

## **5.2 IDENTIFICATION OF NATURAL HAZARDS OF CONCERN**

To provide a strong foundation for mitigation strategies considered in Sections 6 and 9, Fulton County considered a full range of natural hazards that could impact the area, and then identified and ranked those hazards that presented the greatest concern. The natural hazard of concern identification process incorporated input from the County and participating jurisdictions; review of the 2008 New York State Hazard Mitigation Plan (NYS HMP) and previous hazard identification efforts; 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** is defined as 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 natural 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 386-1, “Understanding Your Risks, Identifying Hazards and Estimating Losses; FEMA’s “Multi-Hazard Identification and Risk Assessment – The Cornerstone of the National Mitigation Strategy”), and consideration of hazard grouping in the NYS HMP.

The “Flood” hazard includes riverine, flash, ice jam, man-made dam and beaver dam 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.

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Please note that 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.

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Table 5.2-1. Identification of Natural Hazards of Concern for Fulton County, New York

Hazard	Step 1	Step 2	Step 3	
	Is this a hazard that may occur in Fulton County?	If yes, does this hazard pose a significant threat to Fulton County?	Why was this determination made?	Source(s)
Avalanche	No	No	<ul style="list-style-type: none"> <li>The NYS HMP does not identify avalanche as a hazard of concern for New York State.</li> <li>The topography and climate of Fulton County does not readily 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 1950 and 2006.</li> <li>Avalanche is not addressed in the Fulton County HAZNY.</li> </ul>	<ul style="list-style-type: none"> <li>NYSDPC</li> <li>Review of NAC-AAA database between 1950 and 2006</li> </ul>
Coastal Erosion / Coastal Storm	No	No	<ul style="list-style-type: none"> <li>Fulton County is not bounded by coastal waters; therefore, not directly impacted by coastal storms that result in coastal erosion.</li> </ul>	<ul style="list-style-type: none"> <li>NYSDPC</li> </ul>
Drought (including Extreme Heat)	Yes	No	<ul style="list-style-type: none"> <li>The NYS HMP identifies drought and extreme heat events as hazards of concern for New York State.</li> <li>Fulton County is located within the Mohawk Climate Division. Between 1908 and 1999, nine severe and extreme droughts struck this climate division. These events include:                             <ul style="list-style-type: none"> <li>October – December 1908</li> <li>November 1930 – March 1931</li> <li>May – December 1934</li> <li>August – September 1941</li> <li>January – April 1942</li> <li>December 1947 – January 1948</li> <li>September 1964 – January 1965</li> <li>August – September 1995</li> <li>April – December 1999</li> </ul> </li> <li>Various sources indicated that many drought events or periods impacted large regions of the State, including Fulton County. Such events include:                             <ul style="list-style-type: none"> <li>July – August 1999 – New York State was declared a farm disaster area due to drought conditions.</li> </ul> </li> <li>Record extreme heat events during the summer months of May through September in Fulton County occurred on:                             <ul style="list-style-type: none"> <li>August 1948 – Temperatures averaged 969°F throughout County</li> <li>July 1953 – Temperatures averaged 989°F throughout County</li> <li>September 1953 – Temperatures averaged 99°F throughout County</li> <li>June 2005 – Temperatures averaged 96°F throughout County</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>NYSDPC</li> <li>NYSEMO CEMP</li> <li>USGS</li> <li>NOAA-NCDC</li> <li>Drought Reporter</li> <li>SHELDUS</li> <li>NY Times</li> <li>U.S. Drought Monitor Archive</li> <li>The Weather Channel</li> </ul>



