

5.2 IDENTIFICATION OF HAZARDS OF CONCERN

To provide a strong foundation for mitigation actions considered in Sections 6 and 9, Suffolk County focused on considering a full range of hazards that could impact the area, and then identified and ranked those hazards that presented the greatest concern. The hazard of concern identification process incorporated input from the County and participating jurisdictions; review of the New York State Hazard Mitigation Plan (NYS HMP 2019); review of the 2014 Suffolk County HMP; research and local, state, and federal information on the frequency, magnitude, and costs associated with the various hazards that have previously, or could feasibly,

Hazards of Concern
are those hazards that
are considered most
likely to impact a
community. These are
identified using
available data and local
knowledge.

impact the region; and qualitative or anecdotal information regarding natural hazards and the perceived vulnerability of the study area's assets to them. Table 5.2-1 documents the process of identifying the hazards of concern for further profiling and evaluation.

5.2.1 Changes from 2014 Hazard Mitigation Plan

The 2014 Suffolk County HMP did not identify disease outbreak, cyber security, and extreme temperature as hazards of concern. These hazards have been included as hazards of concern for the 2020 HMP update due to previous instances of these hazards occurring within the County and based on input from members of the Steering Committee and the Planning Partnership.

The 2020 Suffolk County HMP includes best available data throughout the plan to present an updated understanding of the risk that Suffolk County faces.

5.2.2 Hazard Groupings

As per the 2014 Suffolk County HMP, the Steering Committee and Planning Partnership maintained the grouping of hazards, based on the similarity of hazard events, their typical concurrence or their impacts, consideration of how hazards have been grouped in Federal Emergency Management Agency (FEMA) guidance documents (FEMA 386-2, *Understanding Your Risks, Identifying Hazards and Estimating Losses*; FEMA's *Multi-Hazard Identification and Risk Assessment – The Cornerstone of the National Mitigation Strategy*; FEMA's *Local Mitigation Planning Handbook*), and consideration of hazard grouping in the NYS HMP.

The Coastal Erosion hazard profile includes long-term erosion and short term/episodic erosion events.

The *Cyber Security* hazard profile includes events involving the theft or modification of information on government agency computer systems, or a system compromise with the potential to disrupt essential services. The DMA 2000 regulations do not require consideration of technological hazards due to limited funding, but Cyber Security was chosen for inclusion in this plan by the County and planning participants.

The *Disease Outbreak* hazard profile specifically addresses mosquito borne disease (West Nile, Eastern Equine Encephalitis, St. Louis Encephalitis, La Crosse Encephalitis), tick borne disease (Lyme Disease), respiratory viruses (Influenza, MERS-CoV, SARS, and Coronavirus), Ebola, Measles, Tuberculosis, and Hepatitis A.

The *Drought* hazard profile specifically addresses drought events which have occurred in Suffolk County or have had a considerable impact on the County.

The *Earthquake* hazard profile specifically addresses earthquakes which have occurred in Suffolk County or have had a considerable impact on the County and secondary impacts such as tsunamis and landslides.





The Expansive Soils hazard profile includes soils that tend to swell or shrink due to changes in moisture content.

The Extreme Temperature hazard profile includes extreme heat and extreme cold weather events.

The *Flood* hazard profile includes coastal flooding, riverine flooding, flash flooding, shallow flooding, urban flooding, dam failure flooding, and sea level rise. Inclusion of the various forms of flooding under a general "Flood" hazard is consistent with FEMA's "Multi-Hazard Identification and Risk Assessment" guidance and the NYS HMP.

The *Groundwater Contamination* hazard profile includes natural contaminants, non-natural contaminants, and saltwater intrusion.

The *Hurricane* hazard profile includes all tropical disturbances (hurricanes, tropical storms and tropical depressions.

The *Infestation and Invasive Species* hazard profile specifically addresses invasive species that have the potential to affect the built environment and public infrastructure in Suffolk County and the surrounding region.

The Nor'Easter hazard profile includes all non-tropical coastal storms that impact Suffolk County.

