



### 5.4.13 SEVERE STORM

This section provides a hazard profile and vulnerability assessment of the severe storm hazard for the Suffolk County HMP.

#### Hazard Profile

This section presents information regarding the description, extent, location, previous occurrences and losses, and probability of future occurrences for the severe storm hazard.

#### Description

For the purpose of this HMP and as deemed appropriated by Suffolk County, the severe storm hazard includes hailstorms, windstorms, lightning, thunderstorms, and tornadoes which are defined below. Tropical storms and hurricanes are discussed in Section 5.4.10. Since most northeasters, (or Nor'Easters) a type of an extra-tropical cyclone, generally take place during the winter weather months, Nor'Easters have been grouped as a type of severe winter weather storm, further discussed in Section 5.4.12 (Nor'Easters).

#### Thunderstorms

A thunderstorm is a local storm produced by a cumulonimbus cloud and accompanied by lightning and thunder (National Weather Service [NWS] 2009). A thunderstorm forms from a combination of moisture; rapidly rising warm air; and a force capable of lifting air, such as a warm front, cold front, a sea breeze, or a mountain. Thunderstorms form from the equator to as far north as Alaska. Although thunderstorms generally affect a small area when they occur, they have the potential to become dangerous due to their ability to generate tornadoes, hailstorms, strong winds, flash flooding, and lightning.

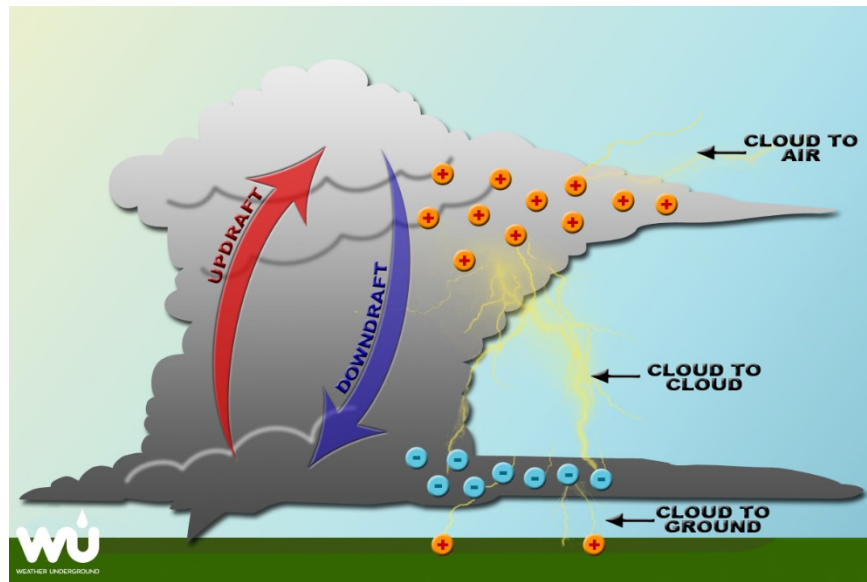
Thunderstorms can lead to heavy rain induced flooding, landslides, strong winds, and lightning. Roads may become impassable from flooding, downed trees or power lines, or a landslide. Downed power lines can lead to loss of utility services, such as water, phone, and electricity. Typical thunderstorms are 15 miles in diameter and last an average of 30 minutes. During the summer, thunderstorms are responsible for most of the rainfall.

#### Lightning

Lightning is a bright flash of electrical energy produced by a thunderstorm. The resulting clap of thunder is the result of a shock wave created by the rapid heating and cooling of the air in the lightning channel. All thunderstorms produce lightning and are very dangerous. Lightning ranks as one of the top weather killers in the United States, killing approximately 50 people and injuring hundreds each year. Lightning can occur anywhere there is a thunderstorm. Lightning can be cloud to air, cloud to cloud, and cloud to ground. Figure 5.4.13-1 demonstrates the variety of lightning types.



Figure 5.4.13-1. Types of Lightning

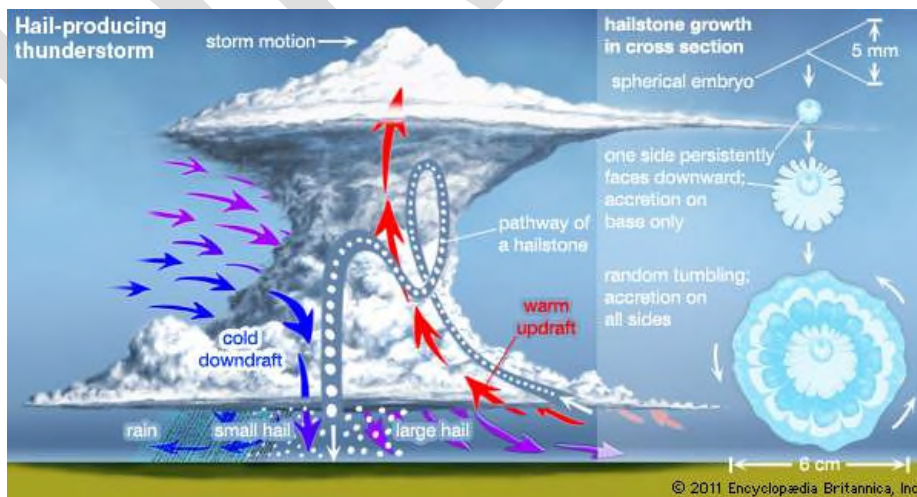


Source: Weather Underground 2020

### Hailstorms

Hail forms inside a thunderstorm or other storms with strong updrafts of warm air and downdrafts of cold water. If a water droplet is picked up by the updrafts, it can be carried well above the freezing level. Water droplets freeze when temperatures reach 32 degrees Fahrenheit (°F) or colder. As the frozen droplet begins to fall, it may thaw as it moves into warmer air toward the bottom of the thunderstorm. However, the droplet may be picked up again by another updraft and carried back into the cold air and re-freeze. With each trip above and below the freezing level, the frozen droplet adds another layer of ice. The frozen droplet, with many layers of ice, falls to the ground as hail. Most hail is small and typically less than (2 inches in diameter (NWS 2010). Figure 5.4.13-2 shows how hail is formed within thunderstorms.

Figure 5.4.13-3. Hail Formation in Thunderstorms



Source: Encyclopædia Britannica 2011



Windstorms

Wind begins with differences in air pressures and occurs through rough horizontal movement of air caused by uneven heating of the earth’s surface. Wind occurs at all scales, from local breezes lasting a few minutes to global winds resulting from solar heating of the earth. High winds are often associated with other severe weather events such as thunderstorms, derechos, tornadoes, nor’easters, hurricanes, and tropical storms.

Tornadoes

A tornado appears as a rotating, funnel-shaped cloud that extends from a thunderstorm to the ground with whirling winds that can reach 250 miles per hour (mph). Damage paths can be greater than 1 mile wide and 50 miles long. Tornadoes typically develop from either a severe thunderstorm or hurricane as cool air rapidly overrides a layer of warm air. Tornadoes typically move at speeds between 30 and 125 mph and can generate combined wind speeds (forward motion and speed of the whirling winds) exceeding 300 mph. The lifespan of a tornado rarely is longer than 30 minutes (FEMA 1997). Tornadoes can occur at any time of the year, with peak seasons at different times for different states (National Severe Storms Laboratory [NSSL] 2013).

Extent

The extent (severity or magnitude) of a severe storm is largely dependent upon the most damaging aspects of each type of severe weather. This section describes the extent of thunderstorms, lighting, hail, windstorms, and tornadoes in Suffolk County. Historical data presented in Table 5.4.13-1 shows the most powerful severe weather records in Suffolk County.

Table 5.4.13-1. Severe Storm Extent in Suffolk County (1950 to 2020)

Extent of Severe Storms in Suffolk County	
Largest Hailstone on Record	2.5 inches
Strongest Tornado on Record	F2
Highest Wind Speed on Record	83 knots (96 mph)

Source: NOAA NCEI 2020

Thunderstorms

NWS considers a thunderstorm severe if it produces damaging wind gusts of 58 mph or higher, hail 1 inch (quarter size) in diameter or larger, or tornadoes (NWS 2010). Severe thunderstorm watches and warnings are issued by the local NWS office and NOAA’s Storm Prediction Center (SPC). NWS and SPC will update the watches and warnings and will notify the public when they are no longer in effect. Watches and warnings for thunderstorms in New York are defined as follows:

- *Severe Thunderstorm Warnings* are issued when there is evidence based on radar or a reliable spotter report that a thunderstorm is producing (or is forecast to produce) wind gusts of 58 mph or greater, structural wind damage, and hail 1 inch in diameter or greater. A warning will include the location of the storm, the municipalities that are expected to be impacted, and the primary threat associated with the severe thunderstorm warning. After it has been issued, the NWS office will follow up periodically with Severe Weather Statements, which contain updated information on the severe thunderstorm and will let the public know when the warning is no longer in effect (NWS 2009, 2010).
- *Severe Thunderstorm Watches* are issued by the SPC when conditions are favorable for the development of severe thunderstorms over a larger-scale region for a duration of at least 3 hours. Tornadoes are not expected in such situations, but isolated tornado development may also occur. Watches are normally






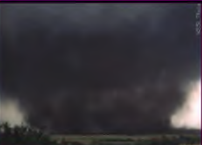


issued well in advance of the actual occurrence of severe weather. During the watch, NWS will keep the public informed on developments happening in the watch area and will also notify the public when the watch has expired or been cancelled (NWS 2009, 2010).

- *Special Weather State for Near Severe Thunderstorms* bulletins are issued for strong thunderstorms that are below severe levels, but still may have some adverse impacts. Usually, they are issued for the threat of wind gusts of 40 to 58 mph or small hail less than one (1) inch in diameter (NWS 2010).

In addition, the SPC issues severe thunderstorm risk maps based on the likelihood of different severities of thunderstorms. Figure 5.4.13-3 shows the SPC’s severe thunderstorm risk categories.

Figure 5.4.13-3. Severe Thunderstorm Risk Categories.

Understanding Severe Thunderstorm Risk Categories					
<b>THUNDERSTORMS</b> (no label)	<b>1 - MARGINAL</b> (MRGL)	<b>2 - SLIGHT</b> (SLGT)	<b>3 - ENHANCED</b> (ENH)	<b>4 - MODERATE</b> (MDT)	<b>5 - HIGH</b> (HIGH)
<b>No severe* thunderstorms expected</b>	<b>Isolated severe thunderstorms possible</b>	<b>Scattered severe storms possible</b>	<b>Numerous severe storms possible</b>	<b>Widespread severe storms likely</b>	<b>Widespread severe storms expected</b>
Lightning/flooding threats exist with <u>all</u> thunderstorms	Limited in duration and/or coverage and/or intensity	Short-lived and/or not widespread, isolated intense storms possible	More persistent and/or widespread, a few intense	Long-lived, widespread and intense	Long-lived, very widespread and particularly intense
					
<ul style="list-style-type: none"> <li>• Winds to 40 mph</li> <li>• Small hail</li> </ul>	<ul style="list-style-type: none"> <li>• Winds 40-60 mph</li> <li>• Hail up to 1"</li> <li>• Low tornado risk</li> </ul>	<ul style="list-style-type: none"> <li>• One or two tornadoes</li> <li>• Reports of strong winds/wind damage</li> <li>• Hail ~1", isolated 2"</li> </ul>	<ul style="list-style-type: none"> <li>• A few tornadoes</li> <li>• Several reports of wind damage</li> <li>• Damaging hail, 1 - 2"</li> </ul>	<ul style="list-style-type: none"> <li>• Strong tornadoes</li> <li>• Widespread wind damage</li> <li>• Destructive hail, 2" +</li> </ul>	<ul style="list-style-type: none"> <li>• Tornado outbreak</li> <li>• Derecho</li> </ul>
<small>* NWS defines a severe thunderstorm as measured wind gusts to at least 58 mph, and/or hail to at least one inch in diameter, and/or a tornado. All thunderstorm categories imply lightning and the potential for flooding. Categories are also tied to the probability of a severe weather event within 25 miles of your location.</small>					

Source: NOAA SPC 2017

### Lightning

Lightning is most often associated with moderate to severe thunderstorms. The severity of lightning refers to the frequency of lightning strikes during a storm. The New York City Office of Emergency Management (NYC OEM) notes that lightning strikes occur with moderate frequency in the State of New York, with 3.8 strikes occurring per square mile each year. Multiple devices are available to track and monitor the frequency of lightning.

### Hail

The severity of a hailstorm is measured by duration, hail size, and geographic extent. Most hail stones from hailstorms are made up of variety of sizes. Only the very largest hail stones pose serious risk to people, if exposed (NYS DHSES 2014). The size of hail is estimated by comparing it to a known object. Table 5.4.13-2 describes the different sizes of hail as compared to real-world objects and lists approximate measurements.



**Table 5.4.13-2. Hail Size**

Description	Diameter (in inches)	Description	Diameter (in inches)
Pea	0.25	Golf ball	1.75
Marble or mothball	0.50	Hen’s egg	2.00
Penny or dime	0.75	Tennis ball	2.75
Nickel	0.88	Baseball	2.75
Quarter	1.00	Tea cup	3.00
Half dollar	1.25	Grapefruit	4.00
Walnut or ping pong ball	1.50	Softball	4.50

Source: NWS 2010c; NYS DHSES 2014

**Windstorms**

Table 5.4.13-3 provides the NWS descriptions of winds during wind-producing events.

**Table 5.4.13-4. NWS Wind Descriptions**

Descriptive Term	Sustained Wind Speed (mph)
Strong, dangerous, or damaging	≥40
Very windy	30-40
Windy	20-30
Breezy, brisk, or blustery	15-25
None	5-15 or 10-20
Light or light and variable wind	0-5

Source: NWS 2015

NWS issues advisories and warnings for winds, which are normally site-specific. High wind advisories, watches, and warnings are issued by the NWS when wind speeds may pose a hazard or may be life threatening. The criterion for each of these varies from state to state. Wind warnings and advisories for New York State are as follows:

- *High Wind Warnings* are issued when sustained winds of 40 mph or greater are forecast for 1 hour or longer, or wind gusts of 58 mph or greater are forecast for any duration.
- *Wind Advisories* are issued when sustained winds of 30 to 39 mph are forecast for one 1 hour or longer, or wind gusts of 46 to 57 mph are forecast for any duration (NWS 2015).