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	Is this a hazard that may occur in Fulton County?	If yes, does this hazard pose a significant threat to Fulton County?	Why was this determination made?	Source(s)
			<ul style="list-style-type: none"> <li>o May 2006 – Temperatures averaged 90°F throughout County</li> <li>• The Fulton County HAZNY ranked drought and extreme temperature as a moderately low hazard for the County.</li> <li>• Fulton County was unable to locate further local information with their available resources regarding this hazard of concern, including significant losses to the County and/or municipalities from historic events. Therefore, the County decided not to analyze the drought hazard.</li> </ul>	
Earthquake	Yes	Yes	<ul style="list-style-type: none"> <li>• The NYS HMP identifies earthquake as a hazard of concern for New York State. Areas within the State with a higher seismic risk include; The North and Northeast third (1/3) of the State (The North Country/Adirondack Region including a portion of the Greater Albany-Saratoga region), the Southeast corner (including the greater New York City area and western Long Island), and the Northwest corner (including the City of Buffalo and vicinity) of the State, in that order from higher to lower.</li> <li>• According to the USGS online seismic hazard maps, the peak ground acceleration with a 10% probability of exceedance over 50 years for Fulton County is between 4 and 5% g. FEMA guidance recommends earthquakes are evaluated further if an area has a 3% g peak acceleration or more.</li> <li>• The Fulton County HAZNY ranked earthquake as a moderately low hazard for the County.</li> </ul>	<ul style="list-style-type: none"> <li>• NYSDPC</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>• The NYS HMP identifies expansive soils as a hazard of concern for New York State.</li> <li>• USGS indicated that Fulton County has little or no clays with swelling potential or have less than 50 percent of soils with abundant clays of slight to moderate swelling potential.</li> <li>• Based on all sources reviewed, no known historical occurrences are reported for Fulton County.</li> <li>• Expansive soil is not addressed in the Fulton County HAZNY.</li> </ul>	<ul style="list-style-type: none"> <li>• NYSDPC</li> <li>• USGS 1989 Swelling Clays Map of the Conterminous United States</li> </ul>
Extreme Temperature	Yes	Yes (only for Extreme Cold)	<p align="center">Please see Drought for Extreme Heat Events Please see Severe Winter Storms for Extreme Cold Events</p>	
Flood (Riverine, Flash, Ice Jam Dam/Beaver)	Yes	Yes	<ul style="list-style-type: none"> <li>• The NYS HMP identifies flooding as the main hazard of concern for New York State.</li> <li>• Fulton County has been issued three FEMA Disaster Declarations for flood-related events, each event resulting in extensive damages.</li> </ul>	<ul style="list-style-type: none"> <li>• NYSDPC</li> <li>• NYSEMO</li> <li>• FEMA</li> </ul>



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	Is this a hazard that may occur in Fulton County?	If yes, does this hazard pose a significant threat to Fulton County?	Why was this determination made?	Source(s)
Dam Flooding)			<ul style="list-style-type: none"> <li>o FEMA DR-1148 (November 1996)</li> <li>o FEMA DR-1650 (June – July 2006)</li> <li>• NOAA’s NCDC storm events database indicates that Fulton County was impacted by approximately 27 flood events between 1950 and 2009. This includes flash flooding.</li> <li>• The 2008 NYS HMP indicated that Fulton County has been ranked as the 46<sup>th</sup> most flood vulnerable county in New York State based on potential flood exposure and vulnerability to loss. Over 5-percent of the County is located in a 100-year floodplain.</li> <li>• NFIP identifies that Fulton County has made 57 flood claims between January 1, 1978 and March 31, 2010, receiving \$866,989.43 in total payments.</li> <li>• FISs were prepared for the Cities of Johnstown and Gloversville. Flooding in these areas typically occurs in the late winter and early spring. It is usually a result of ice jams accompanied by rainfall or snowmelt. Flooding can also occur during the late summer from tropical storms heading north along the Atlantic coast or from regional thunderstorms.</li> <li>• The Fulton County HAZNY ranked flooding as a moderately low hazard of concern for the County.</li> <li>• Ice Jams are mentioned separately in this Table but are grouped with the Flood hazard in this plan (see below).</li> </ul>	<ul style="list-style-type: none"> <li>• Hazards &amp; Vulnerability Research Institute (SHELDUS)</li> <li>• NOAA-NCDC</li> <li>• NPDP</li> <li>• NYS DEP</li> <li>• NFIP</li> </ul>
Ground Failure (Landslide, Land Subsidence)	Yes	No	<p><b>Landslide</b></p> <ul style="list-style-type: none"> <li>• The NYS HMP identifies landslide as a hazard of concern for New York State, with Fulton County located in a low landslide incidence area. The NYS HMP indicates that Fulton County has had two landslide occurrences from 1837 to 2007. The NYS HMP listed Fulton County as the 54<sup>th</sup> County in the State most threatened by and vulnerable to landslides and landslide losses.</li> <li>• According to National Atlas, Fulton County has a low occurrence of a landslide incident.</li> <li>• Due to the fact that this hazard has a low occurrence of incidents and that the county could not quantify significant losses to the County and/or municipalities from historic events, the County decided not to analyze the landslide hazard for the purposes of this plan.</li> </ul> <p><b>Land Subsidence</b></p> <ul style="list-style-type: none"> <li>• The NYS HMP indicates that New York State is vulnerable to land</li> </ul>	<ul style="list-style-type: none"> <li>• NYSDPC</li> <li>• USGS</li> <li>• National Atlas.gov (USGS)</li> <li>• USGS Fact Sheet 165-00 (Dec. 2000)</li> <li>• Radbruch-Hall et al. (USGS)</li> </ul>