The *Severe Storm* hazard profile includes windstorms that often entail a variety of other influencing weather conditions including thunderstorms, hail, lightning, and tornadoes.

The Severe Winter Storm hazard includes heavy snowfall, blizzards, freezing rain/sleet, and ice storms. This grouping is consistent with the NYS HMP.

The *Shallow Groundwater Flooding* hazard includes flooding caused by long-term erosion and short term/episodic groundwater table flooding events.

The Wildfire hazard profile covers wildfire and brushfire events in Suffolk County.

The County may attempt to expand the scope of this HMP to include other less frequent natural hazards and/or technological (hazardous material incidents) and man-made (terrorism, man-made dam breaches/failures) hazards as resources permit.

Table 5.2-1. Identification of Natural Hazards of Concern for Suffolk County

Hazard	Is this a hazard that may occur in Suffolk County?	If yes, does this hazard pose a significant threat to the County?	Why was this determination made?	Source(s)
Avalanche	No	No	 The NYS HMP identifies avalanche as a hazard of concern. Avalanches can occur in any situation where snow, slope and weather conditions combine to create proper conditions. About 90% of all avalanches start on slopes of 30 to 45 degrees and about 98% of all avalanches occur on slopes of 25 to 50 degrees. The topography of Suffolk County does not support the occurrence of an avalanche. New York State, in general, has a very low occurrence of avalanche events based on statistics provided by National Avalanche Center – American Avalanche Association (NAC-AAA) between 1998 and 2018. Avalanche is identified as a hazard in the NYS HMP and there have been occurrences in the State; however, there have been no occurrences in Suffolk County and the Planning Partnership does not consider the hazard to be a significant concern. 	NYS DHSES NAC-AAA





	Is this a	If yes, does this		
	hazard that may occur in	hazard pose a significant		
Hazard	Suffolk County?	threat to the County?	Why was this determination made?	Source(s)
Coastal Erosion	Yes	Yes	 The NYS HMP identifies coastal erosion as a hazard of concern for the State. Counties bounded by coastal waters are most affected by coastal erosion. Suffolk County is bounded to the north, south, and east by coastal waters; therefore, coastal erosion was identified as a hazard of concern by the Planning Committee. The NYS HMP states that multiple local jurisdictions along the Atlantic Coast are highly susceptible to coastal erosion and areas have been identified as Coastal Erosion Hazard Areas (CEHA). Suffolk County has been identified as a CEHA. Documented coastal erosion has occurred in coastal towns and villages in Suffolk County Between 1954 and 2020, New York State and Suffolk County were not included in any Federal Emergency Management Agency (FEMA) declared coastal erosion specific disasters (DR) or emergency declarations (EM). However, Suffolk County has been included in numerous declarations that involved hurricanes, coastal storms, and coastal floods. According to the NYS HMP, between 1996 and 2017, Suffolk County had three weather events that caused coastal erosion. Based on the potential for significant loss and input from the Steering Committee and Planning Partnership, coastal erosion is identified as a hazard of concern for Suffolk County. 	NYS DHSES Input from Steering Committee and Planning Partnership FEMA NOAA-NCDC
Cyber Security	Yes	Yes	 The 2019 NYS HMP does not identify cyber security as a hazard of concern. The U.S. Department of Homeland Security has recorded an increase in significant cyber incidents in the United States and abroad. Numerous communities in Suffolk County have experienced cyber attacks. Based on the potential for significant loss and input from the Steering Committee and Planning Partnership, cyber security is identified as a hazard of concern for Suffolk County. 	NYS DHSES U.S. Department of Homeland Security Input from Steering Committee and Planning Partnership
Dam Failure	Yes	Yes	 The 2019 NYS HMP identifies dam failure as a hazard of concern for New York State and includes it in the flood hazard profiles. According to the NYS DEC there are 147 dams in Suffolk County: 63 low hazard, 7 intermediate hazard, 9 high hazard, and 68 negligible or no hazard classification (NYSDEC 2018). Dam failure is included in the flood profile. 	 NYS DHSES Input from Steering Committee and Planning Partnership NYSDEC NYS GIS
Disease Outbreak	Yes	Yes	 The 2019 NYS HMP does not identify disease outbreak as a hazard of concern for New York State. The county has been impacted by various diseases (influenza, Lyme disease) and the coronavirus pandemic. The Steering Committee and Planning Partnership identifies disease outbreak as a hazard of concern for Suffolk County. 	 NYS DHSES NYS DEC NYS DOH Input from Steering Committee and Planning Partnership
Drought	Yes	Yes	 The NYS HMP identifies drought as a hazard of concern for the State. Suffolk County has been impacted by many drought events that have occurred in New York State. Since 2013, the County has been impacted by drought events as classified by the U.S. Drought Monitor. September 10, 2013 – April 1, 2014 reached moderate drought status July 1 – December 15, 2014 reached moderate drought status 	NYS DHSES Input from Planning Committee NRCC - Coastal Climate Division



