



## 5.2 IDENTIFICATION OF HAZARDS OF CONCERN

To provide a strong foundation for mitigation actions considered in Sections 6 and 9, 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); 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.

For the purposes of this planning effort, the Planning Committee chose to group some hazards together, 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 “Flood” hazard includes riverine, flash, ice jam, dam failure flooding (overtopping or breaching from natural causes). Other types of flooding such as coastal or urban drainage do not generally occur within the County; therefore, they were not further considered for inclusion within this HMP. 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.

The “Severe Storm” hazard includes windstorms that often entail a variety of other influencing weather conditions including thunderstorms, hail, lightning and tornadoes. Since tropical disturbances are identified as a type of severe storm event, this hazard also includes tropical cyclone events (hurricanes, tropical storms and tropical depressions). Tropical cyclones were not grouped as a separate hazard, because the County felt that these types of events do not directly impact the County on a frequent basis and that exposure and risk of such events are minimal in comparison to communities along the New York coastline.

The “Severe Winter Storm” hazard includes heavy snowfall, blizzards, freezing rain/sleet, ice storms and extra-tropical cyclones (Nor’Easters and severe winter low-pressure systems). Extra-tropical events generally occur during winter weather months; therefore, for the purpose of this HMP, all such events are to be grouped within this hazard. Although not all extra-tropical events, such as nor’easters, occur during the winter, they will remain grouped within this hazard category to avoid duplication of events in hazard profiles. Also, since extreme cold temperatures are generated during winter weather months and/or accompany winter storms, extreme cold events have also been grouped with this hazard. This grouping is consistent with that used in the NYS HMP, as well as the “Severe Winter Storm” hazard used in FEMA’s “Multi-Hazard Identification and Risk Assessment” guidance.

These groupings do not change the definition of the included specific events/hazards, as defined within FEMA guidance and other risk assessment documents, and does not affect the hazard analysis conducted through the use of HAZUS-MH, either directly or as a risk assessment support tool.



## *Section 5.2: Risk Assessment – Identification of Hazards of Concern*

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Please note that technological [e.g. hazardous material incidents] and man-made hazards (e.g. terrorism) are not being addressed in this planning process. The DMA 2000 regulations do not require consideration of such hazards, these were not chosen for inclusion in this plan update by the County and planning participants.



Table 5.2-1. Identification of 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 the County?	Why was this determination made?	Source(s)
Avalanche	No	No	<ul style="list-style-type: none"> <li>The topography and climate of Chenango County does not support the occurrence of an avalanche event.</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 2013.</li> <li>Avalanche was identified as a hazard in the NYS HMP; however, there have been no occurrences in Chenango County.</li> </ul>	<ul style="list-style-type: none"> <li>NYS DHSES</li> <li>Input from Planning Committee</li> <li>Review of NAC-AAA database between 1998 and 2013.</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 the State. Counties bounded by coastal waters are most affected by coastal erosion. Chenango County is not bounded by coastal waters; therefore, coastal erosion is not a hazard of concern for the County.</li> </ul>	<ul style="list-style-type: none"> <li>NYS DHSES</li> <li>Input from Planning Committee</li> </ul>
Coastal Storm (tropical and extra-tropical cyclones)	Yes	No	<p>For tropical cyclones, please see Severe Storm For extra-tropical cyclones, please see Winter Storms</p>	
Dam Failure	Yes	Yes	Please see Flood	
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 many drought events that have occurred in New York State.</li> <li>Since the 2008 HMP, the County has not been impacted any drought events; however, the Planning Committee identified drought has a hazard of concern because droughts can impact agriculture, drinking water, and exacerbate wildfire concerns throughout the County.</li> </ul>	<ul style="list-style-type: none"> <li>NYS DHSES</li> <li>Input from Planning Committee</li> <li>NOAA-NCDC</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>USGS indicates that the 2008 PGA for Chenango County is between 2 and 3%. According to FEMA, any jurisdiction that has a PGA of 3% or greater is required to fully profile the earthquake hazard. However, the County has a PGA between 2 and 3% with a low seismic risk. Based on the County’s PGA, the lack of earthquake occurrences, the rural setting of the County with limited at-risk areas and a majority of the critical facilities are of modern construction and considered earthquake-resistant, earthquake is not a hazard of concern for the County.</li> <li>According to the NYS HMP, between 1973 and 2012, there have been 189 earthquakes epicentered in the State. Of those 189 events, none have been epicentered in Chenango County.</li> <li>According to the NGDC, New York State has only had eight significant earthquakes between 1823 and 2014; none of which were epicentered in the vicinity of Chenango County.</li> </ul>	<ul style="list-style-type: none"> <li>NYS DHSES</li> <li>Input from Planning Committee</li> <li>NOAA – Review of NGDC Earthquake Database from 1800 to present</li> <li>USGS – Earthquake Hazards Program, Review of USGS Seismic Maps</li> </ul>
Expansive Soils	No	No	<ul style="list-style-type: none"> <li>Expansive soils are not identified as a hazard in the NYS HMP.</li> <li>USGS indicated that Chenango County does not have the type of soils (swelling clay) that would result in expansive or swelling soils; therefore, the County has little to no swelling potential.</li> <li>Based on the location of the County and input from the Planning Committee, expansive soils are</li> </ul>	<ul style="list-style-type: none"> <li>NYS DHSES</li> <li>Input from Planning Committee</li> <li>Review of USGS</li> </ul>



