



5.2 IDENTIFICATION OF HAZARDS OF CONCERN

To provide a strong foundation for mitigation actions considered in Sections 6 and 9, Onondaga 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 2014); review of the 2013 Onondaga 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 natural 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.

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

5.2.1 Changes from 2013 Hazard Mitigation Plan

The 2013 Onondaga County Hazard Mitigation Plan did not identify drought, harmful algal bloom, and invasive species as hazards of concern. These hazards have been included as hazards of concern for the 2019 Hazard Mitigation Plan Update due to previous instances of these hazards occurring within the County and because of input by members of the Steering Committee and the Planning Partnership. In addition, the ground failure hazard is incorporated into the Geologic hazard section for the current plan.

The 2019 Onondaga County Hazard Mitigation Plan Update includes best available data throughout the plan to present an updated understanding of the risk that Onondaga County faces.

5.2.2 Hazard Groupings

As per the 2013 Onondaga 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 *Drought* hazard profile specifically addresses drought events which have occurred in Onondaga County or have had a considerable impact on the county.

The *Earthquake* hazard profile specifically addresses earthquakes which have occurred in Onondaga County or have had a considerable impact on the county.

The *Flood* hazard includes riverine flooding, flash flooding, shallow flooding, ice jam flooding, and dam failure flooding. 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 *Geologic* hazard includes geological or hydrological processes that pose a threat to human lives and natural lands. For the purpose of this HMP update, landslides, land subsidence, and mudboils are included in this hazard.

The *Harmful Algal Bloom (HAB)* hazard addresses out of control colonies of algae that produce toxins or have harmful health effects.



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The *Invasive Species* hazard profile specifically addresses invasive species that have the potential to affect the built environment and public infrastructure in Onondaga 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 the purpose of 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.

Technological (for example, hazardous material incidents) and man-made hazards (for example, terrorism) 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 the County and planning participants. 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 Onondaga County

Hazard	Is this a hazard that may occur in Onondaga County?	If yes, does this hazard pose a significant threat to the County?	Why was this determination made?	Source(s)
Avalanche	No	No	<ul style="list-style-type: none"> 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 Onondaga 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 Onondaga County and the Planning Partnership does not consider the hazard to be a significant concern. 	<ul style="list-style-type: none"> NYS DHSES NAC-AAA
Coastal Erosion	No	No	<ul style="list-style-type: none"> The NYS HMP 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. Onondaga County is not a coastal county and therefore, coastal erosion is not considered a hazard of concern by the Steering Committee and Planning Partnership. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering Committee and Planning Partnership
Dam Failure	Yes	Yes	<ul style="list-style-type: none"> The 2014 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 Onondaga 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. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering Committee and Planning Partnership NYSDEC NYS GIS
Disease Outbreak	Yes	No	<ul style="list-style-type: none"> The 2014 NYS HMP does not identify disease outbreak as a hazard of concern for New York State. 	<ul style="list-style-type: none"> NYS DHSES NYS DEC



