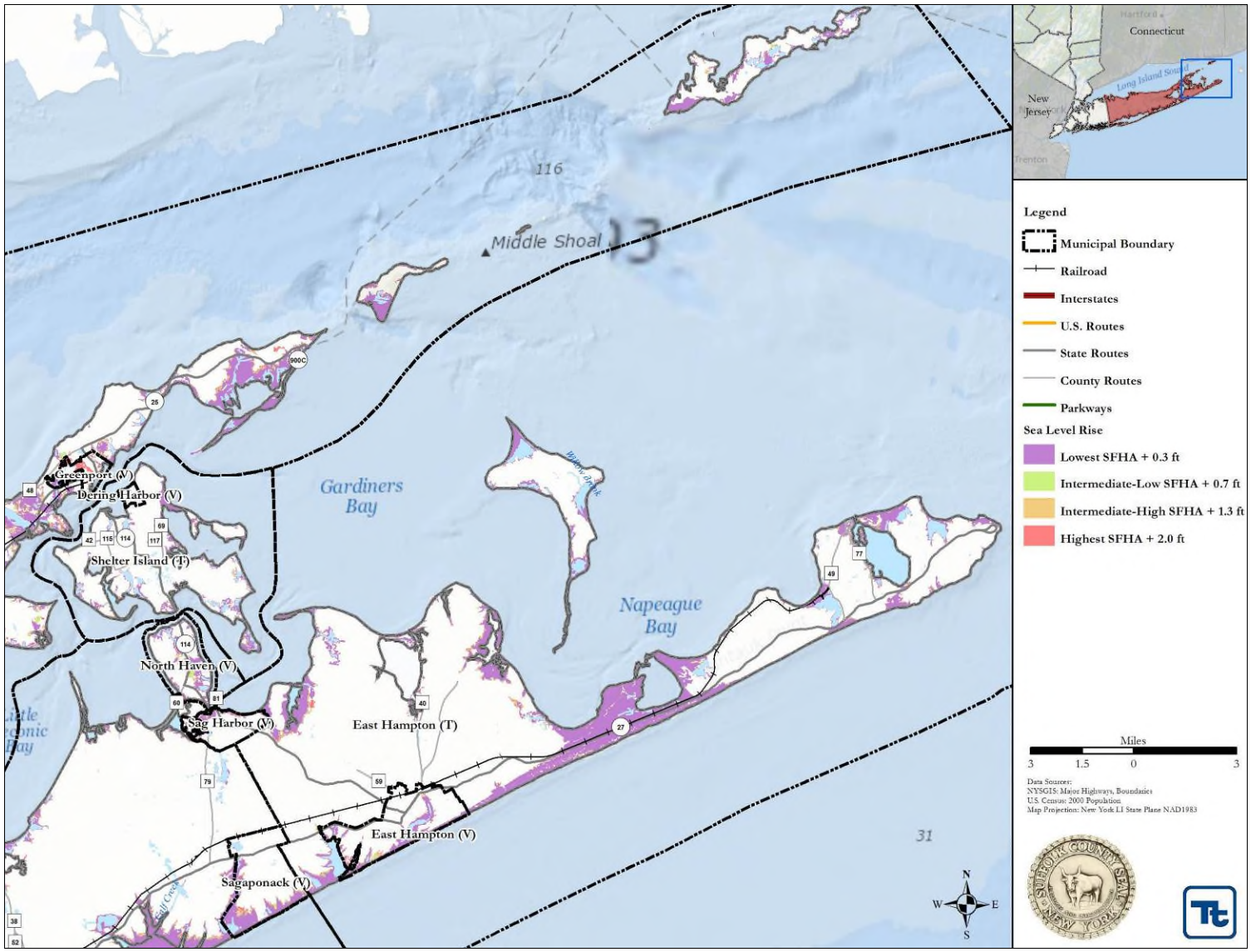
Source: NOAA

Figure 5.4.5-13. Sea Level Rise Scenarios for Suffolk - Central



Source: NOAA

Figure 5.4.5-14. Sea Level Rise Scenarios for Suffolk - East



Source: NOAA

Impact on Life, Health and Safety

The impact of flooding on life, health and safety is dependent upon several factors including the severity of the event and whether or not adequate warning time is provided to residents. Exposure represents the population living in or near floodplain areas that could be impacted should a flood event occur. Additionally, exposure should not be limited to only those who reside in a defined hazard zone, but everyone who may be affected by the effects of a hazard event (e.g., people are at risk while traveling in flooded areas, or their access to emergency services is compromised during an event). The degree of that impact will vary and is not strictly measurable.

To estimate the population exposed to the 1-percent flood event, the floodplain boundaries were overlaid upon the 2010 Census population data in GIS (U.S. Census 2010). The 2010 Census blocks with their centroid in the flood boundaries were used to calculate the estimated population exposed to this hazard. Census blocks do not follow the boundaries of the floodplain and can grossly over or under estimate the population exposed when using the centroid or intersect of the Census block with the flood zones. Further, the seasonal population that visits or temporarily resides in the planning area is not captured in the Census population and may underestimate the population exposed. The limitations of these analyses are recognized, and as such the results are only used to provide a general estimate.

The calculation for the 0.2-percent annual chance flood event is cumulative in nature, as the population exposed to the 1-percent flood event will also be exposed to the 0.2-percent annual chance flood event. Using this approach, it was estimated that 43,968 people are exposed to the 1-percent annual chance event and 51,505 people are exposed to the 0.2-percent annual chance flood event. Table 5.4.5-5 lists the estimated population located within the 1- and 0.2-percent annual chance flood boundaries by jurisdiction.

Table 5.4.5-5. Estimated Population Exposed to the Flood Hazard

Jurisdiction	Total Population	Population in 100-Year SFHA		Population in 500-Year Flood Zone	
		Number	% of Total	Number	% of Total
Amityville (V)	9,523	2,274	23.9	2,327	24.4
Asharoken (V)	654	643	98.3	643	98.3
Babylon (T)	164,661	7,851	4.8	9,893	6.0
Babylon (V)	12,166	3,079	25.3	3,217	26.4
Belle Terre (V)	792	0	0.0	0	0.0
Bellport (V)	2,084	24	1.2	24	1.2
Brightwaters (V)	3,103	68	2.2	126	4.1
Brookhaven (T)	434,886	5,779	1.3	6,384	1.5
Dering Harbor (V)	11	0	0.0	0	0.0
East Hampton (T)	18,205	751	4.1	1,046	5.7
East Hampton (V)	1,083	40	3.7	69	6.4
Greenport (V)	2,197	224	10.2	261	11.9
Head of the Harbor (V)	1,472	22	1.5	22	1.5
Huntington (T)	190,124	570	0.3	619	0.3
Huntington Bay (V)	1,425	49	3.4	49	3.4
Islandia (V)	3,335	0	0.0	0	0.0
Islip (T)	328,989	7,228	2.2	7,533	2.3
Lake Grove (V)	11,163	0	0.0	0	0.0
Lindenhurst (V)	27,253	3,571	13.1	3,858	14.2
Lloyd Harbor (V)	3,660	64	1.7	64	1.7
Mastic Beach (V)	14,841	2,220	15.0	2,521	17.0
Nissequoque (V)	1,749	242	13.8	242	13.8
North Haven (V)	833	119	14.3	174	20.9
Northport (V)	7,401	329	4.4	358	4.8
Ocean Beach (V)	79	79	100.0	79	100.0
Old Field (V)	918	327	35.6	327	35.6
Patchogue (V)	11,798	1,282	10.9	1,433	12.1
Poquott (V)	953	0	0.0	0	0.0
Port Jefferson (V)	7,750	136	1.8	136	1.8
Quogue (V)	967	131	13.5	154	15.9

Jurisdiction	Total Population	Population in 100-Year SFHA		Population in 500-Year Flood Zone	
		Number	% of Total	Number	% of Total
Riverhead (T)	33,506	854	2.5	1,665	5.0
Sag Harbor (V)	2,169	247	11.4	402	18.5
Sagaponak (V)	313	43	13.7	43	13.7
Saltaire (V)	37	37	100.0	37	100.0
Shelter Island (T)	2,381	274	11.5	289	12.1
Shoreham (V)	531	0	0.0	0	0.0
Smithtown (T)	112,773	19	0.0	128	0.1
Southampton (T)	49,130	3,220	6.6	4,494	9.1
Southampton (V)	3,109	43	1.4	53	1.7
Southold (T)	19,771	1,695	8.6	2,227	11.3
The Branch (V)	1,807	59	3.3	59	3.3
West Hampton Dunes (V)	55	55	100.0	55	100.0
Westhampton Beach (V)	1,721	202	11.7	202	11.7
Shinnecock Tribal Nation	662	118	17.8	292	44.1
Unkechaug Tribal Nation	324	0	0.0	0	0.0
Suffolk County	**1,493,350**	**43,968**	**2.9**	**51,505**	**3.4**

Sources: HAZUS-MH 2.1; FEMA 2009
Note:
SFHA = Special Flood Hazard Area which includes both A and V zones.
The centroid analysis is underestimating the estimated population exposed on the Unkechaug reservation. This is due to the methodology using the U.S. Census-block centroid. There are floodplains located on the reservation and Tribal members are exposed to the flood hazard.

The table above shows that approximately 2.9 percent of the total population is exposed to the 1-percent annual chance flood event (both riverine and coastal) and that approximately 3.4 percent of the total population is exposed to the 0.2-percent annual chance flood event. For this project, the potential population impacted is used as a guide. Because the estimated population exposed to flooding does not include storm surge, this is a conservative estimate and may be higher if multiple impacts occur (see Section 5.4.7 Hurricane). In addition, it does not account for the increase in seasonal population along the County's coastal shores.

Of the population exposed, the most vulnerable include the economically disadvantaged and the population over the age of 65. Economically disadvantaged populations are more vulnerable because they are likely to evaluate their risk and make decisions to evacuate based on the net economic impact to their family. The population over the age of 65 is also more vulnerable because they are more likely to seek or need medical attention which may not be available to due isolation during a flood event and they may have more difficulty evacuating.

The total number of injuries and casualties resulting from flooding is generally limited based on advance weather forecasting, blockades and warnings. Therefore, injuries and deaths generally are not anticipated if proper warning and precautions are in place. Ongoing mitigation efforts should help to avoid the most likely cause of injury, which results from persons trying to cross flooded roadways or channels during a flood.

To estimate population vulnerable to potential sea level rise, a spatial analysis using the centroid of the 2010 Census blocks and the NOAA sea level rise scenarios extents (+0.3 feet and +2.0 feet). Table 5.4.5-6 summarizes these results by jurisdiction. As described earlier regarding the centroid analysis methodology, the limitations of these analyses are recognized, and as such the results are only used to provide a general estimate.

Table 5.4.5-6. Estimated Population Exposed to Projected Sea Level Rise

Jurisdiction	U.S. Census 2010 Population	Estimated Population Exposed			
		Number in SFHA + 0.3 feet	% of Total Exposed	Number in SFHA + 2.0 feet	% of Total Exposed
Amityville (V)	9,523	1,818	19.1	2,253	23.7
Asharoken (V)	654	489	74.8	489	74.8
Babylon (T)	164,661	9,459	5.7	10,499	6.4
Babylon (V)	12,166	3,186	26.2	4,169	34.3
Belle Terre (V)	792	0	0.0	0	0.0
Bellport (V)	2,084	24	1.2	33	1.6
Brightwaters (V)	3,103	141	4.5	264	8.5
Brookhaven (T)	434,886	5,624	1.3	8,008	1.8
Dering Harbor (V)	11	0	0.0	0	0.0
East Hampton (T)	18,205	788	4.3	1,096	6.0
East Hampton (V)	1,083	40	3.7	67	6.2
Greenport (V)	2,197	216	9.8	701	31.9
Head of the Harbor (V)	1,472	10	0.7	10	0.7
Huntington (T)	190,124	898	0.5	1,183	0.6
Huntington Bay (V)	1,425	49	3.4	49	3.4
Islandia (V)	3,335	0	0.0	0	0.0
Islip (T)	328,989	8,404	2.6	13,038	4.0
Lake Grove (V)	11,163	0	0.0	0	0.0
Lindenhurst (V)	27,253	3,061	11.2	4,042	14.8
Lloyd Harbor (V)	3,660	64	1.7	64	1.7
Mastic Beach (V)	14,841	2,309	15.6	3,173	21.4
Nissequoque (V)	1,749	92	5.3	92	5.3

Jurisdiction	U.S. Census 2010 Population	Estimated Population Exposed			
		Number in SFHA + 0.3 feet	% of Total Exposed	Number in SFHA + 2.0 feet	% of Total Exposed
North Haven (V)	833	119	14.3	130	15.6
Northport (V)	7,401	199	2.7	244	3.3
Ocean Beach (V)	79	79	100.0	79	100.0
Old Field (V)	918	0	0.0	0	0.0
Patchogue (V)	11,798	1,524	12.9	2,168	18.4
Poquott (V)	953	7	0.7	7	0.7
Port Jefferson (V)	7,750	149	1.9	269	3.5
Quogue (V)	967	124	12.8	170	17.6
Riverhead (T)	33,506	773	2.3	962	2.9
Sag Harbor (V)	2,169	216	10.0	288	13.3
Sagaponak (V)	313	59	18.8	59	18.8
Saltaire (V)	37	37	100.0	37	100.0
Shelter Island (T)	2,381	172	7.2	180	7.6
Shoreham (V)	531	0	0.0	0	0.0
Smithtown (T)	112,773	155	0.1	155	0.1
Southampton (T)	49,130	3,071	6.3	3,761	7.7
Southampton (V)	3,109	58	1.9	90	2.9
Southold (T)	19,771	1,305	6.6	1,741	8.8
The Branch (V)	1,807	59	3.3	59	3.3
West Hampton Dunes (V)	55	55	100.0	55	100.0
Westhampton Beach (V)	1,721	204	11.9	294	17.1
Shinnecock Tribal Nation	662	292	44.1	322	48.6
Unkechaug Tribal Nation	324	0	0.0	0	0.0
Suffolk County	**1,493,350**	**24,588**	**1.6**	**60,300**	**4.0**

Source: U.S. Census 2010, NOAA 2013
Notes:
The centroid analysis is underestimating the estimated population exposed on the Unkechaug Tribal reservation. This is due to the methodology using the U.S. Census-block centroid. The projected sea-level rise areas extend into the reservation and Tribal members may be exposed to this hazard.

Impact on General Building Stock

Coastal and Riverine Flood

After considering the population exposed and vulnerable to the flood hazard, the built environment was evaluated. Exposure in the flood zone includes those buildings located in the flood zone. Potential damage is the modeled loss that could occur to the exposed inventory, including structural and content value.

The total land area located in the 1-percent and 0.2-percent annual chance flood zones was calculated for each jurisdiction, as presented in Table 5.4.5-7 below.

