



## 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), Chenango 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 2015 Chenango County HMP (Chenango County HMP 2015); 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 (not manmade) 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 Chenango 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, or geological event.

### 5.2.1 Changes from 2015 Hazard Mitigation Plan

The 2015 Chenango County Hazard Mitigation Plan identified infestation of plants, animals, and insects and related diseases as a hazard of concern. For the 2021 Hazard Mitigation Plan Update, members of the Steering and Planning Committees identified invasive species and disease outbreak as separate hazards of concern. The invasive species hazard addresses and identifies invasive plants, animals, and insects that can be a risk to the welfare of the public. The disease outbreak hazard addresses and identifies communicable diseases, as well as disease outbreaks related to infectious insects (i.e. mosquitoes and ticks). The 2021 Update also includes the addition of Harmful Algal Blooms (HABs) as a hazard of concern.



Source: NYIS (2019)

The 2021 Chenango County Hazard Mitigation Plan Update includes best available data throughout the plan to present an updated understanding Chenango County’s risk.

### 5.2.2 Hazard Groupings

As per the 2015 Chenango 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 NYS HMP.



The *Disease Outbreak* hazard profile addresses mosquito-borne, tick borne, and communicable respiratory diseases that occurred in Chenango County or had a considerable impact on the county.



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



-  The *Extreme Temperature* hazard profile specifically addresses periods of extreme temperature that occurred in Chenango County or 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 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 Chenango County and the surrounding region.
-  The *Invasive Species* hazard profile specifically addresses invasive species that affect Chenango County and the surrounding region.
-  The *Natural Gas* hazard profile addresses incidents related to natural gas development events that affect Chenango 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 *Wildfire* hazard profile specifically addresses wildfires that occurred in Chenango County or had a considerable impact on the county.

Technological (e.g., hazardous material incidents) and man-made hazards (e.g., terrorism, man-made dam breaches/failures) 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 Chenango 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 Chenango County

Hazard	Is this a hazard that may occur in Chenango County?	If yes, does this hazard pose a significant threat to Chenango County?	Why was this determination made?	Source(s)
Avalanche	No	No	<ul style="list-style-type: none"> <li>The NYS HMP identifies avalanche as a hazard of concern.</li> <li>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 Chenango County does not support the occurrence of an avalanche.</li> <li>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 2020.</li> <li>Avalanche was identified as a hazard in the NYS HMP and there have been occurrences in the state; however, there were no known occurrences in Chenango County. The Steering and Planning Committees do not consider the hazard to be a significant concern.</li> </ul>	<ul style="list-style-type: none"> <li>NYS DHSES</li> <li>NAC-AAA</li> </ul>
Coastal Erosion	No	No	<ul style="list-style-type: none"> <li>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.</li> <li>As stated above, coastal erosion is limited to the state’s coastal counties. Chenango County is not a coastal county; therefore, the Steering and Planning Committees do not consider the hazard to be a significant concern.</li> </ul>	<ul style="list-style-type: none"> <li>NYS DHSES</li> <li>Input from Steering and Planning Committees</li> </ul>
Dam Failure	Yes	Yes	<ul style="list-style-type: none"> <li>The 2019 NYS HMP identifies dam failure as a hazard of concern for New York State and includes it in the Flood hazard profiles.</li> <li>According to the NYS DEC there are 158 dams are within Chenango County, as shown in Section 4. Of these 158 dams, 116 are low hazard, 10 are intermediate hazard, 11 are high hazard, and 17 are negligible or have no hazard classification. Four dams have an unknown classification (NYS DEC 2020).</li> <li>Dam failure is included in the flood profile.</li> </ul>	<ul style="list-style-type: none"> <li>NYS DHSES</li> <li>Input from Steering and Planning Committees</li> <li>NYSDEC</li> <li>NYS GIS</li> </ul>
Disease Outbreak	Yes	Yes	<ul style="list-style-type: none"> <li>The 2019 NYS HMP does not identify disease outbreak as a hazard of concern for New York State.</li> <li>The County has been impacted by the COVID-19 pandemic (DR-4480). Between March 15, 2020 and February 8, 2021, there have been 2,273 confirmed cases of COVID-19, and 47 fatalities in the County.</li> </ul>	<ul style="list-style-type: none"> <li>NYS DHSES</li> <li>NYS DEC</li> <li>Input from Steering and Planning Committees</li> </ul>