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Hazard	Is this a hazard that may occur in Onondaga County?	If yes, does this hazard pose a significant threat to the County?	Why was this determination made?	Source(s)
			<ul style="list-style-type: none"> While the county has been impacted by various diseases (influenza, Lyme disease), the Steering Committee and Planning Partnership does not identify disease outbreak as a hazard of concern for Onondaga County. 	<ul style="list-style-type: none"> Input from Steering Committee and Planning Partnership
Drought	Yes	Yes	<ul style="list-style-type: none"> The NYS HMP identifies drought as a hazard of concern for the State. Onondaga County has been impacted by several drought events that have occurred in New York State. Drought conditions can cause shortages in water for human consumption, can impact agricultural production and can lead to reduced local firefighting capabilities. In the short-term, surface water supplies are affected more quickly during droughts than groundwater sources. New York State is included in one FEMA drought-related disaster declaration which does not include Onondaga County. Onondaga County is included in two recent drought-related USDA disaster declarations: <ul style="list-style-type: none"> S3427 – Drought / Excessive Heat – 2012 S3441 – Drought – 2012 S4023 – Drought Fast Track– 2016 According to the NYSDEC, Onondaga County is located in the Finger Lakes Drought Management Region. This division has been impacted by periods of severe and extreme drought including the following events: <ul style="list-style-type: none"> September 1-30, 1999 April 1, 2001 May 8-September 24, 2001 March 19-April 1, 2002 July 23-August 5, 2002 September 3-30, 2002 April 19-25, 2005 May 31-June 20, 2005 August 9-September 5, 2005 April 11-June 5, 2006 August 7-November 26, 2007 June 10-July 14, 2008 April 13-May 10, 2010 May 25-June 7, 2010 July 26-September 12, 2011 July 10-December 31, 2012 April 9-15, 2013 January 27-June 8, 2015 September 8, 2015-February 22, 2016 May 24, 2016-February 6, 2017 September 26-October 30, 2017 June 19-July 30, 2018 Based on previous occurrences and the existence of significant agricultural assets in the County, and input from the Steering Committee and Planning Partnership, drought is identified as a hazard of concern for Onondaga County. 	<ul style="list-style-type: none"> NYS DHSES FEMA USDA Input from Steering Committee and Planning Partnership NOAA-NCEI NYSDEC
Earthquake	Yes	No	<ul style="list-style-type: none"> The NYS HMP identifies earthquake as a hazard of concern for the State. Onondaga County has a PGA below 3%. 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); Onondaga County was not included in this declaration. According to the NYS HMP, between 1973 and 2012, there have been 189 earthquakes epicentered in the State. Of those 189 events, none had an epicenter in Onondaga 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 Onondaga County. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering Committee and Planning Partnership USGS – Earthquake Hazards Program, Review of



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Hazard	Is this a hazard that may occur in Onondaga County?	If yes, does this hazard pose a significant threat to the County?	Why was this determination made?	Source(s)
				USGS Seismic Maps
Expansive Soils	Yes	No	<ul style="list-style-type: none"> The NYS HMP identifies expansive soils as a hazard of concern for New York State. However, a majority of Onondaga 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. The Steering Committee and Planning Partnership does not identify expansive soils as a hazard of concern for Onondaga County. Therefore, it will not be further discussed in detail. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering Committee and Planning Partnership Review of USGS 1989 Swelling Clays Map of the Conterminous United States
Extreme Temperature	Yes	No	<ul style="list-style-type: none"> The NYS HMP identifies extreme temperatures as a hazard of concern for New York State. According to the NOAA-NCEI database, between 1950 and August 2018, there have been 17 extreme temperature events in Onondaga County, resulting in \$30 thousand in property damages. Onondaga County is included in any FEMA disaster declarations for extreme temperature-related events; however, the county has been included in nine recent USDA disaster declarations: <ul style="list-style-type: none"> S3249 – frosts and freezes- March 2012 S3411- Weather related armyworm outbreak- May 2012 S3427 – Heat – June 2012 S3594 – Frosts and Freezes – January 2013 S3666 – Freeze – January 2014 S3672 – Freeze – January S3746 - freeze – February 2014 S3886 – Frosts and Freeze – January 2015 S4052- Unseasonably Warm Followed by Freeze – October 2016 The Steering and Planning Committees does not identify extreme temperature as a hazard of concern for Onondaga County with the understanding that associated impacts with this hazard are addressed in the drought and severe winter weather hazard profiles in the plan. Therefore, this hazard is not considered a separate hazard of concern. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering Committee and Planning Partnership NOAA-NCEI USDA
Flood (riverine, ice jam, dam failure and flash)	Yes	Yes	<ul style="list-style-type: none"> The NYS HMP identifies flooding as a hazard of concern for New York State. According to the NOAA-NCEI database, between 1950 and August 2018, there have been 6 flood events in Onondaga County. Onondaga County is included in eight flood-related FEMA disaster declarations: <ul style="list-style-type: none"> FEMA-DR-338 (Tropical Storm Agnes) – June 1972 FEMA-DR-447 (Severe Storms and Flooding) – July 1974 FEMA-DR-487 (Storms, Rains, Landslides & Flooding) – October 1975 FEMA-DR-1095 (Severe Storms and Flooding) – January 1996 FEMA-DR-1335 (Severe Storms and Flooding) – May-August 2000 FEMA-DR-1534 (Severe Storms and Flooding) – May & June 2004 FEMA-DR-1564 (Severe Storms and Flooding) – August-September 2004 FEMA-DR-1993 (Severe Storms, Flooding, Tornadoes, and Straight Line Winds) – April & May 2011 Between 1950 and 2018, there has been one ice jam in the county. Based on previous events and input from the Steering Committee and Planning Partnership, flood is identified as a hazard of concern for the county. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering Committee and Planning Partnership FEMA NOAA-NCEI USACE CRREL Ice Jam Database
Hailstorm	Yes	Yes	Please see Severe Storm	
Harmful Algal Bloom	Yes	Yes	<ul style="list-style-type: none"> The NYS HMP does not identify harmful algal bloom as a hazard of concern for New York State. 	<ul style="list-style-type: none"> NYSDEC NYGIS