Table 5.4.5-7. Total Land Area Located in the 1-Percent Annual Chance Flood Zones (Acres)

Jurisdiction	Total Area (acres)	1% Flood Event Hazard Area				0.2% Flood Event Hazard Area	
		A-Zone Area (acres)	% of Total	V-Zone Area (acres)	% of Total	Area (acres)	% of Total
Amityville (V)	1,368	414	30.3%	8	0.6%	434	31.7%
Asharoken (V)	840	209	24.9%	110	13.1%	321	38.2%
Babylon (T)	27,022	3,383	12.5%	691	2.6%	4,271	15.8%
Babylon (V)	1,623	483	29.8%	16	1.0%	533	32.9%
Belle Terre (V)	573	4	0.8%	21	3.7%	26	4.5%

Jurisdiction	Total Area (acres)	1% Flood Event Hazard Area				0.2% Flood Event Hazard Area	
		A-Zone Area (acres)	% of Total	V-Zone Area (acres)	% of Total	Area (acres)	% of Total
Bellport (V)	921	94	10.2%	16	1.7%	114	12.3%
Brightwaters (V)	622	64	10.3%	2	0.3%	72	11.6%
Brookhaven (T)	155,028	7,635	4.9%	2,398	1.5%	10,297	6.6%
Dering Harbor (V)	192	8	4.0%	6	3.3%	19	9.7%
East Hampton (T)	44,409	6,336	14.3%	2,008	4.5%	9,038	20.4%
East Hampton (V)	3,141	450	14.3%	155	4.9%	782	24.9%
Greenport (V)	591	85	14.4%	21	3.5%	146	24.7%
Head of the Harbor (V)	1,883	37	1.9%	150	8.0%	188	10.0%
Huntington (T)	51,312	614	1.2%	362	0.7%	1,044	2.0%
Huntington Bay (V)	604	44	7.3%	21	3.5%	68	11.3%
Islandia (V)	1,423	23	1.6%	0	0.0%	23	1.6%
Islip (T)	64,673	5,813	9.0%	785	1.2%	6,853	10.6%
Lake Grove (V)	1,880	0	0.0%	0	0.0%	0	0.0%
Lindenhurst (V)	2,387	308	12.9%	6	0.2%	343	14.4%
Lloyd Harbor (V)	5,889	328	5.6%	307	5.2%	646	11.0%
Mastic Beach (V)	2,911	786	27.0%	48	1.7%	880	30.2%
Nissequogue (V)	2,746	386	14.0%	308	11.2%	696	25.4%
North Haven (V)	1,725	405	23.5%	64	3.7%	689	40.0%
Northport (V)	1,475	16	1.1%	46	3.1%	68	4.6%
Ocean Beach (V)	91	76	83.8%	14	15.8%	91	99.6%
Old Field (V)	1,362	267	19.6%	126	9.3%	401	29.4%
Patchogue (V)	1,553	344	22.1%	14	0.9%	372	24.0%
Poquott (V)	285	7	2.6%	18	6.4%	26	9.0%
Port Jefferson (V)	1,955	31	1.6%	27	1.4%	60	3.1%
Quogue (V)	2,705	1,068	39.5%	115	4.2%	1,270	46.9%
Riverhead (T)	43,525	1,563	3.6%	461	1.1%	2,689	6.2%
Sag Harbor (V)	1,127	166	14.7%	16	1.4%	297	26.3%
Sagaponack (V)	2,971	421	14.2%	265	8.9%	816	27.5%
Saltaire (V)	165	134	81.3%	31	18.7%	165	100.0%
Shelter Island (T)	7,800	1,094	14.0%	339	4.4%	1,795	23.0%
Shoreham (V)	272	0	0.0%	9	3.3%	9	3.3%
Smithtown (T)	29,538	648	2.2%	99	0.3%	784	2.7%
Southampton (T)	76,795	7,252	9.4%	1,682	2.2%	10,957	14.3%
Southampton (V)	4,255	829	19.5%	386	9.1%	1,308	30.7%
Southold (T)	35,100	5,848	16.7%	1,718	4.9%	9,063	25.8%
Village of the Branch (V)	617	44	7.2%	0	0.0%	49	7.9%
West Hampton Dunes (V)	180	112	62.1%	68	37.6%	179	99.7%
Westhampton Beach (V)	1,856	779	42.0%	129	7.0%	968	52.1%
Shinnecock Tribal Nation	892	308	34.5%	16	1.8%	399	44.7%
Unkechaug Tribal Nation	55	13	24.2%	2	3.2%	15	27.9%
Suffolk County	**588,336**	**48,929**	**8.3%**	**13,085**	**2.2%**	**69,261**	**11.8%**

Source: FEMA 2009
Note: % = Percent
The area presented includes the area of inland waterways and excludes bays or oceans.

To provide a general estimate of the structural/content replacement value exposure, the 1- and 0.2-percent DFIRM flood boundaries were overlaid upon the County's updated building stock inventory at the structure level. The buildings with their centroid in the flood boundary were totaled for each municipality. Table 5.4.5-8 summarizes these results. In summary, there 27,837 buildings located in the 1-percent annual chance flood boundary with an estimated $22 billion of building/contents exposed. This represents approximately 3% of the County's total general building stock replacement value inventory (greater than $702 billion).

There 34,908 buildings located in the 0.2-percent annual chance flood boundary with an estimated $28.5 billion of building/contents exposed. This represents approximately 4.1% of the County's total general building stock replacement value inventory.

The HAZUS-MH model estimated potential damages to the buildings in Suffolk County at the structure level using the custom County structure inventory developed for this plan. The potential damage estimated by HAZUS-MH to the general building stock inventory associated with the 1-percent annual chance flood is nearly than $2 billion or less than one-percent of the total building stock replacement value. The potential damage estimated by HAZUS-MH to the general building stock inventory associated with the 0.2-percent annual chance flood is nearly $5 billion or less than one-percent of the total building stock replacement value.

Table 5.4.5-8. Estimated General Building Stock Exposure to the 1-Percent Annual Chance Flood Event – All Occupancies

Jurisdiction	Total # Buildings	Total RCV	Total (All Occupancies)							
			A-Zone				V-Zone			
			# Buildings	% Total	RCV	% Total	# Buildings	% Total	RCV	% Total
Amityville (V)	4,112	$4,252,136,181	1,292	31.4	$756,756,516	17.8	7	0.2	$1,793,031	0.0
Asharoken (V)	439	$372,107,179	235	53.5	$188,253,844	50.6	61	13.9	$45,762,558	12.3
Babylon (T)	56,432	$65,453,076,501	3,423	6.1	$1,730,852,603	2.6	13	0.0	$21,231,740	0.0
Babylon (V)	5,287	$4,543,925,987	1,255	23.7	$859,647,792	18.9	5	0.1	$1,475,086	0.0
Belle Terre (V)	401	$669,659,013	0	0.0	$0	0.0	2	0.5	$937,929	0.1
Bellport (V)	1,684	$1,916,728,157	46	2.7	$40,017,309	2.1	0	0.0	$0	0.0
Brightwaters (V)	1,676	$1,513,218,570	47	2.8	$40,582,973	2.7	0	0.0	$0	0.0
Brookhaven (T)	165,626	$190,143,257,364	3,797	2.3	$3,144,990,722	1.7	341	0.2	$310,070,693	0.2
Dering Harbor (V)	71	$50,907,547	0	0.0	$0	0.0	2	2.8	$602,970	1.2
East Hampton (T)	22,561	$14,753,173,216	1,443	6.4	$864,952,420	5.9	197	0.9	$169,535,032	1.1
East Hampton (V)	2,994	$2,592,657,128	83	2.8	$48,300,516	1.9	71	2.4	$89,671,061	3.5
Greenport (V)	1,363	$959,195,848	82	6.0	$75,487,686	7.9	16	1.2	$23,832,161	2.5
Head of the Harbor (V)	836	$1,460,689,661	2	0.2	$1,619,606	0.1	0	0.0	$0	0.0
Huntington (T)	76,595	$87,620,284,012	120	0.2	$247,292,595	0.3	75	0.1	$66,534,566	0.1
Huntington Bay (V)	739	$824,147,761	40	5.4	$44,514,888	5.4	17	2.3	$20,754,597	2.5
Islandia (V)	1,195	$3,165,387,995	0	0.0	$0	0.0	0	0.0	$0	0.0
Islip (T)	102,388	$116,722,805,765	3,598	3.5	$3,165,612,721	2.7	213	0.2	$231,830,994	0.2
Lake Grove (V)	4,015	$4,981,641,857	0	0.0	$0	0.0	0	0.0	$0	0.0
Lindenhurst (V)	10,823	$7,338,416,625	1,519	14.0	$874,340,711	11.9	15	0.1	$8,069,773	0.1
Lloyd Harbor (V)	1,807	$2,454,429,712	12	0.7	$17,460,430	0.7	15	0.8	$29,434,673	1.2
Mastic Beach (V)	7,305	$3,233,984,869	1,652	22.6	$676,016,102	20.9	20	0.3	$10,931,483	0.3
Nissequogue (V)	854	$3,556,614,754	49	5.7	$73,950,539	2.1	18	2.1	$26,932,274	0.8
North Haven (V)	742	$1,038,696,076	15	2.0	$13,575,900	1.3	0	0.0	$0	0.0
Northport (V)	3,475	$3,098,715,281	10	0.3	$27,287,739	0.9	17	0.5	$11,429,087	0.4
Ocean Beach (V)	573	$506,864,928	558	97.4	$496,825,836	98.0	12	2.1	$8,223,856	1.6
Old Field (V)	529	$999,833,880	28	5.3	$29,142,926	2.9	7	1.3	$9,476,171	0.9
Patchogue (V)	4,277	$5,365,465,598	154	3.6	$174,315,993	3.2	0	0.0	$0	0.0
Poquott (V)	480	$613,660,785	3	0.6	$979,838	0.2	7	1.5	$1,859,048	0.3
Port Jefferson (V)	2,931	$4,974,246,594	28	1.0	$100,780,416	2.0	12	0.4	$4,338,678	0.1
Quogue (V)	1,675	$2,538,333,603	368	22.0	$565,120,844	22.3	35	2.1	$52,866,416	2.1
Riverhead (T)	21,343	$20,620,083,411	427	2.0	$251,981,002	1.2	115	0.5	$67,757,691	0.3
Sag Harbor (V)	3,011	$2,555,414,041	159	5.3	$211,700,402	8.3	2	0.1	$1,541,155	0.1
Sagaponack (V)	759	$1,538,825,257	61	8.0	$103,786,200	6.7	30	4.0	$37,131,384	2.4
Saltaire (V)	443	$577,966,672	412	93.0	$545,229,631	94.3	31	7.0	$32,737,041	5.7
Shelter Island (T)	4,061	$2,627,033,680	77	1.9	$82,627,725	3.1	24	0.6	$21,871,658	0.8
Shoreham (V)	304	$444,350,589	0	0.0	$0	0.0	0	0.0	$0	0.0
Smithtown (T)	42,097	$72,444,940,121	24	0.1	$32,441,259	0.0	8	0.0	$24,705,627	0.0

Jurisdiction	Total # Buildings	Total RCV	Total (All Occupancies)							
			A-Zone				V-Zone			
			# Buildings	% Total	RCV	% Total	# Buildings	% Total	RCV	% Total
Southampton (T)	32,382	$38,161,684,004	2,365	7.3	$2,505,777,368	6.6	249	0.8	$296,162,167	0.8
Southampton (V)	3,578	$5,883,613,602	187	5.2	$430,594,440	7.3	58	1.6	$138,514,020	2.4
Southold (T)	21,584	$15,067,456,341	1,161	5.4	$716,815,235	4.8	157	0.7	$104,855,955	0.7
Village of the Branch (V)	675	$1,314,993,732	2	0.3	$388,707	0.0	0	0.0	$0	0.0
West Hampton Dunes (V)	285	$309,912,300	197	69.1	$217,347,600	70.1	85	29.8	$89,538,000	28.9
Westhampton Beach (V)	2,265	$2,752,056,759	821	36.2	$949,580,642	34.5	61	2.7	$78,976,788	2.9
Shinnecock Tribal Nation	618	$473,022,431	65	10.5	$47,261,611	10.0	0	0.0	$0	0.0
Unkechaug Tribal Nation	146	$76,936,042	21	14.4	$9,228,045	12.0	1	0.7	$867,789	1.1
Suffolk County	**617,436**	**$702,562,551,430**	**25,838**	**4.2**	**$20,363,439,334**	**2.9**	**1,999**	**0.3**	**$2,042,253,150**	**0.3**

Source: HAZUS-MH v2.1; Suffolk County Planning Department, 2014; Suffolk County Real Property Tax Service, 2014
Note: RCV = Replacement Cost Value; T = Town; V = Village; # = Number; % = Percent.

Table 5.4.5-9. Estimated General Building Stock Exposure to the 1-Percent Annual Chance Flood Event – Residential Occupancy Class

Jurisdiction	Total # Buildings (all occupancies)	Total RCV	Residential							
			A-Zone				V-Zone			
			# Buildings	% Total	RCV	% Total	# Buildings	% Total	RCV	% Total
Amityville (V)	4,112	$4,252,136,181	1,229	29.9	$598,200,262	14.1	7	0.2	$1,793,031	0.0
Asharoken (V)	439	$372,107,179	234	53.3	$184,677,021	49.6	61	13.9	$45,762,558	12.3
Babylon (T)	56,432	$65,453,076,501	3,346	5.9	$1,587,182,691	2.4	10	0.0	$6,242,206	0.0
Babylon (V)	5,287	$4,543,925,987	1,216	23.0	$773,166,506	17.0	4	0.1	$581,555	0.0
Belle Terre (V)	401	$669,659,013	0	0.0	$0	0.0	2	0.5	$937,929	0.1
Bellport (V)	1,684	$1,916,728,157	43	2.6	$38,176,139	2.0	0	0.0	$0	0.0
Brightwaters (V)	1,676	$1,513,218,570	46	2.7	$37,421,950	2.5	0	0.0	$0	0.0
Brookhaven (T)	165,626	$190,143,257,364	3,557	2.1	$2,722,468,747	1.4	319	0.2	$280,540,804	0.1
Dering Harbor (V)	71	$50,907,547	0	0.0	$0	0.0	2	2.8	$602,970	1.2
East Hampton (T)	22,561	$14,753,173,216	1,356	6.0	$719,957,211	4.9	178	0.8	$143,857,410	1.0
East Hampton (V)	2,994	$2,592,657,128	77	2.6	$44,921,927	1.7	60	2.0	$56,536,588	2.2
Greenport (V)	1,363	$959,195,848	48	3.5	$18,967,993	2.0	4	0.3	$1,460,952	0.2
Head of the Harbor (V)	836	$1,460,689,661	2	0.2	$1,619,606	0.1	0	0.0	$0	0.0
Huntington (T)	76,595	$87,620,284,012	79	0.1	$59,961,779	0.1	62	0.1	$42,834,118	0.0
Huntington Bay (V)	739	$824,147,761	32	4.3	$29,789,960	3.6	13	1.8	$5,461,722	0.7
Islandia (V)	1,195	$3,165,387,995	0	0.0	$0	0.0	0	0.0	$0	0.0
Islip (T)	102,388	$116,722,805,765	3,215	3.1	$2,571,481,325	2.2	201	0.2	$203,039,952	0.2
Lake Grove (V)	4,015	$4,981,641,857	0	0.0	$0	0.0	0	0.0	$0	0.0
Lindenhurst (V)	10,823	$7,338,416,625	1,471	13.6	$720,727,499	9.8	15	0.1	$8,069,773	0.1
Lloyd Harbor (V)	1,807	$2,454,429,712	8	0.4	$5,495,099	0.2	6	0.3	$1,332,374	0.1
Mastic Beach (V)	7,305	$3,233,984,869	1,643	22.5	$665,406,715	20.6	19	0.3	$9,680,941	0.3
Nissequogue (V)	854	$3,556,614,754	46	5.4	$66,330,616	1.9	12	1.4	$13,943,065	0.4
North Haven (V)	742	$1,038,696,076	15	2.0	$13,575,900	1.3	15	2.0	$8,006,829	0.8
Northport (V)	3,475	$3,098,715,281	3	0.1	$5,110,618	0.2	0	0.0	$0	0.0
Ocean Beach (V)	573	$506,864,928	516	90.1	$384,726,094	75.9	12	2.1	$8,223,856	1.6
Old Field (V)	529	$999,833,880	25	4.7	$21,254,077	2.1	3	0.6	$2,162,686	0.2
Patchogue (V)	4,277	$5,365,465,598	122	2.9	$104,108,402	1.9	0	0.0	$0	0.0
Poquott (V)	480	$613,660,785	3	0.6	$979,838	0.2	7	1.5	$1,859,048	0.3
Port Jefferson (V)	2,931	$4,974,246,594	3	0.1	$29,534,095	0.6	6	0.2	$3,315,399	0.1
Quogue (V)	1,675	$2,538,333,603	366	21.9	$563,389,964	22.2	32	1.9	$51,659,400	2.0
Riverhead (T)	21,343	$20,620,083,411	390	1.8	$169,416,796	0.8	113	0.5	$63,600,617	0.3
Sag Harbor (V)	3,011	$2,555,414,041	112	3.7	$78,427,012	3.1	2	0.1	$1,541,155	0.1
Sagaponack (V)	759	$1,538,825,257	61	8.0	$103,786,200	6.7	29	3.8	$35,700,600	2.3
Saltaire (V)	443	$577,966,672	396	89.4	$515,241,887	89.1	31	7.0	$32,737,041	5.7
Shelter Island (T)	4,061	$2,627,033,680	62	1.5	$29,652,907	1.1	16	0.4	$8,747,402	0.3
Shoreham (V)	304	$444,350,589	0	0.0	$0	0.0	0	0.0	$0	0.0
Smithtown (T)	42,097	$72,444,940,121	21	0.0	$20,040,168	0.0	2	0.0	$5,435,677	0.0

Jurisdiction	Total # Buildings (all occupancies)	Total RCV	Residential							
			A-Zone				V-Zone			
			# Buildings	% Total	RCV	% Total	# Buildings	% Total	RCV	% Total
Southampton (T)	32,382	$38,161,684,004	2,289	7.1	$2,393,249,923	6.3	241	0.7	$276,707,291	0.7
Southampton (V)	3,578	$5,883,613,602	177	4.9	$408,459,233	6.9	46	1.3	$131,544,842	2.2
Southold (T)	21,584	$15,067,456,341	1,039	4.8	$487,608,747	3.2	141	0.7	$80,933,557	0.5
Village of the Branch (V)	675	$1,314,993,732	2	0.3	$388,707	0.0	0	0.0	$0	0.0
West Hampton Dunes (V)	285	$309,912,300	197	69.1	$217,347,600	70.1	85	29.8	$89,538,000	28.9
Westhampton Beach (V)	2,265	$2,752,056,759	792	35.0	$919,416,110	33.4	55	2.4	$70,727,827	2.6
Shinnecock Tribal Nation	618	$473,022,431	21	3.4	$8,847,900	1.9	0	0.0	$0	0.0
Unkechaug Tribal Nation	146	$76,936,042	19	13.0	$7,316,232	9.5	0	0.0	$0	0.0
Suffolk County	**617,436**	**$702,562,551,430**	**24,279**	**3.9**	**17,327,831,459**	**2.5**	**1,811**	**0.3**	**$1,695,119,175**	**0.2**

Source: HAZUS-MH v2.1; Suffolk County Planning Department, 2014; Suffolk County Real Property Tax Service, 2014
Note: RCV = Replacement Cost Value; T = Town; V = Village; # = Number; % = Percent.

