Section IV - Hazard Profiles 201.6(c)(2)(i)

A. Yates County Hazard Profiles

A hazard profile follows for each of the 12 hazards identified in Section III, where it was determined the hazard poses a significant risk, or a serious occurrence could have major impacts for Yates County. The unique characteristics of each community have a significant influence on the severity or impacts of a particular hazard and how it will affect the area. For example, because Yates County is sparsely populated and predominantly agricultural, hazards such as transportation accidents or winter storms will have largely different character and impacts than they would in an urban setting. In addition, hazards produce different kinds of effects as they vary in magnitude, duration or intensity. In the past, tornados in Yates County have been infrequent and of minimal impact, but Yates County could just as likely experience the kind of devastating tornados that have affected other New York communities. Geography, demographics, development, environmental, economic and other factors all impact how a hazard will affect Yates County. The hazard profiles examine these features to determine in what ways and to what extent the hazard can impact Yates County.

Table 4-1 Hazard Profile - Extreme Temperatures

Hazard	Previous Events	Likely Impacts	Probability of Future Event
Definition: Sustained periods when the heat index is 100 degrees or greater, or when sustained nighttime temperatures exceed 80 degrees. Sustained periods when the windchill is minus 20 degrees or colder ***Impact Area:*** Countywide	16 events 1993-2010	Water supply disruption (freezing) Severe impacts for the elderly, young children and those with health complications Approximately 15 % of Yates County population, or 3700 people are 65 and older. About 6 % or 1500 youth are under age 5 School, business closings Power reduction, disruption Impacts to agriculture Increased fire hazards	Average one occurrence per year

Heat Index

Created by the National Weather Service, the Heat Index measures apparent temperature of the air as it increases with the relative humidity. The Heat Index can be used to determine what effects the temperature and humidity can have on the population. To determine the Heat Index, you need the temperature and the relative humidity. Once both values are known, the Heat Index will be the corresponding number with both values. That number provides how it really feels. It is important to know that the Heat Index values are devised for shady, light wind conditions. Exposure to full sunshine can increase Heat Index values by up to 15 degrees. Also, strong winds, particularly with very hot, dry-air can be extremely hazardous to individuals.

Table 4-1a Heat Indices

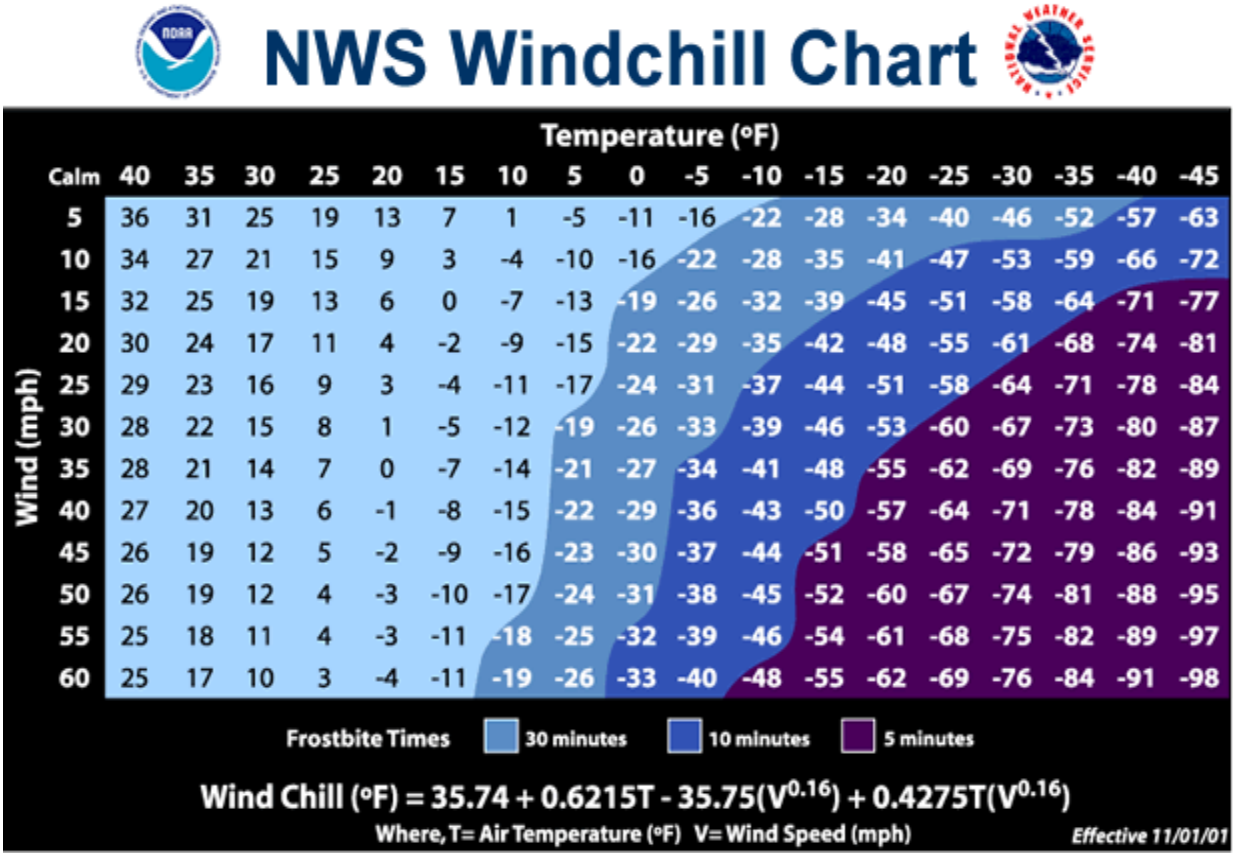
Category	Heat Index	Health Hazards
Extreme Danger	**130°F - Higher**	**Heat Stroke/ Sunstroke is likely with continued exposure**
Danger	**105°F - 129°F**	**Sunstroke, muscle cramps and/or heat exhaustion possible with prolonged exposure and /or physical activity.**
Extreme Caution	**90°F - 105°F**	**Sunstroke, muscle cramps and/or heat exhaustion possible with prolonged exposure and /or physical activity.**
Caution	**80°F - 90°F**	**Fatigue possible with prolonged exposure and/or physical activity**