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	Is this a hazard that may occur in Fulton County?	If yes, does this hazard pose a significant threat to Fulton County?	Why was this determination made?	Source(s)
			<p>subsidence; however, this hazard is “extremely localized” and poses a “very low risk to population and property.” The NYS HMP does not identify Fulton County as a County that has experienced land subsidence in the past.</p> <ul style="list-style-type: none"> <li>• According to USGS, Fulton County is not made up of unconsolidated aquifer systems, hence it is unlikely that there will be permanent subsidence and related ground failures.</li> <li>• Ground failure is not addressed in the Fulton County HAZNY.</li> <li>• Due to the fact that this hazard has a low occurrence of incidents and that the county could not quantify significant losses to the County and/or municipalities from historic events, the County decided not to analyze the land subsidence hazard for the purposes of this plan.</li> </ul>	
Hailstorm	Yes	Yes	Please see Severe Storm	
Hurricane (and other Tropical Cyclones)	Yes	Yes	Please see Severe Storm	
Ice Jams (categorized as a Flood hazard in this HMP)	Yes	Yes	<ul style="list-style-type: none"> <li>• The NYS HMP identifies ice jam flooding as a hazard of concern for New York State (grouped as a type of flood). New York State ranks 2<sup>nd</sup> in the Nation for total number of ice jam events, with over 1,500 incidents documented between 1857 and 2010.</li> <li>• The USACE CRREL Ice Jam Database, NYS HMP and various other sources, indicates that 18 reported ice jam events have occurred within Fulton County between 1857 and 2010. Major events include those that occurred on: <ul style="list-style-type: none"> <li>○ February 28, 1997 – An ice jam blocked the river channel at the Route 29 Bridge in the Village of Dolgeville, along the Herkimer/Fulton County line. Ice was backed up under the bridge and was backing up basements of nearby buildings.</li> </ul> </li> <li>• The Fulton County HAZNY ranked ice jams has a moderately high hazard for the County.</li> </ul>	<ul style="list-style-type: none"> <li>• NYSDPC</li> <li>• Review of USACE CRREL Ice Jam Database</li> <li>• NY Times</li> </ul>
Ice Storm	Yes	Yes	Please see Severe Winter Storm	
Infestation	No	No	<ul style="list-style-type: none"> <li>• The NYS HMP does not identify infestation as a hazard of concern for New York State.</li> <li>• Based on all sources reviewed, no known significant occurrences are reported for Fulton County</li> </ul>	<ul style="list-style-type: none"> <li>• NYSDPC</li> </ul>



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			<ul style="list-style-type: none"> <li>Infestation is not addressed in the Fulton County HAZNY.</li> </ul>	
Land Subsidence	Yes	No	Please see Ground Failure	
Landslide	Yes	No	Please see Ground Failure	
Nor'Easters (and other extra tropical storms)	Yes	Yes	Please see Severe Winter Storm	
Severe Storm (Windstorms, Thunderstorms, Hail, Lightning, Tornadoes and Hurricanes)	Yes	Yes	<ul style="list-style-type: none"> <li>The NYS HMP identifies all types of severe storms as hazards of concern for New York State. Fulton County has experienced eight tornado events. NYS HMP listed Fulton County as the 46<sup>th</sup> County in the State most threatened by and vulnerable to extreme wind and wind losses.</li> <li>The NYS HMP, NYSEMO, FEMA indicate that Fulton County has been issued two FEMA Disaster Declarations for severe storm events (some also identified as flooding events).                             <ul style="list-style-type: none"> <li>FEMA DR-1244 (September 1998)</li> <li>FEMA DR-1486 (July – August 2003)</li> </ul> </li> <li>NOAA's NCDC storm events database indicates that Fulton County was impacted by approximately 219 severe storm events between 1950 and 2009.</li> <li>The Fulton County HAZNY ranked severe storm as a moderately high hazard for the County. It is ranked as the highest hazard for the County. The HAZNY ranked tornado as a moderately low hazard for the County.</li> </ul>	<ul style="list-style-type: none"> <li>NYSDPC</li> <li>FEMA</li> <li>Hazards &amp; Vulnerability Research Institute (SHELDUS)</li> <li>NOAA-NCDC</li> </ul>
Severe Winter Storm (Heavy Snow, Blizzards, Freezing Rain/Sleet, Ice Storms, Nor'Easters and Extreme Cold)	Yes	Yes	<ul style="list-style-type: none"> <li>The NYS HMP identifies all types of severe winter storms as hazards of concern for New York State. The NYSDPC and NYSEMO listed Fulton County as the 20<sup>th</sup> County in the State most threatened by and vulnerable to snow and snow loss, with an annual average snowfall 84 inches. Fulton County is also listed as the 52<sup>nd</sup> County in New York State most threatened by and vulnerable to ice storms and ice storm loss.</li> <li>Fulton County was not declared a disaster area for any FEMA Disaster Declarations (DR) or Emergencies (EM).</li> <li>Record cold temperatures during the winter months of December through March in Fulton County occurred on:                             <ul style="list-style-type: none"> <li>November 1951 – Record low 0 °F in County</li> <li>February 1979 – Record low -26 °F in County</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>NYSDPC</li> <li>NYSEMO</li> <li>FEMA</li> <li>NOAA-NCDC Hazards &amp; Vulnerability Research Institute (SHELDUS)</li> <li>Kocin and Uccellini</li> <li>The Weather</li> </ul>