**Tornado**

The magnitude or severity of a tornado is categorized using the Enhanced Fujita Tornado Intensity Scale (EF Scale). Figure 5.4.13-4 illustrates the relationship between EF ratings, wind speed, and expected tornado damage.



Figure 5.4.13-5. Enhanced Fujita Tornado Intensity Scale Ratings, Wind Speeds, and Expected Damage

EF Rating	Wind Speeds	Expected Damage	
<b>EF-0</b>	65-85 mph	'Minor' damage: shingles blown off or parts of a roof peeled off, damage to gutters/siding, branches broken off trees, shallow rooted trees toppled.	
<b>EF-1</b>	86-110 mph	'Moderate' damage: more significant roof damage, windows broken, exterior doors damaged or lost, mobile homes overturned or badly damaged.	
<b>EF-2</b>	111-135 mph	'Considerable' damage: roofs torn off well constructed homes, homes shifted off their foundation, mobile homes completely destroyed, large trees snapped or uprooted, cars can be tossed.	
<b>EF-3</b>	136-165 mph	'Severe' damage: entire stories of well constructed homes destroyed, significant damage done to large buildings, homes with weak foundations can be blown away, trees begin to lose their bark.	
<b>EF-4</b>	166-200 mph	'Extreme' damage: Well constructed homes are leveled, cars are thrown significant distances, top story exterior walls of masonry buildings would likely collapse.	
<b>EF-5</b>	> 200 mph	'Massive/incredible' damage: Well constructed homes are swept away, steel-reinforced concrete structures are critically damaged, high-rise buildings sustain severe structural damage, trees are usually completely debarked, stripped of branches and snapped.	

Source: NWS 2018

Tornado watches and warning are issued by the local NWS office. A tornado watch is released when tornadoes are possible in an area. A tornado warning means a tornado has been sighted or indicated by weather radar. The current average lead time for tornado warnings is 13 minutes. Occasionally, tornadoes develop so rapidly, that little, if any, advance warning is possible (NOAA 2011).

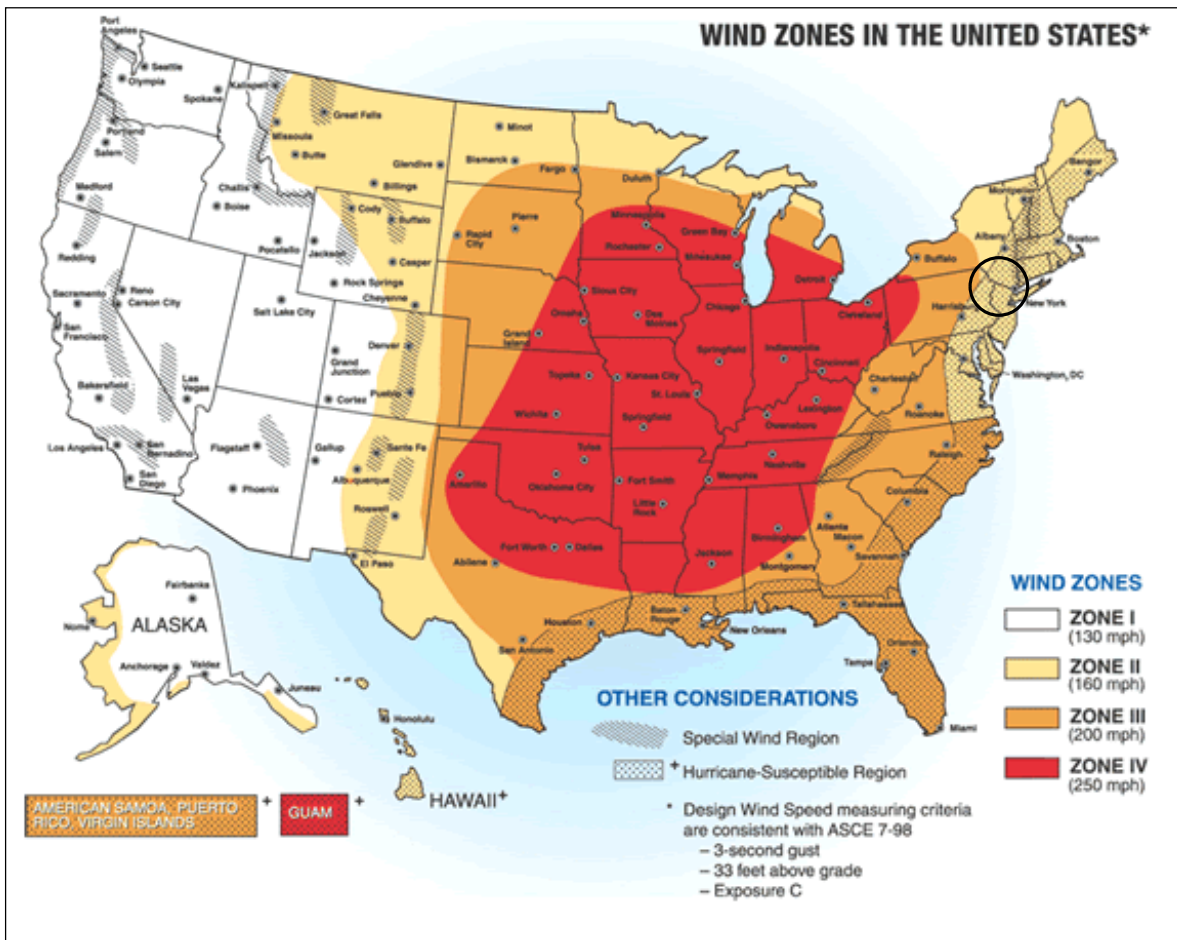
### Location

Severe storms are a common natural hazard in New York State because the State exhibits a unique blend of weather (geographically and meteorological) features that influence the potential for severe storms and associated flooding. Factors include temperature, which is affected by latitude, elevation, proximity to water bodies and source of air masses; and precipitation which includes snowfall and rainfall. Precipitation intensities and effects are influenced by temperature, proximity to water bodies, and general frequency of storm systems. The Cornell Climate Report also indicates that the geographic position of the State (Northeast U.S.) makes it vulnerable to frequent storm and precipitation events. This is because nearly all storms and frontal systems moving eastward across the continent pass through, or in close proximity to New York State. Additionally, the potential for prolonged thunderstorms or coastal storms and periods of heavy precipitation is increased throughout the state because of the available moisture that originates from the Atlantic Ocean (NYS DHSES 2011).



All of Suffolk County is exposed to hail, lightning, windstorms and high wind, thunderstorms, and tornadoes and all of the County is subject to high winds from severe weather events. Hailstorm events can occur anywhere within New York State independently or during a tornado, thunder or lightning storm event and are usually localized in scale (NYS DHSES 2019). Figure 5.4.13-5 indicates how the frequency and strength of windstorms impacts the U.S. and the general location of the most wind activity. This is based on 40 years of tornado history and 100 years of hurricane history, collected by FEMA. Suffolk County is located in Wind Zone II with speeds up to 200 miles per hour. The County is also located within the hurricane susceptible region (FEMA 2012).

Figure 5.4.13-6. Wind Zones in the U.S.



Source: FEMA n.d.

Note: The black circle indicates the approximate location of Suffolk County.

### Previous Occurrences and Losses

#### FEMA Major Disasters and Emergency Declarations

Between 1954 and 2020, the State of New York was included in 28 severe storm-related disaster (DR) or emergency (EM) declarations. Generally, these disasters cover a wide region of the State; therefore, they may have impacted many counties. Suffolk County was included in five declarations (FEMA 2020).



**Table 5.4.13-5. Severe Storm-Related FEMA Declarations for Suffolk County, 1954 to August 2018**

Date(s) of Event	FEMA Declaration Number	Event Type
October 19-20, 1996	DR-1146	Severe Storms, Flooding, Heavy Rains, High Winds
May 13-June 17, 2004	DR-1534	Severe Storms and Flooding
April 14-18, 2007	DR-1692	Severe Storms and Inland and Coastal Flooding
November 12-14, 2009	DR-1869	Severe Storms and Flooding Associated with Tropical Depression Ida and Nor’Easter
March 13-31, 2010	DR-1899	Severe Storms and Flooding

Source: FEMA 2020

Table 5.4.13-5 summarizes the known severe storm events that have impacted Suffolk County between 2013 and 2020. Events identified in the 2014 Plan are included in Appendix E.

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Table 5.4.13-6. Severe Storm Events Between 2013 and 2020

Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Location	Description
July 19, 2013	Lightning, Hail	N/A	N/A	Mt. Sinai	Multiple thunderstorms formed along the sea breeze boundary across Long Island, with isolated severe mainly over the eastern end of the island.  A house caught on fire due to a lightning strike. Firefighters reported the roof had collapsed by the time of arrival. A dozen firefighters had to be treated for heat exhaustion fighting the fire. Penny to quarter size hail was reported.
August 9, 2013	Thunderstorm Wind	N/A	N/A	Middleville	Isolated severe thunderstorms formed along a pre-frontal trough.  High winds downed multiple trees that brought wires down along Bernard Street.
September 3, 2013	Thunderstorm Wind, Lightning, Hail	N/A	N/A	Amityville, Canoe Place	Scattered showers and thunderstorms with embedded severe thunderstorms formed across the southern coast of Long Island ahead of an approaching cold front.  Multiple trees were reported down around Amityville resulting in \$1K in property damage. A lightning strike caused the Hampton Bays Police Department to lose their communications system resulting in \$1K in property damage. Quarter size hail was reported across Hampton Bays.
November 27, 2013	Strong Wind	N/A	N/A	Southwest Suffolk	Strong southerly winds in the morning ahead of a cold front shifted to the west.  In North Babylon, strong winds knocked down wires and a tree limb on Deer Park Avenue around 5:45 am. This caused power outages across the region. \$10K in property damages were reported.
March 26, 2014	Strong Wind	N/A	N/a	Southwest Suffolk	Deepening low pressure over the western Atlantic Ocean resulted in strong northeast winds across the area.  At 3:45 pm, the broadcast media reported a large tree limb down on the roof of a car in West Babylon. Wind gusts of 51 mph were observed at Islip McArthur Airport earlier in the day, at 11:36 am. \$5K in property damages were reported.
April 15, 2014	Strong Wind	N/A	N/A	Southwest Suffolk	Strong southerly winds ahead of a cold front occurred across parts of Nassau and Southwest Suffolk Counties on Long Island.  At 1:34 pm, the Long Island Office of Emergency Management reported 1,064 customers without power in Wyandanch due to strong winds. Farmingdale Airport reported wind gusts to 41 knots around that time. \$100K in property damage was reported.
May 16-17, 2014	Strong Wind	N/A	N/A	Northwest Suffolk, Southwest Suffolk	Strong south winds occurred across Western Suffolk County ahead of an approaching cold front.



Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Location	Description
					South winds gusted up to 45 mph, with a peak wind measured at Islip MacArthur Airport of 37 knots. This occurred at 1044 pm. Shortly after midnight, a National Weather Service employee reported a large branch was knocked down onto power lines in Centereach. \$100K in property damage was reported. A measured gust of 36 knots occurred at Farmingdale Airport at 10:38 pm. A trained spotter reported power lines down at 10:50 pm, in Lindenhurst near Montauk Highway. \$20K in property damage was reported.
July 15, 2014	Thunderstorm Wind	N/A	N/A	West Bayshore, Centereach, Manorville	A cold front moving across the area interacted with a very moist airmass which produced showers and thunderstorms with damaging winds and torrential downpours resulting in flash flooding portions of southeast New York. Multiple trees were reported down around the town. \$2K in property damages were reported. Multiple reports of trees being down on cars and being down on wires and roads around Centereach with \$5K in property damage reported. Multiple trees were reported down across the town of Manorville with \$2K in property damage reported.
October 22, 2014	Strong Wind	N/A	N/A	Southeast Suffolk, Northeast Suffolk, Northwest Suffolk	Deep low pressure passed to the south and east of the area which produced strong winds and isolated flash flooding across portions of New York City and Long Island. At Westhampton Airport, sustained winds of 38 mph, and gusts of 52 mph were measured at 7:15 pm EDT. At Brookhaven Airport in Shirley, sustained winds of 30 mph were measured at 7:30 pm EDT. \$20K in property damage was reported. At 8:00 pm EDT, a wind gust of 51 mph was reported by a trained spotter in Orient Point. \$20K in property damage was reported. At Islip MacArthur Airport, sustained winds of 36 mph were measured at 10:40 pm EDT. \$20K in property damage was reported. In Eatons Neck, a mesonet reported a wind gust to 51 mph at 2:15 am EDT. \$20K in property damage was reported.
November 2, 2014	Strong Wind	N/A	N/A	Southwest Suffolk, Northwest Suffolk, Southeast Suffolk,	Deep low pressure passed south and east of Long Island. At Islip MacArthur Airport, a gust of 53 mph was measured at 10:40 am, with a sustained wind of 37 mph also measured at 10:40 am. At Farmingdale Airport, a gust of 47 mph was measured at 8:48 am, with a sustained wind of 33 mph also measured at 8:48 am. \$20K in property damage was reported. In Northwest Suffolk, a National Weather Service Employee reported a utility pole down due to strong winds at 11 am. The Utility Pole was knocked down onto power lines on route 25 in Middle Island. Nearby, a wind gust of 52 mph was measured at Islip McArthur Airport at 10:40 am. \$20K in property damage was reported.



Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Location	Description
					At Westhampton Airport, a gust of 48 mph was measured at 1:10 pm, with a sustained wind of 35 mph measured at 1:20 pm. Shirley Airport measured a gust to 46 mph at 10:58 am, and a sustained wind of 32 mph at 1 pm.
December 9, 2014	Strong Wind	N/A	N/A	Southeast Suffolk, Northeast Suffolk, Southwest Suffolk	A coastal storm passed just south and east of the area causing strong winds and heavy rain with flooding in portions of Southeast New York.  At Westhampton Airport, a sustained wind of 35 mph was measured at 2:32 pm, and a gust of 43 mph was measured at 11:45 am. A mesonet station at Napeague measured a wind gust of 52 mph at 11:36 am. At Islip MacArthur Airport, a sustained wind of 33 mph was measured at 1:59 pm, and a gust of 48 mph was measured at 12:12 pm. Southeast Suffolk reported \$10K in property damages. The mesonet station at Great Gull Island measured a wind gust to 52 mph at 11:49 am. Northeast Suffolk reported \$10K in property damage. At Farmingdale Airport, a sustained wind of 37 mph was measured at 1:48 pm, and a gust of 46 mph was measured at 1:28 pm. At Islip MacArthur Airport, a sustained wind of 33 mph was measured at 1:59 pm, and a gust of 48 mph was measured at 12:12 pm. Southwest Suffolk reported \$10K in property damage.
January 31, 2015	Strong Wind	N/A	N/A	Northwest Suffolk, Southwest Suffolk, Southeast Suffolk	Low pressure deepened as it tracked to the northeast of the area, resulting in strong winds.  The mesonet station at Eatons Neck reported a sustained wind of 38 mph at 3:35 am with gusts ranging from 40 to 50 mph. Northwest Suffolk reported \$10K in property damage. At Islip MacArthur Airport, a sustained wind of 37 mph was measured at 7:53 am with gusts ranging from 40 to 50 mph. Southwest Suffolk reported \$10K in property damage. At Shirley Brookhaven Airport, a sustained wind of 37 mph was measured at 7:42 am. At Westhampton Gabreski Airport, sustained winds were also measured at 37 mph at 10:08 am. Winds gusted from 40 to 50 mph. Southeast Suffolk reported \$10K in property damage.
February 15, 2015	High Wind	N/A	N/A	Northeast Suffolk, Southeast Suffolk, Southwest Suffolk, Northwest Suffolk	An area of low pressure deepened as it tracked to the northeast of the local region resulting in high winds.  The mesonet station around 3 miles east northeast of Plum Island reported a wind gust to 60 mph, with a sustained wind of 49 mph at 9:14 am. Northeast Suffolk reported \$10K in property damage. The ASOS at Westhampton Gabreski Airport reported a wind gust to 55 mph at 9:41 am, and sustained winds of 41 mph at 9:04 am. At Shirley Brookhaven Airport, sustained winds of 39 mph were reported at 9:01 am. Southeast Suffolk reported \$10K in property damage. The ASOS at Islip MacArthur Airport reported a wind gust to 56 mph at 9:24 am, and sustained winds of 41 mph at 9:24 am. At the mesonet station at Point O Woods Fire Island, sustained winds of 39 mph were reported at 9:15 am. Southwest Suffolk reported \$10K in property damage. The mesonet station at Eatons



Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Location	Description
					Neck reported a wind gust to 53 mph at 10:55 am, and sustained winds of 43 mph at 11:00 am. Northwest Suffolk reported \$10K in property damage.
March 17, 2015	Strong Wind	N/A	N/A	Southwest Suffolk	Strong winds were observed behind a cold front. A wind gust of 55 mph was observed at Islip MacArthur Airport at 4:41 pm. Southwest Suffolk reported \$10K in property damage.
April 2, 2015	Strong Wind	N/A	N/A	Southwest Suffolk, Southeast Suffolk, Northeast Suffolk	Strong southerly winds occurred which were enhanced by an early spring sea breeze. A 33 mph sustained wind was measured at Farmingdale Airport at 2:52 pm. At Islip MacArthur airport, sustained winds of 31 mph were measured at 2:17 pm. Southwest Suffolk reported \$10K in property damage. A 34 mph sustained wind was measured at a mesonet site in East Hampton at 3:50 pm. Southeast Suffolk reported \$10K in property damage. A 32 mph sustained wind was measured at a mesonet station by Plum Island at 4:55 pm. Northeast Suffolk reported \$10K in property damage.
April 4, 2015	Strong Wind	N/A	N/A	Southeast Suffolk, Southwest Suffolk, Northeast Suffolk	Strong northwest winds occurred behind a cold front. The ASOS at Westhampton Gabreski Airport measured sustained winds of 33 mph at 10:53 am. Southeast Suffolk reported \$10K in property damage. The mesonet station at Point O' Woods on Fire Island reported a sustained wind of 35 mph at 11:35 am. At Islip MacArthur airport, a sustained wind of 32 mph was measured at 11:56 am. Southwest Suffolk reported \$20K in property damage. The weather flow station near Plum Island reported sustained winds of 39 mph at 1:20 pm. Northeast Suffolk reported \$10K in property damage.
June 23, 2015	Thunderstorm Wind, Hail	N/A	N/A	East Huntington, Huntington, Northport, Peconic, Greenport, Laughing Waters, Plum Island, Fishers Island	A passing cold front triggered widespread severe thunderstorms across Long Island and isolated severe thunderstorms across the lower Hudson Valley and Queens. A 68 mph wind gust was measured. In addition, there was damage to roof siding and branches down. East Huntington reported \$1K in property damage. Huntington reported 1 inch hail. Northport reported 0.88 inch hail. Peconic reported scattered trees and branches down with \$5K in property damage. A wind gust of 68 MPH was measured at a mesonet location in Greenport. There were two large trees reported down in Laughing Waters resulting in \$5.5K in property damage. The first was down on wires at the intersection of New York State Route 25 (Main Road) and South Harbor Road, the second at the intersection of South Harbor Road and Baywater Avenue. A telephone pole was reported down and a roof damaged on Plum Island resulting in \$5K in property damage. On Fishers Island, a tree was reported down along Avenue B and another along Madeline Avenue with \$2K in property damage.



Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Location	Description
July 1, 2015	Thunderstorm Wind	N/A	N/A	Riverhead, Mattituck, Shelter Island	<p>A passing warm front triggered a severe thunderstorm that impacted Northeastern Suffolk County.</p> <p>In Riverhead, trees were reported down on Marcy, Sweezy and Hamilton Avenues with \$5K in property damage reported. A large tree was reported down on a house along Wilson Avenue with \$3K in property damage. Trees were reported down along Bailie Beach Road in Mattituck with \$1.5K in property damage. A tree was reported down along Osprey Road on Shelter Island with \$1K in property damage.</p>
August 4, 2015	Thunderstorm Wind, Hail	N/A	N/A	Nissequogue, Kings Park, St. James, Hauppauge, Stony Brook, Centereach, Setauket, Poquott, Belle Terre, Port Jefferson, Miller Place, Sound Beach, Rocky Point, Ridge, Shoreham, Wading River, Southold, North Haven, Orient Point, Fishers Island	<p>An approaching cold front triggered a cluster of severe thunderstorms producing multiple macrobursts that impacted the North Shore of Long Island, from Northwest Nassau County onto the North Fork of Long Island. Hail of 1.75 inches was reported in Mount Sinai. Hail of 1 inch was reported in Shoreham. A gust of 71 mph was measured at Great Gull Island. A wind gust of 95 mph was measured on the roof of Stony Brook University's Health Sciences Tower.</p> <p>Several trees were reported down on Frank Street in Nissequogue with \$3K in property damage. A tree was reported down, blocking Nowick Lane in the San Remo neighborhood of Kings Park with \$1K in property damage. Multiple trees and wires were reported down throughout the Hamlet of St. James with \$7.5K in property damage. Large branches and tree limbs were reported down at the intersection of Helen Marie Place and Bretton Road in Hauppauge with \$1K in property damage. A tree was reported down on Stony Brook Road in Stony Brook, resulting in \$1K in property damage. A second downed tree in Stony Brook brought down power lines over the track of the Port Jefferson Branch of the Long Island Railroad resulting in \$1K in property damage. Trees were reported down along Lower Sheep Pasture Road in Stony Brook resulting in \$3K in property damage. A large tree branch was reported down in Centereach resulting in 0.75K in property damage. A large tree was reported down on a house near the intersection of Dorn Place and Milford Lane in Centereach resulting in \$15K in property damage. A tree was reported down through a home on Settlers Way in Setauket resulting in \$7.5K in property damage. Multiple trees were reported down on Harmony Lane in Poquott, resulting in \$7.5K in property damage.</p> <p>Multiple trees were reported down on houses with roof damage, as well as power lines reported as down around the Port Jefferson Firehouse in Belle Terre resulting in \$25K in property damage. Numerous trees and power lines were reported down between Main Street and Bennets Road in South Setauket, resulting in \$15K in property damage. Multiple trees were reported down throughout the Village of Port Jefferson, resulting in \$10K in property damage. Two large trees were reported down in Miller Place, blocking Wylde Road, resulting in \$4K in property damage. A tree fell down on a fence in Miller Place, resulting in \$2K in property damage. A large tree was reported down on a car on Jackson Avenue in Sound Beach with \$10K in property damage reported. A tree was</p>



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					reported down on a car on Zenith Road in Rocky Point with \$10K in property damage reported. Numerous trees and wires were reported down with many roads blocked near the Leisure Village Area of Ridge. Large trees were reported down across the intersection of Dartmouth and Valentine Roads of Shoreham with \$6K in property damage reported. Multiple trees and power lines were reported down throughout the Hamlet of Wading River resulting in \$7.5K in property damage. Numerous trees and wires were reported down across Southold with \$7.5K in property damage reported. Trees and branches were reported down along Noyack Road with \$3K in property damage. Trees and wires were reported down across Shelter Island with \$7.5K in property damage. Trees and power lines were reported down throughout the Hamlet of Orient Point with \$7.5K in property damage reported. Trees and widespread large branches were reported down along the East End Road on Fishers Island resulting in \$5K in property damage.
January 10, 2016	High Wind	N/A	N/A	Southwest Suffolk	A warm front lifted to the north, allowing for high winds to mix down from aloft over portions of western Suffolk County. A gust of 71 mph was measured at the Captree State Park mesonet location at 920 a.m. and a gust of 60 mph was measured at Islip Airport ASOS at 943 a.m.
February 13, 2016	Strong Wind	N/A	N/A	Southwest Suffolk	Strong west winds were observed behind an arctic front. At 341 pm, a measured wind gust of 47 mph was observed at State Boat Channel in southwest Suffolk County. A National Weather Service employee witnessed an accident on Ocean Parkway, near Gilgo State Park. The wind flipped a minivan on its side. The driver sustained a broken leg as a result. \$20K in property damage was reported.
February 16, 2016	Strong Wind	N/A	N/A	Southwest Suffolk, Northwest Suffolk, Northeast Suffolk	Strong to isolated high winds occurred ahead of an area of low pressure and associated frontal boundary. A 56 mph wind gust was reported at Captree State Park at 255 pm. Republic Airport in Farmingdale reported a wind gust of 54 mph at 303 pm. Southwest Suffolk reported \$50K in property damages. A wind gust up to 55 mph was reported at Eatons Neck at 315 pm. Northwest Suffolk reported \$20K in property damage. A gust of 67 mph was measured at the mesonet location on Great Gull Island.
February 24, 2016	Strong Wind	N/A	N/A	Northwest Suffolk, Southeast Suffolk	Strong winds occurred behind a warm front and ahead of a cold front. The WeatherFlow station in Belle Terre measured a wind gust up to 52 mph at 1056 pm on the 24th. Numerous branches were knocked down due to strong winds with \$20K in property damage reported. At 136 am on 2/25, a wind gust to 54 mph was reported at Shirley, Brookhaven Airport. Numerous tree branches were knocked down across the area. Southeast Suffolk reported \$20K in property damage.