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			<ul style="list-style-type: none"> Onondaga County has a significant amount of exposure to harmful algal bloom due to approximately 10% of the county consisting of surface water features. Municipalities utilize surface water features such as lakes and reservoirs as sources of potable water, some of which have tested positive for harmful algal bloom, which leads to heightened exposure to a considerable amount of the County’s population. Between 2012 and 2018, there were twenty-one harmful algal bloom events: <ul style="list-style-type: none"> 2012- Oneida River- S (Suspicious Bloom) 2013- Oneida Lake- C (Confirmed Bloom) 2013- Oneida River- S (Suspicious Bloom) 2014- Oneida Lake- S (Suspicious Bloom) 2015- Oneida Lake- S (Suspicious Bloom) 2015- Otisco Lake- S (Suspicious Bloom) 2016- Hiawatha Lake- C (Confirmed Bloom) 2016- Oneida Lake- S (Suspicious Bloom) 2016- Oneida River- HT (Confirmed with High Toxins Bloom) 2016- Tully Lake- C (Confirmed Bloom) 2017- De Ruyter Reservoir- HT (Confirmed with High Toxins Bloom) 2017- Hiawatha Lake- HT (Confirmed with High Toxins Bloom) 2017- Jamesville Reservoir- C (Confirmed Bloom) 2017- Oneida Lake- HT (Confirmed with High Toxins Bloom) 2017- Otisco Lake- C (Confirmed Bloom) 2017- Skaneateles Lake- HT (Confirmed with High Toxins Bloom) 2017- Tully Lake- C (Confirmed Bloom) 2018- Hiawatha Lake- No additional information available 2018- Jamesville Reservoir- C (Confirmed Bloom) 2018- Skaneateles Lake- C (Confirmed Bloom) 2018- Oneida Lake- S (Suspicious Bloom) Based on previous events and input from the Steering Committee and Planning Partnership, harmful algal bloom is identified as a hazard of concern for the County. 	<ul style="list-style-type: none"> Cornell Cooperative Extension CNY Central
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	Yes	<ul style="list-style-type: none"> 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 Onondaga County (emerald ash borer, hemlock wooly adelgid). The NYS DEC identifies Onondaga County as being located within the emerald ash borer restricted zone and has identified several known locations of the emerald ash borer within the County. In addition to the emerald ash borer, there are several species of invasive animals, insects, and plants which have had an impact on the County. After review of the available data, at this time, the Steering Committee and Planning Partnership identifies invasive species as a hazard of concern for Onondaga County. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees NYSDEC EDDMapS
Land Subsidence	Yes	Yes	<ul style="list-style-type: none"> 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 Committee and Planning Partnership identifies land subsidence as a potential hazard of concern for Onondaga County and it is included in the Geologic Hazard profile in this plan. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering Committee and Planning Partnership USGS