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Hazard	Is this a hazard that may occur in Chenango County?	If yes, does this hazard pose a significant threat to the County?	Why was this determination made?	Source(s)
			not considered a hazard of concern for Chenango County.	1989 Swelling Clays Map of the Conterminous United States.
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>Between 2008 and 2014, Chenango County experienced the following extreme temperature events:               <ul style="list-style-type: none"> <li>July 21-23, 2011 (Excessive Heat)</li> <li>March 17-23, 2012 (Heat)</li> </ul> </li> <li>The Planning Committee identified extreme temperatures as a significant hazard impacting the County.</li> </ul>	<ul style="list-style-type: none"> <li>NYS DHSES</li> <li>Input from Planning Committee</li> <li>NOAA-NCDC</li> </ul>
Flood (riverine, flash, dam failure, and ice jam)	Yes	Yes	<ul style="list-style-type: none"> <li>The NYSHMP identified flood as a hazard of concern for New York State. Chenango County is made up of numerous waterbodies, including the Chenango River, Susquehanna River, Genegantslet Creek, and the Otselic River.</li> <li>Five FEMA declarations for flooding, since 2008, were issued for Chenango County:               <ul style="list-style-type: none"> <li>FEMA-DR-1857 (Flash Flood) – August 8-10, 2009</li> <li>FEMA-DR-1993 (Flash Flood) – April 26-May 8, 2011</li> <li>FEMA-DR-4031 (Tropical Storm Lee) – September 7, 2011</li> <li>FEMA-EM-3351 (Hurricane Sandy) – October 29, 2012</li> <li>FEMA-DR-4129 (Severe Storms and Flooding) – June 25-July 4, 2013</li> </ul> </li> <li>According to the NFIP statistics, there have been 517 claims made between 1978 and 2013 by Chenango County, with over \$10 million in flood-related losses paid to the towns and villages.</li> <li>There are 66 dams located in Chenango County (eight high hazard, 11 significant hazard, 23 low hazard, and 12 without a hazard identification).</li> <li>Between 1921 and 2014, there have been 40 ice jam occurrences in Chenango County. These events occurred on Buttermilk Creek, Canasawacta Creek, Chenango River, Genegantslet Creek, Mill Brook, Sage Brook, Susquehanna River, Unadilla River, and the West Branch Oswegatchie River.</li> <li>Based on the history and frequency of flooding events, the number of dams, and input from the Planning Committee, flooding has 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 Planning Committee</li> <li>FEMA</li> <li>NOAA-NCDC</li> <li>National Inventory of Dams</li> <li>CRREL Ice Jam Database</li> </ul>
Hailstorm	Yes	Yes	Please see Severe Storm	
Hurricane (tropical cyclones, including tropical storms and tropical)	Yes	No	Please see Severe Storm	