Table 5.4.5-10. Estimated General Building Stock Exposure to the 1-Percent Annual Chance Flood Event – Commercial Occupancy Class

Jurisdiction	Total # Buildings (all occupancies)	Total RCV	Commercial							
			A-Zone				V-Zone			
			# Buildings	% Total	RCV	% Total	# Buildings	% Total	RCV	% Total
Amityville (V)	4,112	$4,252,136,181	58	1.4	$100,169,866	23.6	0	0.00	$0	0.0
Asharoken (V)	439	$372,107,179	0	0.0	$0	0.0	0	0.00	$0	0.0
Babylon (T)	56,432	$65,453,076,501	75	0.1	$140,330,573	2.1	2	0.00	$11,828,510	0.0
Babylon (V)	5,287	$4,543,925,987	38	0.7	$83,320,262	18.3	1	0.02	$893,531	0.0
Belle Terre (V)	401	$669,659,013	0	0.0	$0	0.0	0	0.00	$0	0.0
Bellport (V)	1,684	$1,916,728,157	1	0.1	$959,155	0.5	0	0.00	$0	0.0
Brightwaters (V)	1,676	$1,513,218,570	0	0.0	$0	0.0	0	0.00	$0	0.0
Brookhaven (T)	165,626	$190,143,257,364	148	0.1	$327,834,071	1.7	7	0.00	$5,756,760	0.0
Dering Harbor (V)	71	$50,907,547	0	0.0	$0	0.0	0	0.00	$0	0.0
East Hampton (T)	22,561	$14,753,173,216	74	0.3	$137,661,667	9.3	19	0.08	$25,677,622	0.2
East Hampton (V)	2,994	$2,592,657,128	6	0.2	$3,378,588	1.3	11	0.37	$33,134,474	1.3
Greenport (V)	1,363	$959,195,848	33	2.4	$55,954,310	58.3	12	0.88	$22,371,209	2.3
Head of the Harbor (V)	836	$1,460,689,661	0	0.0	$0	0.0	0	0.00	$0	0.0
Huntington (T)	76,595	$87,620,284,012	35	0.0	$168,310,544	1.9	12	0.02	$23,430,739	0.0
Huntington Bay (V)	739	$824,147,761	8	1.1	$14,724,928	17.9	4	0.54	$15,292,874	1.9
Islandia (V)	1,195	$3,165,387,995	0	0.0	$0	0.0	0	0.00	$0	0.0
Islip (T)	102,388	$116,722,805,765	353	0.3	$503,705,310	4.3	9	0.01	$19,307,971	0.0
Lake Grove (V)	4,015	$4,981,641,857	0	0.0	$0	0.0	0	0.00	$0	0.0
Lindenhurst (V)	10,823	$7,338,416,625	45	0.4	$133,915,673	18.2	0	0.00	$0	0.0
Lloyd Harbor (V)	1,807	$2,454,429,712	3	0.2	$8,804,307	3.6	8	0.44	$26,735,769	1.1
Mastic Beach (V)	7,305	$3,233,984,869	8	0.1	$10,427,192	3.2	1	0.01	$1,250,542	0.0
Nissequogue (V)	854	$3,556,614,754	3	0.4	$7,619,923	2.1	6	0.70	$12,989,209	0.4
North Haven (V)	742	$1,038,696,076	0	0.0	$0	0.0	0	0.00	$0	0.0
Northport (V)	3,475	$3,098,715,281	7	0.2	$22,177,121	7.2	1	0.03	$261,235	0.0
Ocean Beach (V)	573	$506,864,928	32	5.6	$69,482,556	137.1	0	0.00	$0	0.0
Old Field (V)	529	$999,833,880	3	0.6	$7,888,849	7.9	4	0.76	$7,313,486	0.7
Patchogue (V)	4,277	$5,365,465,598	19	0.4	$55,304,420	10.3	0	0.00	$0	0.0
Poquott (V)	480	$613,660,785	0	0.0	$0	0.0	0	0.00	$0	0.0
Port Jefferson (V)	2,931	$4,974,246,594	18	0.6	$59,489,708	12.0	4	0.14	$707,847	0.0
Quogue (V)	1,675	$2,538,333,603	0	0.0	$0	0.0	1	0.06	$648,432	0.0
Riverhead (T)	21,343	$20,620,083,411	31	0.1	$73,246,545	3.6	2	0.01	$4,157,075	0.0
Sag Harbor (V)	3,011	$2,555,414,041	43	1.4	$119,713,256	46.8	0	0.00	$0	0.0
Sagaponack (V)	759	$1,538,825,257	0	0.0	$0	0.0	0	0.00	$0	0.0
Saltaire (V)	443	$577,966,672	10	2.3	$14,285,542	24.7	0	0.00	$0	0.0
Shelter Island (T)	4,061	$2,627,033,680	14	0.3	$52,855,706	20.1	8	0.20	$13,124,256	0.5
Shoreham (V)	304	$444,350,589	0	0.0	$0	0.0	0	0.00	$0	0.0
Smithtown (T)	42,097	$72,444,940,121	3	0.0	$12,401,092	0.2	6	0.01	$19,269,950	0.0

Jurisdiction	Total # Buildings (all occupancies)	Total RCV	Commercial							
			A-Zone				V-Zone			
			# Buildings	% Total	RCV	% Total	# Buildings	% Total	RCV	% Total
Southampton (T)	32,382	$38,161,684,004	60	0.2	$93,807,165	2.5	7	0.02	$18,472,261	0.0
Southampton (V)	3,578	$5,883,613,602	4	0.1	$6,483,773	1.1	2	0.06	$996,957	0.0
Southold (T)	21,584	$15,067,456,341	104	0.5	$210,133,470	13.9	15	0.07	$23,499,637	0.2
Village of the Branch (V)	675	$1,314,993,732	0	0.0	$0	0.0	0	0.00	$0	0.0
West Hampton Dunes (V)	285	$309,912,300	0	0.0	$0	0.0	0	0.00	$0	0.0
Westhampton Beach (V)	2,265	$2,752,056,759	25	1.1	$29,548,536	10.7	2	0.09	$4,407,811	0.2
Shinnecock Tribal Nation	618	$473,022,431	0	0.0	$0	0.0	0	0.00	$0	0.0
Unkechaug Tribal Nation	146	$76,936,042	2	1.4	$1,911,812	24.8	1	0.68	$867,789	1.1
Suffolk County	**617,436**	**$702,562,551,430**	**1,263**	**0.2**	**$2,525,845,923**	**3.6**	**145**	**0.02**	**$292,395,945**	**0.0**

Source: HAZUS-MH v2.1; Suffolk County Planning Department, 2014; Suffolk County Real Property Tax Service, 2014
Note: RCV = Replacement Cost Value; T = Town; V = Village; # = Number; % = Percent.

Table 5.4.5-11. Estimated General Building Stock Exposure to the 0.2-Percent Annual Chance Flood Event – All Occupancies

Jurisdiction	Total # Buildings	Total RCV	Total (All Occupancies) 0.2-Percent # Buildings	% Total	RCV	% Total
Amityville (V)	4,112	$4,252,136,181	1,340	32.6	$777,618,455	18.3
Asharoken (V)	439	$372,107,179	297	67.7	$234,644,989	63.1
Babylon (T)	56,432	$65,453,076,501	4,016	7.1	$2,095,917,075	3.2
Babylon (V)	5,287	$4,543,925,987	1,368	25.9	$967,725,417	21.3
Belle Terre (V)	401	$669,659,013	2	0.5	$937,929	0.1
Bellport (V)	1,684	$1,916,728,157	57	3.4	$57,538,332	3.0
Brightwaters (V)	1,676	$1,513,218,570	63	3.8	$74,818,667	4.9
Brookhaven (T)	165,626	$190,143,257,364	4,504	2.7	$3,807,377,540	2.0
Dering Harbor (V)	71	$50,907,547	4	5.6	$2,101,942	4.1
East Hampton (T)	22,561	$14,753,173,216	2,121	9.4	$1,404,254,113	9.5
East Hampton (V)	2,994	$2,592,657,128	257	8.6	$229,104,563	8.8
Greenport (V)	1,363	$959,195,848	156	11.4	$156,217,955	16.3
Head of the Harbor (V)	836	$1,460,689,661	2	0.2	$1,619,606	0.1
Huntington (T)	76,595	$87,620,284,012	237	0.3	$379,560,991	0.4
Huntington Bay (V)	739	$824,147,761	60	8.1	$70,723,780	8.6
Islandia (V)	1,195	$3,165,387,995	0	0.0	$0	0.0
Islip (T)	102,388	$116,722,805,765	4,082	4.0	$3,752,091,479	3.2
Lake Grove (V)	4,015	$4,981,641,857	0	0.0	$0	0.0
Lindenhurst (V)	10,823	$7,338,416,625	1,637	15.1	$945,853,200	12.9
Lloyd Harbor (V)	1,807	$2,454,429,712	29	1.6	$50,207,403	2.0
Mastic Beach (V)	7,305	$3,233,984,869	1,884	25.8	$772,186,927	23.9
Nissequogue (V)	854	$3,556,614,754	67	7.8	$100,882,813	2.8
North Haven (V)	742	$1,038,696,076	107	14.4	$141,702,900	13.6
Northport (V)	3,475	$3,098,715,281	34	1.0	$87,086,806	2.8
Ocean Beach (V)	573	$506,864,928	570	99.5	$505,049,691	99.6
Old Field (V)	529	$999,833,880	36	6.8	$40,514,619	4.1
Patchogue (V)	4,277	$5,365,465,598	165	3.9	$205,895,841	3.8
Poquott (V)	480	$613,660,785	10	2.1	$2,838,887	0.5
Port Jefferson (V)	2,931	$4,974,246,594	42	1.4	$107,290,537	2.2
Quogue (V)	1,675	$2,538,333,603	464	27.7	$735,302,560	29.0
Riverhead (T)	21,343	$20,620,083,411	1,333	6.2	$834,125,942	4.0
Sag Harbor (V)	3,011	$2,555,414,041	455	15.1	$539,115,854	21.1
Sagaponack (V)	759	$1,538,825,257	129	17.0	$221,115,084	14.4
Saltaire (V)	443	$577,966,672	443	100.0	$577,966,672	100.0
Shelter Island (T)	4,061	$2,627,033,680	273	6.7	$216,317,656	8.2
Shoreham (V)	304	$444,350,589	0	0.0	$0	0.0
Smithtown (T)	42,097	$72,444,940,121	37	0.1	$60,910,642	0.1
Southampton (T)	32,382	$38,161,684,004	4,152	12.8	$4,385,464,833	11.5
Southampton (V)	3,578	$5,883,613,602	286	8.0	$646,267,904	11.0
Southold (T)	21,584	$15,067,456,341	2,785	12.9	$1,828,874,467	12.1
Village of the Branch (V)	675	$1,314,993,732	2	0.3	$388,707	0.0
West Hampton Dunes (V)	285	$309,912,300	282	98.9	$306,885,600	99.0
Westhampton Beach (V)	2,265	$2,752,056,759	973	43.0	$1,131,282,215	41.1
Shinnecock Tribal Nation	618	$473,022,431	124	20.1	$92,537,321	19.6
Unkechaug Tribal Nation	146	$76,936,042	23	15.8	$10,536,374	13.7
Suffolk County	**617,436**	**$702,562,551,430**	**34,908**	**5.7**	**$28,558,854,293**	**4.1**

Source: HAZUS-MH v2.1; Suffolk County Planning Department, 2014; Suffolk County Real Property Tax Service, 2014
Note: RCV = Replacement Cost Value; T = Town; V = Village; # = Number; % = Percent.

Table 5.4.5-12. Estimated General Building Stock Exposure to the 0.2-Percent Annual Chance Flood Event – Residential Occupancy Class

Jurisdiction	Total # Buildings	Total RCV	Residential 0.2-Percent # Buildings	% Total	RCV	% Total
Amityville (V)	4,112	$4,252,136,181	1,277	31.1	$619,062,201	14.6
Asharoken (V)	439	$372,107,179	296	67.4	$231,068,165	62.1
Babylon (T)	56,432	$65,453,076,501	3,933	7.0	$1,927,706,105	2.9
Babylon (V)	5,287	$4,543,925,987	1,323	25.0	$875,745,231	19.3
Belle Terre (V)	401	$669,659,013	2	0.5	$937,929	0.1
Bellport (V)	1,684	$1,916,728,157	54	3.2	$55,697,162	2.9
Brightwaters (V)	1,676	$1,513,218,570	62	3.7	$71,657,643	4.7
Brookhaven (T)	165,626	$190,143,257,364	4,234	2.6	$3,319,981,915	1.7
Dering Harbor (V)	71	$50,907,547	4	5.6	$2,101,942	4.1
East Hampton (T)	22,561	$14,753,173,216	1,970	8.7	$1,149,699,171	7.8
East Hampton (V)	2,994	$2,592,657,128	231	7.7	$172,336,951	6.6
Greenport (V)	1,363	$959,195,848	104	7.6	$42,374,915	4.4
Head of the Harbor (V)	836	$1,460,689,661	2	0.2	$1,619,606	0.1
Huntington (T)	76,595	$87,620,284,012	162	0.2	$116,945,887	0.1
Huntington Bay (V)	739	$824,147,761	48	6.5	$40,705,978	4.9
Islandia (V)	1,195	$3,165,387,995	0	0.0	$0	0.0
Islip (T)	102,388	$116,722,805,765	3,653	3.6	$2,987,125,697	2.6
Lake Grove (V)	4,015	$4,981,641,857	0	0.0	$0	0.0
Lindenhurst (V)	10,823	$7,338,416,625	1,587	14.7	$791,371,456	10.8
Lloyd Harbor (V)	1,807	$2,454,429,712	16	0.9	$10,139,774	0.4
Mastic Beach (V)	7,305	$3,233,984,869	1,873	25.6	$759,455,287	23.5
Nissequogue (V)	854	$3,556,614,754	58	6.8	$80,273,681	2.3
North Haven (V)	742	$1,038,696,076	107	14.4	$141,702,900	13.6
Northport (V)	3,475	$3,098,715,281	21	0.6	$17,346,507	0.6
Ocean Beach (V)	573	$506,864,928	528	92.1	$392,949,950	77.5
Old Field (V)	529	$999,833,880	29	5.5	$25,312,285	2.5
Patchogue (V)	4,277	$5,365,465,598	130	3.0	$112,287,636	2.1
Poquott (V)	480	$613,660,785	10	2.1	$2,838,887	0.5
Port Jefferson (V)	2,931	$4,974,246,594	10	0.3	$34,568,523	0.7
Quogue (V)	1,675	$2,538,333,603	459	27.4	$732,364,664	28.9
Riverhead (T)	21,343	$20,620,083,411	1,246	5.8	$604,244,953	2.9
Sag Harbor (V)	3,011	$2,555,414,041	357	11.9	$306,399,286	12.0
Sagaponack (V)	759	$1,538,825,257	128	16.9	$219,684,300	14.3
Saltaire (V)	443	$577,966,672	427	96.4	$547,978,928	94.8
Shelter Island (T)	4,061	$2,627,033,680	243	6.0	$140,664,112	5.4
Shoreham (V)	304	$444,350,589	0	0.0	$0	0.0
Smithtown (T)	42,097	$72,444,940,121	27	0.1	$27,297,130	0.0
Southampton (T)	32,382	$38,161,684,004	4,020	12.4	$4,190,305,585	11.0
Southampton (V)	3,578	$5,883,613,602	264	7.4	$617,163,520	10.5
Southold (T)	21,584	$15,067,456,341	2,540	11.8	$1,362,096,160	9.0
Village of the Branch (V)	675	$1,314,993,732	2	0.3	$388,707	0.0
West Hampton Dunes (V)	285	$309,912,300	282	98.9	$306,885,600	99.0
Westhampton Beach (V)	2,265	$2,752,056,759	917	40.5	$1,075,649,248	39.1
Shinnecock Tribal Nation	618	$473,022,431	48	7.8	$19,749,300	4.2
Unkechaug Tribal Nation	146	$76,936,042	20	13.7	$7,756,773	10.1
Suffolk County	**617,436**	**$702,562,551,430**	**32,704**	**5.3**	**$24,141,641,649**	**3.4**

Source: HAZUS-MH v2.1; Suffolk County Planning Department, 2014; Suffolk County Real Property Tax Service, 2014
Note: RCV = Replacement Cost Value; T = Town; V = Village; # = Number; % = Percent.