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Landslide	Yes	Yes	<ul style="list-style-type: none"> The NYS HMP includes landslide as a hazard of concern for New York State. According to the NYS HMP, 0 people in Onondaga County live within a high incidence of landslide area, 111,568 people live in a moderate susceptibility/low incidence, and 1,623 people live in an area of moderate incidence. The remainder of the population lives within a low incidence area. Between 1954 and 2018 New York State was included in one landslide-related disaster declaration which included Onondaga County. Based on previous occurrences and input from the Steering Committee and Planning Partnership, the landslide hazard is identified as a hazard of concern for Onondaga County and it is included in the Geologic Hazard profile in this plan. . 	<ul style="list-style-type: none"> NYS DHSES Input from Steering Committee and Planning Partnership FEMA
Nor'Easters	Yes	Yes	Please see Severe Storm	
Severe Storm (windstorms, thunderstorms, hurricanes / tropical storms, Nor'Easters, hail and tornados)	Yes	Yes	<ul style="list-style-type: none"> The NYS HMP identifies severe storm as a hazard of concern for New York State. However, for the State HMP, the hazards were profiled in individual sections: hailstorm, high wind, and hurricane. For the purpose of this County HMP, the hazards were combined into one profile. The NOAA-NCEI Storm Events Database indicated that Onondaga County was impacted by 292 severe storm-related events between 1950 and August 2018. This resulted in six fatalities, 33 injuries, and over \$100 million in damages (as reported by NOAA-NCEI). According to the SPC, 6 tornados have impacted Onondaga County between 1950 and 2017. Onondaga County is included in 10 severe storm-related FEMA disaster declarations: <ul style="list-style-type: none"> FEMA-DR-338 (Tropical Storm Agnes) – June 1972 FEMA-DR-447 (Severe Storms and Flooding) – July 1974 FEMA-DR-487 (Storms, Rains, Landslides & Flooding) – October 1975 FEMA-DR-1095 (Severe Storms and Flooding) – January 1996 FEMA-DR-1244 (Severe Storm: Severe Weather) – September 1998 FEMA-DR-1335 (Severe Storms and Flooding) – May-August 2000 FEMA-DR-1534 (Severe Storms and Flooding) – May & June 2004 FEMA-DR-1564 (Severe Storms and Flooding) – August-September 2004 FEMA-DR-1993 (Severe Storms, Flooding, Tornados, and Straight Line Winds) – April & May 2011 FEMA-EM-3351 (Hurricane Sandy) – October & November 2012 Based on previous occurrences and input from the Steering and Planning Committees identifies severe storms as a hazard of concern for Onondaga County. 	<ul style="list-style-type: none"> NYS DHSES FEMA NOAA-NCEI SPC Input from Steering Committee and the Planning Partnership
Severe Winter Storm (heavy snow, blizzards, ice storms)	Yes	Yes	<ul style="list-style-type: none"> The NYS HMP identifies severe winter storm as a hazard of concern for New York State and stated that Onondaga County has experienced over 200 winter storm events. The NOAA-NCEI Storm Events Database indicated that Onondaga County has been impacted by 140 severe winter storm-related events between 1950 and August 2018. This has resulted in one fatality, one injury, and over \$7.5 million in damages (as reported by NOAA-NCEI). FEMA included Onondaga County in three winter storm-related disaster declarations: <ul style="list-style-type: none"> FEMA-EM-3107 (Severe Blizzard) – March 1993 FEMA-DR-1467 (Ice Storm) – April 2003 Based on previous occurrences and input from the Steering Committee and Planning Partnership severe winter storms is an identified hazard of concern for Onondaga County. 	<ul style="list-style-type: none"> NYS DHSES FEMA NOAA-NCEI Input from Steering Committee and Planning Partnership
Tornado	Yes	Yes	Please see Severe Storm	
Tsunami	No	No	<ul style="list-style-type: none"> Tsunami is not identified as a hazard of concern in the NYS HMP and, therefore, the Steering Committees and Planning Partnership do not consider 	<ul style="list-style-type: none"> NYS DHSES



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			tsunami to be a significant concern to Onondaga County and it is not discussed in further detail.	<ul style="list-style-type: none"> Input from Steering Committee and Planning Partnership
Volcano	No	No	<ul style="list-style-type: none"> The NYS HMP does not identify volcano as a hazard of concern for New York State and, therefore, the Steering Committee and Planning Partnership does not consider volcano to be a hazard of concern for Onondaga County and it will not be further discussed in detail. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering Committee and Planning Partnership
Wildfire	Yes	No	<ul style="list-style-type: none"> The NYS HMP identifies wildfire as a hazard of concern for New York State. Onondaga County has not been included in any FEMA wildfire-related disaster declarations. There have not been significant occurrences of wildfire within Onondaga County Based on available data, the Steering Committee and Planning Partnership do not consider wildfire to be a hazard of concern for Onondaga County. Therefore it will not be further discussed in detail. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering committee and Planning Partnerships 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 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 eight natural 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):

- Drought
- Earthquake
- Flood (riverine, dam failure, flash, and ice jam)
- Geological Hazards
- Harmful Algal Bloom
- Invasive Species and Infestation
- Severe Storm (thunderstorm, hail, wind, tornado, hurricane/tropical storm, and Nor’Easter)
- Severe Winter Storm

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

