



5.2 IDENTIFICATION OF HAZARDS OF CONCERN

To provide a strong foundation for mitigation actions considered in Sections 6 and 9, Warren 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); review of the previous Warren 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.

For the purposes of this planning effort, The Planning and Steering Committees 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 flooding, flash flooding, ice jam flooding, dam failure flooding, and flooding due to beaver dams. 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 "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; however, for the purpose of this HMP, tropical disturbances were not identified as a hazard of concern for the county based on input from the planning and steering committees.

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

The "Landslide" hazard was added due to the County's concern of steep slopes near roads and the history of events occurring throughout the County.



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Hazard	Is this a hazard that may occur in Warren 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"> 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 Warren 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 2015. Avalanche was identified as a hazard in the NYS HMP and there have been occurrences in the State; however, there have been no occurrences in Warren County. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees Review of NAC-AAA database between 1998 and 2015
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. Warren County is not bordered by any coastal waters. Lake George and the Hudson River are subject to erosion; however, based on input from the planning committee, coastal erosion was not identified as a hazard of concern for the County. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees
Cyber Security	Yes	Yes	<ul style="list-style-type: none"> The 2014 NYS HMP does not identify cyber security as a hazard of concern for New York State. Cyber threats to Warren County’s critical infrastructures can be posed by anyone with the capability, technology, opportunity, and intent to do harm. To date, there have no major cyber security breaches in the County; however, the Steering and Planning Committees identified cyber security as a hazard of concern for Warren County. 	<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 2014 NYS HMP identifies dam failure as a hazard of concern for New York State and includes it in the Flood hazard profiles. There are 58 dams located in Warren County: 33 Class A, 17 Class B and 8 Class C). The dams are located in Bolton, Chester, Horicon, Johnsburg, Lake George, Lake Luzerne, Queensbury, Stony Creek, Thurman, and Warrensburg. The Steering and Planning Committees identified dam failure as a hazard of concern for Warren County. Dam failure is included in the Flood hazard profile. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees NYSDEC
Disease Outbreak	Yes	Yes	<ul style="list-style-type: none"> The 2014 NYS HMP does not identify disease outbreak as a hazard of concern for New York State. Based on input from the Steering and Planning Committees, disease outbreak was identified as a hazard of concern for the County. The County identified influenza, Zika virus, and Ebola as 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees



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Hazard	Is this a hazard that may occur in Warren County?	If yes, does this hazard pose a significant threat to the County?	Why was this determination made?	Source(s)
Drought	Yes	No	<p>disease that may lead to a pandemic outbreak and pose a threat to the County.</p> <ul style="list-style-type: none"> • The NYS HMP identifies drought as a hazard of concern for the State. Warren County has been impacted by several drought events that have occurred in New York State. • According to the NOAA-NCDC Storm Events Database, between 1950 and 2015, Warren County has experienced two drought events. • New York State has been included in one FEMA drought-related disaster declaration; however, Warren County was not included in the declaration. • Warren County has been included in two drought-related USDA disaster declarations: <ul style="list-style-type: none"> ○ S3441 – Drought – 2012 ○ S3887 – Drought – 2015 • According to the NRCC, Warren County is located within three climate divisions: Northern Plateau, Hudson Valley, and Champlain Valley. All of which have been impacted by periods of severe and extreme drought and include the following events: <ul style="list-style-type: none"> ○ August-November 1899 ○ October 1908-January 1909 ○ May-November 1911 ○ April-June 1915 ○ October 1930-April 1931 ○ July-December 1934 ○ November 1939-February 1942 ○ October 1947-December 1949 ○ February-May 1957 ○ August-November 1957 ○ December 1960-March 1961 ○ June 1964-August 1966 ○ April-May 1985 ○ August-September 1995 ○ July-August 1999 ○ November 2001-April 2002 • Based on previous occurrences and input from the Steering and Planning Committees, drought was not identified as a hazard of concern for Warren County. 	<ul style="list-style-type: none"> • NYS DHSES • FEMA • USDA • Input from Steering and Planning Committees • NOAA-NCDC • NRCC
Earthquake	Yes	Yes	<ul style="list-style-type: none"> • The NYS HMP identified earthquake as a hazard of concern for the State. • USGS indicates that the 2014 PGA for Warren County is between 3 and 4%. According to FEMA, any jurisdiction that has a PGA of 3% or greater is required to fully profile the 	<ul style="list-style-type: none"> • NYS DHSES • Input from Steering and Planning