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			<ul style="list-style-type: none"> <li>The County has been impacted by various diseases (COVID-19, West Nile Virus, Lyme disease); therefore, the Steering and Planning Committees identified disease outbreak as a hazard of concern for Chenango County.</li> </ul>	
Drought	Yes	Yes	<ul style="list-style-type: none"> <li>The NYS HMP identifies drought as a hazard of concern for the state. Chenango County has been impacted by several drought events that have occurred in New York State.</li> <li>Drought conditions can cause shortages in water for human consumption, impact agricultural production, and lead to reduced local firefighting capabilities.</li> <li>New York State was included in one FEMA drought-related disaster declaration, which did not include Chenango County.</li> <li>Chenango County was included in five recent drought-related USDA disaster declarations:               <ul style="list-style-type: none"> <li>S4031 – Drought – 2016</li> </ul> </li> <li>According to the NRCC, Chenango County is in the Eastern Plateau Climate Division. This division has been impacted by 27 different periods of severe and extreme drought between 1895 and 2002. 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 Chenango County.</li> </ul>	<ul style="list-style-type: none"> <li>NYS DHSES</li> <li>FEMA</li> <li>USDA</li> <li>Input from Steering and Planning Committees</li> <li>NOAA-NCEI</li> <li>NRCC</li> </ul>
Earthquake	Yes	No	<ul style="list-style-type: none"> <li>The NYS HMP identified earthquake as a hazard of concern for the state.</li> <li>Chenango 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.</li> <li>New York State was included in one FEMA earthquake-related disaster declaration (DR-1415); Chenango County was not included in this declaration.</li> <li>According to the NYS HMP, between 1973 and 2012, there were 189 earthquakes epicentered in the state. Of those 189 events, none had an epicenter in Chenango County.</li> <li>Based on the potential for significant loss and input from the Steering and Planning Committees, earthquake has not been identified as a hazard of concern for Chenango County.</li> </ul>	<ul style="list-style-type: none"> <li>NYS DHSES</li> <li>Input from Steering and Planning Committees</li> <li>USGS – Earthquake Hazards Program, Review of USGS Seismic Maps</li> </ul>
Extreme Temperature	Yes	Yes	<ul style="list-style-type: none"> <li>The NYS HMP identified extreme temperatures as a hazard of concern for New York State.</li> <li>Chenango County was included in one recent USDA disaster declarations related to extreme temperature events:               <ul style="list-style-type: none"> <li>S4031 – September 2016 – Heat, excessive heat (also included drought)</li> </ul> </li> <li>The Steering and Planning Committees identified extreme temperature as a hazard of concern for Chenango County.</li> </ul>	<ul style="list-style-type: none"> <li>NYS DHSES</li> <li>Input from Steering and Planning Committees</li> <li>NOAA-NCEI</li> <li>USDA</li> </ul>



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Flood (riverine, ice jam, dam failure and flash)	Yes	Yes	<ul style="list-style-type: none"> <li>The NYS HMP identified flooding as a hazard of concern for New York State.</li> <li>Between 1954 and 2020, Chenango County was included in 16 FEMA flood-related declarations.               <ul style="list-style-type: none"> <li>FEMA-DR-338 (Flood) – June 1972</li> <li>FEMA-DR-1095 (Flood) – January 1996</li> <li>FEMA-DR-1335 (Severe Storms and Flooding) – Summer 2000</li> <li>FEMA-DR-1534 (Severe Storms and Flooding) – May-June 2004</li> <li>FEMA-DR-1565 (Tropical Depression Ivan) – October 2004</li> <li>FEMA-DR-1589 (Severe Storms and Flooding) – April 2005</li> <li>FEMA-DR-1650 (Severe Storms and Flooding) – June-July 2006</li> <li>FEMA-DR-1670 (Severe Storms and Flooding) – November 2006</li> <li>FEMA-DR-1857 (Severe Storms and Flooding) – August 2009</li> <li>FEMA-DR-1993 (Severe Storms, Flooding, Tornadoes, and Straight-Line Winds) – April-May 2011</li> <li>FEMA-EM-3341 (Remnants of Tropical Storm Lee) – September 2011</li> <li>FEMA-DR-4031 (Remnants of Tropical Storm Lee) – September 2011</li> <li>FEMA-EM-3351 (Hurricane Sandy) – October 2012</li> <li>FEMA-DR-4129 (Severe Storms and Flooding) – June-July 2013</li> <li>FEMA-DR-4397 (Severe Storms and Flooding) – August 2018</li> <li>FEMA-DR-4472 (Severe Storms, Straight-Line Winds, and Flooding) – November 2019</li> </ul> </li> <li>Between 1950 and 2020, there have been two ice jam events in the county.</li> <li>Based on the history of flooding and its impacts on Chenango County and input from the Steering and Planning Committees identified flooding as a hazard of concern for the county.</li> </ul>	<ul style="list-style-type: none"> <li>NYS DHSES</li> <li>Input from Steering and Planning Committees</li> <li>FEMA</li> <li>NOAA-NCEI</li> <li>USACE CRREL Ice Jam Database</li> </ul>
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	Yes	<ul style="list-style-type: none"> <li>The 2019 NYS HMP does not identify invasive species as a hazard of concern for New York State.</li> <li>New York State has been affected by various instances of invasive ticks and mosquitos.</li> </ul>	<ul style="list-style-type: none"> <li>NYS DEC</li> <li>Input from Steering and Planning Committees</li> </ul>