TO SERVICE SER	Is this a hazard that may occur in Suffolk	If yes, does this hazard pose a significant threat to the		
Hazard	County?	County?	Why was this determination made?	Source(s)
падагц	county?	County?	 May 5, 2015 – February 22, 2016 reached moderate drought status April 19, 2016 – April 3, 2017 reached severe drought status Since 2014, Suffolk County has been included in 3 USDA disaster declarations that involved drought. S3775: 2014, Drought. S3928: 2015, Drought. S4045: 2016, Drought; Wind, high winds; Fire, wildfire; Heat, excessive heat, high temp; Insects (USDA 2020) There are more than 1,100 active private wells in Suffolk County that get water from three major aquifers. Drought conditions have the potential to impact these private wells. According to the NRCC, Suffolk County is located within the Coastal Climate Division, which has been impacted by periods of severe and extreme drought and include the following events: September 1910 – July 1911 March 1930 – February 1931 November 1931 – February 1932 November 1949 – January 1950 September – December 1964 May 1965 – August 1966 March – April 1985 July – August 1999 January – May 2002 August – September 2010 The Planning Committee identified the drought hazard as impacting agriculture, drinking water, and exacerbating wildfire concerns, in certain parts of the County. Based on the potential for significant loss and input from the Steering Committee and Planning Partnership, drought is 	Source(s)
Earthquake	Yes	No	 identified as a hazard of concern for Suffolk County. The NYS HMP identifies earthquake as a hazard of concern for the State. Suffolk County has a PGA below 3%g. According to the FEMA document "Understanding Your Risks: Identifying Hazards and Estimating Losses," areas with 3%g should conduct a risk assessment for earthquakes. New York State has been included in one FEMA earthquake-related disaster declaration (DR-1415); Suffolk County was not included in this declaration. According to the NYS HMP, between 1996 and 2017, there have been no earthquakes with an epicenter in Suffolk County. Based on the potential for significant loss and input from the Steering Committee and Planning Partnership, earthquake is identified as a hazard of concern for Suffolk County. 	NYS DHSES Input from Steering Committee and Planning Partnership USGS – Earthquake Hazards Program, Review of USGS Seismic Maps
Expansive Soils	Yes	Yes	 The NYS HMP identifies expansive soils has a hazard of concern for New York State. However, a majority of Suffolk County is underlain by soils with little to no swelling potential and less than 50% of the area is underlain by soils with abundant clays of slight to moderate swelling potential. USGS indicated that Suffolk County does not have the type of soils (swelling clay) that would result in expansive or swelling soils; therefore, Suffolk County has little to no swelling potential. Expansive soils are not identified as a hazard in the NYS HMP. The Town of Smithtown identified a localized problem with expansive soils, on or near a golf course. Based on the potential for significant loss and input from the Steering Committee and Planning Partnership, expansive soils is identified as a hazard of concern for Suffolk County. 	NYS DHSES Input from Steering Committee and Planning Partnership Review of USGS 1989 Swelling Clays Map of the Conterminous United States