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Hazard	Is this a hazard that may occur in Warren County?	If yes, does this hazard pose a significant threat to the County?	Why was this determination made?	Source(s)
			<p>earthquake hazard.</p> <ul style="list-style-type: none"> According to the NYS HMP, between 1973 and 2012, there have been 189 earthquakes epicentered in the State. Of those 189 events, only four had an epicenter in Warren County. There have been several earthquakes with epicenters located in close proximity to Warren County. Based on previous occurrences and input from the Steering and Planning Committees, earthquakes were identified as a hazard of concern for Warren County. 	<p>Committees</p> <ul style="list-style-type: none"> USGS – Earthquake Hazards Program, Review of USGS Seismic Maps
Expansive Soils	Yes	No	<ul style="list-style-type: none"> The NYS HMP identified expansive soils as a hazard of concern for New York State. However, a majority of Warren County is underlain by soils with little to no swelling potential and contains areas with less than 50% of the area is underlain by soils with abundant clays of slight to moderate swelling potential. The Steering and Planning Committees did not identify expansive soils as a hazard of concern for Warren County. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees 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 identified extreme temperatures as a hazard of concern for New York State. According to the NOAA-NCDC database, between 1950 and 2015, there have been 59 extreme temperature events in Warren County. Warren County has not been included in any FEMA disaster declarations for extreme temperature-related events; however, the County has been included in one USDA disaster declaration. The Steering and Planning Committees did not identify extreme temperatures as a hazard of concern for the County. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees NOAA-NCDC
Flood (riverine, ice jam, dam failure and flash)	Yes	Yes	<ul style="list-style-type: none"> The NYS HMP identified flooding as a hazard of concern for New York State. The County has been included in seven flood-related FEMA disaster declarations: <ul style="list-style-type: none"> FEMA-DR-515 (Severe Storms and Flooding) – July 21, 1976 FEMA-DR-1095 (Severe Storms and Flooding) – January 19-20, 1996 FEMA-DR-1534 (Severe Storms and Flooding) – May-June 2004 FEMA-DR-1564 (Severe Storms and Flooding) – August 13-September 16, 2003 FEMA-DR-1899 (Severe Storms and Flooding) – March 13-31, 2010 FEMA-DR-1993 (Severe Storms, Flooding, Tornadoes, and Straight-Line Winds) – April 26-May 8, 2011 FEMA-DR-4129 (Severe Storms and Flooding) – Jun3 26-July 10, 2013 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees FEMA NOAA-NCDC USACE CRREL Ice Jam Database



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Hazard	Is this a hazard that may occur in Warren 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"> Between 1780 and 2015, there have been 27 ice jams in the County that have occurred along English Brook, Glen Creek, Hudson River, and Northwest Bay Brook. The Steering and Planning Committees identified flooding as a hazard of concern for the County. 	
Hailstorm	Yes	Yes	Please see Severe Storm	
Hazardous Materials	Yes	Yes	<ul style="list-style-type: none"> The 2014 NYS HMP does not identify hazardous materials as a hazard of concern for New York State. There are over 1,248 miles of roads located within the County; some of which are used to transport hazardous materials. There are been numerous hazardous material incidents in Warren County, which led to road closures and hazmat response. Based on the history of occurrences and input from the Steering and Planning Committees, hazardous materials was identified as a hazard of concern for Warren County. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees NYS DOT
Hurricane	Yes	No	Please see Severe Storms	
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"> The 2014 NYS HMP does not identify infestation as a hazard of concern for New York State; however, the Steering and Planning Committees identified infestation as a hazard of concern for Warren County. Infestations of Asian Longhorned Beetle, Balsam Woolly Adelgid, Hemlock Woolly Adelgid, Sirex woodwasp, Emerald Ash Borer, and Gypsy Moths have all been reported in or have the potential to impact Warren County. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees USDA NYSDEC
Land Subsidence	Yes	No	<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.” NYS HMP does not identify Warren County as a county 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. Sinkholes often occur in areas underlain by carbonate rock, limestone, salt beds or rocks that naturally dissolve by groundwater circulating through them. Portions of eastern Warren County are underlain by carbonate rock. The Steering and Planning Committees did not identify land subsidence as a hazard of concern for Warren County. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees USGS



