



5.2 IDENTIFICATION OF HAZARDS OF CONCERN

To provide a strong foundation for mitigation actions considered in Sections 6 (Mitigation Strategy) and 9 (Jurisdictional Annexes), Cayuga 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 hazards 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 Cayuga 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, impact the region; and qualitative or anecdotal information regarding hazards and the perceived vulnerability of the study area's assets to them. Table 5.2-1 documents the process of identifying the natural hazards of concern for further profiling and evaluation. Specific hazards not identified as a hazard of concern for Cayuga County will not be further discussed in detail.

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

Natural Hazards are those hazards that are a source of harm or difficulty created by a meteorological, environmental, biological, or geological event.

5.2.1 Changes from 2014 Hazard Mitigation Plan

The 2014 Cayuga County Hazard Mitigation Plan identified the following five hazards of concern:

- Flood
- Ground Failure
- Severe Storm
- Severe Winter Storm
- Transportation Hazards

The 2021 Cayuga County Hazard Mitigation Plan update identifies an additional three hazards of concern and has omitted Ground Failure as a stand-alone hazard.

- Disease Outbreak
- Drought
- Harmful Algal Bloom

This plan update includes best available data throughout the plan to present an updated understanding Cayuga County's risk.

5.2.2 Hazard Groupings

As per the 2014 Cayuga County HMP, the Steering and Planning Committees maintained the grouping of hazards based on the similarity of hazard events, typical concurrence or 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; Multi-Hazard Identification and Risk Assessment – The Cornerstone of the National Mitigation Strategy; Local Mitigation Planning Handbook*), and consideration of hazard grouping in the 2019 NYS HMP.



The *Disease Outbreak* hazard profile addresses coronavirus, influenza, mosquito-borne diseases (West Nile Virus and Eastern equine encephalitis), and tick-borne diseases (Lyme disease).



The *Drought* hazard profile specifically addresses drought events that occurred in Cayuga County or had a considerable impact on the county.



The *Flood* hazard includes riverine flooding, flash flooding, stormwater flooding, ice jam flooding, and dam failure flooding. Inclusion of the various forms of flooding under a general *Flood* hazard is consistent with that used in FEMA's *Multi-Hazard Identification and Risk Assessment* guidance and the NYS HMP.



The *Harmful Algal Bloom (HABs)* hazard profile specifically addresses confirmed, and suspected HABs that have affected waterbodies in Cayuga County and the surrounding region.



The *Severe Storm* hazard includes windstorms that often entail a variety of other influencing weather conditions, including thunderstorms, hail, lightning, and tornadoes. Tropical disturbances (hurricanes, tropical storms and tropical depressions) are often identified as a type of severe storm. For this HMP update *Severe Storm* includes thunderstorms, hail, lightning, tornadoes, hurricanes, tropical storms, and Nor'Easters.



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



The *Transportation* hazard vehicular accidents, HAZMAT in transit incidents, aviation accidents, at-grade railroad crossings, and flood vulnerable roadways.

Not all technological or man-made hazards are not being addressed in this planning process. The DMA 2000 regulations do not require consideration of such hazards, and due to limited funding, these were not chosen for inclusion in this plan by Cayuga County and planning participants. The County can expand the scope of this HMP to include other less frequent natural, technological, and man-made hazards as resources permit.