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Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Location	Description
February 25, 2016	Strong Wind	N/A	N/A	Southwest Suffolk, Northeast Suffolk, Stony Brook, Baiting Hollow, Southampton	<p>Strong winds occurred behind a warm front and ahead of a cold front. A wind gust of 58 mph was measured by ASOS at Brookhaven Airport in Shirley. A gust of 69 mph was measured at the mesonet location at Shinnecock Light.</p> <p>At the WeatherFlow station at Captree State Park, a wind gust to 56 mph was measured at 106 am. At Islip MacArthur Airport, a wind gust of 52 mph was measured at 208 am. At Republic Airport, wind gusts of 53 mph were measured at 1215 am. Numerous tree branches were knocked down due to strong winds. Southwest Suffolk reported \$20K in property damage. At 205 am, the WeatherFlow station measured a wind gust up to 69 mph near Hampton Bays. Northeast Suffolk reported \$10K in property damage. The WeatherFlow station near Plum Island measured a wind gust up to 51 mph at 228 am on the 25th. Numerous tree branches were knocked down due to strong winds. Northeast Suffolk reported \$20K in property damage. A trained spotter measured a gust of 67 mph and several large branches were reported down throughout the West Meadow Beach neighborhood of Stony Brook resulting in 0.5K in property damage. Wires were reported down at the intersection of Sound Avenue and Warner Drive in Baiting Hollow with \$0.75K in property damage reported. Multiple trees and power lines were reported down throughout the Town of Southampton with \$7.5K in property damage.</p>
March 28-29, 2016	High Wind	N/A	N/A	Northwest Suffolk, Northeast Suffolk, Southwest Suffolk.	<p>High winds occurred behind deepening low pressure.</p> <p>At Eatons Neck, a wind gust up to 58 mph was measured at 1115 pm. Northwest Suffolk reported \$10K in property damage. Near Plum Island, a mesonet site reported a wind gust up to 56 mph at 1008 pm. Near Calverton, a wind gust up to 53 mph was measured at 1230 am on the 29th. Northeast Suffolk reported \$10K in property damage. The ASOS at Republic Airport in Farmingdale measured a wind gust up to 51 mph at 107 am. Southwest Suffolk reported \$10K in property damage.</p>
April 3, 2016	High Wind	N/A	N/A	Northwest Suffolk, Southwest Suffolk, Northeast Suffolk, Southeast Suffolk	<p>Deep low pressure tracked just to the east of the area.</p> <p>In Eatons Neck, a wind gust up to 63 mph was measured by a mesonet station at 910 am. Northwest Suffolk reported \$20K in property damage. At 9 am, the public reported trees and power lines down due to the high winds in West Islip, on Udall Road and Jean Road. In Islip, a tree was knocked down on cars on Patricia Ave. The tree also brought down wires. This occurred at 930 am. At 1130 am, a tree was reported down by the public in North Babylon. It was downed on Route 231 and the Southern State Parkway. Southwest Suffolk reported \$100K in property damage. At 910 am, a mesonet station measured a wind gust up to 68 mph, near Calverton. Another station near Plum Island measured a wind gust of 62 mph at 923 am. Northeast Suffolk reported \$100K in property damage. The broadcast media reported a downed tree, which blocked Evergreen Avenue at 10 am. Southeast Suffolk reported \$50K in property damage.</p>





Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Location	Description
July 1, 2016	Thunderstorm Wind	N/A	N/A	Riverhead, Mattituck	<p>A passing cold front triggered isolated severe thunderstorms in Orange and Suffolk Counties.</p> <p>There were multiple reports of trees and wires down throughout Riverhead resulting in \$3K in property damage. Trees were reported down in Mattituck resulting in \$3K in property damage.</p>
July 18, 2016	Thunderstorm Wind	N/A	N/A	West Gilgo Beach	<p>A passing cold front triggered isolated severe thunderstorms over the Lower Hudson Valley, New York City, and Long Island.</p> <p>A gust of 58 mph was measured at the Gilgo Beach mesonet location.</p>
August 10, 2016	Lightning, Thunderstorm Wind, Tornado	N/A	N/A	East Marion, Beixedon Estates, Mattituck, Noyack, Sag Harbor, Amagansett	<p>A trough of low pressure helped trigger isolated severe storms, which impacted Suffolk County. This storm produced a tornado.</p> <p>A house was struck by lightning on Bailey Avenue, between Knapp and Champlin Places, resulting in a fire. This was between Greenport and East Marion and resulted in \$25K in property damage. Trees and wires were reported down, blocking Lighthouse Road near Soundview Avenue, just east of Horton Point Lighthouse on the north fork. Beixedon Estates reported \$3K in property damage. A house was struck by lightning on Wells Avenue in Southold, causing a fire which destroyed the house resulting in \$500K in property damage. Trees were reported down at the intersection of Mill Lane and Route 25, just east of Mattituck resulting in \$4K in property damage. A house was struck by lightning on Poplar Street, between Noyack Road and Benard Place in Noyack, resulting in a fire and \$25K in property damages. A house was struck by lightning on Union Street, between Madison and Division Streets in Sag Harbor, resulting in a fire resulting in \$25K in property damage. A house on the corner of Montauk Highway and Atlantic Avenue was struck by lightning, resulting in a fire. This was east of Amagansett and resulted in \$25K in property damage.</p> <p>The National Weather Service in New York, NY confirmed a weak tornado near Mattituck in Suffolk County, New York on August 10, 2016. Based on a survey conducted by an NWS Meteorologist, and information from NWS doppler weather radar data, emergency management, and trained Skywarn spotters, the National Weather Service confirmed a weak EF0 tornado occurred in Mattituck, caused by a severe thunderstorm moving over the area. Most wind damage was concentrated between Main Road and New Suffolk Avenue close to the corridor from Cardinal Drive southeast to Blossom Bend, where the tornado lifted before reaching New Suffolk Avenue. Wind damage was confined mainly to trees, where several trees were snapped in half. Based on this limited damage, this tornado is classified as an EF-0 with wind gusts up to 70 mph.</p>





Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Location	Description
August 12, 2016	Thunderstorm Wind	N/A	N/A	Lloyd Harbor	A trough of low pressure helped trigger isolated severe storms, which impacted Nassau and Suffolk Counties. A tree was reported down on Soundcrest Lane in Lloyd Harbor resulting in \$1K in property damage.
October 22, 2016	Strong Wind	N/A	N/A	Northwest Suffolk, Northeast Suffolk, Southeast Suffolk	Strong winds occurred behind deep low pressure. At Eatons Neck, a mesonet site measured a gust up to 53 mph at 8:05 pm. Northwest Suffolk reported \$30K in property damage. A gust up to 56 mph was measured near Fishers Island at 12:31 am on the twenty third of October. On 10/22, a gust to 56 mph was measured at 8:15 pm near Calverton. Around 10:33 pm, a gust up to 55 mph was measured near Plum Island. Northeast Suffolk reported \$50K in property damage. Near North Haven, a measured gust up to 53 mph occurred at 9:23 pm. Southeast Suffolk reported \$30K in property damage.
November 11, 2016	Strong Wind	N/A	N/A	Northeast Suffolk	Strong winds occurred ahead of and behind a cold front. A wind gust up to 53 mph occurred near Calverton at 3:30 pm. Northeast Suffolk reported \$20K in property damage.
November 20, 2016	Strong Wind	N/A	N/A	Northeast Suffolk, Southwest Suffolk	Strong winds occurred behind a deepening area of low pressure. At 10:00 am, strong winds in Orient knocked down a phone pole on Route 25 near the Oysterponds School and Fire House. A mesonet station in Orient measured a wind gust up to 56 mph at 5:40 pm. Northeast Suffolk reported \$50K in property damage. A wind gust up to 51 mph was measured near Ocean Beach at 5:00 pm. Southwest Suffolk resulted in \$50K in property damage.
November 21, 2016	Strong Wind	N/A	N/A	Southeast Suffolk	Strong winds occurred behind a deepening area of low pressure. At 4:15 am, a measured gust up to 50 mph occurred near Hampton Bays. Southeast Suffolk reported \$50K in property damage.
December 15, 2016	Strong Wind	N/A	N/A	Southeast Suffolk, Northeast Suffolk	Strong winds occurred behind a deep area of low pressure. At 1155 am near Mecox Bay, a wind gust up to 55 mph was measured. Southeast Suffolk reported \$50K in property damage. A wind gust up to 55 mph was measured near Fishers Island at 940 pm. Northeast Suffolk reported \$30K in property damage.
January 23, 2017	Strong Wind	N/A	N/A	Southwest Suffolk, Northeast Suffolk, Southeast Suffolk	Deep low pressure passed south and east of Long Island. At Islip MacArthur Airport, a gust up to 55 mph was measured at 208 am on the 24th. Near Oakville, a 55 mph gust was observed at 225 am on the 24th. Near Blue Point, a 52 mph gust was measured at 1220 am on the 24th, and a 50 mph gust was observed near



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				Suffolk, Northwest Suffolk	<p>Amityville at 305 pm on the 23rd. In Sayville at 530 pm on the 23rd, a National Weather Service employee reported utility lines down from wind at Railroad and Center Streets. Southwest Suffolk reported \$50K in property damage.</p> <p>A mesonet nearby in Napeague reported a gust to 62 mph at 158 am on the 24th. Another mesonet station reported a gust to 52 mph in Cutchogue at 418 pm on the 23rd. A trained spotter reported a downed large tree in Orient at Old Farm Road and Orchard Street at 7 am on the 24th. In Riverhead, law enforcement reported a downed utility pole on East Main Street and Union Avenue at 5 pm on the 23rd. Northeast Suffolk reported \$100K in property damage.</p> <p>The highest wind gust of 69 mph occurred at 115 am on the 24th near Mecox Bay. At 158 am on the 24th, a wind gust of 62 mph was reported near Napeague. At 105 am, a 62 mph gust occurred near Hampton Bays. At 415 pm on the 23rd, a wind gust of 62 mph was observed near Montauk Highway over the southeast fork. A 60 mph gust was measured near Hither Hills at 113 am on the 24th. Sag Harbor observed a wind gust of 57 mph at 549 pm on the 23rd. The broadcast media reported a road closed due to fallen power lines on Henry Road in Southampton at 8 am on the 24th. Southeast Suffolk reported \$100K in property damage.</p> <p>The mesonet station at Eatons Neck reported a wind gust up to 54 mph at 1030 pm on the 23rd. At 6 am on the 24th, a large tree was knocked down along the side of an apartment building at Lake Point Drive and Picasso Way. This was reported by the public. In Melville, a trained spotter reported a large branch blocking Beamont Drive at 413 pm on the 23rd. Northwest Suffolk reported \$100K in property damage.</p>
February 13, 2017	High Wind	N/A	N/A	Northwest Suffolk, Southeast Suffolk, Northeast Suffolk, Southwest Suffolk	<p>Low pressure passed to the east and rapidly deepened.</p> <p>At Eatons Neck, the mesonet station measured a wind gust to 59 mph at 530 am. Near Northport, a mesonet station measured a wind gust to 64 mph at 105 pm. Northwest Suffolk reported \$50K in property damage. A mesonet station at Mecox Bay reported a wind gust up to 64 mph at 115 pm. Near Montauk Highway across the southeast fork, a wind gust up to 58 mph was measured at another mesonet station at 1015 am. Southeast Suffolk reported \$50K in property damage. A mesonet station reported a wind gust up to 67 mph at 205 pm near Calverton. In Orient, a wind gust up to 58 mph was reported by a trained spotter at 1101 am. Northeast Suffolk reported \$50K in property damage.</p> <p>The ASOS at Farmingdale Airport reported a wind gust up to 58 mph at 1158 am. In Deer Park, the public reported tree limbs and power lines down at Oak Street and Deer Park Avenue at 10 am. In addition, the broadcast media reported a large tree was knocked down onto a car, and took down power lines on 10th street in West Babylon at 8 am. In North Babylon, branches were knocked down onto wires in the vicinity of Whittier</p>



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					Avenue, Thorn Street and Route 231 at 11 am according to the public. Southwest Suffolk reported \$100K in property damage.
March 2, 2017	Strong Wind	N/A	N/A	Southwest Suffolk, Northeast Suffolk, Southeast Suffolk, Northeast Suffolk	<p>Gusty northwest winds occurred behind a strong cold front.</p> <p>At 851 am, a mesonet station near Copiague measured wind gusts up to 51 mph. At 434 am, a mesonet station reported wind gusts up to 50 mph near Captree State Park. At 11 am, the public reported large tree limbs were knocked down, along with power lines in East Patchogue. There were power outages in the area. Southwest Suffolk reported \$100K in property damage.</p> <p>A mesonet station reported a wind gust up to 58 mph at 630 am. At 915 am, the public reported trees and power lines down on Carls Path and Cass Street in the town of Dix Hills. At 945 am, the public also reported a power outage in Kings Park in a large section of town. This included Main Street and southward down to St Johnland Road. Another power outage was reported by the public in East Setauket. This occurred at 1130 am and was caused by downed power lines. Northeast Suffolk reported \$100K in property damage.</p> <p>A mesonet station near the town of Hampton Bays measured a wind gust up to 50 mph at 9 am. Southeast Suffolk reported \$10K in property damage. A trained spotter in Orient reported a wind gust up to 61 mph at 941 am. Northeast Suffolk reported \$10K in property damage.</p>
March 3, 2017	Strong Wind	N/A	N/A	Northeast Suffolk, Northwest Suffolk	<p>Strong gusty winds occurred behind a surface trough.</p> <p>Near Calverton, a mesonet station measured a wind gust to 55 mph at 940 pm. Northeast Suffolk reported \$10K in property damage. Near Eatons Neck, a mesonet station measured a wind gust to 55 mph at 1040 pm. Northwest Suffolk reported \$10K in property damage.</p>
March 14, 2017	High Wind	N/A	N/A	Southeast Suffolk, Northwest Suffolk, Northeast Suffolk	<p>On Tuesday, March 14th, rapidly deepening low pressure tracked up the eastern seaboard.</p> <p>A 61 mph gust was measured at Hither Hills State Park at 1014 am. At 1145 am, the public reported high winds knocked down power lines in Hampton Bays. In East Hampton, the fire department reported all lanes of Montauk Highway were closed between Davids Lane and Dayton Lane due to downed trees. This occurred at 309 pm. At 103 pm, a mesonet station in East Moriches measured a wind gust to 52 mph. Southeast Suffolk reported \$100K in property damage. At 1035 am, the mesonet station at Eatons Neck measured a 62 mph wind gust. At 1130 am, law enforcement reported a tree and</p>



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					wires down in Huntington Station on Park Avenue due to the high winds. Northwest Suffolk reported \$50K in property damage.  A trained spotter measured a wind gust up to 68 mph at 135 pm in Orient. A mesonet station near Fishers Island measured a wind gust up to 67 mph at 129 pm. A National Weather Service employee observed trees down on the grounds of Brookhaven National Laboratory in Upton at 227 pm. A mesonet station near Calverton observed wind gusts up to 58 mph at 540 pm. Northeast Suffolk reported \$50K in property damage.
March 22, 2017	Strong Wind	N/A	N/A	Northwest Suffolk, Southwest Suffolk, Northeast Suffolk, Southeast Suffolk	Gusty northwest winds occurred behind deep low pressure and strong cold front.  A mesonet station near Eatons Neck reported a wind gust up to 51 mph at 925 am. At 145 pm, the public reported trees, branches, and power lines down on Nichols Road in Nesconset. In West Hills, the public reported that power lines were knocked down around 330 pm due to a fallen tree, which resulted in a local power outage. Northwest Suffolk reported \$100K in property damage.  The public reported a large tree branch was knocked down at 945 am, and partially blocked a road in North Babylon. In Patchogue, law enforcement reported wires down on North Prospect Avenue at 145 pm. Southwest Suffolk reported \$50K in property damage. A trained spotter in Orient measured a wind gust up to 53 mph at 240 pm. Near Calverton, a mesonet station measured a wind gust up to 52 mph at 1135 am. Northeast Suffolk reported \$50K in property damage.  The ASOS at Westhampton Gabreski Airport reported a wind gust up to 54 mph at 1246 pm. A gust up to 52 mph was measured by a mesonet station near Montauk Highway at 139 pm, and a 50 mph gust was measured by another mesonet station near Hampton Bays at 3 pm. Southeast Suffolk reported \$50K in property damage.
April 6, 2017	Thunderstorm Wind	N/A	N/A	Hauppauge, Smithtown, West Islip, Selden	An approaching cold front triggered isolated severe thunderstorms impacting Nassau and Suffolk counties. A gust of 59 mph was measured at the Mt. Sinai Harbor mesonet location.  Numerous trees were reported down throughout the Hamlet of Hauppauge resulting in \$5K in property damage. Multiple trees were reported down throughout the town of Smithtown, including one on a house. A shed was also lifted off the ground. Smithtown reported \$10K in property damage. Large tree limbs were reported down on wires in West Bayshore in Islip resulting in \$1.5K in property damage. A tree was reported down on South Bicycle Path near Selden resulting in \$1K in property damage.
May 2, 2017	Strong Wind	N/A	N/A	Southwest Suffolk	Strong winds occurred behind a cold front.