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			<ul style="list-style-type: none"> <li>The NYS DEC has identified Chenango County to be located within the emerald ash borer restricted zone and identified several known locations of the emerald ash borer within the County.</li> <li>In addition to the emerald ash borer, several species of animals, insects, and plants have impacted the county. The Chenango County Steering and Planning Committees identified invasive species as a hazard of concern due to previous occurrences of invasive species within Chenango County.</li> </ul>	
Land Subsidence	Yes	No	<ul style="list-style-type: none"> <li>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.”</li> <li>The Steering and Planning Committees did not identify land subsidence as a hazard of concern for Chenango County.</li> </ul>	<ul style="list-style-type: none"> <li>NYS DHSES</li> <li>Input from Steering and Planning Committees</li> <li>USGS</li> </ul>
Landslide	Yes	No	<ul style="list-style-type: none"> <li>The 2019 NYS HMP includes landslide as a hazard of concern for New York State.</li> <li>According to the USGS, the majority of Chenango County is located within a low incidence area. The southwest corner of Chenango County has moderate landslide susceptibility.</li> <li>Between 1954 and 2020 New York State has included in one landslide-related disaster declaration. This event did not include Chenango County.</li> <li>Based on previous occurrences and input from the Steering and Planning Committees, the landslide hazard was not identified as a hazard of concern for Chenango County.</li> </ul>	<ul style="list-style-type: none"> <li>NYS DHSES</li> <li>Input from Steering and Planning Committees</li> <li>FEMA</li> </ul>
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"> <li>The 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 thunderstorms, lightning, hail, tornadoes, high winds, and hurricanes/tropical storms. For the Chenango County HMP, the hazards were combined into one profile.</li> <li>Between 1954 and 2020, Chenango County was included in 17 FEMA severe storm-related declarations.               <ul style="list-style-type: none"> <li>FEMA-DR-338 (Tropical Storm Agnes) – June 1972</li> <li>FEMA-DR-1095 (Severe Storms and Flooding) – January 1996</li> <li>FEMA-DR-1222 (Severe Storms and Tornadoes) – May-June 1998</li> <li>FEMA-DR-1534 (Severe Storms and Flooding) – May-June 2004</li> <li>FEMA-DR-1565 (Tropical Depression Ivan) – September 2004</li> <li>FEMA-DR-1589 (Severe Storms and Flooding) – April 2005</li> <li>FEMA-DR-1650 (Severe Storms and Flooding) – June-July 2006</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>NYS DHSES</li> <li>FEMA</li> <li>NOAA-NCEI</li> <li>SPC</li> <li>Input from Steering and Planning Committees</li> </ul>