Table 5.4.5-13. Estimated General Building Stock Exposure to the 0.2-Percent Annual Chance Flood Event – Commercial Occupancy Class

Jurisdiction	Total # Buildings	Total RCV	Commercial 0.2-Percent # Buildings	% Total	RCV	% Total
Amityville (V)	4,112	$4,252,136,181	58	1.4	$100,169,866	2.4
Asharoken (V)	439	$372,107,179	79	18.0	$158,549,583	42.6
Babylon (T)	56,432	$65,453,076,501	44	0.1	$88,819,163	0.1
Babylon (V)	5,287	$4,543,925,987	1	0.0	$959,155	0.0
Belle Terre (V)	401	$669,659,013	0	0.0	$0	0.0
Bellport (V)	1,684	$1,916,728,157	0	0.0	$0	0.0
Brightwaters (V)	1,676	$1,513,218,570	0	0.0	$0	0.0
Brookhaven (T)	165,626	$190,143,257,364	159	0.1	$366,580,507	0.2
Dering Harbor (V)	71	$50,907,547	0	0.0	$0	0.0
East Hampton (T)	22,561	$14,753,173,216	136	0.6	$240,627,122	1.6
East Hampton (V)	2,994	$2,592,657,128	24	0.8	$54,028,928	2.1
Greenport (V)	1,363	$959,195,848	51	3.7	$113,277,657	11.8
Head of the Harbor (V)	836	$1,460,689,661	0	0.0	$0	0.0
Huntington (T)	76,595	$87,620,284,012	56	0.1	$214,916,931	0.2
Huntington Bay (V)	739	$824,147,761	12	1.6	$30,017,802	3.6
Islandia (V)	1,195	$3,165,387,995	0	0.0	$0	0.0
Islip (T)	102,388	$116,722,805,765	393	0.4	$655,573,555	0.6
Lake Grove (V)	4,015	$4,981,641,857	0	0.0	$0	0.0
Lindenhurst (V)	10,823	$7,338,416,625	47	0.4	$134,784,205	1.8
Lloyd Harbor (V)	1,807	$2,454,429,712	11	0.6	$35,540,077	1.4
Mastic Beach (V)	7,305	$3,233,984,869	10	0.1	$12,549,445	0.4
Nissequogue (V)	854	$3,556,614,754	9	1.1	$20,609,132	0.6
North Haven (V)	742	$1,038,696,076	0	0.0	$0	0.0
Northport (V)	3,475	$3,098,715,281	12	0.3	$66,579,276	2.1
Ocean Beach (V)	573	$506,864,928	32	5.6	$69,482,556	13.7
Old Field (V)	529	$999,833,880	7	1.3	$15,202,335	1.5
Patchogue (V)	4,277	$5,365,465,598	20	0.5	$59,775,690	1.1
Poquott (V)	480	$613,660,785	0	0.0	$0	0.0
Port Jefferson (V)	2,931	$4,974,246,594	22	0.8	$60,197,555	1.2
Quogue (V)	1,675	$2,538,333,603	1	0.1	$648,432	0.0
Riverhead (T)	21,343	$20,620,083,411	71	0.3	$207,788,950	1.0
Sag Harbor (V)	3,011	$2,555,414,041	92	3.1	$216,372,369	8.5
Sagaponack (V)	759	$1,538,825,257	0	0.0	$0	0.0
Saltaire (V)	443	$577,966,672	10	2.3	$14,285,542	2.5
Shelter Island (T)	4,061	$2,627,033,680	27	0.7	$73,367,952	2.8
Shoreham (V)	304	$444,350,589	0	0.0	$0	0.0
Smithtown (T)	42,097	$72,444,940,121	10	0.0	$33,613,512	0.0
Southampton (T)	32,382	$38,161,684,004	107	0.3	$169,939,591	0.4
Southampton (V)	3,578	$5,883,613,602	6	0.2	$7,480,730	0.1
Southold (T)	21,584	$15,067,456,341	198	0.9	$421,230,476	2.8
Village of the Branch (V)	675	$1,314,993,732	0	0.0	$0	0.0
West Hampton Dunes (V)	285	$309,912,300	0	0.0	$0	0.0
Westhampton Beach (V)	2,265	$2,752,056,759	47	2.1	$50,620,616	1.8
Shinnecock Tribal Nation	618	$473,022,431	0	0.0	$0	0.0
Unkechaug Tribal Nation	146	$76,936,042	3	2.1	$2,779,601	3.6
Suffolk County	**617,436**	**$702,562,551,430**	**1,755**	**0.3**	**$3,696,368,311**	**0.5**

Source: HAZUS-MH v2.1; Suffolk County Planning Department, 2014; Suffolk County Real Property Tax Service, 2014
Note: RCV = Replacement Cost Value; T = Town; V = Village; # = Number; % = Percent.

Table 5.4.5-14. Estimated General Building Stock Potential Loss to the 1-Percent Annual Chance Flood Event – All Occupancies

Jurisdiction	Total RCV	All Occupancies			
		1% Annual Chance Event		0.2% Annual Chance Event	
		Estimated Loss (RCV)	% of Total	Estimated Loss (RCV)	% of Total
Amityville (V)	$4,252,136,181	$131,466,183	3.1	$187,878,132	4.4
Asharoken (V)	$372,107,179	$29,703,526	8.0	$59,119,365	15.9
Babylon (T)	$65,453,076,501	$202,090,599	0.3	$323,196,644	0.5
Babylon (V)	$4,543,925,987	$70,835,634	1.6	$120,103,908	2.6
Belle Terre (V)	$669,659,013	$168,386	0.0	$192,663	0.0
Bellport (V)	$1,916,728,157	$2,314,199	0.1	$4,550,929	0.2
Brightwaters (V)	$1,513,218,570	$480,079	0.0	$4,446,810	0.3
Brookhaven (T)	$190,143,257,364	$375,288,602	0.2	$610,697,112	0.3
Dering Harbor (V)	$50,907,547	$278,856	0.5	$342,270	0.7
East Hampton (T)	$14,753,173,216	$125,364,697	0.8	$252,373,192	1.7
East Hampton (V)	$2,592,657,128	$6,884,454	0.3	$29,584,680	1.1
Greenport (V)	$959,195,848	$6,921,506	0.7	$11,722,008	1.2
Head of the Harbor (V)	$1,460,689,661	$235,267	0.0	$379,416	0.0
Huntington (T)	$87,620,284,012	$30,854,144	0.0	$75,643,790	0.1
Huntington Bay (V)	$824,147,761	$9,183,858	1.1	$17,489,771	2.1
Islandia (V)	$3,165,387,995	$0	0.0	$0	0.0
Islip (T)	$116,722,805,765	$519,405,259	0.4	$783,304,733	0.7
Lake Grove (V)	$4,981,641,857	$0	0.0	$0	0.0
Lindenhurst (V)	$7,338,416,625	$97,645,341	1.3	$151,545,552	2.1
Lloyd Harbor (V)	$2,454,429,712	$15,635,244	0.6	$20,900,413	0.9
Mastic Beach (V)	$3,233,984,869	$96,673,226	3.0	$144,918,821	4.5
Nissequogue (V)	$3,556,614,754	$5,545,961	0.2	$10,414,216	0.3
North Haven (V)	$1,038,696,076	$213,484	0.0	$971,786	0.1
Northport (V)	$3,098,715,281	$10,433,252	0.3	$17,424,397	0.6
Ocean Beach (V)	$506,864,928	$137,639,580	27.2	$176,693,437	34.9
Old Field (V)	$999,833,880	$9,843,926	1.0	$13,797,170	1.4

Jurisdiction	Total RCV	All Occupancies			
		1% Annual Chance Event		0.2% Annual Chance Event	
		Estimated Loss (RCV)	% of Total	Estimated Loss (RCV)	% of Total
Patchogue (V)	$5,365,465,598	$13,039,274	0.2	$24,710,413	0.5
Poquott (V)	$613,660,785	$1,165,857	0.2	$1,341,343	0.2
Port Jefferson (V)	$4,974,246,594	$3,328,257	0.1	$15,193,985	0.3
Quogue (V)	$2,538,333,603	$62,930,814	2.5	$124,693,602	4.9
Riverhead (T)	$20,620,083,411	$24,859,626	0.1	$51,798,550	0.3
Sag Harbor (V)	$2,555,414,041	$11,436,368	0.4	$34,694,640	1.4
Sagaponack (V)	$1,538,825,257	$22,552,675	1.5	$39,620,273	2.6
Saltaire (V)	$577,966,672	$147,537,122	25.5	$195,757,758	33.9
Shelter Island (T)	$2,627,033,680	$7,108,567	0.3	$14,290,911	0.5
Shoreham (V)	$444,350,589	$0	0.0	$0	0.0
Smithtown (T)	$72,444,940,121	$5,733,386	0.0	$14,568,281	0.0
Southampton (T)	$38,161,684,004	$381,451,338	1.0	$668,181,199	1.8
Southampton (V)	$5,883,613,602	$95,700,968	1.6	$159,963,531	2.7
Southold (T)	$15,067,456,341	$89,765,253	0.6	$166,043,387	1.1
Village of the Branch (V)	$1,314,993,732	$4,266	0.0	$4,266	0.0
West Hampton Dunes (V)	$309,912,300	$81,317,110	26.2	$112,732,151	36.4
Westhampton Beach (V)	$2,752,056,759	$114,077,265	4.1	$196,286,247	7.1
Shinnecock Tribal Nation	$473,022,431	$3,560,365	0.8	$12,233,323	2.6
Unkechaug Tribal Nation	$76,936,042	$1,238,025	1.6	$2,422,980	3.1
Suffolk County	**$702,562,551,430**	**$2,951,911,802**	**0.4**	**$4,852,228,055**	**0.7**

Source: HAZUS-MH v2.1; Suffolk County Planning Department, 2014; Suffolk County Real Property Tax Service, 2014
Note: RCV = Replacement Cost Value; T = Town; V = Village; % = Percent.

Table 5.4.5-15. Estimated General Building Stock Potential Loss to the 1-Percent Annual Chance Flood Event – Residential Occupancy Class

Jurisdiction	Total RCV	Residential			
		1% Annual Chance Event		0.2% Annual Chance Event	
		Estimated Loss (RCV)	% of Total	Estimated Loss (RCV)	% of Total
Amityville (V)	$4,252,136,181	$89,432,314	2.1	$133,480,498	3.1
Asharoken (V)	$372,107,179	$29,703,526	8.0	$58,330,220	15.7
Babylon (T)	$65,453,076,501	$179,302,160	0.3	$279,511,389	0.4
Babylon (V)	$4,543,925,987	$61,255,777	1.3	$101,961,114	2.2
Belle Terre (V)	$669,659,013	$168,386	0.0	$192,663	0.0
Bellport (V)	$1,916,728,157	$2,055,199	0.1	$4,106,204	0.2
Brightwaters (V)	$1,513,218,570	$480,079	0.0	$4,446,810	0.3
Brookhaven (T)	$190,143,257,364	$279,876,208	0.1	$458,088,653	0.2
Dering Harbor (V)	$50,907,547	$278,856	0.5	$342,270	0.7
East Hampton (T)	$14,753,173,216	$108,471,798	0.7	$209,212,713	1.4
East Hampton (V)	$2,592,657,128	$6,660,509	0.3	$18,711,218	0.7
Greenport (V)	$959,195,848	$3,021,173	0.3	$5,114,949	0.5
Head of the Harbor (V)	$1,460,689,661	$235,267	0.0	$379,416	0.0
Huntington (T)	$87,620,284,012	$12,846,951	0.0	$25,033,093	0.0
Huntington Bay (V)	$824,147,761	$2,562,102	0.3	$5,641,217	0.7
Islandia (V)	$3,165,387,995	$0	0.0	$0	0.0
Islip (T)	$116,722,805,765	$408,833,377	0.4	$602,735,034	0.5
Lake Grove (V)	$4,981,641,857	$0	0.0	$0	0.0
Lindenhurst (V)	$7,338,416,625	$74,868,098	1.0	$114,318,799	1.6
Lloyd Harbor (V)	$2,454,429,712	$1,146,409	0.0	$1,808,363	0.1
Mastic Beach (V)	$3,233,984,869	$93,722,432	2.9	$140,677,531	4.3
Nissequogue (V)	$3,556,614,754	$3,051,091	0.1	$6,539,248	0.2
North Haven (V)	$1,038,696,076	$213,484	0.0	$971,786	0.1
Northport (V)	$3,098,715,281	$2,354,348	0.1	$4,483,519	0.1
Ocean Beach (V)	$506,864,928	$89,342,285	17.6	$117,704,088	23.2
Old Field (V)	$999,833,880	$3,156,003	0.3	$5,343,654	0.5

Jurisdiction	Total RCV	Residential			
		1% Annual Chance Event		0.2% Annual Chance Event	
		Estimated Loss (RCV)	% of Total	Estimated Loss (RCV)	% of Total
Patchogue (V)	$5,365,465,598	$4,900,919	0.1	$9,253,697	0.2
Poquott (V)	$613,660,785	$1,165,857	0.2	$1,341,343	0.2
Port Jefferson (V)	$4,974,246,594	$1,433,387	0.0	$4,287,622	0.1
Quogue (V)	$2,538,333,603	$62,770,526	2.5	$123,820,921	4.9
Riverhead (T)	$20,620,083,411	$24,152,422	0.1	$44,159,921	0.2
Sag Harbor (V)	$2,555,414,041	$4,543,706	0.2	$10,548,663	0.4
Sagaponack (V)	$1,538,825,257	$22,111,250	1.4	$38,924,073	2.5
Saltaire (V)	$577,966,672	$138,583,372	24.0	$183,173,057	31.7
Shelter Island (T)	$2,627,033,680	$4,233,621	0.2	$7,438,165	0.3
Shoreham (V)	$444,350,589	$0	0.0	$0	0.0
Smithtown (T)	$72,444,940,121	$3,556,236	0.0	$6,037,301	0.0
Southampton (T)	$38,161,684,004	$342,227,893	0.9	$607,977,413	1.6
Southampton (V)	$5,883,613,602	$88,058,605	1.5	$147,105,561	2.5
Southold (T)	$15,067,456,341	$69,696,866	0.5	$124,109,320	0.8
Village of the Branch (V)	$1,314,993,732	$4,266	0.0	$4,266	0.0
West Hampton Dunes (V)	$309,912,300	$81,317,110	26.2	$112,732,151	36.4
Westhampton Beach (V)	$2,752,056,759	$111,994,379	4.1	$187,628,765	6.8
Shinnecock Tribal Nation	$473,022,431	$1,159,114	0.2	$2,416,702	0.5
Unkechaug Tribal Nation	$76,936,042	$1,154,920	1.5	$1,732,390	2.3
Suffolk County	**$702,562,551,430**	**$2,416,102,281**	**0.3**	**$3,911,825,781**	**0.6**

Source: HAZUS-MH v2.1; Suffolk County Planning Department, 2014; Suffolk County Real Property Tax Service, 2014
Note: RCV = Replacement Cost Value; T = Town; V = Village; % = Percent.