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

Hazard	Is this a hazard that may occur in Cayuga County?	If yes, does this hazard pose a significant threat to Cayuga County?	Why was this determination made?	Source(s)
Avalanche	No	No	<ul style="list-style-type: none"> The 2019 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 percent of all avalanches start on slopes of 30 to 45 degrees and about 98 percent of all avalanches occur on slopes of 25 to 50 degrees. The topography of Cayuga 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 was identified as a hazard in the NYS HMP and there have been occurrences in the state; however, there were no occurrences in Cayuga County. The Steering and Planning Committees do not consider the hazard to be a significant concern. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees
Coastal Erosion	No	No	<ul style="list-style-type: none"> The NYSHMP identifies coastal erosion as a hazard of concern for New York State. Erosion can impact all of the state’s coastal counties along: Lake Erie and the Niagara River, Lake Ontario and the St. Lawrence River, Atlantic Ocean and Long Island Sound, Hudson River south of the federal dam in Troy, the East River, the Harlem River, the Kill van Kull and Arthur Kill, and all connecting waterbodies, bays, harbors, shallows and wetlands. As stated above, Coastal Erosion is limited to the state’s coastal counties. While Cayuga County is considered a coastal county, it has limited coastal shoreline and is only a concern for the Town of Sterling and Village of Fair Haven within the town. Therefore, the Steering and Planning Committees do not consider the hazard to be a significant concern. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees
Dam Failure	Yes	Yes	<ul style="list-style-type: none"> 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 99 dams are within Cayuga County, as shown in Section 4. Of these 9 dams, 60 low hazard, 4 intermediate hazard, 2 high hazard, and 34 negligible or no hazard classification and 1 has an unknown classification. Dam failure is included in the flood profile. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees NYSDEC NYS GIS
Disease Outbreak	Yes	Yes	<ul style="list-style-type: none"> The 2019 NYS HMP does not identify disease outbreak as a hazard of concern for New York State. Between March 23 and December 8, 2020, Cayuga County reported 1,282 positive COVID-19 cases. In addition to COVID-19, the County has been impacted by influenza, Lyme disease, and mosquito-borne diseases. 	<ul style="list-style-type: none"> NYS DHSES NYS Department of Health Input from Steering and Planning Committees



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			<ul style="list-style-type: none"> • Due to the recent COVID-19 pandemic, the County identified disease outbreak as a hazard of concern for the County. 	
Drought	Yes	Yes	<ul style="list-style-type: none"> • The 2019 NYS HMP identifies drought as a hazard of concern for the state. Cayuga County has been impacted by several drought events that have occurred in New York State. • New York State was included in a FEMA drought-related disaster declaration in September 2016; however, Cayuga County was not included in the declaration. • Cayuga County was included in six recent drought-related USDA disaster declarations: <ul style="list-style-type: none"> ○ S4023 – August 2016 – Drought ○ S4031 – July 2016 – Drought ○ S4037 – July 2016 - Drought ○ S4062 – April 2016 – Drought ○ S3427 – June 2012 – Drought ○ S3441 – June 2012 – Drought • According to the NRCC, Cayuga County is in the Central Lakes Climate Division. This division has been impacted by 20 periods of severe and extreme drought between 1899 and 1999. • Based on previous occurrences, the existence of agricultural assets in the county, and input from the Steering and Planning Committees, drought is identified as a hazard of concern for Cayuga County. 	<ul style="list-style-type: none"> • NYS DHSES • FEMA • USDA • Input from Steering and Planning Committees • NOAA-NCEI • NRCC
Earthquake	Yes	No	<ul style="list-style-type: none"> • The 2019 NYS HMP identified earthquake as a hazard of concern for the state. • Cayuga 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 was included in one FEMA earthquake-related disaster declaration (DR-1415); Cayuga County was not included in this declaration. • According to the NYS HMP, New York State has experienced over 500 earthquakes through 2016. • According to USGS, there have been no earthquake epicenters in Cayuga County. • The Steering and Planning Committees did not identify earthquake as a hazard of concern for Cayuga County. 	<ul style="list-style-type: none"> • NYS DHSES • Input from Steering and Planning Committees • USGS – Earthquake Hazards Program, Review of USGS Seismic Maps
Expansive Soils	Yes	No	<ul style="list-style-type: none"> • The 2019 NYS HMP did not identify expansive soils as a hazard of concern for New York State. A majority of Cayuga County is partly, less than 50%, underlain by soils with abundant clays of slight to moderate swelling potential. 	<ul style="list-style-type: none"> • NYS DHSES • Input from Steering and Planning Committees