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					At 623 pm, law enforcement reported a tree down on Great East Neck Road, at Montauk Highway in the town of West Babylon resulting in \$50K in property damage.
September 6, 2017	Thunderstorm Wind	N/A	N/A	Shelter Island, Orient	A passing cold front triggered an isolated severe thunderstorm which impacted Eastern Suffolk County. Wires and branches were reported down on Shelter Island resulting in \$1.5K in property damage. A tree was reported down on Old Main Road , just north of Main Road (25) in Orient resulting in \$1K in property damage.
October 24, 2017	Strong Wind	N/A	N/A	Northwest Suffolk, Southwest Suffolk	Strong winds occurred ahead of and behind a cold front. The Department of Highways reported a tree leaning on wires that closed Route 25A between Stony Road and Wellington Drive in Stony Brook. This occurred at 1025 pm. At 8 am in Miller Place, a large tree branch was knocked down on power lines on Sylvan Avenue. This was reported by social media. Northwest Suffolk reported \$50K in property damage. At 145 pm, power lines were knocked down resulting in power outages along the south side of Union Blvd. in Bay Shore. This was reported by the public. Southwest Suffolk reported \$50K in property damage.
October 29-30, 2017	High Wind	N/A	N/A	Southeast Suffolk, Northeast Suffolk, Southwest Suffolk, Northwest Suffolk	A low pressure system rapidly intensified as it moved north, passing west of the local area. A mesonet station near Hampton Bays measured a 67 mph wind gust at 1135 pm on the 29th. At 1215 am on the 30th, a trained spotter in Montauk measured a wind gust to 67 mph. Another mesonet station measured a wind gust to 64 mph at Hither Hills at 206 am on the 30th. A mesonet station in Mastic Beach measured a wind gust to 63 mph at 841 pm on the 29th. At 11 pm on the 29th, the broadcast media reported trees down with power outages across town. Southeast Suffolk reported \$100K in property damage. A mesonet station, at an elevation of 53 feet, measured a 75 mph gust near Plum Island at 210 am on the 30th. Another mesonet station near Fishers Island measured a wind gust to 64 mph at 130 am on the 30th. At 915 pm on the 29th, a trained spotter observed power lines down, which led to power outages for the town of Orient. At 929 pm, a trained spotter in Manorville observed several medium sized trees down. At 11 pm, a National Weather Service employee reported a large tree down on Duryea Street in Riverhead. At the National Weather Service office in Upton, a large tree limb and branch was downed, which blocked the adjacent road around 1 am. Northeast Suffolk reported \$100K in property damage.



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Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Location	Description
					<p>A 67 mph gust was measured at a mesonet station at Captree State Park at 1109 pm on the 29th. Near Copiague, a mesonet station measured a wind gust to 59 mph at 1204 am on the 30th. In the town of Babylon, social media reported a wind gust to 63 mph at 1019 pm on the 29th. Also in Babylon, a downed tree on East Main Street was reported by the public at 1145 pm. Sustained winds of 41 mph were measured at Farmingdale Airport at 1041 pm, and at Islip MacArthur Airport at 1044 pm on the 29th. Southwest Suffolk reported \$50K in property damage.</p> <p>At 1030 pm on the 29th, the broadcast media reported a large tree uprooted and fell onto a roof of a home on Sherbrooke Drive in Hauppauge. At 1045 pm, a National Weather Service employee observed a tree down on power lines on NY454 and NY111 in Hauppauge. At the same time, the media reported a large tree down blocking Boulder Street in Ronkonkoma. In Huntington, numerous trees snapped and were uprooted with trees and power lines down throughout the town around 11 pm. At midnight on the 30th, the broadcast media reported a large branch down on a minivan in East Northport. At 2 am on the 30th, a National Weather Service employee reported numerous large branches down on Hargrove Drive in Stony Brook. At 6 am in Hauppauge, the broadcast media reported power lines down with a transformer fire on Veterans Highway, leading to a road closure. A mesonet station measured a 60 mph wind gust near Belle Terre at 1105 pm on the 29th. Northwest Suffolk reported \$500K in property damage.</p>
November 19, 2017	Strong Wind	N/A	N/A	Southwest Suffolk, Northeast Suffolk, Northwest Suffolk, Southeast Suffolk	<p>Strong gusty northwest winds occurred behind a strong cold front.</p> <p>At 1118 am, the public reported a downed tree across a sidewalk and yard in the town of Babylon due to the winds. The broadcast media also reported a large tree snapped and fell onto a roof of a home at Parkway Boulevard resulting in structural damage in Wyandanch around 1130 am. Southwest Suffolk reported \$50K in property damage.</p> <p>Several mesonet stations reported strong gusts in excess of 50 mph. At 1105 am, the mesonet at Great Gull Island measured a gust to 56 mph. At Fishers Island, a gust to 52 mph was observed at 11 am. Near Calverton, a gust to 51 mph was measured at 1250 pm. Northeast Suffolk reported \$1K in property damage.</p> <p>At 1245 pm, law enforcement reported multiple trees and power lines down due to the winds causing power outages in the towns of Greenlawn, Elwood, and East Northport. The mesonet station in Eatons Neck measured a 56 mph wind gust at 1140 am. Northwest Suffolk reported \$10K in property damage.</p>
December 25, 2017	Strong Wind	N/A	N/A	Northeast Suffolk	Strong winds developed behind deepening low pressure and a cold front.





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Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Location	Description
					At 1220 pm, the mesonet station located on Great Gull Island reported a wind gust of 56 mph, and a gust to 52 mph was measured on Fishers Island Airport at 1210 pm. Northeast Suffolk reported \$10K in property damage.
March 2, 2018	High Wind	N/A	N/A	Northwest Suffolk, Southeast Suffolk, Southwest Suffolk, Northeast Suffolk	<p>A deep area of low pressure passed off the coast.</p> <p>The mesonet station at Eatons Neck reported a 69 mph wind gust at 320 pm. At 215 pm, a trained spotter reported a large tree down on the corner of Roundtree Drive and Beaumont Drive in Melville. Around 220 pm in Smithtown, the Department of Highways reported a tree down on NY 25A at Sunken Meadow Road, with all lanes closed. In Mount Sinai, the public reported a tree down on Mead Avenue around 430 pm. Northwest Suffolk reported \$100K in property damage.</p> <p>The mesonet station in Napeague measured a 62 mph wind gust at 350 pm. At Montauk Airport, a 58 mph wind gust was reported at 7 pm. Southeast Suffolk reported \$10K in property damage. A trained spotter in Babylon measure a 61 mph wind gust around 535 pm. At 430 pm, the public reported trees down in Babylon and West Islip causing power lines to come down and power outages along Montauk Highway in both towns. Southwest Suffolk reported \$100K in property damage.</p> <p>The mesonet station measured a 65 mph wind gust at 745 pm at Great Gull Island. A trained spotter measured a 58 mph wind gust in Orient at 525 pm. At 7 pm, a trained spotter reported a tree down causing wires to come down in the town of Orient. Northeast Suffolk reported \$50K in property damage.</p>
April 4, 2018	Strong Wind	N/A	N/A	Northwest Suffolk	<p>Strong winds occurred ahead of and behind a cold front.</p> <p>A mesonet station at Eatons Neck measured a 51 mph wind gust at 715 pm. Northwest Suffolk reported \$10K in property damage.</p>
April 16, 2018	Strong Wind	N/A	N/A	Southwest Suffolk, Northeast Suffolk	<p>Strong winds occurred ahead of deep low pressure and associated warm front.</p> <p>The mesonet station at the Fire Island Coast Guard measured a 61 mph wind gust at 1009 am. The instrument is elevated at a height of 34 ft. Southwest Suffolk reported \$10K in property damage. The mesonet station at Great Gull Island measured a 61 mph wind gust at 151 pm. The instrument is elevated at 53 ft. Northeast Suffolk reported \$10K in property damage.</p>
May 15, 2018	Thunderstorm Wind	N/A	N/A	Eatons Neck, Fishers Island Airport	An approaching cold front triggered numerous severe thunderstorms over southeastern New York. These storms produced 3 tornadoes in the Lower Hudson Valley, as well as microbursts and macrobursts.



**SECTION 5.4.13: RISK ASSESSMENT – SEVERE STORM**

Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Location	Description
					A 59 mile per hour wind gust was reported at Eatons Neck mesonet, and winds at 71 ft. A 55 mile per hour gust was reported at Great Gull Island mesonet resulting in \$1K in property damage.
July 17, 2018	Lightning	N/A	N/A	Terryville	A cold front approached from the west and brought a line with isolated severe thunderstorms across Westchester County.  Lightning struck a fence and shattered it in Terryville resulting in \$0.75K in property damage.
August 9, 2018	Thunderstorm Wind	N/A	N/A	Commack	A cold front and a mid level disturbance moved through the region and triggered severe thunderstorms.  A large tree took down powerlines on Old Indian Head Road between Vance Street and Jericho Turnpike in Commack resulting in \$4K in property damage.
August 11, 2018	Thunderstorm Wind	N/A	N/A	Ridge	A slow moving cold front along with an upper level disturbance triggered thunderstorms across the region.  Numerous large tree branches reported down on farm along Route 25 in Ridge resulting in \$4K in property damage.
August 18, 2018	Lightning	N/A	N/A	Lake Ronkonkoma, San Remo	A cold front along with an upper level disturbance triggered thunderstorms across the southeastern New York.  Wires were down at Portion Road and Patchogue-Holbrook Road in Lake Ronkonkoma resulting in \$2K in property damage. A person struck by lightning sheltering under a tree at Sunken Meadow Park resulting in one fatality.
October 2, 2018	Thunderstorm Wind, Tornado, Lightning	N/A	N/A	Miller Place, Babylon, Wyandanch, Hauppauge, Islip, Ronkonkoma, Yaphank	An approaching cold front triggered severe thunderstorms across southeastern New York, they produced 3 tornadoes across Rockland, Westchester and Suffolk Counties.  Tree down on a car on Falmouth Drive. A tree came down on a car on Falmouth Drive in Miller Place resulting in \$5K in property damage. Trees reported down by media in Babylon resulting in \$3K in property damage. Tree reported down in Wyandanch resulting in \$1K in property damage. Multiple trees reported down in a field on Bridge Road in Hauppauge resulting in \$5K in property damage. Tree reported down on Veterans Highway between Connectquot Avenue and 5th Avenue in Central Islip resulting in \$1K in property damage. Lightning strike reported by Broadcast Media in Yaphank resulted in \$6K in property damage.  A National Weather Service Storm Survey of damage in the Hamlet of Ronkonkoma New York was conducted in conjunction with the Town of Islip. Based on the results of this survey and NWS Doppler Radar data the following information has been determined.







Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Location	Description
					The tornado originated just north of the western end of Seneca Street and ended about one-eighth of a mile east of the intersection of Mohican Avenue and Seneca Street. The damage was confined to between Iroquois and Ontario streets along Mohican Avenue. Numerous homes sustained damage to siding and gutters and outdoor furniture. Trees have visibly sheared tops, and at least two or three trees were downed on cars. This damage is consistent with maximum wind speeds of around 85 mph, making this an EF-0 tornado. The tornado had a maximum path width of around 200 yards and was on the ground continuously for around 400 yards. Damage from the tornado resulted in \$100K in property damage.
October 27, 2018	High Wind	N/A	N/A	Southwest Suffolk, Southeast Suffolk, Northeast Suffolk	A coastal storm moved to the east of the area. Social media reported a tree down in West Babylon on 17th street in West Babylon around 630 am. Later in the day in the town of West Islip, wires and branches were reported down on Higbie Lane at 2 pm. This report was from the public. Southwest Suffolk reported \$50K in property damage. The public reported a wind gust up to 66 mph around 955 am in Amagansett. The mesonet station at Shinnecock, a gust up to 60 mph was reported at 1018 am. Southeast Suffolk reported \$50K in property damage. The mesonet station at Great Gull Island reported a wind gust to 65 mph at 1045 am. The site is at an elevation of 53 ft. Northeast Suffolk reported \$10K in property damage.
October 29, 2018	Tornado	N/A	N/A	Fishers Island	An upper level disturbance associated with an upper level low in Southeastern Canada, along with a surface trough of low pressure approaching from the west resulted in a line of severe thunderstorms which produced a tornado over Fishers Island, NY. The tornado began around one quarter of a mile east of Wilderness Point on Wilderness Road. A circular house sustained minor damage with glass shattered and blown nearby. A beam of the house was lifted up a hill and dropped near another home. Several trees were uprooted and snapped, and a shed was toppled over. A few trees were downed at another home across the street in a convergent pattern, with a small fence toppled over. This damage was consistent with an EF0 tornado. The tornado continued moving to the northeast with EF0 damage near a home on Isabella Beach Road. Many trees were uprooted and snapped. One tree fell over and a piece of its trunk was forced several feet into the ground. The EF0 tornado continued northeast along Isabella Beach Road with a few trees and branches downed by the intersection of Old Mallory Road. More significant damage occurred about a tenth of a mile from the intersection of Old Mallory Road and East End Road. Large hardwood trees were snapped, twisted, and sheared off. Several trees were downed and uprooted. A large branch fell through the roof of the garage on the property and another branch caused minor damage to the back of the roof of the home. The damage at this location was consistent with an EF1 tornado with estimated max wind speeds of 90 mph. The tornado weakened to an EF0 as it continued moving northeast. Several trees were snapped and uprooted near the intersection of East End Road and



Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Location	Description
					Cedar Ridge. A small shed was also toppled over. A few trees were downed about a tenth of a mile north of the intersection of East End Road and Clay Point Road. This is where the tornado moved off of Fishers island. \$50K in property damage was reported.
November 3, 2018	Strong Wind	N/A	N/A	Northwest Suffolk, Northeast Suffolk	Low pressure deepened as it moved to the northeast, with strong westerly winds in its wake on Saturday November 3rd.  At 1 pm in the town of Miller Place, large tree limbs and branches were knocked down on Sarah Anne Court. Northwest Suffolk reported \$50K in property damage. A trained spotter in the town of Orient reported a wind gust of 59 mph at 219 pm. A gust as high as 58 mph was measured at a mesonet site on Great Gull Island at 240 pm. Northeast Suffolk reported \$50K in property damage.
November 15-16, 2018	Strong Wind	N/A	N/A	Northwest Suffolk, Southwest Suffolk, Southeast Suffolk, Northeast Suffolk	Strong east to northeast winds developed across the region Thursday Night into early Friday morning, as an intensifying coastal storm tracked across the area.  The mesonet station in Eatons Neck reported a wind gust to 52 mph at 934 pm. Northwest Suffolk reported \$10K in property damage. During the overnight hours on November 16th, a couple of mesonet stations reported wind gusts over 50 mph. They include Point O Wodds Yaht Club at 105 am, with a wind gust up to 57 mph, and a gust of 55 mph at the Fire Island Coast Guard station at 111 am. Southwest Suffolk reported \$50K in property damage.  During the overnight hours on November 16th, numerous mesonet stations reported wind gusts over 50 mph. Many are elevated. The highest reports from these elevated stations include 64 MPH at Shinnecock around 333 am, 59 mph in the town of Napeague at 355 am, 55 mph in Mecox Bay at 307 am, and 52 mph at the East Moriches Coast Guard station at 152 am. Southeast Suffolk reported \$50K in property damage.  During the overnight hours on November 16th, numerous mesonet stations reported wind gusts over 50 mph. Many are elevated. The highest reports from these elevated stations include 67 MPH at Great Gull Island around 326 am, 59 mph at the Fishers Island Airport at 345 am, and 52 mph in the town of Peconic at 320 am. Northeast Suffolk reported \$50K in property damage.
November 25-26, 2018	Strong Wind	N/A	N/A	Southeast Suffolk, Northeast Suffolk, Southwest Suffolk	A coastal storm passed east of Long Island resulting in strong winds.  During the overnight hours on November 25th, a few observing sites reported wind gusts over 50 mph. The highest report was from an elevated mesonet station in Shinnecock around 318 am. The wind gusted as high as 58 mph at this elevated station. In Napeague, a wind gust of 54 mph was measured at 425 am. The ASOS located at Westhampton Airport reported a wind gust of 51 mph at 241 am. Southeast Suffolk reported \$10K in property damage.



Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Location	Description
					A wind gust of 53 mph was measured in Great Gull Island at 751 pm. A 50 mph gust was reported at Fishers Island at 845 pm. Northeast Suffolk reported \$10K in property damage. A wind gust of 51 mph was measured at the mesonet station in Eatons Neck at 937 pm. Southwest Suffolk reported \$10K in property damage.
December 21, 2018	Strong Wind	N/A	N/A	Northwest Suffolk, Northeast Suffolk	Intensifying low pressure moving up the spine of the Appalachians on December 21st and into southern Quebec the morning of the 22nd produced strong southeast winds.  An elevated mesonet station in Eatons Neck reported a wind gust up to 57 mph around 629 am. At 1230 pm, Route 25A was closed between Hunter Avenue and North Country Road due to a downed electrical transformer. This occurred in Miller Place resulting in \$50K in property damage. A 65 mph gust was measured by a trained spotter in the town of Orient at 1240 pm. Northeast Suffolk reported \$10K in property damage.
January 21, 2019	High Wind	N/A	N/A	Northeast Suffolk, Northwest Suffolk, Southeast Suffolk	Deep low pressure tracked to the northeast of the area.  A 60 MPH wind gust was measured at the mesonet station on Great Gull Island at 844 am. Northeast Suffolk reported \$10K in property damage. The mesonet station near Middle Island reported a wind gust up to 64 mph at 1215 pm. Another mesonet station in Eatons Neck measured a 54 mph wind gust at 435 pm. Northwest Suffolk reported \$10K in property damage. The mesonet station in Shinnecock measured a 50 mph wind gust at 1028 pm. Southeast Suffolk reported \$10K in property damage.
January 24, 2019	Strong Wind	N/A	N/A	Northwest Suffolk, Southwest Suffolk, Southeast Suffolk, Northeast Suffolk	Strong winds occurred ahead of and behind low pressure and a cold front.  The mesonet station at Eatons Neck measured a 55 mph wind gust at 1021 am. Northwest Suffolk reported \$10K in property damage. A measured sustained wind of 40 mph was observed at Farmingdale Airport at 1132 am. Southwest Suffolk reported \$50K in property damage.  The mesonet station at Shinnecock measured a 53 mph wind gust at 1233 pm. The ASOS at Shirley, Brookhaven Airport reported a 52 mph wind gust at 152 pm. Sustained winds of 36 mph were measured at Shirley Airport at 153 pm. Southeast Suffolk reported \$10K in property damage. The mesonet station at Great Gull Island measured a 61 mph wind gust at 239 pm. Northeast Suffolk reported \$50K in property damage.
January 30, 2019	High Wind	N/A	N/A	Southeast Suffolk, Southwest Suffolk, Northwest Suffolk	High winds occurred behind low pressure and cold front.  At 450 pm, a wind gust of 59 mph was measured at the East Moriches Coast Guard Station. Around 448 pm, a mesonet station at Shinnecock measured a wind gust up to 57 mph. A 51 mph gust was reported at a mesonet station around Mecox Bay at 502 pm. A 35 mph sustained wind was measured at Westhampton Airport at 517 pm, and a 32 mph



**SECTION 5.4.13: RISK ASSESSMENT – SEVERE STORM**

Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Location	Description
					<p>sustained wind was measured at Shirley Brookhaven Airport at 649 pm. Southeast Suffolk reported \$50K in property damage.</p> <p>The ASOS at Islip Macarthur Airport measured a sustained wind of 33 mph at 503 pm. A 32 mph sustained wind was measured at Farmingdale Airport at 428 pm. A National Weather Service Employee reported a tree down around the Great River, East Islip border on Main Street. This occurred around 7 pm. Southwest Suffolk reported \$50K in property damage.</p> <p>The mesonet station at Eatons Neck measured a wind gust up to 64 mph at 431 pm. The elevation is 71 ft. Northwest Suffolk reported \$10K in property damage. The mesonet station at Orient Yacht Club measured a 64 mph wind gust around 544 pm. At Great Gull Island, a wind gust to 63 mph was reported around 609 pm. Northeast Suffolk reported \$50K in property damage.</p>
February 25, 2019	High Wind	N/A	N/A	Northwest Suffolk, Southwest Suffolk, Northeast Suffolk, Southeast Suffolk	<p>High winds occurred behind a strong cold front and deepening low pressure.</p> <p>A mesonet station at Eatons Neck reported a wind gust up to 66 mph at 111 am. The station elevation is 71 ft. Northwest Suffolk reported \$50K in property damage.</p> <p>A National Weather Service employee reported a tree down in the right lane on Sills Road and Woodside Ave in Medford around 9 am. Later in the day, around 430 pm, another National Weather Service Employee reported a tree down on a car with downed power lines on Woodland Lane in East Islip. Southwest Suffolk reported \$100K in property damage.</p> <p>A Co-Op observer in Orient measured a 69 mph gust at 10 am. A 61 mph gust was reported on Great Gull Island at 138 pm. This was at an elevation of 53 ft. Northeast Suffolk reported \$50K in property damage.</p> <p>The ASOS at Westhampton Airport measured a wind gust up to 58 mph at 1238 pm. Around the same time, the sustained wind was measured at 39 mph. A mesonet station located at the Coast Guard station in East Moriches measured a wind gust to 58 mph as well. This occurred at 131 pm. Southeast Suffolk reported \$50K in property damage.</p>
May 28, 2019	Hail	N/A	N/A	Westhampton Beach	<p>A warm front and mid level disturbance triggered severe thunderstorms across Southeastern New York.</p> <p>Hail of 1 inch in diameter reported in Westhampton Beach.</p>
June 2, 2019	Lightning, Thunderstorm Wind	N/A	N/A	Amityville, Northport, Mount Sinai	<p>A cold front and a mid level disturbance triggered severe thunderstorms across Southeast New York.</p>





**SECTION 5.4.13: RISK ASSESSMENT – SEVERE STORM**

Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Location	Description
					<p>Lightning struck a man and the home in Islip, injuring the man and resulting in \$6K in property damage. A tree crushed a fence on Deauville Boulevard in Copiague resulting in \$5K in property damage.</p> <p>Person was struck by lightning on Ocean Avenue in the village of Northport. The person had minor injuries. A house was struck by lightning on Dairy Lane in Mount Sinai resulting in \$6K in property damage.</p>
June 29, 2019	Thunderstorm Wind	N/A	N/A	North Lindenhurst	<p>A weak upper level disturbance in association with a cold front lead to the development of severe thunderstorms across Southeastern New York.</p> <p>Large tree branches down between porch and fence with time estimated by radar resulted in \$3K in property damage in North Lindenhurst.</p>
June 30, 2019	Thunderstorm Wind, Hail	N/A	N/A	Islip, West Sayville, Asharoken, Commack, Northport, Village of the Branch, Elwood, Huntington, Hauppauge, Sound Beach, Kings Park, Babylon, Brentwood, Bohemia, Shelter Island	<p>A strong upper level disturbance triggered severe thunderstorms across Southeastern New York. One inch hail reported in Islip. 0.75 inch hail was reported in West Sayville</p> <p>Trees and power lines reported down in Asharoken resulted in \$3K in property damage. Multiple trees and wires down from Northport to Commack resulting in \$7K in property damage. Trees down on Elder Drive and Cottonwood Drive resulted in \$3K in property damage in Commack. Multiple Large trees down on Rhoda Avenue resulted in \$7K in property damage in Village of the Branch. Trees down on Kenneth Avenue in Elwood resulted in \$3K in property damage. A large tree down on Ketay Drive North in East Northport resulted in \$4K in property damage. Large tree down on Bogart Street between Evergreen Avenue and Depot Road in Huntington resulted in \$4K in property damage. Multiple trees down on Yates Avenue in Commack resulted in \$4K in property damage. Downed trees and power lines on Townline Road in Hauppauge resulted in \$3K in property damage. Downed tree on Northern State Parkway westbound between Exit 43 at Commack Road and exit 42N at NY231 in Commack resulted in \$1K in property damage. Multiple trees down on Soma Lane in East Northport resulted in \$4K in property damage. Large tree branches reported down in Sound Beach resulted in \$3K in property damage. Large tree branches reported down in Mount Sinai resulted in \$2K in property damage. A 22 inch diameter tree snapped about 25 feet above the ground on Sunny Lane in Brightwaters resulted in \$1K in property damage. Trees reported down on Stanwich Road in Kings Park resulted in \$3K in property damage. Trees snapped and uprooted on Thorn Street in North Babylon resulted in \$3K in property damage. Large tree down into a home on Alkier Street in Brentwood resulted in \$10K in property damage. A large tree reported down on Wensley Lane in East Islip resulted in \$4K in property damage. A tree down in front of Islip Town Hall on Nassau Avenue in Islip resulted in \$1K in property damage. A large tree down on Locust Avenue and Brooktreet Court in Bohemia resulted in \$4K in property damage. Trees and power lines down on Campbell Lane in East Islip resulted in \$3K in property damage. Large tree branches reported down on Vail Street</p>





**SECTION 5.4.13: RISK ASSESSMENT – SEVERE STORM**

Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Location	Description
					near Route 111 in Islip resulted in \$2K in property damage. Wires brought down on West Neck Road in Shelter Island resulted in \$2K in property damage.
July 22, 2019	Thunderstorm Wind	N/A	N/A	West Gilgo Beach, McArthur Field, South Haven	A cold front stalled as a stationary boundary triggering severe thunderstorms that impacted Southeastern New York. A wind gust of 65 mph was recorded in West Gilgo Beach. A tree reported down on house resulted in \$11K in property damage in McArthur Field. Tree down on house along the William Floyd Parkway in South Haven resulted in \$11K in property damage.
July 30, 2019	Thunderstorm Wind, Hail	N/A	N/A	Wading River, Rocky Point	A mid level disturbance and a trough of low pressure at the surface triggered severe thunderstorms that impacted Southeastern New York. Wading River reported 0.75 inch hail. Trees reported down on Rocky Point Business District Bypass in Rocky Point resulted in \$3K in property damage.
August 22, 2019	Thunderstorm Wind	N/A	N/A	Babylon, Amityville, West Bayshore, Islip Terrace, Sayville, Bohemia, Ronkonkoma, Yaphank, Shelter Island	A cold front triggered severe thunderstorms across Southeastern New York. A thunderstorm wind gust of 60 mph was reported in Babylon. A tree down on Ketcham Avenue with outdoor furniture damage in Amityville resulted in \$2K in property damage. Multiple trees down on Copiague Road in Amityville Airport resulted in \$5K in property damage. Partial building collapse onto multiple vehicles on Executive Boulevard in Amityville resulted in \$30K in property damage. Large tree down on power lines on Richland Boulevard in West Bayshore resulted in \$5K in property damage. Large tree down on Grand Boulevard in Islip Terrace resulted in \$4K in property damage. Large oak tree snapped at the intersection of Depot Street and Railroad Avenue in Sayville resulted in \$3K in property damage. Multiple trees down on Walnut Avenue in Bohemia resulted in \$4K in property damage. Multiple trees and wires down across Ronkonkoma with several roads blocked resulted in \$7K in property damage. Large tree limbs ripped off tree near Michael Murphy Park in Lake Ronkonkoma resulted in \$3K in property damage. Trees and wires reported down on Raimond Street in Yaphank resulted in \$3K in property damage. Trees down on Yaphank Middle Island Road near Main Street and on East Main Street near River Road in Yaphank resulted in \$4K in property damage. Large tree limbs blocking westbound lane of Moriches Middle Island Road just east of the William Floyd Parkway in Yaphank resulting in \$2K in property damage. Trees and wires down throughout island in Shelter Island resulted in \$7K in property damage.
September 2, 2019	Tornado, Funnel Cloud	N/A	N/A	Manorville	A cold front in tandem with a mid level disturbance triggered severe thunderstorms, including a tornado in Manorville.