Table 5.4.5-16. Estimated General Building Stock Potential Loss to the 1-Percent Annual Chance Flood Event – Commercial Occupancy Class

Jurisdiction	Total RCV	Commercial			
		1% Annual Chance Event		0.2% Annual Chance Event	
		Estimated Loss (RCV)	% of Total	Estimated Loss (RCV)	% of Total
Amityville (V)	$4,252,136,181	$30,624,774	0.7	$40,133,421	0.9
Asharoken (V)	$372,107,179	$0	0.0	$0	0.0
Babylon (T)	$65,453,076,501	$22,311,551	0.0	$42,473,594	0.1
Babylon (V)	$4,543,925,987	$9,569,182	0.2	$17,844,793	0.4
Belle Terre (V)	$669,659,013	$0	0.0	$0	0.0
Bellport (V)	$1,916,728,157	$3,544	0.0	$119,767	0.0
Brightwaters (V)	$1,513,218,570	$0	0.0	$0	0.0
Brookhaven (T)	$190,143,257,364	$66,333,774	0.0	$111,300,735	0.1
Dering Harbor (V)	$50,907,547	$0	0.0	$0	0.0
East Hampton (T)	$14,753,173,216	$15,904,678	0.1	$41,101,060	0.3
East Hampton (V)	$2,592,657,128	$223,945	0.0	$10,873,461	0.4
Greenport (V)	$959,195,848	$3,899,281	0.4	$6,555,018	0.7
Head of the Harbor (V)	$1,460,689,661	$0	0.0	$0	0.0
Huntington (T)	$87,620,284,012	$17,144,025	0.0	$44,277,117	0.1
Huntington Bay (V)	$824,147,761	$6,621,756	0.8	$11,848,554	1.4
Islandia (V)	$3,165,387,995	$0	0.0	$0	0.0
Islip (T)	$116,722,805,765	$99,923,324	0.1	$159,591,201	0.1
Lake Grove (V)	$4,981,641,857	$0	0.0	$0	0.0
Lindenhurst (V)	$7,338,416,625	$22,777,243	0.3	$36,406,512	0.5
Lloyd Harbor (V)	$2,454,429,712	$13,472,954	0.5	$17,091,443	0.7
Mastic Beach (V)	$3,233,984,869	$2,927,134	0.1	$4,194,116	0.1
Nissequogue (V)	$3,556,614,754	$2,494,870	0.1	$3,874,968	0.1
North Haven (V)	$1,038,696,076	$5,704,751	0.5	$0	0.0
Northport (V)	$3,098,715,281	$0	0.0	$10,329,576	0.3
Ocean Beach (V)	$506,864,928	$28,382,845	5.6	$33,494,257	6.6
Old Field (V)	$999,833,880	$6,687,923	0.7	$8,453,516	0.8

Jurisdiction	Total RCV	Commercial			
		1% Annual Chance Event		0.2% Annual Chance Event	
		Estimated Loss (RCV)	% of Total	Estimated Loss (RCV)	% of Total
Patchogue (V)	$5,365,465,598	$7,262,684	0.1	$13,086,145	0.2
Poquott (V)	$613,660,785	$0	0.0	$0	0.0
Port Jefferson (V)	$4,974,246,594	$1,458,228	0.0	$9,324,295	0.2
Quogue (V)	$2,538,333,603	$0	0.0	$78,451	0.0
Riverhead (T)	$20,620,083,411	$707,205	0.0	$7,454,976	0.0
Sag Harbor (V)	$2,555,414,041	$6,580,942	0.3	$20,449,618	0.8
Sagaponack (V)	$1,538,825,257	$0	0.0	$0	0.0
Saltaire (V)	$577,966,672	$3,482,925	0.6	$5,183,893	0.9
Shelter Island (T)	$2,627,033,680	$2,861,986	0.1	$6,818,083	0.3
Shoreham (V)	$444,350,589	$0	0.0	$0	0.0
Smithtown (T)	$72,444,940,121	$2,177,150	0.0	$8,530,980	0.0
Southampton (T)	$38,161,684,004	$35,552,877	0.1	$52,046,322	0.1
Southampton (V)	$5,883,613,602	$2,198,364	0.0	$3,753,272	0.1
Southold (T)	$15,067,456,341	$18,503,867	0.1	$38,848,312	0.3
Village of the Branch (V)	$1,314,993,732	$0	0.0	$0	0.0
West Hampton Dunes (V)	$309,912,300	$0	0.0	$0	0.0
Westhampton Beach (V)	$2,752,056,759	$1,002,951	0.0	$6,415,092	0.2
Shinnecock Tribal Nation	$473,022,431	$0	0.0	$0	0.0
Unkechaug Tribal Nation	$76,936,042	$83,105	0.1	$690,591	0.9
Suffolk County	**$702,562,551,430**	**$436,879,837**	**0.1**	**$772,643,137**	**0.1**

Source: HAZUS-MH v2.1; Suffolk County Planning Department, 2014; Suffolk County Real Property Tax Service, 2014
Note: RCV = Replacement Cost Value; T = Town; V = Village; % = Percent.

NFIP Statistics

In addition to total building stock modeling, individual data available on flood policies, claims, Repetitive Loss Properties (RLP) and severe RLP (SRLs) were analyzed. FEMA Region 2 provided a list of residential properties with NFIP policies, past claims and multiple claims (RLPs). According to the metadata provided: "The (*sic* National Flood Insurance Program) NFIP Repetitive Loss File contains losses reported from individuals who have flood insurance through the Federal Government. A property is considered a repetitive loss property when there are two or more losses reported which were paid more than $1,000 for each loss. The two losses must be within 10 years of each other & be as least 10 days apart. Only losses from (*sic* since) 1/1/1978 that are closed are considered."

SRLs were then examined for the County. According to section 1361A of the National Flood Insurance Act, as amended (NFIA), 42 U.S.C. 4102a, an SRL property is defined as a residential property that is covered under an NFIP flood insurance policy and:

- Has at least four NFIP claim payments (including building and contents) over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; or
- For which at least two separate claims payments (building payments only) have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building.
- For both of the above, at least two of the referenced claims must have occurred within any 10-year period, and must be greater than 10 days apart.

Table 5.4.5-19 and Figure 5.4.5-15 through Figure 5.4.5-17 summarizes the NFIP policies, claims and repetitive loss statistics for Suffolk County. According to FEMA, Table 5.4.5-17 summarizes the occupancy classes of the repetitive loss and severe repetitive loss properties in the County. The majority of the repetitive loss occupancy class is single family residences (93%). The majority of severe repetitive loss occupancy class is also single family residences (87%) (FEMA, 2014). This information is current as of January 31, 2014.

The location of the properties with policies, claims and repetitive and severe repetitive flooding were geocoded by FEMA with the understanding that there are varying tolerances between how closely the longitude and latitude coordinates correspond to the location of the property address, or that the indication of some locations are more accurate than others.

Table 5.4.5-17. Occupancy Class of Repetitive Loss Structures in Suffolk County

Occupancy Class	Total Number of Repetitive Loss Properties	Total Number of Severe Repetitive Loss Properties	Total (RL + SRL)
Single Family	2,232	396	2,628
Condo	38	25	63
2-4 Family	58	16	74
Other Residential	18	2	20
Non Residential	47	15	63
Suffolk County	**2,393**	**454**	**2,848**

Source: FEMA 2014
Note: RL = Repetitive Loss Property; SRL = Severe Repetitive Loss Property

Table 5.4.5-18. Occupancy Class of Repetitive Loss Structures in Suffolk County, by Jurisdiction

Jurisdiction	Repetitive Loss Properties					Severe Repetitive Loss Properties				
	2-4 Family	Assumed Condo	Non Residential	Other Residential	Single Family	2-4 Family	Assumed Condo	Non Residential	Other Residential	Single Family
Village of Amityville	2	2	4	0	179	1	0	0	0	39
Village of Asharoken	0	5	0	0	15	0	0	0	0	1
Village of Babylon	2	1	2	0	153	2	0	4	0	35
Town of Babylon	22	1	0	5	351	5	0	1	0	83
Village of Bellport	0	0	0	0	4	0	0	0	0	0
Village of Brightwaters	0	0	0	0	5	0	0	0	0	0
Town of Brookhaven	6	2	2	1	267	3	2	3	0	39
Town of East Hampton	0	0	1	0	37	0	0	0	0	2
Village of East Hampton	0	2	0	0	3	0	0	0	0	0
Village of Greenport	0	0	0	0	3	0	0	2	0	0
Village of Huntington Bay	0	0	3	0	5	0	0	0	0	0
Town of Huntington	0	0	1	0	24	0	0	0	0	2
Town of Islip	5	5	6	3	340	2	5	0	2	48
Village of Lake Grove	14	0	1	0	245	2	1	0	0	71
Village of Lindenhurst	0	0	0	0	1	0	0	0	0	0
Village of Nissequogue	0	0	0	0	2	0	0	0	0	0
Village of North Haven	0	0	0	0	1	0	0	0	0	0
Village of Northport	0	0	0	0	2	0	0	0	0	1
Village of Ocean Beach	0	0	10	1	94	1	0	3	0	19
Village of Old Field	0	0	0	0	2	0	0	0	0	0
Village of Patchogue	2	0	0	4	33	0	0	1	0	3
Village of Poquott	0	0	0	0	1	0	0	0	0	0
Village of Port Jefferson	0	0	1	1		0	0	1	0	0
Village of Quogue	0	0	0	0	29	0	2	0	0	1
Town of Riverhead	0	2	3	0	34	0	2	0	0	2
Village of Sag Harbor	0	1	0	0	7	0	2	0	0	2
Village of Saltaire	0	0	1	0	9	0	0	0	0	0

Jurisdiction	Repetitive Loss Properties					Severe Repetitive Loss Properties				
	2-4 Family	Assumed Condo	Non Residential	Other Residential	Single Family	2-4 Family	Assumed Condo	Non Residential	Other Residential	Single Family
Town of Shelter Island	0	0	2	0	5	0	0	0	0	0
Town of Smithtown	0	0	0	0	3	0	0	0	0	0
Town of Southampton	1	8	2	1	224	0	2	0	0	19
Village of Southampton	0	0	3	1	11	0	0	0	0	0
Town of Southold	0	3	2	0	46	0	0	1	0	6
Village of West Hampton Dunes	2	0	0	0	56	0	7	0	0	14
Village of Westhampton Beach	2	6	3	1	41	0	2	0	0	9
Suffolk County	**58**	**38**	**47**	**18**	**2232**	**16**	**25**	**16**	**2**	**396**

Source: FEMA, 2014
Note (1): Policies, claims, repetitive loss and severe repetitive loss statistics provided by FEMA Region 2, and are current as of January 31, 2014.
Note (2): The statistics were summarized using the Community Name provided by FEMA Region 2.
Note (3): The Shinnecock and Unkechaug Tribal Nations do not participate in the NFIP.

Table 5.4.5-19. NFIP Policies, Claims and Repetitive Loss Statistics

Jurisdiction	# Policies (1)	# Claims (Losses) (1)	Total Loss Payments (2)	# Rep. Loss Prop. (1)	Severe Rep. Loss Prop. (1)	# Policies in the 1% Flood Boundary (3)	# Policies in the 0.2% Flood Boundary (3)	# Policies Outside the Combined 1% and 0.2% Flood Boundaries Hazard Areas (3)
Village of Amityville	1,096	1,532	$83,461,980	227	40	757	20	319
Village of Asharoken	172	247	$6,325,415	21	1	154	0	18
Village of Babylon	1,243	1,757	$90,906,465	199	41	743	55	445
Town of Babylon	3,234	4,282	$167,646,793	468	89	1,973	332	929
Village of Belle Terre	11	6	$65,991	0	0	0	0	11
Village of Bellport	148	47	$891,539	4	0	19	3	126
Village of Brightwaters	189	118	$3,416,895	5	0	23	10	156
Town of Brookhaven	6,370	4,492	$114,549,216	325	47	2,681	211	3,478
Village of Dering Harbor	12	2	$0	0	0	0	0	12
Town of East Hampton	3,009	761	$6,979,997	40	2	433	119	2,457
Village of East Hampton	431	65	$1,237,298	5	0	65	42	324
Village of Greenport	215	147	$2,421,362	5	2	63	20	132
Village of Head of the Harbor	12	3	$17,188	0	0	2	0	10
Village of Huntington Bay	70	80	$1,756,888	8	0	21	2	47
Town of Huntington	875	521	$6,451,178	27	2	80	7	788
Village of Islandia	4	0	$0	0	0	0	0	4
Town of Islip	6,677	5,304	$201,009,662	416	57	2,164	155	4,358
Village of Lake Grove	16	0	$0	0	0	0	0	16
Village of Lindenhurst	1,465	2,730	$90,459,135	334	74	1,058	53	354
Village of Lloyd Harbor	70	27	$335,310	1	0	2	0	68
Village of Nissequogue	44	40	$680,187	2	0	27	0	17
Village of North Haven	175	52	$425,216	1	0	33	38	104
Village of Northport	114	92	$1,268,993	3	1	19	5	90
Village of Ocean Beach	570	962	$46,714,500	128	23	552	0	18
Village of Old Field	37	19	$154,581	2	0	5	0	32
Village of Patchogue	438	368	$12,576,675	43	4	206	30	202
Village of Poquott	16	2	$61,322	1	0	0	0	16

Jurisdiction	# Policies (1)	# Claims (Losses) (1)	Total Loss Payments (2)	# Rep. Loss Prop. (1)	Severe Rep. Loss Prop. (1)	# Policies in the 1% Flood Boundary (3)	# Policies in the 0.2% Flood Boundary (3)	# Policies Outside the Combined 1% and 0.2% Flood Boundaries Hazard Areas (3)
Village of Port Jefferson	68	62	$977,308	3	1	14	2	52
Village of Quogue	556	354	$8,212,037	32	3	65	10	481
Town of Riverhead	744	751	$12,371,429	43	4	129	66	549
Village of Sag Harbor	381	149	$1,908,532	12	4	108	102	171
Village of Sagaponack	156	15	$1,085,559	0	0	0	0	156
Village of Saltaire	355	380	$14,885,923	10	0	293	0	62
Town of Shelter Island	283	104	$1,823,966	7	0	21	27	235
Village of Shoreham	No record	5	$1,033	0	0	0	0	0
Town of Smithtown	337	288	$1,135,162	3	0	4	1	332
Town of Southampton	4,890	3,171	$76,508,723	257	21	1,442	483	2,965
Village of Southampton	682	225	$3,499,714	15	0	194	17	471
Town of Southold	1,860	1,079	$16,291,431	58	7	514	316	1,030
Village of The Branch	6	4	$7,881	0	0	0	0	6
Village of West Hampton Dunes	179	56	$881,171	79	21	170	0	9
Village of Westhampton Beach	955	1,296	$33,348,427	64	11	665	65	225
Suffolk County	**38,165**	**31,595**	**$1,012,752,084**	**2,848**	**455**	**14,699**	**2,191**	**14,699**

Source: FEMA, 2014

Note (1) Policies, claims, repetitive loss and severe repetitive loss statistics provided by FEMA and are current as of January 31, 2014 and are summarized by Community Name. Please note the total number of repetitive loss properties excludes the severe repetitive loss properties. The number of claims represents claims closed by 1/31/2014.

Note (2) Total building and content losses from the claims file provided by FEMA Region 2.

Note (3) The policies inside and outside of the flood zones is based on the latitude and longitude provided by FEMA Region 2 in the policy file.

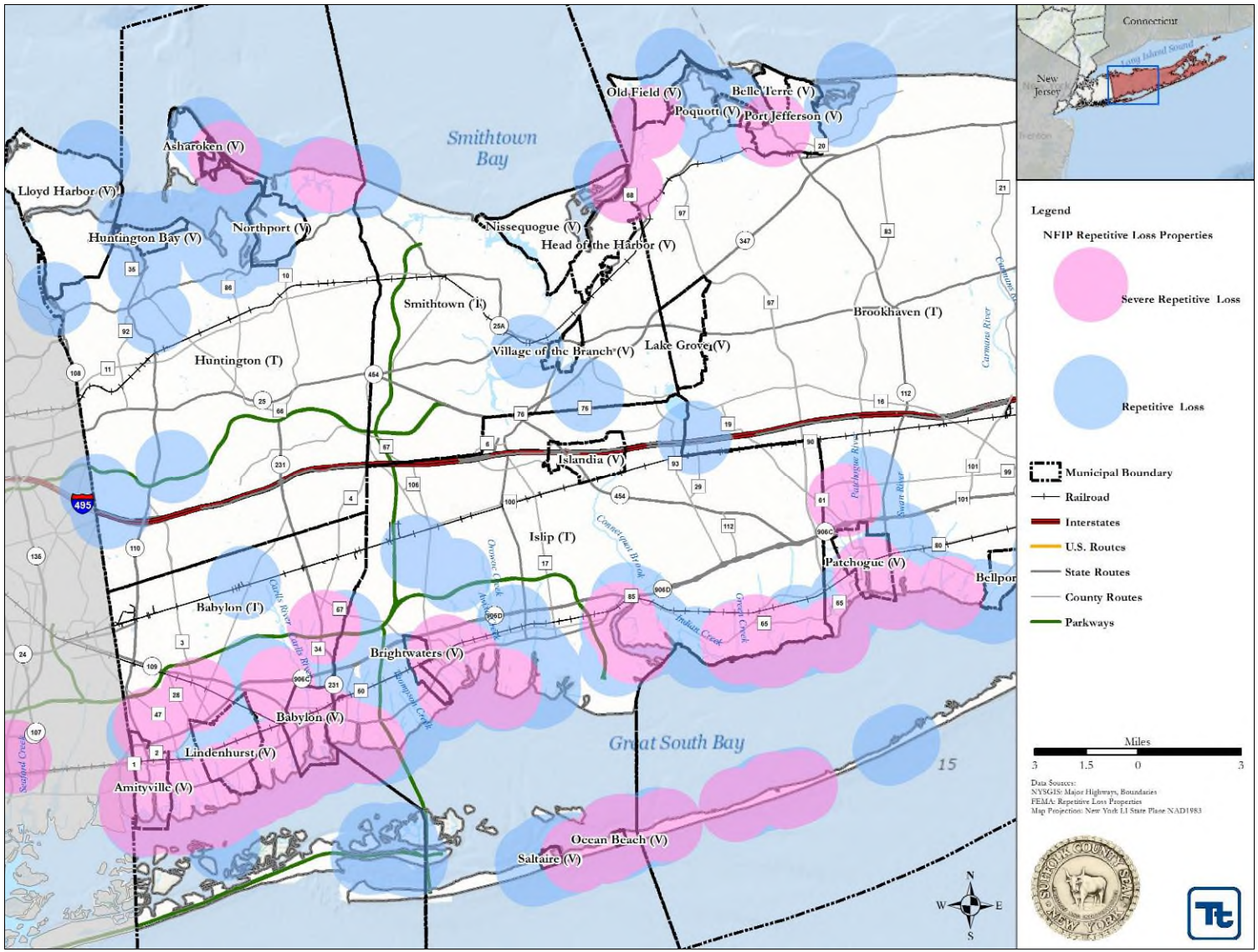
Note (4) FEMA noted that where there is more than one entry for a property, there may be more than one policy in force or more than one GIS possibility.

Note (5) A zero percentage denotes less than 1/100th percentage and not zero damages or vulnerability as may be the case.

Note (6) The Shinnecock and Unkechaug Tribal Nations do not participate in the NFIP.