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			<ul style="list-style-type: none"> The Steering and Planning Committees did not identify expansive soils as a hazard of concern for Cayuga County. 	<ul style="list-style-type: none"> Review of USGS 1989 Swelling Clays Map of the Conterminous United States
Extreme Temperature	Yes	No	<ul style="list-style-type: none"> The 2019 NYS HMP identified extreme temperatures as a hazard of concern for New York State. While the County experiences periods temperatures above or below average, the Steering and Planning Committees did not identify extreme temperature as a hazard of concern for Cayuga County. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees
Flood (riverine, ice jam, dam failure and flash)	Yes	Yes	<ul style="list-style-type: none"> The 2019 NYS HMP identified flooding as a hazard of concern for New York State. Between 1954 and 2020, Cayuga County was included in five FEMA flood-related declarations. <ul style="list-style-type: none"> FEMA-DR-338 (Tropical Storm Agnes) – June 1972 FEMA-DR-367 (High Winds, Wave Action and Flooding) – March 1973 FEMA-DR-487 (Storms, Rains Landslides and Flooding) – October 1975 FEMA-DR-1095 (Severe Storms and Flooding) – January 1996 FEMA-DR-4348 (Flooding) – May-August 2017 Based on the history of flooding and its impacts on Cayuga County and input from the Steering and Planning Committees identified flooding as a hazard of concern for the County. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees FEMA NOAA-NCEI USACE CRREL Ice Jam Database
Hailstorm	Yes	Yes	Please see Severe Storm	
Hurricane	Yes	Yes	Please see Severe Storm	
Ice Jams	Yes	Yes	Please see Flood	
Ice Storm	Yes	Yes	Please see Severe Winter Storm	
Infestation	Yes	No	Please see invasive species	
Invasive Species	Yes	No	<ul style="list-style-type: none"> The 2019 NYS HMP does not identify invasive species as a hazard of concern for New York State. Cayuga County has been impacted by several invasive species, including Emerald Ash Borer and Hemlock Woolly Adelgid. The county has implemented projects to assist with reducing the spread invasive species, including a development plan to respond to infestations. While the county is impacted by invasive species, the Cayuga County Steering and Planning Committees did not identify invasive species as a hazard of concern. 	<ul style="list-style-type: none"> NYS DEC Input from Steering and Planning Committees



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Hazard	Is this a hazard that may occur in Cayuga County?	If yes, does this hazard pose a significant threat to Cayuga County?	Why was this determination made?	Source(s)
Land Subsidence	Yes	No	<ul style="list-style-type: none"> The 2019 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.” The Steering and Planning Committees did not identify land subsidence as a hazard of concern for Cayuga County. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees USGS
Landslide	Yes	No	<ul style="list-style-type: none"> The 2019 NYS HMP includes landslide as a hazard of concern for New York State. A majority of Cayuga County is located within a low landslide incidence area, with a small portion having a moderate susceptibility to landsliding and low incidence. There are small areas with moderate landslide incidence. Between 1954 and 2020 New York State has included in one landslide-related disaster declaration, which did not include Cayuga County. Based on previous occurrences and input from the Steering and Planning Committees, the landslide hazard was not identified as a hazard of concern for Cayuga County. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees FEMA
Nor’Easters	Yes	Yes	Please see Severe Storm	
Severe Storm (windstorms, thunderstorms, hurricanes / tropical storms, hail and tornados)	Yes	Yes	<ul style="list-style-type: none"> The 2019 NYS HMP identified severe storm as a hazard of concern for New York State; however, for the state HMP, the hazards were profiled in individual sections for thunderstorms, lightning, hail, tornadoes, high winds, and hurricanes/tropical storms. For the Cayuga County HMP, the hazards were combined into one profile. Between 1954 and 2020, Cayuga County was included in eight FEMA severe storm-related declarations. <ul style="list-style-type: none"> FEMA-DR-338 (Tropical Storm Agnes) – June 1972 FEMA-DR-367 (High Winds, Wave Action and Flooding) – March 1973 FEMA-DR-487 (Storms, Rains Landslides and Flooding) – October 1975 FEMA-DR-1095 (Severe Storms and Flooding) – January 1996 FEMA-DR-1244 (NY Severe Weather) – September 1998 FEMA-DR-1534 (Severe Storms and Flooding) – May-June 2004 FEMA-DR-1589 (Severe Storms and Flooding) – April 2005 FEMA-EM-3351 (Hurricane Sandy) – October-November 2012 As reported to NOAA-NCEI, between 1956 and 2020, over 400 severe storm events impacted the County, causing over \$32 million in property damage and over \$2 million in crop damage. Based on previous occurrences and input from the Steering and Planning Committees, severe storms are identified as a hazard of concern for Cayuga County. 	<ul style="list-style-type: none"> NYS DHSES FEMA NOAA-NCEI Input from Steering and Planning Committees
Severe Winter Storm	Yes	Yes	<ul style="list-style-type: none"> The 2019 NYS HMP identified severe winter storm as a hazard of concern for New York State. FEMA included Cayuga County in three winter storm-related disaster declarations: 	<ul style="list-style-type: none"> NYS DHSES FEMA NOAA-NCEI