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Hazard	Is this a hazard that may occur in Warren County?	If yes, does this hazard pose a significant threat to the County?	Why was this determination made?	Source(s)
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, 250 people in Warren County live within a high incidence of landslide area. The remainder of the population lives within a low incidence area. Between 1954 and 2015, New York State was included in one landslide-related disaster declaration; however, Warren County was not included in the declaration. However, FEMA-DR-1993 (Severe Storms, Flooding, Tornadoes and Straight-Line Winds) that occurred April 28-29, 2011, led to reported mudslides in the Towns of Johnsburg and Chester. The Steering and Planning Committees did identify landslide as a hazard of concern for Warren County. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees FEMA
Nor'Easters	Yes	No	<ul style="list-style-type: none"> The NYS HMP identified severe winter storm, which includes Nor'Easters as a hazard of concern for New York State. The NOAA-NCDC Storm Events Database did not identify any Nor'Easter events that impacted Warren County between 2010 and 2015. The Steering and Planning Committees did not identify Nor'Easters as a hazard of concern for Warren County. 	<ul style="list-style-type: none"> NYS DHSES NOAA-NCDC Input from Steering and Planning Committees
Severe Storm (windstorms, thunderstorms, hail and tornados)	Yes	Yes	<ul style="list-style-type: none"> 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: hailstorm, high wind, and hurricane. For the purpose of this County HMP, the hazards were combined into one profile, excluding hurricane. The NOAA-NCDC Storm Events Database indicated that Warren County was impacted by 264 severe storm-related events between 1950 and 2015. According to the SPC, three tornadoes have impacted Warren County between 1950 and 2015. FEMA included Warren County in 10 severe storm-related disaster declarations: <ul style="list-style-type: none"> FEMA-DR-515 (Severe Storms and Flooding) – July 21, 1976 FEMA-DR-1095 (Severe Storms and Flooding) – January 19-20, 1996 FEMA-DR-1296 (Hurricane Floyd) – September 16-18, 1999 FEMA-DR-1534 (Severe Storms and Flooding) – May-June 2004 FEMA-DR-1564 (Severe Storms and Flooding) – August 13-September 16, 2003 FEMA-DR-1899 (Severe Storms and Flooding) – March 13-31, 2010 FEMA-DR-1993 (Severe Storms, Flooding, Tornadoes, and Straight-Line Winds) – April 26-May 8, 2011 FEMA-DR-4020 (Hurricane Irene) – August 28, 2011 FEMA-EM-3351 (Hurricane Sandy) – October 28, 2012 FEMA-DR-4129 (Severe Storms and Flooding) – Jun3 26-July 10, 2013 The Steering and Planning Committees identified severe storms as a hazard of concern for 	<ul style="list-style-type: none"> NYS DHSES FEMA NOAA-NCDC SPC Input from Steering and Planning Committees



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			Warren County.	
Severe Winter Storm (heavy snow, blizzards, ice storms)	Yes	Yes	<ul style="list-style-type: none"> The NYS HMP identified severe winter storm as a hazard of concern for New York State. The NOAA-NCDC Storm Events Database indicated that Warren County was impacted by 205 winter storm events between 1950 and 2015. FEMA included Warren County in one winter storm-related disaster declaration: <ul style="list-style-type: none"> FEMA-EM-3107 (Severe Blizzard) – March 14-17, 1993 The Planning and Steering Committees identified severe winter storm as a hazard of concern for Warren County. 	<ul style="list-style-type: none"> NYS DHSES FEMA NOAA-NCDC Input from Steering and Planning Committees
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. The Planning and Steering Committees does not consider tsunami to be a significant concern to the planning area. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees
Volcano	No	No	<ul style="list-style-type: none"> The NYS HMP did not identify volcano as a hazard of concern for New York State. The Planning and Steering Committees does not consider volcano to be a hazard of concern for the planning area. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees
Wildfire	Yes	Yes	<ul style="list-style-type: none"> The NYS HMP identified wildfire as a hazard of concern for New York State. Approximately 80.5% of the County’s total population is exposed to the Intermix or Interface wildfire hazard areas. The Planning and Steering Committees identified wildfire as a hazard of concern for Warren County. 	<ul style="list-style-type: none"> NYS DHSES Input from Steering and Planning Committees FEMA
Windstorm	Yes	Yes	Please see Severe Storm	

<i>CRREL</i>	<i>Cold Regions Research and Engineering Laboratory</i>	<i>SPC</i>	<i>Storm Prediction Center</i>
<i>DR</i>	<i>Presidential Disaster Declaration Number</i>	<i>USDA</i>	<i>U.S. Department of Agriculture</i>
<i>EM</i>	<i>Presidential Disaster Emergency Number</i>	<i>USGS</i>	<i>United States Geologic Survey</i>
<i>FEMA</i>	<i>Federal Emergency Management Agency</i>		
<i>NCDC</i>	<i>National Climatic Data Center</i>		
<i>NOAA</i>	<i>National Oceanic and Atmospheric Administration</i>		
<i>NRCC</i>	<i>Northeast Regional Climate Center</i>		
<i>NYS DHSES</i>	<i>New York State Division of Homeland Security and Emergency Services</i>		
<i>NYS HMP</i>	<i>New York State Hazard Mitigation Plan</i>		





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):

- Earthquake
- Disease Outbreak/Pandemic
- Flood (riverine, dam failure, flash, ice jam, beaver dam)
- Infestation
- Landslide
- Severe Storm (thunderstorm, hail, wind, tornado)
- Severe Winter Storm
- Wildfire

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

Further, the Warren County Steering Committee has identified the following non-natural/mad-made hazards of concern for specific consideration in this plan update:

- Cyber-Security
- Hazardous Materials (In-Transit and Fixed Facility)