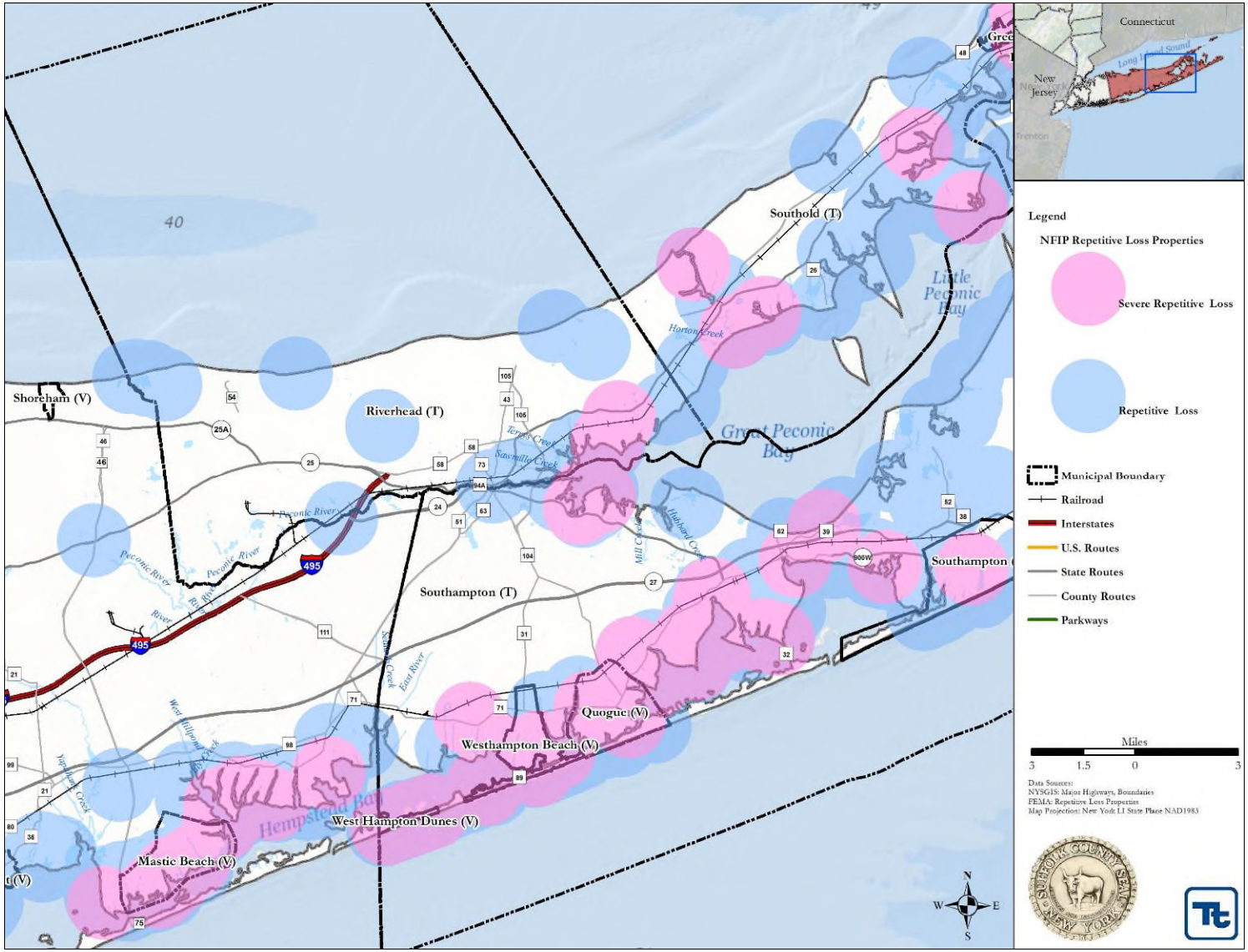
Note (7) While the Village of Mastic Beach participates in the NFIP, there are no NFIP statistics available for this community.

Figure 5.4.5-15. NFIP Repetitive Loss Areas - West



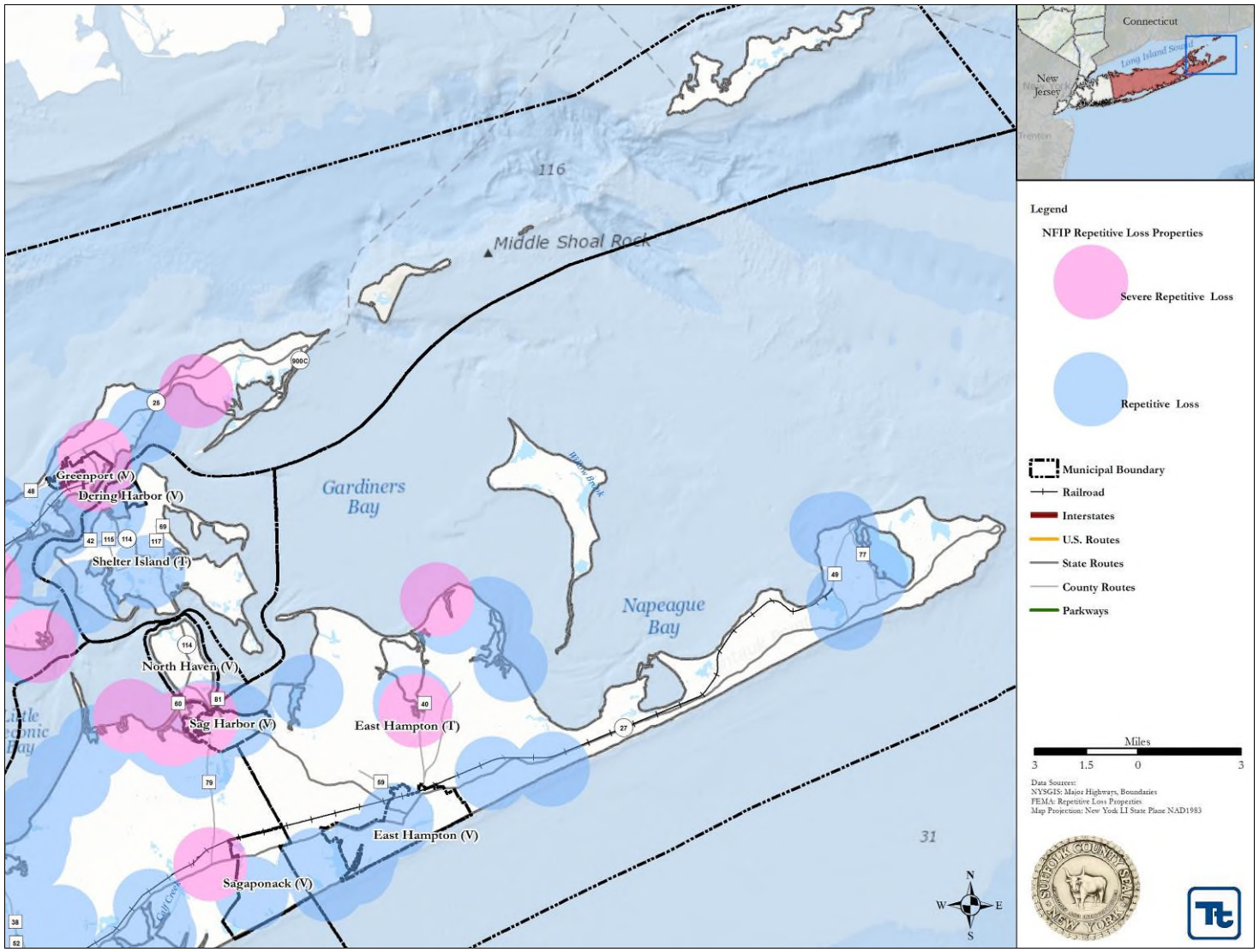
Source: FEMA Region 2, 2014

Figure 5.4.5-16. NFIP Repetitive Loss Areas - Central



Source: FEMA Region 2, 2014

Figure 5.4.5-17. NFIP Repetitive Loss Areas - East



Source: FEMA Region 2, 2014

Sea Level Rise

To estimate general building stock replacement cost value vulnerable to potential sea level rise, the updated building inventory was used. The buildings with their centroid in the estimated hazard areas were determined in GIS.

Table 5.4.5-20. Estimated Number of Buildings and Building Replacement Cost Value Exposed to Projected Sea Level Rise

Jurisdiction	Number of Buildings	Total RCV (Structure and Contents)	All Occupancies							
			Number of Buildings SFHA +0.3 feet	% of Total	RCV in SFHA + 0.3 feet	% of Total	Number of Buildings SFHA +2 feet	% of Total	RCV in SFHA + 2 feet	% of Total
Amityville (V)	4,112	$4,252,136,181	1,337	32.5	$795,727,714	18.7	1,536	37.4	$940,364,176	22.1
Asharoken (V)	439	$372,107,179	303	69.0	$240,132,649	64.5	310	70.6	$249,346,499	67.0
Babylon (T)	56,432	$65,453,076,501	4,189	7.4	$2,190,717,417	3.3	5,050	8.9	$3,032,645,980	4.6
Babylon (V)	5,287	$4,543,925,987	1,580	29.9	$1,165,704,030	25.7	1,964	37.1	$1,535,871,521	33.8
Belle Terre (V)	401	$669,659,013	4	1.0	$1,750,447	0.3	4	1.0	$1,750,447	0.3
Bellport (V)	1,684	$1,916,728,157	63	3.7	$63,305,778	3.3	91	5.4	$116,754,461	6.1
Brightwaters (V)	1,676	$1,513,218,570	68	4.1	$53,019,623	3.5	176	10.5	$160,575,460	10.6
Brookhaven (T)	165,626	$190,143,257,364	4,503	2.7	$3,875,023,951	2.0	5,765	3.5	$5,022,036,714	2.6
Dering Harbor (V)	71	$50,907,547	2	2.8	$602,970	1.2	3	4.2	$2,022,403	4.0
East Hampton (T)	22,561	$14,753,173,216	2,141	9.5	$1,572,306,995	10.7	2,651	11.8	$1,930,035,240	13.1
East Hampton (V)	2,994	$2,592,657,128	196	6.5	$170,072,000	6.6	277	9.3	$233,868,884	9.0
Greenport (V)	1,363	$959,195,848	126	9.2	$139,991,088	14.6	298	21.9	$328,116,085	34.2
Head of the Harbor (V)	836	$1,460,689,661	4	0.5	$2,861,570	0.2	4	0.5	$2,861,570	0.2
Huntington (T)	76,595	$87,620,284,012	291	0.4	$413,170,540	0.5	409	0.5	$968,261,280	1.1
Huntington Bay (V)	739	$824,147,761	77	10.4	$84,899,294	10.3	97	13.1	$112,720,150	13.7
Islandia (V)	1,195	$3,165,387,995	0	0.0	$0	0.0	0	0.0	$0	0.0
Islip (T)	102,388	$116,722,805,765	4,745	4.6	$4,424,222,195	3.8	6,672	6.5	$6,502,069,933	5.6
Lake Grove (V)	4,015	$4,981,641,857	0	0.0	$0	0.0	0	0.0	$0	0.0
Lindenhurst (V)	10,823	$7,338,416,625	1,615	14.9	$965,215,215	13.2	1,940	17.9	$1,208,812,690	16.5
Lloyd Harbor (V)	1,807	$2,454,429,712	47	2.6	$71,653,316	2.9	55	3.0	$83,697,475	3.4
Mastic Beach (V)	7,305	$3,233,984,869	1,740	23.8	$714,121,706	22.1	2,372	32.5	$986,571,457	30.5
Nissequogue (V)	854	$3,556,614,754	71	8.3	$102,274,570	2.9	73	8.5	$103,153,401	2.9
North Haven (V)	742	$1,038,696,076	23	3.1	$28,182,600	2.7	54	7.3	$62,624,100	6.0
Northport (V)	3,475	$3,098,715,281	49	1.4	$70,966,392	2.3	60	1.7	$115,676,395	3.7
Ocean Beach (V)	573	$506,864,928	571	99.7	$505,528,540	99.7	571	99.7	$505,528,540	99.7

Jurisdiction	Number of Buildings	Total RCV (Structure and Contents)	All Occupancies							
			Number of Buildings SFHA +0.3 feet	% of Total	RCV in SFHA + 0.3 feet	% of Total	Number of Buildings SFHA +2 feet	% of Total	RCV in SFHA + 2 feet	% of Total
Old Field (V)	529	$999,833,880	43	8.1	$61,675,961	6.2	57	10.8	$110,521,717	11.1
Patchogue (V)	4,277	$5,365,465,598	178	4.2	$249,295,983	4.6	351	8.2	$481,416,993	9.0
Poquott (V)	480	$613,660,785	12	2.5	$5,827,317	0.9	16	3.3	$10,202,646	1.7
Port Jefferson (V)	2,931	$4,974,246,594	77	2.6	$186,785,001	3.8	91	3.1	$223,724,848	4.5
Quogue (V)	1,675	$2,538,333,603	449	26.8	$707,325,372	27.9	590	35.2	$936,758,812	36.9
Riverhead (T)	21,343	$20,620,083,411	626	2.9	$380,447,500	1.8	916	4.3	$596,435,612	2.9
Sag Harbor (V)	3,011	$2,555,414,041	198	6.6	$253,269,182	9.9	339	11.3	$405,731,752	15.9
Sagaponack (V)	759	$1,538,825,257	100	13.2	$190,802,184	12.4	137	18.1	$302,494,284	19.7
Saltaire (V)	443	$577,966,672	443	100.0	$577,966,672	100.0	443	100.0	$577,966,672	100.0
Shelter Island (T)	4,061	$2,627,033,680	150	3.7	$140,546,057	5.3	252	6.2	$205,587,995	7.8
Shoreham (V)	304	$444,350,589	0	0.0	$0	0.0	0	0.0	$0	0.0
Smithtown (T)	42,097	$72,444,940,121	44	0.1	$64,636,062	0.1	62	0.1	$81,642,511	0.1
Southampton (T)	32,382	$38,161,684,004	3,059	9.4	$3,254,526,177	8.5	4,133	12.8	$4,393,662,730	11.5
Southampton (V)	3,578	$5,883,613,602	287	8.0	$690,092,310	11.7	352	9.8	$828,382,625	14.1
Southold (T)	21,584	$15,067,456,341	1,810	8.4	$1,132,452,252	7.5	2,789	12.9	$1,874,449,599	12.4
Village of the Branch (V)	675	$1,314,993,732	2	0.3	$388,707	0.0	2	0.3	$388,707	0.0
West Hampton Dunes (V)	285	$309,912,300	285	100.0	$309,912,300	100.0	285	100.0	$309,912,300	100.0
Westhampton Beach (V)	2,265	$2,752,056,759	1,012	44.7	$1,174,508,466	42.7	1,148	50.7	$1,359,078,790	49.4
Shinnecock Tribal Nation	618	$473,022,431	89	14.4	$65,004,008	13.7	157	25.4	$115,352,784	24.4
Unkechaug Tribal Nation	146	$76,936,042	28	19.2	$12,470,331	16.2	39	26.7	$18,437,755	24.0
Suffolk County	**617,436**	**$702,562,551,430**	**32,637**	**5.3**	**$27,109,382,442**	**3.9**	**42,591**	**6.9**	**$37,037,513,993**	**5.3**

Source: NOAA 2013; Suffolk County Planning Department, 2014; Suffolk County Real Property Tax Service, 2014
Note: RCV = Replacement Cost Value; T = Town; V = Village; % = Percent

Impact on Critical Facilities

HAZUS-MH was used to estimate the flood loss potential to critical facilities exposed to the flood risk. Using depth/damage function curves, HAZUS estimates the percent of damage to the building and contents of critical facilities. Table 5.4.5-21 through Table 5.4.5-22 summarizes the number of critical facilities located in the FEMA flood zones by type and by jurisdiction. Table 5.4.5-23 lists the critical facilities and utilities located in the FEMA flood zones and the percent damage HAZUS-MH 2.1 estimates to the facility as a result of the 1- and 0.2-percent annual chance events.

In cases where short-term functionality is impacted by a hazard, other facilities of neighboring municipalities may need to increase support response functions during a disaster event. Mitigation planning should consider means to reduce impact to critical facilities and ensure sufficient emergency and school services remain when a significant event occurs. Actions addressing shared services agreements are included in Section 9 (Mitigation Strategies) of this plan.