	Is this a hazard that may occur in Suffolk	If yes, does this hazard pose a significant threat to the		
Hazard	County?	County?	Why was this determination made?	Source(s)
Extreme Temperature	Yes	Yes	 The NYS HMP identifies extreme temperatures (cold wave/heat wave) as a hazard of concern for New York State. According to the NOAA-NCEI database, between 1999 and 2020, there have been 17 extreme temperature events in Suffolk County, resulting in five deaths and one injury. Suffolk County has not been included in any FEMA disaster declarations for extreme temperature-related events; however, the county has been included in one recent USDA disaster declarations: S4045: 2016, Drought; Wind, high winds; Fire, wildfire; Heat, excessive heat, high temp; Insects Based on the potential for significant loss and input from the Steering Committee and Planning Partnership, extreme temperature is identified as a hazard of concern for Suffolk County. 	NYS DHSES Input from Steering Committee and Planning Partnership NOAA-NCEI USDA
Flood (coastal, riverine, dam failure, flash, and urban)	Yes	Yes	 The NYS HMP identifies flooding as a hazard of concern for New York State. According to the NOAA-NCEI database, between 1950 and 2020 there have been 138 flood events in Suffolk County. Suffolk County is included in eight flood-related FEMA disaster declarations: FEMA-DR-311 (Severe Storms and Flooding) – September 13, 1971 FEMA-DR-702 (Coastal Storms and Flooding) – March 28-April 8, 1984 FEMA-DR-974 (Coastal Storm, High Tides, Heavy Rain, and Flooding) – December 10-14, 1992 Elevated (shallow) groundwater is considered a significant concern in the Lake Ronkonkoma area, Nissequogue River Basin, and the Village of Lake Grove. Shallow groundwater flooding has been designated as a separate hazard. Based on previous events and input from the Steering Committee and Planning Partnership, flood is identified as a hazard of concern for the county. 	NYS DHSES Input from Steering Committee and Planning Partnership FEMA NOAA-NCEI USACE CRREL Ice Jam Database
Groundwater Contamination	Yes	Yes	The Planning Committee identified groundwater contamination, resulting from natural causes (e.g. nitrates and saltwater intrusion) and unnatural causes to be a concern in certain jurisdictions within the County, specifically Northport Area, North Fork, Shelter Island and Southold. Based on previous events and input from the Steering Committee and Planning Partnership, groundwater contamination is identified as a hazard of concern for the county.	Input from Planning Committee Suffolk County Department of Health Suffolk County Water Authority
Hailstorm	Yes	Yes	Please see Severe Storm	
Harmful Algal Bloom	Yes	Yes	 The NYS HMP does not identify harmful algal bloom as a hazard of concern for New York State. Based on input from the Steering Committee and Planning Partnership, harmful algal bloom is not identified as a hazard of concern for the County. 	Input from Planning Committee NYSDEC
Hurricane (tropical cyclones, including tropical storms and tropical depressions)	Yes	Yes	Suffolk County is primarily bounded to the north, south and east by coastal waters, therefore, highly susceptible to tropical cyclones, including hurricanes, tropical storms and tropical depressions. Four FEMA declarations for hurricanes, since 2008, were issued for Suffolk County: FEMA-DR-1869 (Severe Storms and Flooding) – November 12-14, 2009 FEMA-DR-4020 (Hurricane Irene) – August 26-September 5, 2011 FEMA-DR-4031 (Tropical Storm Lee) – September 7-10, 2011	FEMA Input from Planning Committee NYS HMP Update NOAA NHC