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depressions)				
Ice Jams	Yes	Yes	Please see Flood	
Ice Storm	Yes	Yes	Please see Severe Winter Storm	
Infestation	Yes	Yes	<ul style="list-style-type: none"> <li>The NYS HMP did not identify infestation as a hazard of concern for New York State.</li> <li>Chenango County has been affected by West Nile Virus, Lyme Disease, Asian Longhorned Beetle, Sirex Woodwasp, and Emerald Ash Borer. All have the potential to create secondary hazards and health threats to the County and its population.</li> <li>The Planning Committee considers infestation to be a hazard impacting localized areas throughout the County; therefore, infestation is identified as a hazard of concern for Chenango County.</li> </ul>	<ul style="list-style-type: none"> <li>NYS DHSES</li> <li>Input from Planning Committee</li> </ul>
Land Subsidence	No	No	<ul style="list-style-type: none"> <li>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>NYS HMP does not identify Chenango 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.</li> <li>According to USGS, Chenango County is not made up of unconsolidated aquifer systems, which excessive pumping of such aquifer systems could result in permanent subsidence and related ground failures. The Planning Committee 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 Planning Committee</li> <li>USGS Fact Sheet 165-00</li> </ul>
Landslide	Yes	No	<ul style="list-style-type: none"> <li>The NYSHMP identifies landslide as a hazard of concern for New York State. Chenango County was identified as not having any landslide events occurring between 1960 and 2012.</li> <li>USGS indicates within the National Atlas Map Maker program that a majority of Chenango County is identified as having a low landslide incidence and susceptibility with a the western border as having a moderate landslide susceptibility.</li> <li>Based on history of occurrences, overall susceptibility, and input from the Planning Committee, landslides were 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 Planning Committee</li> <li>National Atlas.gov (USGS)</li> </ul>
Natural Gas	Yes	Yes	<ul style="list-style-type: none"> <li>The NYSHMP does not identify natural gas incidents as a hazard of concern for New York State.</li> <li>In Chenango County, there are three layers of rock particularly relevant to natural gas drilling: Herkimer Sandstone, Marcellus Shale, and Utica Shale. All of these have been targeted by natural gas drilling companies. All of Chenango County is within the Utica Shale fairway, making the entire County potentially attractive for natural gas drilling in the Utica Shale. All but the northern parts of Chenango County are within the Marcellus Shale fairway.</li> <li>Impacts from natural gas drilling include gas leaks from the well sites; ignition and explosion of</li> </ul>	<ul style="list-style-type: none"> <li>NYS DHSES</li> <li>Input from Planning Committee</li> </ul>



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			<p>natural gas; and the increase in truck traffic directly related to drilling could increase the number of transportation accidents.</p> <ul style="list-style-type: none"> <li>• Several incidents as a result of natural gas drilling have impacted Chenango County:               <ul style="list-style-type: none"> <li>○ July 2008 – a faulty valve on a well head blew out during a pressure test and injured a worker; it took up to 45 minutes to fix the gas leak</li> <li>○ January 5, 2009 – a fire erupted at a drilling rig in the Town of Smyrna; rocks were thrown out of the wellhead and the drilling rig was severely damaged.</li> </ul> </li> <li>• Due to the geological makeup of Chenango County and its attraction to natural gas drilling companies, the Planning Committee identified natural gas incidents as a hazard of concern for the County.</li> </ul>	
<p>Severe Storm (windstorms, thunderstorms, hail, hurricane and tornados)</p>	<p>Yes</p>	<p>Yes</p>	<ul style="list-style-type: none"> <li>• The NYSHMP identifies severe storms as a hazard of concern for New York State.</li> <li>• NOAA-NCDC Storm Events Database indicates that Chenango County has been impacted by approximately 118 severe storm events (hail, rain, hurricane, lightning, wind, and tornado) between 2008 and 2014. These events resulted in over \$1.1 million in property damage and \$15,000 in crop damage.</li> <li>• FEMA has included Chenango County in 14 DR or EM declarations between 1950 and 2014; six of those have been declared between 2008 and 2014:               <ul style="list-style-type: none"> <li>○ FEMA-DR-1857 (Severe Storms and Flooding) – August 8-10, 2009</li> <li>○ FEMA-DR-1993 (Severe Storms, Flooding, Tornadoes, and Straight-Line Winds) – April 26 – May 8, 2011</li> <li>○ FEMA-DR-4031 (Remnants of Tropical Storm Lee) – September 7-11, 2011</li> <li>○ FEMA-EM-3351 (Hurricane Sandy) – October 27 – November 8, 2012</li> <li>○ FEMA-DR-4129 (Severe Storms and Flooding) – June 26-July 10, 2013</li> </ul> </li> <li>• Between 1950 and 2014, Chenango County has been impacted by 15 tornadoes; five of which occurred between 2008 and 2014 which resulted in over \$800,000 in property damage.</li> <li>• The Planning Committee identified severe storms as a significant hazard affecting the Chenango County</li> </ul>	<ul style="list-style-type: none"> <li>• NYS DHSES</li> <li>• Input from Planning Committee</li> <li>• FEMA</li> <li>• NOAA-NCDC Storm Events Database</li> </ul>
<p>Severe Winter Storm (heavy snow, blizzards, Nor'Easters and ice storms)</p>	<p>Yes</p>	<p>Yes</p>	<ul style="list-style-type: none"> <li>• The NYSHMP identifies severe winter storms as a hazard of concern for New York State.</li> <li>• According to the NOAA-NCDC Storm Events Database, between 2008 and 2014, there have been 13 winter storm events reported. Damages from these events were not reported in the database.</li> <li>• FEMA has included Chenango County in a total of five declarations as a result of winter storm events; only one of which occurred between 2008 and 2014:               <ul style="list-style-type: none"> <li>○ FEMA-EM-3299 (Sever Winter Storm) – December 11-31, 2008</li> </ul> </li> <li>• The Planning Committed identified severe winter storms as a significant hazard affecting Chenango County.</li> </ul>	<ul style="list-style-type: none"> <li>• NYS DHSES</li> <li>• Input from Planning Committee</li> <li>• FEMA</li> <li>• NOAA-NCDC Storm Events Database</li> </ul>