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	Is this a hazard that may occur in Fulton County?	If yes, does this hazard pose a significant threat to Fulton County?	Why was this determination made?	Source(s)
			<ul style="list-style-type: none"> <li>o March 1980 – Record low -14 °F in County</li> <li>o December 1980 – Record low -23 °F in County</li> <li>o January 1996 - -29 °F in County</li> <li>• NOAA’s NCDC storm events database indicates that Fulton County was impacted by approximately 130 winter storm events and 14 extreme cold / windchill events between 1950 and 2009. However, most events are of a regional extent rather than localized to just one county or community.</li> <li>• The Fulton County HAZNY ranks severe winter storm, ice storm and extreme temperature has a moderately low hazard for the County.</li> </ul>	<ul style="list-style-type: none"> <li>• Channel</li> <li>• NCDC Snow Climatology</li> <li>• NWS</li> </ul>
Tornado	Yes	Yes	Please see Severe Storm	
Tsunami	No	No	<ul style="list-style-type: none"> <li>• Tsunami is not identified as a hazard of concern in the NYS HMP</li> <li>• Tsunami is not addressed in the Fulton County HAZNY.</li> </ul>	<ul style="list-style-type: none"> <li>• NYSDPC</li> </ul>
Volcano	No	No	<ul style="list-style-type: none"> <li>• Volcanoes are not identified as a hazard of concern in the NYS HMP, because there are no known volcanoes located in the state.</li> <li>• Volcano is not addressed in the Fulton County HAZNY.</li> </ul>	<ul style="list-style-type: none"> <li>• NYSDPC</li> </ul>
Wildfire	Yes	No	<ul style="list-style-type: none"> <li>• The NYS HMP identifies wildfires as hazards of concern for New York State.</li> <li>• GeoMac indicates that portions of Fulton County are located within the Wildland-Urban Interface.</li> <li>• USGS indicates that no wildfires greater than 250 acres were experienced in Fulton County between 1980 and 2003.</li> <li>• GeoMAC indicates that no wildfires were experienced in Fulton County between 2001 and 2010.</li> <li>• Wildfire is not addressed in the Fulton County HAZNY.</li> <li>• Due to the fact that this hazard has a low occurrence of incidents and that the county could not quantify significant losses to the County and/or municipalities from historic events, the County decided not to analyze the wildfire hazard for the purposes of this plan.</li> </ul>	<ul style="list-style-type: none"> <li>• NYSDPC</li> <li>• USGS</li> <li>• GeoMAC</li> </ul>
Windstorm	Yes	Yes	Please see Severe Storm	

CEMP	Comprehensive Emergency Management Plan	FEMA	Federal Emergency Management Agency
CRREL	Cold Regions Research and Engineering Laboratory	HAZNY	Hazards New York
DPC	Disaster Preparedness Commission	HMP	Hazard Mitigation Plan
DR	Presidential Disaster Declaration Number	NCDC	National Climatic Data Center
EM	Presidential Emergency Declaration	NGDC	National Geophysical Data Center
EMO	Emergency Management Office	NID	National Inventory of Dams



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NOAA	National Oceanic and Atmospheric Administration
NPDP	National Performance of Dams Program
NRMC	Northeast Regional Climate Center
NWS	National Weather Service
NWPD	National Wildfire Programs Database
NYCEM	New York City Area Consortium For Earthquake Loss Mitigation
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDPC	New York State Disaster Preparedness Commission
NYSEMO	New York State Emergency Management Office
SHELDUS	Spatial Hazard Events and Losses Database for the United States
USACE	U.S. Army Corp of Engineers
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geologic Survey



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According to input from Fulton County, and review of all available resources, a total of four natural hazards of concern were identified as significant hazards affecting the County, to be addressed within this plan:

- Earthquake
- Flooding (riverine, flash, ice jam, and beaver dam)
- Severe Storm (windstorms, thunderstorms, hail, tornadoes and hurricanes/tropical storms)
- Severe Winter Storm (heavy snow, blizzards, ice storms, Nor'Easters) / Extreme cold

Other natural hazards of concern have occurred within the County, but typically have a low potential to result in significant impacts. The County deemed other natural hazards as minor in comparison to those bulleted above; therefore, additional natural hazards will not be further addressed within this version of the Plan. However, if deemed necessary by the County, these hazards may be considered in future versions of the Plan.