Hazard	Is this a hazard that may occur in Suffolk County?	If yes, does this hazard pose a significant threat to the County?	 Why was this determination made? FEMA-DR-4085 (Hurricane Sandy) – October 29, 2012 Between 1842 and 2020, 72 tropical cyclone events passed with 50 nautical miles of Suffolk County. Based on the potential for significant loss and input from the Steering Committee and Planning Partnership, hurricane is identified as a hazard of concern for Suffolk County. 	Source(s)
Ice Jams	Yes	No	 The NYS HMP includes ice jams in the flood hazard profile and identifies it as a hazard of concern for the State. However, the NYS HMP does not document any ice jam events in Suffolk County. Historically, there have been six reported ice jams along the Peconic River in the Town of Riverhead. Between 2014 and 2019, the USACE CRREL Ice Jam Database did not list any ice jam events in Suffolk County. The Planning Committee does not consider ice jams as a significant hazard affecting the County. 	NYS DHSES Input from Planning Committee USACE CRREL Ice Jam Database
Ice Storm	Yes	Yes	Please see Severe Winter Storm	
Infestation	Yes	No	Please see Invasive Species	
Invasive Species	Yes	Yes	 The 2014 NYS HMP does not identify invasive species as a hazard of concern for New York State. According to the New York Invasive Species Map, there have been reported infestations of invasive insects in Suffolk County Based on the potential for significant loss and input from the Steering Committee and Planning Partnership, infestation and invasive species is identified as a hazard of concern for Suffolk County. 	 NYS DHSES Input from Steering and Planning Committees NYSDEC EDDMapS USDA
Land Subsidence	No	No	 NYS HMP indicates New York State is vulnerable to land subsidence; however, this hazard is "extremely localized" and poses a "very low risk to population and property." NYS HMP does not identify Suffolk County as a community that has experienced land subsidence in the past. In general, moderate to low land subsidence susceptibility exists for New York State, however, it was identified that this hazard has a very low risk to population or property. According to USGS, Suffolk County is predominantly made up of unconsolidated aquifer systems, which excessive pumping of such aquifer systems could resulted in permanent subsidence and related ground failures. However, no such incidences have been reported within Suffolk County. The Planning Committee did not identify land subsidence as a hazard of concern for Suffolk County. 	NYS DHSES Input from Planning Committee USGS Fact Sheet 165-00
Landslide	Yes	No	USGS indicates within the National Atlas Map Maker program that Suffolk County is identified as having high landslide susceptibility with a low incidence along the northern and eastern shoreline. A majority of Suffolk County is identified as a low landslide incidence. The NYS HMP identifies landslide as a hazard of concern. However, the Planning Committee does not consider landslide as a significant hazard affecting the County as a whole. Please note that the erosion of coastal bluffs, particularly in the north shore towns, is being considered under the Coastal Erosion hazard.	NYS DHSES Input from Planning Committee National Atlas.gov (USGS)
Nor'Easters	Yes	Yes	Suffolk County is primarily bounded to the north, south and east by coastal waters, therefore, highly susceptible to Nor'Easters and other severe winter low-pressure systems. Two FEMA declarations for Nor'Easters, since 2008, were issued for Suffolk County: FEMA-DR-1869 (Severe Storms and Flooding) – November 12-14, 2009	 FEMA NYS DHSES NOAA-NCEI SHELDUS Input from Planning Committee