Table 5.4.5-21. Number of Critical Facilities Located in the 1-Percent Annual Chance Flood Boundaries

Jurisdiction	Facility Types																			
	Airport	Communication	DPW/DOT	Electric Power	EOC	Ferry	Fire	Bridge	Military	Municipal	Non-Profit	Park/Rec	Police	Ports	Potable	Rail	Suffolk County	School	Senior	Wastewater
Amityville (V)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Asharoken (V)	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0
Babylon (T)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Brookhaven (T)	0	2	0	1	0	0	4	0	1	0	0	0	0	0	10	0	0	0	0	0
East Hampton (T)	1	0	0	2	0	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0
Greenport (V)	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	0	0	0
Islip (T)	0	0	0	3	0	1	2	0	0	0	0	0	0	0	11	0	0	1	1	4
Nissequogue (V)	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
North Haven (V)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Northport (V)	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	1
Ocean Beach (V)	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	1
Patchogue (V)	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Port Jefferson (V)	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Quogue (V)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0
Riverhead (T)	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	3	0	0	1
Sag Harbor (V)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Saltaire (V)	1	0	0	0	1	0	1	0	0	0	0	0	1	0	2	0	0	0	0	0
Shelter Island (T)	0	0	0	0	0	11	0	0	0	0	0	0	0	1	0	0	6	0	0	0
Smithtown (T)	0	0	0	0	0	0	0	3	0	0	0	1	0	0	0	0	0	0	0	1
Southampton (T)	0	3	0	0	0	0	0	0	1	0	1	0	0	0	4	0	3	0	0	0
Southold (T)	2	0	1	0	0	0	1	0	0	0	0	0	0	1	1	0	0	0	0	1
West Hampton Dunes (V)	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0

Jurisdiction	Facility Types																			
	Airport	Communication	DPW/DOT	Electric Power	EOC	Ferry	Fire	Bridge	Military	Municipal	Non-Profit	Park/Rec	Police	Ports	Potable	Rail	Suffolk County	School	Senior	Wastewater
Westhampton Beach (V)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0
Suffolk County	**4**	**6**	**1**	**6**	**1**	**16**	**9**	**3**	**2**	**1**	**1**	**4**	**4**	**5**	**30**	**1**	**19**	**2**	**1**	**15**

Source: FEMA, 2009; Planning Committee

Table 5.4.5-22. Number of Critical Facilities Located in the 0.2-Percent Annual Chance Flood Boundaries

Jurisdiction	Facility Types														
	Communication	DPW/DOT	Electric Power	EOC	Ferry	Fire	Municipal	Non-Profit	Other	Park/Rec	Police	Suffolk County	School	Senior	Wastewater
East Hampton (T)	0	1	0	0	1	0	0	0	0	0	0	0	1	1	0
East Hampton (V)	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0
Greenport (V)	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Huntington (T)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Islip (T)	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2
Northport (V)	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Riverhead (T)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Sag Harbor (V)	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0
Shelter Island (T)	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0
Southampton (T)	1	2	0	0	0	0	0	1	1	0	1	2	0	0	0
Southold (T)	0	0	3	0	0	0	0	0	0	0	0	1	0	0	0
Suffolk County	**1**	**5**	**3**	**1**	**1**	**1**	**1**	**2**	**1**	**1**	**2**	**5**	**1**	**1**	**5**

Source: FEMA, 2009; Planning Committee

Table 5.4.5-23. Critical Facilities Located in the 1-Percent and 0.2-Percent Annual Chance Flood Boundaries and Estimated Potential Damage

			Exposure		Potential Loss from 1% Flood Event			Potential Loss from 0.2% Flood Event		
Name	Jurisdiction	Type	1% Event	0.2% Event	% Structure Damage	% Content Damage	Days to 100-Percent(2)	% Structure Damage	% Content Damage	Days to 100-Percent(2)
Pump Station #9	Amityville (V)	Wastewater	A	X						
Asharoken Village Hall	Asharoken (V)	Municipal	A	X						
Village of Asharoken Police Station	Asharoken (V)	Police	A	X	11.5	46.9	480	16.7	79.3	630
Pump Station #10	Babylon (T)	Wastewater	A	X						
WALK 1370	Brookhaven (T)	Communication	A	X						
WALK 1370	Brookhaven (T)	Communication	A	X						
Shoreham-8z	Brookhaven (T)	Electric Power Substation	A	X						
Point O Woods Fire Department	Brookhaven (T)	Fire	A	X	18.0	83.5	630	24.7	98.8	720
Cherry Grove Fire Department	Brookhaven (T)	Fire	A	X	12.9	59.3	630	17.4	82.0	630
Davis Park Fire Department	Brookhaven (T)	Fire	A	X	11.9	52.5	480	16.8	80.0	630
Fire Island Pines Fire Department	Brookhaven (T)	Fire	A	X	16.0	75.4	630	21.5	93.6	630
Moriches Coast Guard Station	Brookhaven (T)	Military	A	X						
Potable Water Facility	Brookhaven (T)	Potable Water	V	X						
Potable Water Facility	Brookhaven (T)	Potable Water	A	X						
Potable Water Facility	Brookhaven (T)	Potable Water	A	X						
Potable Water Facility	Brookhaven (T)	Potable Water	A	X						
Potable Water Facility	Brookhaven (T)	Potable Water	A	X						
Potable Water Facility	Brookhaven (T)	Potable Water	A	X						
Potable Water Facility	Brookhaven (T)	Potable Water	A	X						
Potable Water Facility	Brookhaven (T)	Potable Water	A	X						
Potable Water Facility	Brookhaven (T)	Potable Water	A	X						
Potable Water Facility	Brookhaven (T)	Potable Water	A	X						
Montauk	East Hampton (T)	Airport	A	X						
NYS DOT East Hampton	East Hampton (T)	DPW/DOT		X				0.0	0.0	
Marketspan Combustion Turbine Generator	East Hampton (T)	Electric Power Facility	A	X						

Name	Jurisdiction	Type	Exposure		Potential Loss from 1% Flood Event			Potential Loss from 0.2% Flood Event		
			1% Event	0.2% Event	% Structure Damage	% Content Damage	Days to 100-Percent[2]	% Structure Damage	% Content Damage	Days to 100-Percent[2]
Montauk-9u	East Hampton (T)	Electric Power Substation	A	X						
East Hampton Commercial Dock	East Hampton (T)	Ferry	V	X						
East Hampton Commercial Dock	East Hampton (T)	Ferry		X						
Montauk	East Hampton (T)	Rail	A	X						
East Hampton Harbor Master/Marine	East Hampton (T)	SC Gov't Facility	V	X						
Wainscott School	East Hampton (T)	School		X				6.2	33.6	480
East Hampton Town EOC	East Hampton (V)	EOC		X						
East Hampton Police Dept	East Hampton (V)	Police		X						
NYS DOT Greenport	Greenport (V)	DPW/DOT		X						
Plum Ferry Terminal	Greenport (V)	Ferry	V	X						
Long Island Seafood Export, Greenport Do	Greenport (V)	Port	A	X						
Robert T. Cooper, Seafood Dock.	Greenport (V)	Port	V	X						
Halesite Basic Life Support	Huntington (T)	Fire						3.2	3.6	480
Halesite Fire Department	Huntington (T)	Fire						3.2	3.6	480
Huntington Town Stp	Huntington (T)	Wastewater		X						
NYS DOT Captree State Park	Islip (T)	DPW/DOT		X				10.5	29.1	
Captree Island-7u	Islip (T)	Electric Power Substation	A	X						
Fair Harbor-7am	Islip (T)	Electric Power Substation	A	X						
Ocean Beach-7lm	Islip (T)	Electric Power Substation	A	X						
Saltaire Ferry Terminal	Islip (T)	Ferry	V	X						
Fair Harbor Fire Department	Islip (T)	Fire	A	X	12.6	57.8	630	16.6	78.7	630
Kismet Fire Department	Islip (T)	Fire	A	X	15.8	74.4	630	20.9	91.7	630
Harbor Police Departments	Islip (T)	Police						6.5	7.5	480
Potable Water Facility	Islip (T)	Potable Water	A	X						
Potable Water Facility	Islip (T)	Potable Water	A	X						
Potable Water Facility	Islip (T)	Potable Water	A	X						

Name	Jurisdiction	Type	Exposure		Potential Loss from 1% Flood Event			Potential Loss from 0.2% Flood Event		
			1% Event	0.2% Event	% Structure Damage	% Content Damage	Days to 100-Percent[2]	% Structure Damage	% Content Damage	Days to 100-Percent[2]
Potable Water Facility	Islip (T)	Potable Water	A	X						
Potable Water Facility	Islip (T)	Potable Water	A	X						
Potable Water Facility	Islip (T)	Potable Water	A	X						
Potable Water Facility	Islip (T)	Potable Water	A	X						
Potable Water Facility	Islip (T)	Potable Water	A	X						
Potable Water Facility	Islip (T)	Potable Water	A	X						
Potable Water Facility	Islip (T)	Potable Water	A	X						
Potable Water Facility	Islip (T)	Potable Water	V	X						
Woodhull School	Islip (T)	School	A	X	0.7	3.8	480	7.0	37.8	480
Our Lady Of Consolation Geriatric	Islip (T)	Senior Facility	A	X				7.0	38.3	
Pump Station # Unknown	Islip (T)	Wastewater	A	X						
Pump Station #4	Islip (T)	Wastewater	A	X						
Pump Station #5	Islip (T)	Wastewater	A	X						
Pump Station #6	Islip (T)	Wastewater	A	X						
Pump Station #2	Islip (T)	Wastewater		X						
Pump Station #7	Islip (T)	Wastewater		X						
Long Beach Marine Response Facility	Nissequogue (V)	Communication	A	X						
North Haven Village Hall	North Haven (V)	School	A	X	9.0	64.1	630	10.4	68.8	630
Northport Village Park & Dock	Northport (V)	Municipal		X						
Cow Harbor Park	Northport (V)	Park/Rec	A	X						
Scudder Park	Northport (V)	Park/Rec	A	X				16.6	77.9	
Northport Village Stp	Northport (V)	Wastewater	A	X						
Ocean Beach Fire Department	Ocean Beach (V)	Fire	A	X	16.0	75.6	630	21.0	92.1	630
Ocean Beach Police Dept	Ocean Beach (V)	Police	A	X	15.1	70.6	630	19.5	87.8	630
Ocean Beach Stp	Ocean Beach (V)	Wastewater	A	X						
Davis Park Ferry	Patchogue (V)	Ferry	V	X						
Fire Island National Seashore	Patchogue (V)	Ferry	A	X						

Name	Jurisdiction	Type	Exposure		Potential Loss from 1% Flood Event			Potential Loss from 0.2% Flood Event		
			1% Event	0.2% Event	% Structure Damage	% Content Damage	Days to 100-Percent[2]	% Structure Damage	% Content Damage	Days to 100-Percent[2]
Watergate Apts	Patchogue (V)	Wastewater	A	X						
Patchogue Village Stp	Patchogue (V)	Wastewater	A	X						
Port Jefferson Fire Department	Port Jefferson (V)	Fire						9.3	17.1	480
Miller Marine Services, Port Jefferson M	Port Jefferson (V)	Port	V	X						
Quogue (post Lane) Bridge Machine Tower	Quogue (V)	SC Gov't Facility	A	X				14.0	84.1	
Quogue (post Lane) Bridge Operator	Quogue (V)	SC Gov't Facility	A	X				7.1	50.4	
POD	Riverhead (T)	POD	A	X						
Larry's Lighthouse Marina	Riverhead (T)	SC Gov't Facility	A	X						
Great Peconic Bay Yacht Basin	Riverhead (T)	SC Gov't Facility	A	X						
East Creek Marina	Riverhead (T)	SC Gov't Facility	A	X				0.7	4.2	
Pump Station #14	Riverhead (T)	Wastewater	A	X						
Pump Station #15	Riverhead (T)	Wastewater		X						
Pump Station #13	Riverhead (T)	Wastewater		X						
Sag Harbor Vol Ambulance Service/ FD	Sag Harbor (V)	Fire		X						
Sag Harbor Village Hwy Dept	Sag Harbor (V)	SC Gov't Facility		X						
Sag Harbor Village	Sag Harbor (V)	Wastewater	A	X						
Sag Harbor Village	Sag Harbor (V)	Wastewater	A	X						
Saltaire Ball Field	Saltaire (V)	Airport	A	X						
Saltaire Village Hall	Saltaire (V)	EOC	A	X	12.7	58.5	630	16.3	77.4	630
Saltaire Fire Department	Saltaire (V)	Fire	A	X	11.7	49.0	480	14.2	65.9	630
Saltaire Village Police Dept	Saltaire (V)	Police	A	X	9.7	18.9	480	11.3	42.6	480
Saltaire Well #2	Saltaire (V)	Potable Water	A	X						
Saltaire Well #1	Saltaire (V)	Potable Water	A	X						
West Neck Anchorage	Shelter Island (T)	Ferry	A	X						
North Ferry Co., Shelter Island Ferry	Shelter Island (T)	Ferry	V	X						
South Ferry Terminal	Shelter Island (T)	Ferry	V	X						

Name	Jurisdiction	Type	Exposure		Potential Loss from 1% Flood Event			Potential Loss from 0.2% Flood Event		
			1% Event	0.2% Event	% Structure Damage	% Content Damage	Days to 100-Percent[2]	% Structure Damage	% Content Damage	Days to 100-Percent[2]
Dering Harbor Town Dock	Shelter Island (T)	Ferry	V	X						
Coecles Harbor Anchorage	Shelter Island (T)	Ferry	A	X						
Dering Harbor Town Dock	Shelter Island (T)	Ferry	V	X						
Coecles Harbor Anchorage	Shelter Island (T)	Ferry	A	X						
Congon's Creek Town Dock	Shelter Island (T)	Ferry	A	X						
West Neck Anchorage	Shelter Island (T)	Ferry	A	X						
North Ferry Terminal	Shelter Island (T)	Ferry	V	X						
Congon's Creek Town Dock	Shelter Island (T)	Ferry	A	X						
POD	Shelter Island (T)	POD		X						
POD	Shelter Island (T)	POD		X						
J.W. Piccozzi, Dering Harbor Heating Oil	Shelter Island (T)	Port	V	X						
Jack's Marina	Shelter Island (T)	SC Gov't Facility	V	X						
Piccozzi's Dering Harbor Marina	Shelter Island (T)	SC Gov't Facility	V	X						
Shelter Island Yacht Club	Shelter Island (T)	SC Gov't Facility	V	X				13.5	78.2	
Clark's Marine	Shelter Island (T)	SC Gov't Facility	A	X				8.4	60.3	
Coecles Harbor Marina	Shelter Island (T)	SC Gov't Facility	V	X						
Island Boat Yard	Shelter Island (T)	SC Gov't Facility	A	X				0.1	0.3	
Shelter Island Heights Highway Dep	Shelter Island (T)	SC Gov't Facility		X						
Oyster Project	Shinnecock Tribal Nation	Tribal	A	X				11.8	51.0	
Tribal office	Shinnecock Tribal Nation	Tribal		X						
POD	Smithtown (T)	POD	A	X						
Sewer Dist 06 Kings Park	Smithtown (T)	Wastewater	A	X						
Telecommunication Tower	Southampton (T)	Communication	A	X						
Telecommunication Tower	Southampton (T)	Communication	A	X						
Telecommunication Tower	Southampton (T)	Communication	A	X						
WRIV 1390	Southampton (T)	Communication		X						

Name	Jurisdiction	Type	Exposure		Potential Loss from 1% Flood Event			Potential Loss from 0.2% Flood Event		
			1% Event	0.2% Event	% Structure Damage	% Content Damage	Days to 100-Percent[2]	% Structure Damage	% Content Damage	Days to 100-Percent[2]
DPW Highway Maintenance	Southampton (T)	DPW/DOT		X						
North Sea HWY Barn	Southampton (T)	DPW/DOT		X						
Shinnecock Coast Guard Station	Southampton (T)	Military	A	X						
Suffolk Cnty Sheriff-Internal	Southampton (T)	Police		X				0.8	0.9	480
SCWA Wells	Southampton (T)	Potable Water	A	X						
SCWA Wells	Southampton (T)	Potable Water	A	X						
SCWA Wells	Southampton (T)	Potable Water	A	X						
SCWA Wells	Southampton (T)	Potable Water	A	X						
US Coast Guard Station - Shinnecock	Southampton (T)	SC Gov't Facility	A	X				14.6	95.7	
Stony Brook Southampton College	Southampton (T)	SC Gov't Facility	A	X				14.9	99.2	
West Bay Bridge (jessup Lane) Op	Southampton (T)	SC Gov't Facility	A	X						
Southampton School Bus Garage	Southampton (T)	SC Gov't Facility		X						
Suffolk County Hampton Bays Yard	Southampton (T)	SC Gov't Facility		X						
Elizabeth Field	Southold (T)	Airport	A	X						
Rose Field	Southold (T)	Airport	A	X						
Advanced Track Products Inc	Southold (T)	Bus	A	X						
Vector Control Storage Garage	Southold (T)	DPW/DOT	A	X				11.5	46.9	
Electric or Gas Facility	Southold (T)	Electric Power Facility		X						
Electric or Gas Facility	Southold (T)	Electric Power Facility		X						
Southold-8j	Southold (T)	Electric Power Substation		X						
Plum Island Fire Department	Southold (T)	Fire	A	X	11.6	48.5	480	16.4	77.9	630
Tilcon Minerals, Mattituck Inlet Wharf.	Southold (T)	Port	A	X						
Bayview At Mattituck Wtp	Southold (T)	Potable Water	A	X						
SCCC Cedar Beach Residence	Southold (T)	SC Gov't Facility		X						
Plum Island Disease Ctr	Southold (T)	Wastewater	A	X						

Name	Jurisdiction	Type	Exposure		Potential Loss from 1% Flood Event			Potential Loss from 0.2% Flood Event		
			1% Event	0.2% Event	% Structure Damage	% Content Damage	Days to 100-Percent(2)	% Structure Damage	% Content Damage	Days to 100-Percent(2)
Westhampton Dunes Police	West Hampton Dunes (V)	Police	A	X	19.9	88.7	630	30.0	100.0	720
SCWA Wells	West Hampton Dunes (V)	Potable Water	A	X						
SCWA Wells	West Hampton Dunes (V)	Potable Water	V	X						
Beach Lane Bridge Machine Tower (s)	Westhampton Beach (V)	SC Gov't Facility	A	X				13.4	77.9	
Beach Lane Bridge North Storage	Westhampton Beach (V)	SC Gov't Facility	A	X				13.4	77.9	
Beach Lane Bridge South Storage	Westhampton Beach (V)	SC Gov't Facility	A	X				14.0	83.4	
Beach Lane Bridge Operator & Machine	Westhampton Beach (V)	SC Gov't Facility	A	X				13.4	77.9	

Source: HAZUS-MH 2.1
Note: T = Town; V = Village.
x = Facility located within the 0.2-percent annual chance flood boundary.
Please note it is assumed that wells have electrical equipment and openings are three-feet above grade.
(1) HAZUS-MH 2.1 provides a general indication of the maximum restoration time for 100% operations. Clearly, a great deal of effort is needed to quickly restore essential facilities to full functionality; therefore this will be an indication of the maximum downtime (HAZUS-MH 2.1 User Manual).
(2) In some cases, a facility may be located in the DFIRM flood hazard boundary; however HAZUS did not calculate potential loss. This may be because the depth of flooding does not amount to any damages to the structure according to the depth damage function used in HAZUS for that facility type.