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			<ul style="list-style-type: none"> <li>○ FEMA-DR-1670 (Severe Storms and Flooding) – November 2006</li> <li>○ FEMA-DR-1857 (Severe Storms and Flooding) – August 2009</li> <li>○ FEMA-DR-1993 (Severe Storms, Flooding, Tornadoes, and Straight-Line Winds) – April-May 2011</li> <li>○ FEMA-EM-3341 (Remnants of Tropical Storm Lee) – September 2011</li> <li>○ FEMA-DR-4031 (Remnants of Tropical Storm Lee) – September 2011</li> <li>○ FEMA-EM-3351 (Hurricane Sandy) – October-November 2012</li> <li>○ FEMA-DR-4129 (Severe Storms and Flooding) – June-July 2013</li> <li>○ FEMA-DR-4397 (Severe Storms and Flooding) – August 2018</li> <li>○ FEMA-DR-4472 (Severe Storms) – December 2019</li> <li>● According to the SPC, 13 tornadoes impacted Chenango County between 1950 and 2020.</li> <li>● Based on previous occurrences and input from the Steering and Planning Committees, severe storms are identified as a hazard of concern for Chenango County.</li> </ul>	
Severe Winter Storm (heavy snow, blizzards, ice storms)	Yes	Yes	<ul style="list-style-type: none"> <li>● The NYS HMP identified severe winter storm as a hazard of concern for New York State. According to Cornell University, Broome County’s annual average snowfall is between 60 and 100 inches and its average annual winter storm losses is \$19,000 according to the 2019 HMP.</li> <li>● FEMA included Chenango County in six winter storm-related disaster declarations:               <ul style="list-style-type: none"> <li>○ FEMA-EM-3107 (Severe Blizzard) – March 1993</li> <li>○ FEMA-DR-3173 (Snowstorms) – December 2002-January 2003</li> <li>○ FEMA-DR-3184 (Snow) – February 2003</li> <li>○ FEMA-DR-1467 (Severe Ice Storm) – April 2003</li> <li>○ FEMA-EM-3299 (Severe Winter Storm) – December 2008</li> <li>○ FEMA-DR-4322 (Severe Winter Storm and Snowstorm) – March 2017</li> </ul> </li> <li>● Based on previous occurrences and input from the Steering and Planning Committees, severe winter storms are identified as a hazard of concern for Chenango County.</li> </ul>	<ul style="list-style-type: none"> <li>● NYS DHSES</li> <li>● FEMA</li> <li>● NOAA-NCEI</li> <li>● Input from Steering and Planning Committees</li> </ul>
Tornado	Yes	Yes	Please see Severe Storm	
Tsunami	No	No	<ul style="list-style-type: none"> <li>● Tsunami is identified as a hazard of concern in the NYS HMP; however, while rare, tsunamis impact the coastal areas of the State.</li> <li>● Due to its inland location and based on input from the Steering and Planning Committees, tsunamis are not identified as a hazard of concern for Chenango County.</li> </ul>	<ul style="list-style-type: none"> <li>● NYS DHSES</li> <li>● Input from Steering and Planning Committees</li> </ul>
Volcano	No	No	<ul style="list-style-type: none"> <li>● The NYS HMP did not identify volcano as a threat for New York State and, therefore, the Steering and Planning Committees does not consider volcano to be a hazard of concern for Chenango County.</li> </ul>	<ul style="list-style-type: none"> <li>● NYS DHSES</li> <li>● Input from Steering and</li> </ul>



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				Planning Committees
Wildfire	Yes	No	<ul style="list-style-type: none"> <li>The NYS HMP identified wildfire as a hazard of concern for New York State.</li> <li>Chenango County was not included in any FEMA wildfire-related disaster declarations.</li> <li>Based on available data, the Steering and Planning Committees identified wildfire as a hazard of concern for Chenango County.</li> </ul>	<ul style="list-style-type: none"> <li>NYS DHSES</li> <li>Input from Steering and Planning Committees</li> <li>FEMA</li> </ul>
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*
- SPC *Storm Prediction Center*
- USDA *U.S. Department of Agriculture*
- USGS *United States Geologic Survey*



### 5.2.3 Summary of Hazards of Concern

In summary, a total of 10 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):

- Disease Outbreak
- Drought
- Extreme Temperatures
- Flood (riverine, dam failure, flash, and ice jam)
- Harmful Algal Bloom
- Invasive Species
- Natural Gas
- Severe Storm (thunderstorm, hail, wind, tornado, hurricane/tropical storm, and Nor'Easter)
- Severe Winter Storm
- Wildfire

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