**SECTION 5.4.13: RISK ASSESSMENT – SEVERE STORM**

Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Location	Description
					<p>A severe thunderstorm moving northeast over Mastic/Shirley and then into Manorville in southeast Suffolk County produced an EF0 tornado. The tornado first touched down on Dayton Street, about 400 yards south of the intersection of South Street and Dayton Avenue in Manorville. It sheared large tree limbs and the tops off of dozens of oak, maple and pine trees, as well as uprooting at least a dozen shallow rooted large trees. Several electric poles were downed by falling trees on this block, with collateral tree damage noted to a few houses in the neighborhood. The tornado continued northeast through the south end of neighboring Rosewood Street and then across its intersecting cross street of South Street. Several more trees were uprooted, large limbs broken, or tree tops sheared on this leg of its path. Facing houses on the north and south side of South Street had widespread tree damage and uprooting. A shed was destroyed in this location as well, with damage to residences in the form of sporadic blown off shingles and siding, missing storm screens, and a couple of broken windows. The tornado then continued northeast through a wooded area, where more tree damage was noted, before crossing the Long Island Expressway near Exit 69 while lifting. The path of tree damage and debris ended on the service road on the north side of the LIE near the intersection with Wading River Road. The tornado resulted in \$75K in property damage.</p> <p>Funnel cloud sighted to the north from Smith Point, exact location unknown, time estimated in Mastic Beach.</p>
October 16-17, 2019	High Wind	N/A	N/A	<p>Northwest Suffolk, Southwest Suffolk, Northeast Suffolk, Southeast Suffolk</p>	<p>High winds occurred behind a deep low pressure.</p> <p>A 65 mph wind gust was measured at the mesonet station in Eatons Neck at 1220 am on the 17th. An elevated sensor, around 390 ft high, measured a wind gust to 83 mph in Stony Brook University. This occurred at 101 am on the 17th. The broadcast media reported large trees down in Selden at 745 pm on the 16th, and large trees down across many roads in Port Jefferson around 745 pm. Several trees and branches were broken in Sunken Meadow Park. In Caumsett Park, a small tree fell against an open shed with some damage to the gutter and roof. Northwest Suffolk reported \$100K in property damage.</p> <p>Large limbs were knocked down in Bayard Arboretum. A large tree was uprooted in Connetquot. At Heckscher Park, many trees were snapped, and one tree was uprooted. A 57 mph wind gust was measured at the Fire Island Coast Guard station at 937 pm on the 16th. Islip MacArthur Airport reported a 55 mph wind gust around 123 am on the 17th. Southwest Suffolk reported \$100K in property damage.</p> <p>The mesonet station located on Great Gull Island measured a 64 mph wind gust at 1154 on the 16th. Around 1202 am on the 17th, the mesonet station on Fishers Island measured a 61 mph wind gust. At 140 am, the mesonet station in Baiting Hollow measured a 59 mph gust. At 902 pm on the 16th, a spotter measured a 59 mph wind gust in Orient.</p>





Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Location	Description
					<p>Around 905 pm, a tree was reported down in Mattituck. It fell across the railroad tracks. Northeast Suffolk reported \$100K in property damage.</p> <p>A mesonet station reported a wind gust to 56 mph in Napeague. Tree branches were downed due to the winds in Hither Hills. Southeast Suffolk reported \$50K in property damage.</p>
October 31, 2019	Strong Wind	N/A	N/A	Northwest Suffolk	<p>Strong winds occurred behind low pressure and strong cold front.</p> <p>The media reported a tree down onto a home in Commack at 1145 pm. Northwest Suffolk resulted in \$100K in property damage.</p>
November 1, 2019	Strong Wind	N/A	N/A	Northwest Suffolk, Southwest Suffolk, Northeast Suffolk, Southeast Suffolk	<p>Strong winds occurred behind low pressure and strong cold front.</p> <p>A National Weather Service Employee reported a large part of a tree split and was hanging across the guard rail and shoulder along Route 25 in Ridge. This was observed around 3 am. The mesonet station in Sinai Harbor measured a 54 mph wind gust at 1234 am. An elevated mesonet station in Eatons Neck measured strong winds in the 50 mph range between 2 and 3 am. Northwest Suffolk reported \$50K in property damage.</p> <p>A mesonet station in the Great South Bay measured a 57 mph wind gust at 139 am. Another mesonet station in Brookhaven reported a 55 mph wind gust around 202 am. The ASOS at Farmingdale Airport measured a 53 mph wind gust at 141 am. The Long Island Railroad reported a downed tree across the tracks near Patchogue at 111 am. Several other mesonet stations reported wind gusts in the lower 50 mph range. Southwest Suffolk reported \$100K in property damage.</p> <p>The mesonet station at Great Gull Island reported a 69 mph wind gust at 258 am. At Fishers Island Airport, a mesonet station measured a 65 mph wind gust around 306 am. Another mesonet station in Orient measured a 60 mph wind gust at 301 am. At 115 am, a National Weather Service employee reported a tree down on the grounds of Brookhaven National Laboratory. Northeast Suffolk reported \$100K in property damage.</p> <p>A mesonet station in Mecox Bay measured a 55 mph wind gust at 3 am. The mesonet station located at the coast guard station in East Moriches reported a 54 mph wind gust at 218 am. The ASOS at Shirley Brookhaven Airport measured a 53 mph wind gust around 2 am. Southeast Suffolk reported \$50K in property damage.</p>
December 30, 2019	Strong Wind	N/A	N/A	Northwest Suffolk, Northeast Suffolk,	<p>Strong winds occurred ahead of low pressure and frontal boundary.</p> <p>The Eatons Neck mesonet station measured a 54 mph wind gust at 2 pm. Northwest Suffolk reported \$50K in property damages. The mesonet station on Great Gull Island measured a 56 mph wind gust at 356 pm. Another mesonet station on Fishers Island</p>





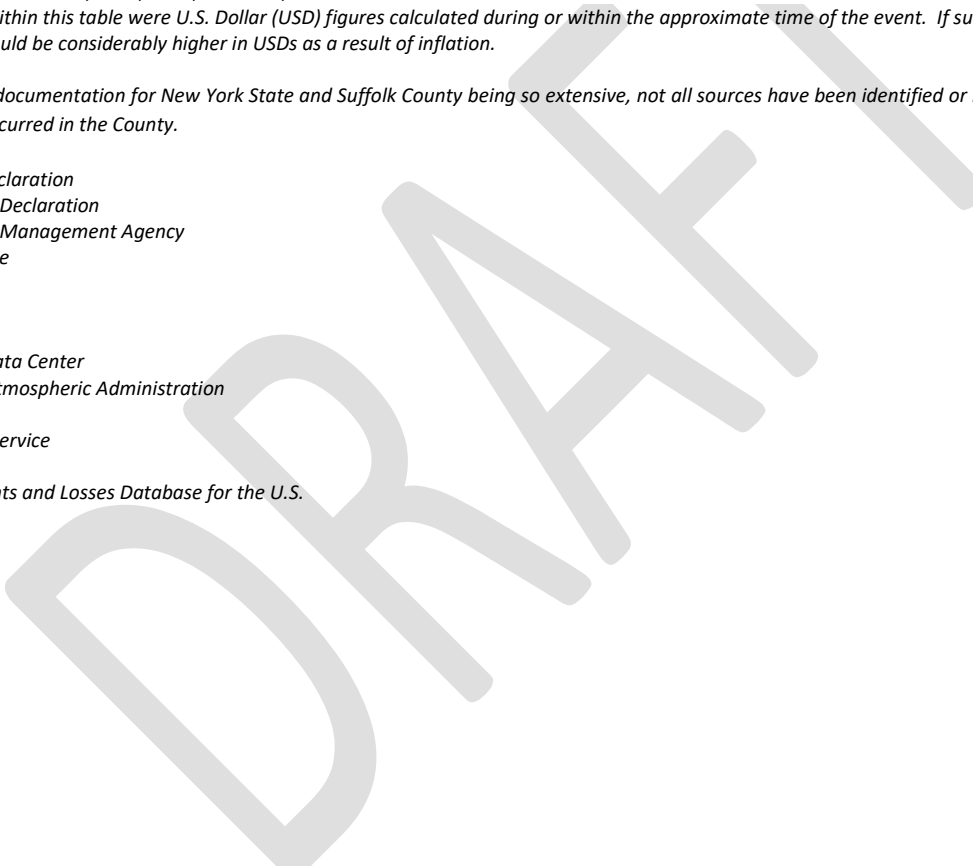
Dates of Event	Event Type	FEMA Declaration Number	County Designated?	Location	Description
				Southwest Suffolk	measured a 50 mph wind gust at 316 pm. Northeast Suffolk reported \$50K in property damage. The mesonet station in Blue Point measured a 53 mph wind gust at 437 pm. Southwest Suffolk reported \$50K in property damage. Numerous trees were reported down around town in Babylon resulted in \$7K in property damage. Trees down on Deer Park Avenue in Babylon resulted in \$3K in property damage.

Sources: NOAA-NCEI 2020; FEMA 2020; NWS, 2020; SHELUDS, 2020

Note: 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 inflation.

With severe storm documentation for New York State and Suffolk County being so extensive, not all sources have been identified or researched. Therefore, 5.4.13-5 may not include all events that have occurred in the County.

- DR Federal Disaster Declaration
- EM Federal Emergency Declaration
- FEMA Federal Emergency Management Agency
- IA Individual Assistance
- K Thousand (\$)
- M Million (\$)
- Mph Miles Per Hour
- NCDC National Climate Data Center
- NOAA National Oceanic Atmospheric Administration
- NYS New York State
- NWS National Weather Service
- PA Public Assistance
- SHELUDS Spatial Hazard Events and Losses Database for the U.S.
- TSTM Thunderstorms





Probability of Future Occurrence

Predicting future severe storm events in a constantly changing climate has proven to be a difficult task. Predicting extremes in New York State is particularly difficult because of the region’s geographic location. It is positioned roughly halfway between the equator and the North Pole and is exposed to both cold and dry airstreams from the south. The interaction between these opposing air masses often leads to turbulent weather across the region (Keim 1997).

According to the Storm Events Database, Suffolk County has been impacted by 341 severe storm events between 1950 and 2020 (Table 5.4.10-6).

Table 5.4.13-6. Probability of Occurrence of Severe Storm Events in Suffolk County

Hazard Type	Number of Occurrences Between 1950 and 2020	Rate of Occurrence or Annual Number of Events (average)	Recurrence Interval (in years) (# Years/Number of Events)	Probability of Event in any given year	% chance of occurrence in any given year
Funnel Cloud	6	0.09	11.83	0.08	8.45%
Hail	51	0.73	1.39	0.72	71.83%
High Wind	61	0.87	1.16	0.86	85.92%
Lightning	26	0.37	2.73	0.37	36.62%
Strong Wind	60	0.86	1.18	0.85	84.51%
Thunderstorm Wind	115	1.64	0.62	1.62	100%
Tornado	22	0.31	3.23	0.31	30.99%
<b>Total</b>	<b>341</b>	<b>4.87</b>	<b>0.21</b>	<b>4.80</b>	<b>100%</b>

Source: NOAA NCEI 2020

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 ranking hazards. Based on historical records and input from the Planning Committee, the probability of occurrence for severe storms in the County is considered ‘frequent’.

It is estimated that Suffolk County will continue to experience direct and indirect impacts of severe storms annually that may induce secondary hazards such as flooding, infrastructure deterioration or failure, utility failures, power outages, water quality and supply concerns, and transportation delays, accidents and inconveniences.

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).

In Region 4, it is estimated that temperatures will increase by 4.1°F to 5.7°F by the 2050s and 5.3°F to 8.8°F by the 2080s (baseline of 54.6 °F, mid-range projection). Precipitation totals will increase between 4 and 11% by the 2050s and 5 to 13% by the 2080s (baseline of 49.7 inches, mid-range projection) (NYSERDA 2014). The heaviest 1% of daily rainfalls have increased by approximately 70% between 1958 and 2011 in the Northeast (Horton et al. 2015). Average annual precipitation is projected to increase in the region by four to 11-percent by the 2050s and five to 13-percent by the 2080s (New York City Panel on Climate Change [NPCC] 2015).

Table 5.4.10-7 displays the projected seasonal precipitation change for the New York City and Long Island ClimAID Region (NYSERDA 2011).