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Hazard	Is this a hazard that may occur in Chenango County?	If yes, does this hazard pose a significant threat to the County?	Why was this determination made?	Source(s)
Tornado	Yes	Yes	Please see Severe Storm	
Tsunami	No	No	<ul style="list-style-type: none"> <li>The NYSHMP identified tsunami as a hazard of concern for New York State. The State HMP indicates that all low-lying coastal areas in the State have the potential to be struck by a tsunami.</li> <li>Chenango County is not bounded by coastal waters. Therefore, based on the County’s inland location and Planning Committee input, tsunami is not considered a hazard of concern for Chenango County.</li> </ul>	<ul style="list-style-type: none"> <li>NYS HMP Update</li> <li>Input from Planning Committee</li> </ul>
Volcano	No	No	<ul style="list-style-type: none"> <li>The NYSHMP does not identify volcanoes as a hazard of concern for New York State.</li> <li>There are no volcanoes located in Chenango County or New York State. Therefore, volcano events have not been identified as a hazard of concern for the County.</li> </ul>	<ul style="list-style-type: none"> <li>NYS HMP Update</li> <li>Input from Planning Committee</li> </ul>
Wildfire	Yes	Yes	<ul style="list-style-type: none"> <li>The NYSHMP identified wildfire has a hazard of concern for New York State. According to the State HMP, between 2000 and 2012, there have been between zero and 29 wildfire occurrences in Chenango County.</li> <li>Approximately 78% of Chenango County’s population is exposed to the WUI (interface and intermix).</li> <li>Due to the County’s exposure and vulnerability to wildfires, the Planning Committee identified wildfire has a hazard of concern for Chenango County.</li> </ul>	<ul style="list-style-type: none"> <li>NYS DHSES</li> <li>Input from Planning Committee</li> <li>FEMA</li> <li>NOAA-NCDC Storm Events Database</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  
*NOAA* National Oceanic and Atmospheric Administration  
*NRCC* Northeast Regional Climate Center  
*NWS* National Weather Service  
*NYSDEC* 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  
*USGS* United States Geologic Survey  
*WUI* Wildland Urban Interface





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
- Extreme Temperatures
- Flooding (riverine, flash, dam failure, and ice jam)
- Infestation (West Nile Virus, Lyme Disease, Asian Longhorned Beetle, Sirex Woodwasp, and Emerald Ash Borer)
- Natural Gas Incidents
- Severe Storms (windstorms, thunderstorms, hail, lightning, hurricanes, tropical storms and tornados)
- Severe Winter Storm (heavy snow, blizzards, ice storms, Nor'Easters)
- Wildfire

Other natural hazards of concern that have occurred within Chenango County, but have a low potential to occur and/or result in significant impacts within the County, and will not be further addressed within this version of the Plan include earthquakes and extreme temperatures. These hazards may be considered in future versions of the Plan.