Your	Is this a hazard that	If yes, does this hazard pose a		
Hazard	may occur in Suffolk County?	significant threat to the County?	Why was this determination made?	Source(s)
			 FEMA-DR-1899 (Severe Storms and Flooding) – March 13-31, 2010 Millions lost from Nor'Easter damage along the coast of Suffolk County to beaches, property, roads/infrastructure, piers/docks, and businesses throughout history. Based on the potential for significant loss and input from the Steering Committee and Planning Partnership, Nor'Easter is identified as a hazard of concern for Suffolk County. 	
Severe Storm (windstorms, thunderstorms, hail and tornados)	Yes	Yes	 NOAA's NCEI storm events database indicates that Suffolk County was impacted by approximately 239 severe storm events between 1950 and 2020 causing a total of 28 injuries, one death and approximately \$8.98 M in property damage. NYS HMP indicates tornadoes are significant hazards that impact New York State. 22 tornadoes have impacted Suffolk County from 1950 to 2020, resulting in \$2.09 M in damages and two injuries. The Planning Committee identified hurricanes and nor'easters as significant enough to warrant stand-alone hazard profiles. Based on the potential for significant loss and input from the Steering Committee and Planning Partnership, severe storm is identified as a hazard of concern for Suffolk County. 	 FEMA NYS DHSES NOAA-NCEI Input from Planning Committee
Severe Winter Storm (heavy snow, blizzards, ice storms)	Yes	Yes	 Six FEMA declarations for winter storms have been issued for Suffolk County: FEMA-EM-3107 (New York Severe Blizzard) – March 13-17, 1993 FEMA-DR-1083 (New York Blizzard) – January 6-12, 1996 FEMA-EM-3184 (New York Snowstorm) – February 17-18, 2003 FEMA-DR-1957 (Severe Winter Storm and Snowstorm) – December 26-27, 2011 FEMA-DR-4111 (Severe Winter Storm and Snowstorm) – February 8-9, 2013 FEMA-DR-4322 (New York Severe Winter Storm and Snowstorm) – March 14-15, 2017 NOAA's NCEI storm events database indicates that Suffolk County was impacted by approximately 67 severe winter storm events between 1950 and 2020 causing a total of eight deaths and approximately \$32 M in property damage. Based on the potential for significant loss and input from the Steering Committee and Planning Partnership, severe winter storm is identified as a hazard of concern for Suffolk County. 	FEMA NYS HMP Update NOAA-NCEI Input from Planning Committee
Tornado	Yes	Yes	Please see Severe Storm	
Tsunami	Yes	Yes	Tsunami is identified as a hazard of concern in the NYS HMP. The Steering Committee and Planning Partnership decided to discuss tsunami in the earthquake profile.	 NYS DHSES Input from Steering Committee and Planning Partnership
Volcano	No	No	 The NYS HMP identifies volcano as a hazard of concern for New York State. The Steering Committee and Planning Partnership does not consider volcano to be a hazard of concern for Suffolk County and it will not be further discussed in detail. 	 NYS DHSES Input from Steering Committee and Planning Partnership
Wildfire	Yes	No	Severe wildfires have taken place within Suffolk County, resulting in millions in damages and significant loss to over 6,000 acres of land, particularly the "Sunrise Fires" of 1995 (FEMA FSA-2115).	NYS HMP Update



Hazard	Is this a hazard that may occur in Suffolk County?	If yes, does this hazard pose a significant threat to the County?	Why was this determination made?	Source(s)
			Suffolk County is more susceptible to wildfires due to the presence of certain environmental conditions that sustain wildfire conditions (e.g. Pine Barrens, state parks) which provide fuel needed for wildfires. The Pitch Pine, oak, and ericaceous shrub-dominated forests of the Central Pine Barrens represent an extremely volatile fuel type with a long history of severe fires, therefore, presenting a significant wildland-urban interface hazard. NYS identified the Central Pine Barrens as one of its highest wildfire hazard area. Based on the potential for significant loss and input from the Steering Committee and Planning Partnership, wildfire is identified as a hazard of concern for Suffolk County.	 Input from Planning Committee FEMA NYSDEC
Windstorm	Yes	Yes	Please see Severe Storm	

CRREL Cold Regions Research and Engineering Laboratory

DOH Department of Health

DR Presidential Disaster Declaration Number
EM Presidential Disaster Emergency Number
FEMA Federal Emergency Management Agency
NCEI National Centers for Environmental Information

NRCC Northeast Regional Climate Center

NYS DHSES New York State Division of Homeland Security and Emergency Services

NYS HMP New York State Hazard Mitigation Plan

SPC Storm Prediction Center
USDA U.S. Department of Agriculture
USGS United States Geologic Survey

In summary, a total of 16 hazards of concern were identified as significant hazards affecting the entire planning area (listed below in alphabetical order):

- Coastal Erosion
- Cyber Security
- Disease Outbreak
- Drought
- Earthquake
- Expansive Soils
- Extreme Temperature (heat and cold)
- Flood (coastal, riverine, dam failure, flash, ice jam, urban)
- Groundwater Contamination
- Hurricane
- Infestation and Invasive Species
- Nor'Easter
- Severe Storm (thunderstorm, hail, wind, tornado)
- Severe Winter Storm
- Shallow Groundwater Flooding
- Wildfire

Other natural hazards of concern that have occurred within Suffolk County, but have a low potential to occur and/or result in significant impacts, may be considered in future versions of the HMP.