* Source: National Weather Service (NWS)

Windchill Index

The NWS Windchill Temperature (WCT) index provides an accurate, understandable, and useful formula for calculating the dangers from winter winds and freezing temperatures. Windchill is the apparent temperature felt on exposed skin due to wind. The degree of this phenomenon depends on both air temperature and wind speed. The wind chill temperature (often popularly called the **wind chill factor**) is always lower than the air temperature for values where the wind chill formula is valid.

Table 4-1b NWS Windchill Chart



Population Vulnerable to Extreme Temperatures

Situational and physical characteristics help to identify vulnerable populations that may not comfortably or safely access and use disaster resources. Specifically, when discussing heat related emergency preparedness, the following groups could be considered vulnerable or at greater risk in a heat emergency:

- Homeless
- Infants and small children under age five
- Women who are pregnant
- Elderly people (age 65 and older)
- Persons who have obesity
- Persons who are bedridden
- Persons with mental illness/disabilities
- Persons with cognitive disorders
- Persons with medical conditions (e.g., heart disease, diabetes, high blood pressure, insulin)

- Persons requiring life-saving medications (e.g., for high blood pressure, depression, insomnia)
- Persons who utilize medical equipment (e.g., ventilators, oxygen, G-tubes)
- Individuals with drug or alcohol addictions
- Persons who use mobility devices (e.g., wheelchairs, walkers, canes)
- Persons who are non-ambulatory
- Those with sensory impairments (blind/visually impaired or deaf/hard of hearing)
- Persons who are under extreme working conditions
- Persons who are poor
- Persons who are socially isolated
- Persons who do not speak English with minimal access to information