Several of the planning partners including the Town of Smithtown and the Suffolk County Water Authority provided specific parcel data for identified critical properties. In addition, the Shinnecock and Unkecaug Tribal Nations identified sacred lands. HAZUS-MH does not estimate potential exposure or loss at the parcel level. Therefore, an exposure analysis was completed to identify the amount of land exposed in the floodplain. Table 5.4.5-24 and Table 5.4.5-25 below summarizes results of the exposure analysis.

Table 5.4.5-24. Planning Partner Property Specific Exposure Analysis

Entity/Type	Jurisdiction	Total Acres of Critical Properties	Acres Exposed		% Exposed	
			1% Event	0.2% Event	1% Event	0.2% Event
SCWA	Babylon (T)	76.4	2.2	2.2	2.9%	2.9%
SCWA	Belle Terre (V)	0.9	0.01	0.0	1.1%	1.1%
SCWA	Brookhaven (T)	457.7	2.6	2.6	0.6%	0.6%
SCWA	Huntington (T)	91.1	0.0	1.2	0.0%	1.4%
SCWA	Islip (T)	234.0	1.1	1.1	0.5%	0.5%
SCWA	Patchogue (V)	11.5	9.1	9.1	79.1%	79.1%
SCWA	Southampton (T)	275.2	20.0	20.9	7.3%	7.6%
Town of Smithtown Parks	Smithtown (T)	1,382.0	180.7	183.5	13.1%	13.3%

Source: FEMA, 2009; Town of Smithtown; Suffolk County Water Authority

Table 5.4.5-25. Tribal Nation Asset Exposure Analysis

Entity/Type	Tribal Nation	Total Acres of Critical Properties	Acres Exposed		% Exposed	
			1% Event	0.2% Event	1% Event	0.2% Event
Area of Flooding and Cemetery	Shinnecock	28.0	28.0	28.0	100.0%	100.0%
Westwoods	Shinnecock	41.1	2.94	3.3	7.2%	8.1%
Sacred Burial Ground	Shinnecock	8.9	8.2	8.8	91.2%	98.0%
Shoreline Protection	Unkechaug	0.2	0.2	0.2	100.0%	100.0%
Cemetery and historical preservation	Unkechaug	1.1	0.2	0.2	15.6%	15.6%
Pow Wow grounds	Unkechaug	1.3	0.1	0.1	8.8%	8.8%

Source: Shinnecock and Unkechaug Tribal Nations

Impact on the Economy

For impact on economy, estimated losses from a flood event are considered. Losses include but are not limited to general building stock damages, agricultural losses, business interruption, impacts to tourism and tax base to Suffolk County. Damages to general building stock can be quantified using HAZUS-MH as discussed above. Other economic components such as loss of facility use, functional downtime and social economic factors are less measurable with a high degree of certainty.

Flooding can cause extensive damage to public utilities and disruptions to the delivery of services. Loss of power and communications may occur; and drinking water and wastewater treatment facilities may be temporarily out of operation. Flooded streets and road blocks make it difficult for emergency vehicles to respond to calls for service. Floodwaters can wash out sections of roadway and bridges (Foster, Date Unknown).

Direct building losses are the estimated costs to repair or replace the damage caused to the building. Refer to the 'Impact on General Building Stock' subsection which discusses these potential losses. These dollar value losses to the County's total building inventory replacement value, in addition to damages to roadways and infrastructure, would greatly impact the local economy.

HAZUS-MH estimates the amount of debris generated from the flood events as a result of 1- and 0.2-percent events. The model breaks down debris into three categories: 1) finishes (dry wall, insulation, etc.); 2) structural (wood, brick, etc.) and 3) foundations (concrete slab and block, rebar, etc.). The distinction is made because of the different types of equipment needed to handle the debris. Table 5.4.5-26 summarizes the debris HAZUS-MH 2.1 estimates for these events.

Table 5.4.5-26. Estimated Debris Generated from the 1-Percent and 0.2-Percent Flood Events

Jurisdiction	1% Flood Event				0.2% Flood Event			
	Total (tons)	Finish (tons)	Structure (tons)	Foundation (tons)	Total (tons)	Finish (tons)	Structure (tons)	Foundation (tons)
Amityville (V)	7,626	6,502	686	437	13,194	9,360	2,098	1,735
Asharoken (V)	13,231	4,296	3,399	5,536	17,230	5,026	4,915	7,289
Babylon (T)	18,294	12,335	3,551	2,407	32,466	18,672	7,378	6,417
Babylon (V)	7,449	6,649	490	310	11,641	10,049	976	617
Belle Terre (V)	3,760	860	1,081	1,820	4,385	942	1,259	2,184
Bellport (V)	3,347	2,194	707	446	3,866	2,213	1,013	640
Brightwaters (V)	586	336	153	97	1,083	547	329	208
Brookhaven (T)	146,572	74,366	34,406	37,800	208,121	87,234	58,129	62,759
Dering Harbor (V)	119	51	30	38	200	65	59	76
East Hampton (T)	54,490	23,302	16,464	14,725	85,286	31,304	28,096	25,886
East Hampton (V)	7,188	3,413	1,708	2,067	11,783	4,979	3,170	3,634
Greenport (V)	1,722	1,017	403	302	2,872	1,384	811	678
Head of the Harbor (V)	2,367	666	731	970	3,570	805	1,071	1,695
Huntington (T)	26,858	6,943	8,985	10,930	38,447	8,908	13,679	15,860
Huntington Bay (V)	3,618	1,309	980	1,330	5,017	1,506	1,545	1,965
Islandia (V)	17	17	0	0	2	2	0	0
Islip (T)	79,534	50,491	13,716	15,327	113,680	64,604	24,399	24,678
Lake Grove (V)	0	0	0	0	0	0	0	0
Lindenhurst (V)	5,355	4,513	514	328	9,014	6,878	1,307	829
Lloyd Harbor (V)	18,181	4,768	5,398	8,016	23,049	5,058	7,225	10,765
Mastic Beach (V)	5,197	4,296	552	349	7,954	6,195	956	802
Nissequogue (V)	8,759	2,954	2,453	3,352	12,527	3,590	3,649	5,287
North Haven (V)	8,043	4,840	1,533	1,670	10,196	5,418	2,371	2,408
Northport (V)	7,727	1,463	2,713	3,551	8,991	1,654	3,214	4,123
Ocean Beach (V)	17,387	8,649	4,143	4,596	23,424	10,248	6,572	6,603
Old Field (V)	11,752	3,995	3,456	4,301	18,181	4,667	5,497	8,017
Patchogue (V)	1,357	1,275	50	32	2,482	2,142	208	132
Poquott (V)	2,209	849	588	772	3,305	992	976	1,337
Port Jefferson (V)	2,864	906	1,191	767	3,789	1,320	1,495	973
Quogue (V)	18,439	12,268	3,230	2,942	30,571	15,493	7,647	7,431
Riverhead (T)	21,196	8,249	6,523	6,423	32,847	10,084	11,347	11,415
Sag Harbor (V)	5,281	3,423	1,088	770	8,495	4,366	2,239	1,890
Sagaponack (V)	15,104	5,520	4,011	5,574	23,820	7,450	6,587	9,783
Saltaire (V)	16,151	7,189	4,040	4,922	23,273	8,853	7,044	7,376
Shelter Island (T)	10,761	5,626	2,639	2,496	15,387	6,225	4,440	4,723
Shoreham (V)	418	110	146	163	857	168	253	436
Smithtown (T)	4,098	2,679	744	675	6,605	3,269	1,761	1,575
Southampton (T)	129,985	72,669	28,027	29,289	204,227	90,535	53,122	60,571
Southampton (V)	24,009	12,511	5,704	5,794	44,192	16,740	12,434	15,019
Southold (T)	54,826	24,966	14,397	15,464	77,448	30,118	22,747	24,582

Jurisdiction	1% Flood Event				0.2% Flood Event			
	Total (tons)	Finish (tons)	Structure (tons)	Foundation (tons)	Total (tons)	Finish (tons)	Structure (tons)	Foundation (tons)
Village of the Branch (V)	132	132	0	0	132	132	0	0
West Hampton Dunes (V)	12,512	6,766	3,290	2,455	24,590	7,115	7,917	9,558
Westhampton Beach (V)	17,343	14,209	1,913	1,221	30,011	20,216	5,530	4,265
Shinnecock Tribal Nation	2,064	932	616	516	3,352	1,198	1,153	1,000
Unkechaug Tribal Nation	248	183	40	25	437	235	116	87
Suffolk County	**798,181**	**410,684**	**186,491**	**201,006**	**1,201,997**	**517,957**	**326,735**	**357,305**

Source: HAZUS-MH 2.1

Effect of Climate Change on Vulnerability

Climate is defined not simply as average temperature and precipitation but also by the type, frequency and intensity of weather events. Both globally and at the local scale, climate change has the potential to alter the prevalence and severity of extremes such as flood events. While predicting changes of flood events under a changing climate is difficult, understanding vulnerabilities to potential changes is a critical part of estimating future climate change impacts on human health, society and the environment (U.S. Environmental Protection Agency [EPA], 2006).

Change of Vulnerability

Suffolk County, its municipalities and the Tribal Nations continue to be vulnerable to the flood hazard. However, there are several differences between the exposure and potential loss estimates between this plan update to the results in the original 2008 HMP. Their differences are due to the new and updated population (U.S. Census 2010 is now available) and building inventories used, and more accurate flood depth grids used to estimate potential losses in HAZUS-MH due to the availability of their DFIRM.

Differences in exposure and potential losses estimated from the 2008 HMP can be attributed to the difference in building stock inventory and methodology used for the risk assessment. For example, the 2008 HMP building inventory was the default HAZUS-MH general building stock with replacement values based on 2006 RS Means. For this plan update, the potential loss analysis was conducted using a custom County-wide building inventory using 2014 RS Means replacement cost values with a regional factor applied specific to Suffolk County as determined by the Steering Committee. The 2008 HMP potential loss estimates were calculated across the Census block; however the 2014 update estimates potential losses at the structure level using the updated building inventory.

For this plan update, the five-foot County-wide DEM used to generate the flood depth grids. The depth grids were integrated into the most current version of HAZUS-MH (2.1) and the model was run to estimate potential losses at the structure level utilizing the custom building inventory developed for this plan update. The Flood Wizard tool, used in the original HMP was not used for this analysis.

Overall, this vulnerability assessment uses a more accurate and updated building inventory which provides more accurate estimated exposure and potential losses for Suffolk County.

Future Growth and Development

As discussed in Section 4, areas targeted for future growth and development have been identified across the County. Any areas of growth could be potentially impacted by the flood hazard if located within the identified hazard areas. Figure 5.4.3-18 illustrates the identified areas of potential new development in relation to the flood boundaries. It is the intention of the County to discourage development in vulnerable areas or to encourage higher regulatory standards on the local level.

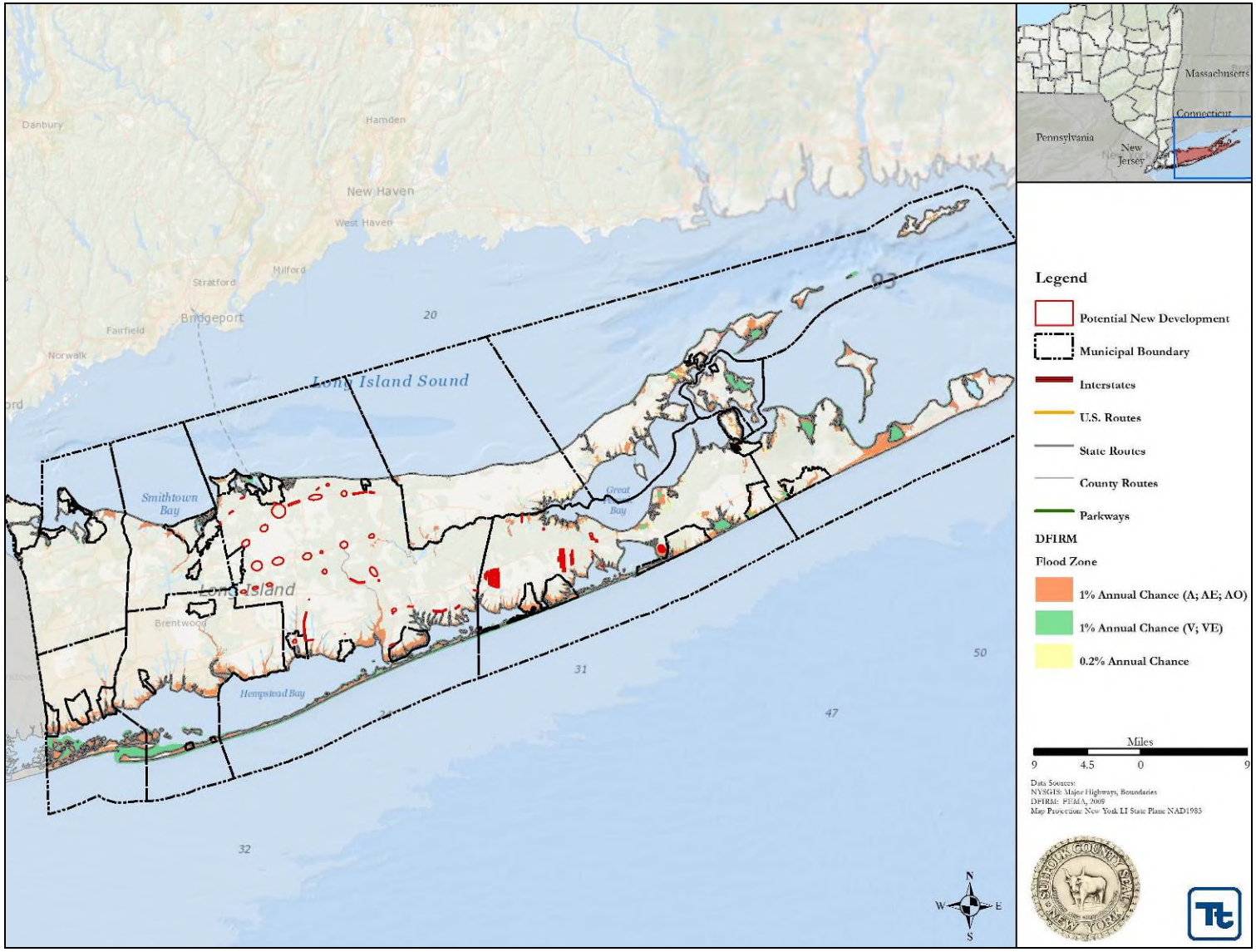
Additional Data and Next Steps

A HAZUS-MH flood analysis was conducted for Suffolk County using the most current and best available data including updated building and critical facility inventories, and DFIRM. For future plan updates, more accurate exposure and loss estimates can be produced by replacing the national default demographic inventory with 2010 U.S. Census data when it becomes available in the HAZUS-MH model.

FEMA's Risk Mapping, Assessment, and Planning (Risk MAP) program provides the flood depth and analysis grids as part of the publicly available DFIRM deliverable. When these depth grids are available for Suffolk County, they can be incorporated into HAZUS and used to recalculate the potential losses to the County's inventory for these recurrence intervals.

Specific mitigation actions addressing improved data collection and further vulnerability analysis is included in Volume II, Section 9 of this plan.

Figure 5.4.3-18. Potential New Development and Flood Boundaries



Source: FEMA, 2009; Planning Committee