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(heavy snow, blizzards, ice storms)			<ul style="list-style-type: none"> o FEMA-EM-3107 (Severe Blizzard) – March 1993 o FEMA-DR-1467 (Ice Storm) – April 2003 o FEMA-EM-3195 (Snow) – January 2004 • Based on previous occurrences and input from the Steering and Planning Committees, severe winter storms are identified as a hazard of concern for Cayuga County. 	<ul style="list-style-type: none"> • Input from Steering and Planning Committees
Tornado	Yes	Yes	Please see Severe Storm	
Tsunami	No	No	<ul style="list-style-type: none"> • The 2019 NYS HMP identifies Tsunami and Seiche events as a hazard of concern for coastal Atlantic communities. • The Steering and Planning Committees do not consider tsunami to be a hazard of concern for Cayuga County. 	<ul style="list-style-type: none"> • NYS DHSES • Input from Steering and Planning Committees
Volcano	No	No	<ul style="list-style-type: none"> • The 2019 NYS HMP does not identify volcano as a hazard of concern for New York State and, therefore, the Steering and Planning Committees does not consider volcano to be a hazard of concern for Cayuga County. 	<ul style="list-style-type: none"> • NYS DHSES • Input from Steering and Planning Committees
Wildfire	Yes	No	<ul style="list-style-type: none"> • The NYS HMP identified wildfire as a hazard of concern for New York State. • Cayuga County was not included in any FEMA wildfire-related disaster declarations. • Based on available data, the Steering and Planning Committees do not consider wildfire a hazard of concern for Cayuga County. 	<ul style="list-style-type: none"> • NYS DHSES • Input from Steering and Planning Committees • FEMA
Windstorm	Yes	Yes	Please see Severe Storm	

- CRREL *Cold Regions Research and Engineering Laboratory*
- 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 DEC *New York State Department of Environmental Conservation*
- NYS DHSES *New York State Division of Homeland Security and Emergency Services*
- NYS HMP *New York State Hazard Mitigation Plan*
- PGA *Peak ground acceleration*
- USDA *U.S. Department of Agriculture*
- USGS *United States Geologic Survey*





5.2.3 Summary of Hazards of Concern

In summary, a total of seven hazards of concern were identified as significant hazards affecting the entire planning area, to be addressed at the county level in this plan (shown here in alphabetical order):

- Disease Outbreak
- Drought
- Flood (riverine, dam failure, flash, and ice jam)
- Harmful Algal Bloom
- Severe Storm (thunderstorm, hail, wind, tornado, hurricane/tropical storm, and Nor'Easter)
- Severe Winter Storm
- Transportation Accidents

Other hazards of concern that might have occurred in Cayuga County but have a low potential to occur or result in significant impacts can be considered in future updates to this plan.