Figure 4-1 Population Susceptible to Extreme Heat Ages 65 and Older

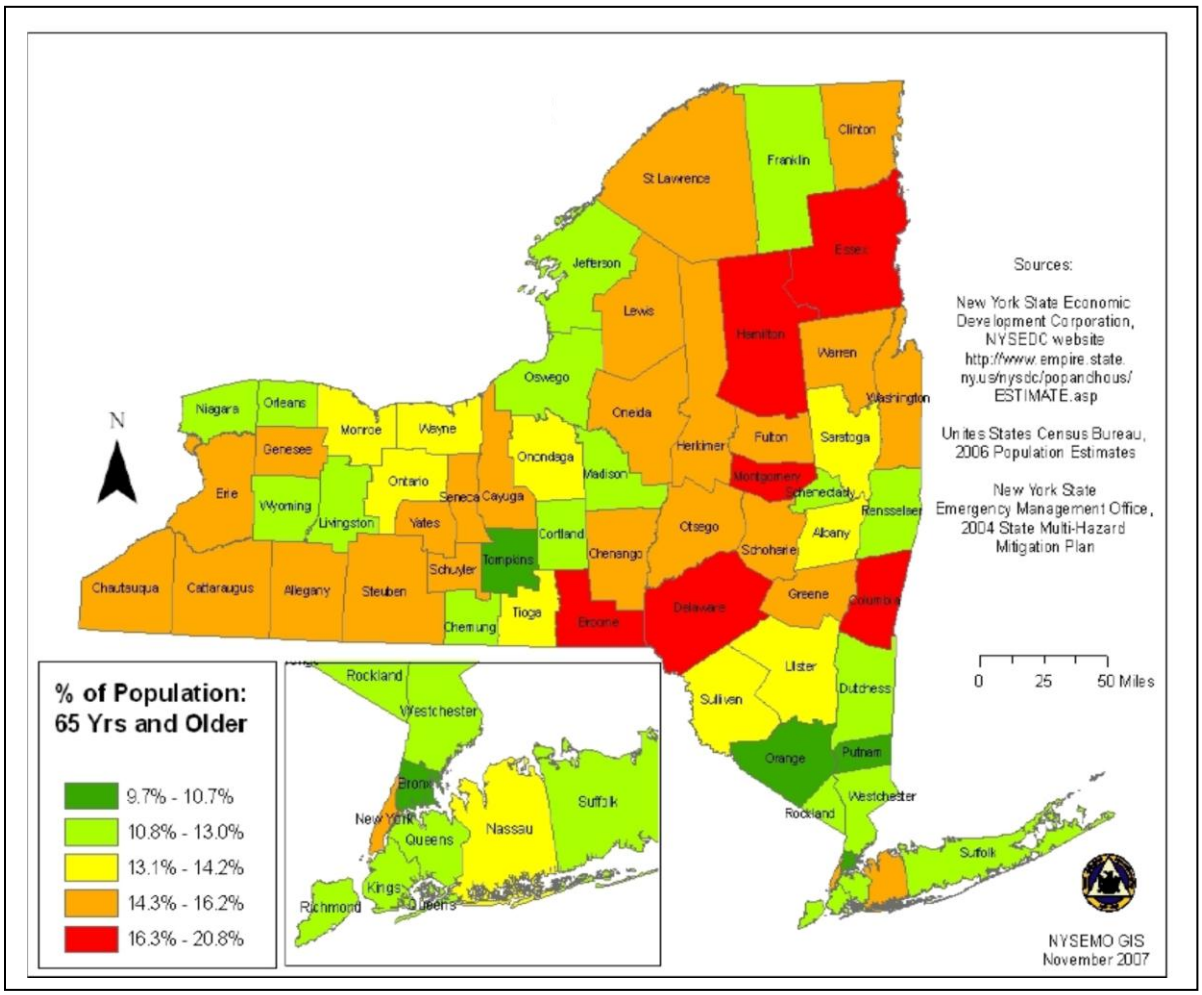


Figure 4-2 Population Susceptible to Extreme Heat Ages 5 and Under

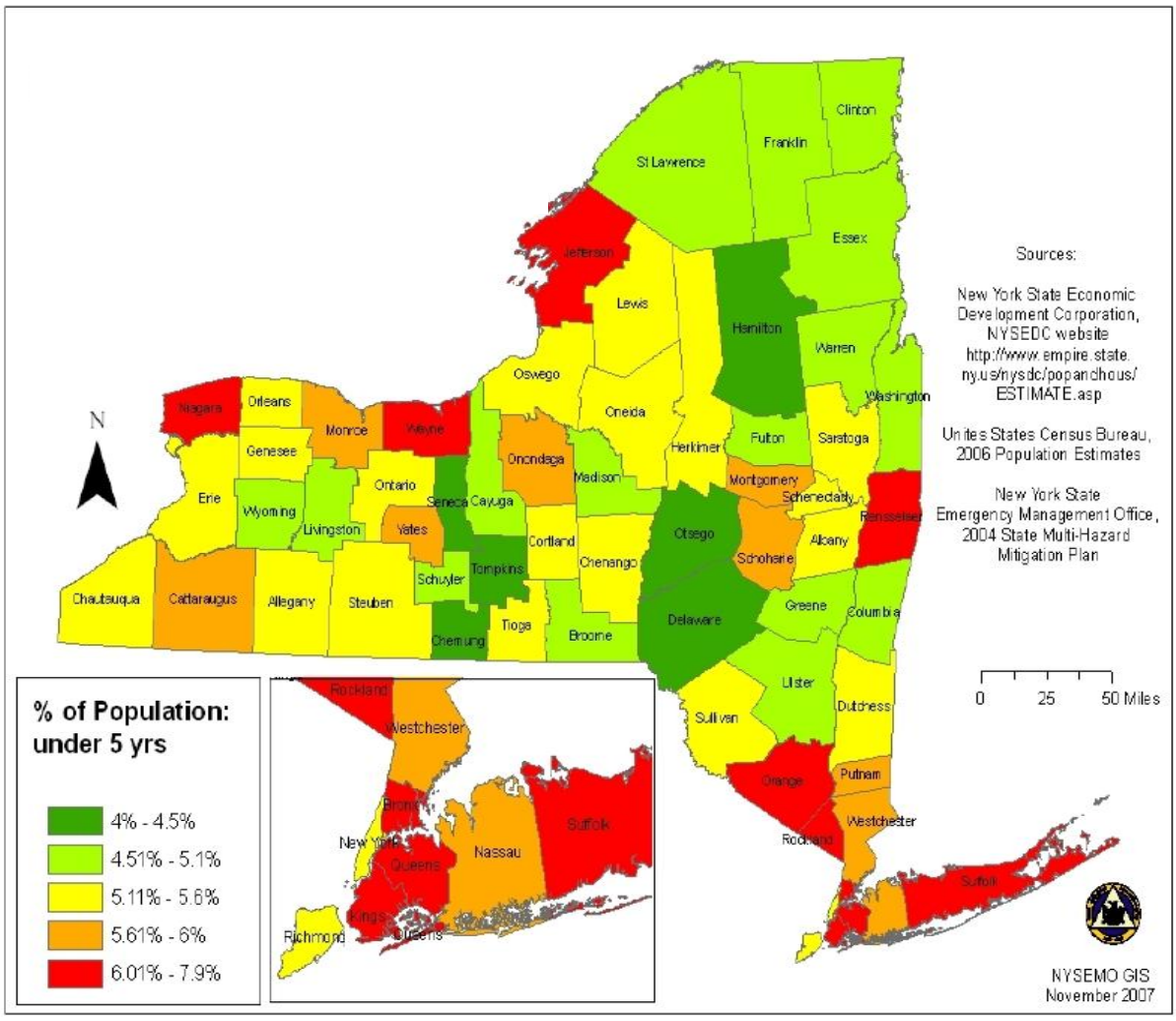


Table 4-2 Hazard Profile - Tornado

Hazard	Previous Events	Likely Impacts	Probability of Future Event
Tornado ***Definition:*** F1 or greater, confirmed by NWS ***Impact Area:*** Countywide -- Increased vulnerability for villages and populated areas	4 Tornados (F1) 1950-2010	Property damage Infrastructure, utility damage Deaths, injuries Power Outages Debris Transportation disruption Strain on medical services Disruption of services Temporary housing School and business closings Economic impacts Mental health/Crisis counseling	There is a 7% chance each year of an **F1** tornado in Yates county Statewide: it can be expected that 1 or 2 **F2** tornados will occur each year somewhere in the state There is a 10% chance each year that an **F4** will occur somewhere in upstate New York

Table 4-2a Tornado – Fujita Scale

Enhanced Fujita Scale Source: NOAA National Climatic Data Center			
Scale	**Wind Speed**	**Description**	**Typical Damages**
F0	40-72 mph	- Gale - Light Damage	Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; signboards damaged.
F1	73-112 mph	- Weak - Moderate Damage	Peels surface off roofs, mobile homes pushed off foundations or overturned, moving autos blown off roads.
F2	113-157 mph	- Strong - Considerable Damage	Peels surface off roofs; mobile homes pushed off foundations or overturned, moving autos blown off roads.
F3	158-206 mph	Severe Damage	Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
F4	207-260 mph	Devastating Damage	Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated.
F5	261-318 mph	Incredible Damage	Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yds); trees debarked; incredible phenomena will occur.