**Table 5.4.13-8. 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: NYSEDA 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 hogs; and increase delays and hazards related to extreme weather events (NYSERDA 2011).

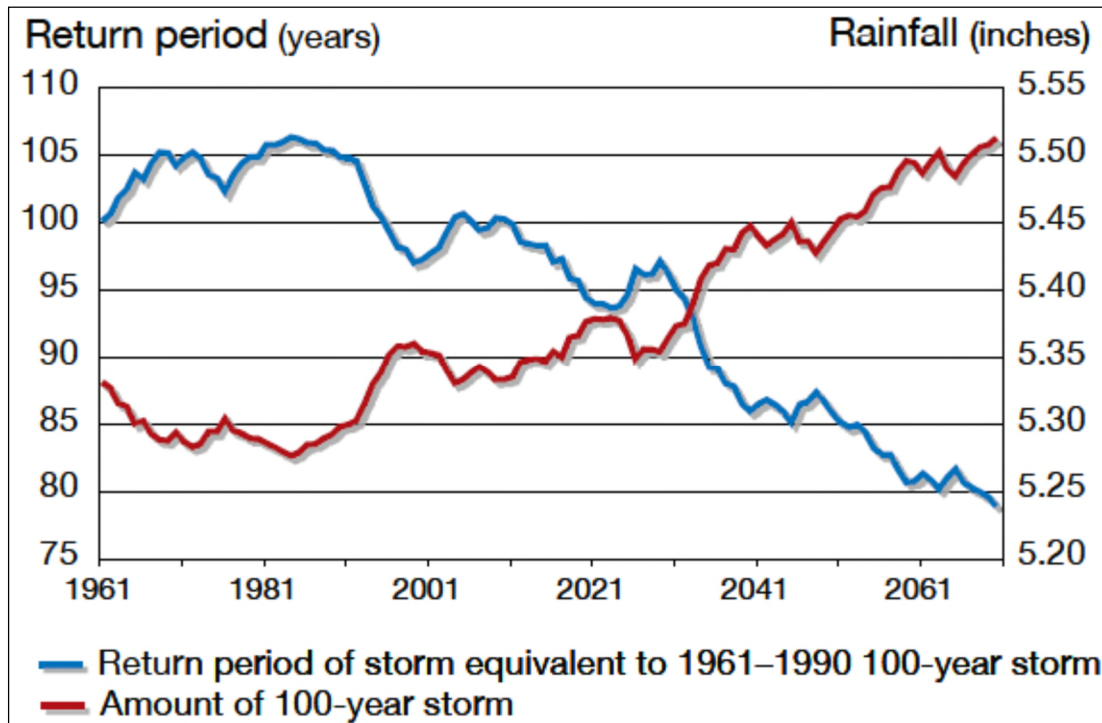
Increasing air temperatures intensify the water cycle by increasing evaporation and precipitation. This can cause an increase in rain totals during events with longer dry periods in between those events. These changes can have a variety of effects on the State’s water resources (NYSERDA 2011).

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 5.4.10-10 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 5.4.13-7. Projected Rainfall and Frequency of Extreme Storms



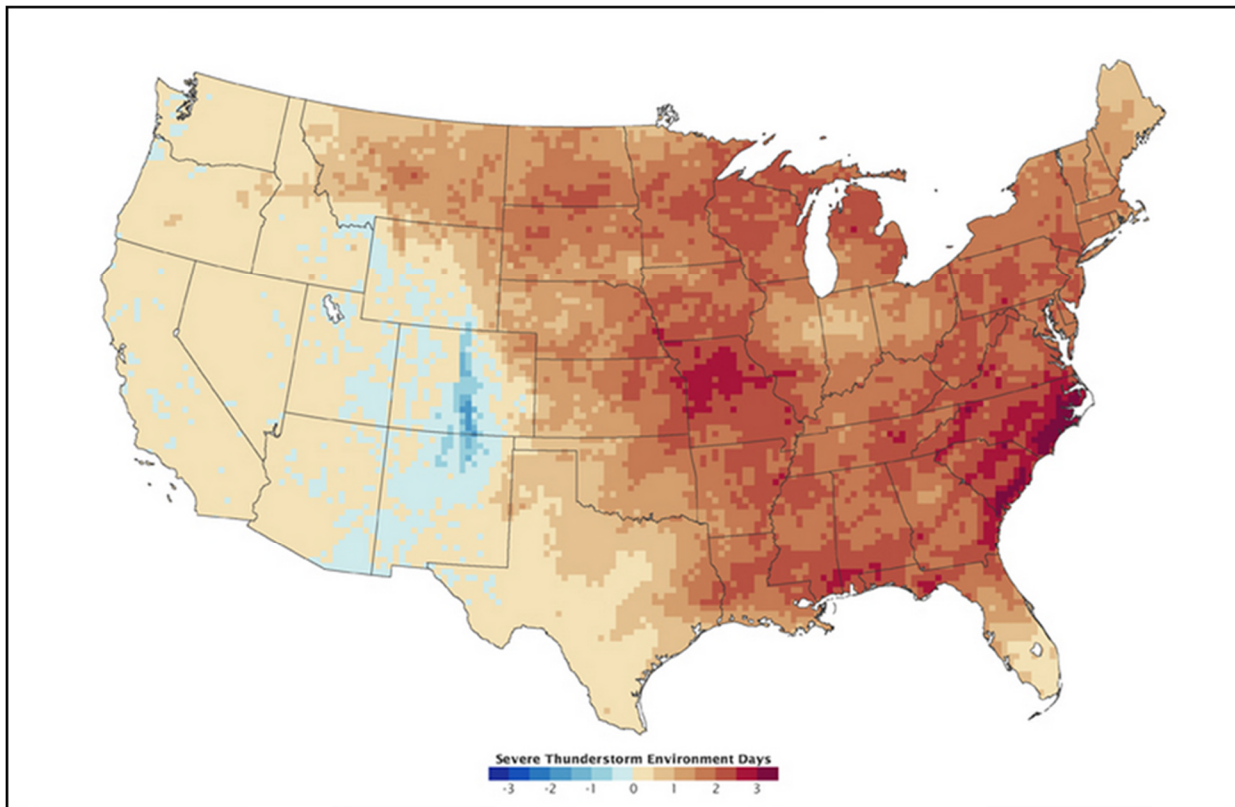
Source: NYSERDA 2011

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).

NASA scientists suggest that the U.S. will face more severe thunderstorms in the future, with deadly lightning, damaging hail and the potential for tornadoes in the event of climate change (Borenstein, 2007). A recent study conducted by NASA predicts that smaller storm events like thunderstorms will be more dangerous due to climate change. As the climate changes, temperatures and the amount of moisture in the air will both increase, thus leading to an increase in the severity of thunderstorms which can lead to derechos and tornadoes. Studies have shown that an increase in greenhouse gases in the atmosphere would significantly increase the number of days that severe thunderstorms occur in the southern and eastern United States (NASA 2005).



Figure 5.4.13-8. Projected Rainfall and Frequency of Extreme Storms



Source: Trapp et. al. 2007

### Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed and vulnerable in the identified hazard area. For severe storms, the entirety of Suffolk County has been identified as the hazard area. Therefore, all assets in the County (population, structures, critical facilities and lifelines), as described in the County profile, are vulnerable.

### Impact on Life, Health and Safety

The entire population of Suffolk County (1,488,179 people) is exposed to severe storm events (American Community Survey 2018). Residents may be displaced or require temporary to long-term sheltering due to severe weather events. The number of households displaced by severe wind events is summarized in Section 5.4.10 (Hurricane). In addition, downed trees, damaged buildings, and debris carried by high winds can lead to injury or loss of life (refer to Section 5.4.10 Hurricane for more information about debris caused by severe wind events).

Socially vulnerable populations are most susceptible, based on a number of factors including their physical and financial ability to react or respond during a hazard and the location and construction quality of their housing. Vulnerable populations include homeless persons, elderly (over 65 years old), low income or linguistically isolated populations, people with life-threatening illnesses, and residents living in areas that are isolated from major roads.

Additionally, people located outdoors (i.e., recreational activities and farming) are considered most vulnerable to hailstorms, thunderstorms and tornadoes. This is because there is little to no warning and shelter may not be



available. Moving to a lower risk location will decrease a person’s vulnerability. Refer to Section 4 (County Profile) for population statistics for each participating jurisdiction.

### Impact on General Building Stock

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As discussed in Table 5.4.13-5, several thousand dollars of reported damages have occurred in Suffolk County due to severe storm events. Damage to buildings is dependent upon several factors including wind speed, wind duration, presence of hail stones or lightning, and building construction. These wind-related damages are discussed further in Section 5.4.10 (Hurricane).

### Impact on Critical Facilities

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Critical facilities are at risk of being impacted by severe storm events, particularly events with high winds. High wind events are typically associated with structural damage, or falling tree limbs/flying debris, which can result in the loss of power. Power loss can greatly impact households, business operations, public utilities, and emergency personnel. Emergency personnel such as police, fire, and EMS will not be able to effectively respond in a power loss event to maintain the safety of its citizens unless backup power and fuel sources are available. Loss of power can impact other public utilities, including potable water, wastewater treatment, and communications. In addition to public water services, property owners with private wells might not have access to potable water until power is restored.

### Impact on Economy

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Severe storm events can have short- and long-lasting impacts on the economy. When a business is closed during storm recovery, there is lost economic activity in the form of day-to-day business and wages to employees. Overall, economic impacts include the loss of business function (e.g., tourism, recreation), damage to inventory, relocation costs, wage loss and rental loss due to the repair/replacement of buildings.

Impacts to transportation lifelines affect both short-term (e.g., evacuation activities) and long-term (e.g., day-to-day commuting and goods transport) transportation needs. Utility infrastructure (power lines, gas lines, electrical systems) could suffer damage and impacts can result in the loss of power, which can impact business operations and can impact heating or cooling provision to the population.

Section 5.4.10 (Hurricane) estimates the total economic loss caused by severe wind events. These losses include direct building losses and business interruption losses, which are the estimated costs to repair or replace the damage caused to the building and the losses associated with the inability to operate a business because of the wind damage sustained during the storm or the temporary living expenses for those displaced from their home because of the event, respectively.

### Impact on Environment

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The impact of severe storm events on the environment varies, but researchers are finding that the long-term impacts of more severe weather can be destructive to the natural and local environment. National organizations such as USGS and NOAA have been studying and monitoring the impacts of extreme weather phenomena as it impacts long term climate change, streamflow, river levels, reservoir elevations, rainfall, floods, landslides, erosion, etc. (USGS 2017). For example, severe weather that creates longer periods of rainfall can erode natural banks along waterways and degrade soil stability for terrestrial species. Tornadoes can tear apart habitats causing fragmentation across ecosystems. Researchers also believe that a greater number of diseases will spread across ecosystems because of impacts that severe weather and climate change will have on water supplies (NOAA 2013c). Overall, as the physical environment becomes more altered, species will begin to contract or migrate in response, which may cause additional stressors to the entire ecosystem within Suffolk County. Refer to Section 5.4.11 (Infestation and Invasive Species) for more information about these stressors.



### **Cascading Impacts on Other Hazards**

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Severe storms events may escalate the impacts from other hazards of concern, such as coastal erosion or infestation and invasive species. Severe winds can be destructive to the natural coastlines if the coastal land area is left barren. Furthermore, changes in the land area caused by severe storm events can alter the distribution of species throughout the County, exacerbating the presence of invasive species who can survive in distressed environments.

### **Future Changes That May Impact Vulnerability**

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Understanding future changes that effect vulnerability in the County can assist in planning for future development and ensure establishment of appropriate mitigation, planning, and preparedness measures. Changes in the natural environment and built environment and how they interact can also provide insight about ways to plan for the future.

### **Projected Development**

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As discussed in Section 4, areas targeted for future growth and development have been identified across the County. Any areas of growth throughout the County is vulnerable to severe storm events. There are approximately 49 new development projects identified for the County. New development sites should adhere to the proper building codes to protect against severe storm event elements such as high wind protection and/or flood proofing measures.

### **Projected Changes in Population**

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According to the Suffolk County Department of Economic Development and Planning’s February 2017 Annual Report update, the population of the County is growing. The report indicates that slow population growth is expected to continue in the future. Any growth can create changes in density throughout the County. Higher density can, not only create issues for local residents during evacuation of a natural hazard event, but can also impact tourists that travel to or through Suffolk County for vacation. Historically, flooding and debris with associated severe storm events have severely impacted transportation corridors as well as infrastructure. Refer to Section 4 (County Profile), which includes a discussion on population trends for the County.

### **Climate Change**

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As discussed above, most studies project that the State of New York will see an increase in average annual temperatures and precipitation. Annual precipitation amounts in the region are projected to increase, primarily in the form of heavy rainfalls, which have the potential to increase the risk of storm surge, and flood critical transportation corridors and infrastructure. Increases in precipitation may alter and expand the floodplain boundaries of storm surge areas and runoff patterns, resulting in the exposure of populations, buildings, and critical facilities and infrastructure that were previously outside the floodplain. This increase in exposure would result in an increased risk to life and health, an increase in structural losses, a diversion of additional resources to response and recovery efforts, and an increase in business closures affected by future flooding events due to loss of service or access.

Furthermore, 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 events like hurricanes. While predicting changes to the prevalence or intensity of severe storms 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 Since the 2014 HMP**

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Since the 2014 analysis, population statistics have been updated using the 5-Year 2014-2018 American Community Survey Population Estimates. The general building stock was also updated using RS Means 2019 building valuations that estimated replacement cost value for each building in the inventory. Updated building stock provided by the County was utilized to update the user-defined facility inventory and critical facility inventory dataset. Last, an updated version of FEMA’s HAZUS-MH hurricane module (version 4.2) was used to estimate potential losses for the 100- and 500-year mean return period hurricane wind events, which was referenced as severe wind events in this section (refer to Section 5.4.10 Hurricane for more detailed results).

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

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