Table 4-2b Yates County Tornado History

4 Tornados were reported in Yates County, New York between 01/01/1950 and 12/31/2009
Source: NOAA National Climatic Data Center

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD: Property Damage
CrD: Crop Damage

New York								
Location or County	**Date**	**Time**	**Type**	**Mag**	**Dth**	**Inj**	**PrD**	**CrD**
1 YATES	07/14/1954	1630	Tornado	F1	0	0	2.5M	0
2 YATES	07/01/1956	2045	Tornado	F1	0	0	0K	0
3 YATES	06/27/1978	1405	Tornado	F1	0	0	2.5M	0
4 Middlesex	06/22/1996	11:20 AM	Tornado	F1	0	0	75K	0K
				TOTALS:	0	0	5.075M	0

Table 4-2c F2 and Greater Tornados in New York State

Tornados in New York State – F2 and Greater – 1950 thru 2009		
Scale	Number	Location
F2	78	Statewide
F3	24	Statewide
F4	6	Columbia, Chautauqua, Montgomery, Schoharie, Albany, Green
F5	0	

Source: NOAA National Climatic Data Center

Figure 4-3 Tornado Risk Areas in the Continental United States

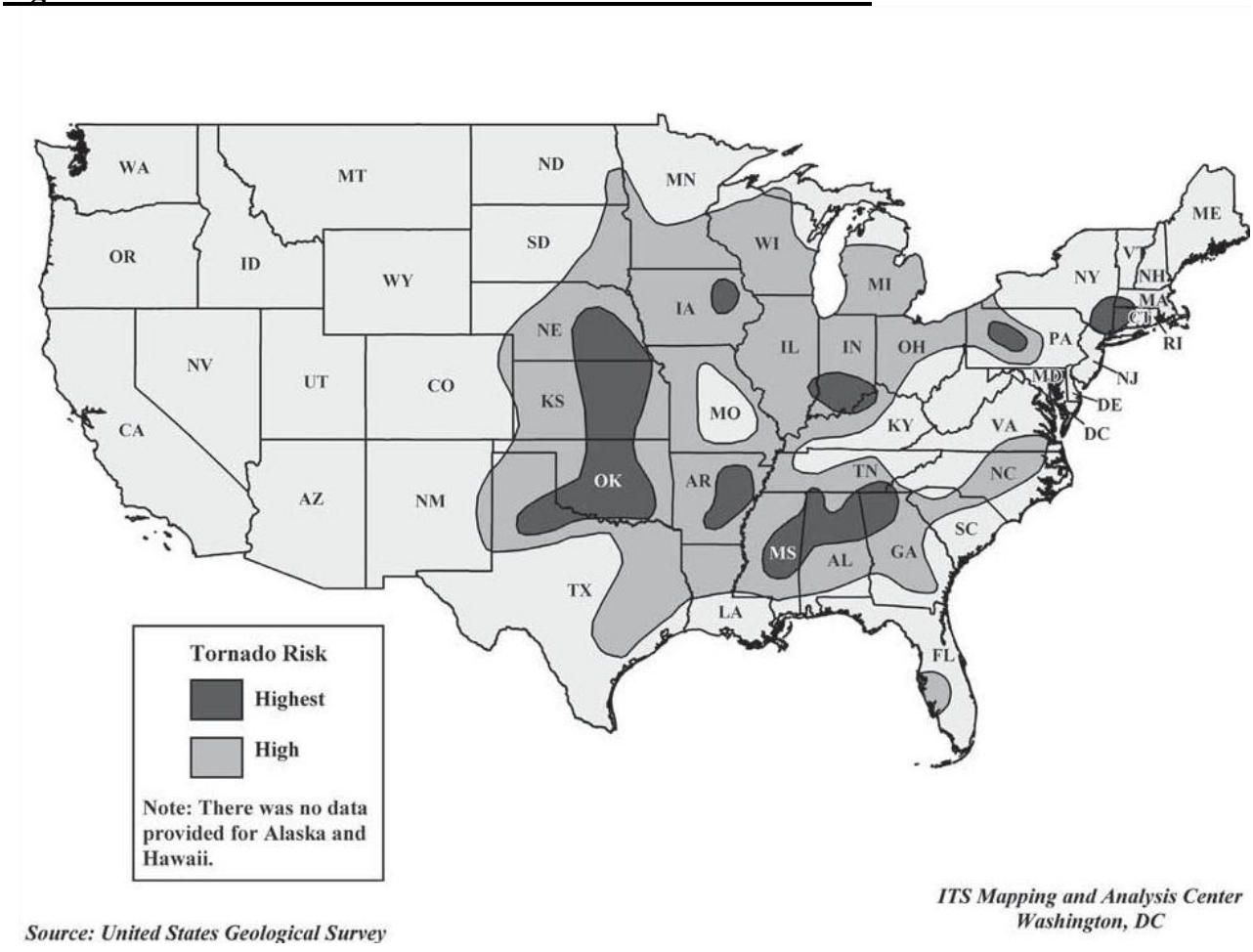


Figure 4-4 Tornados in NY 1950 - 2005

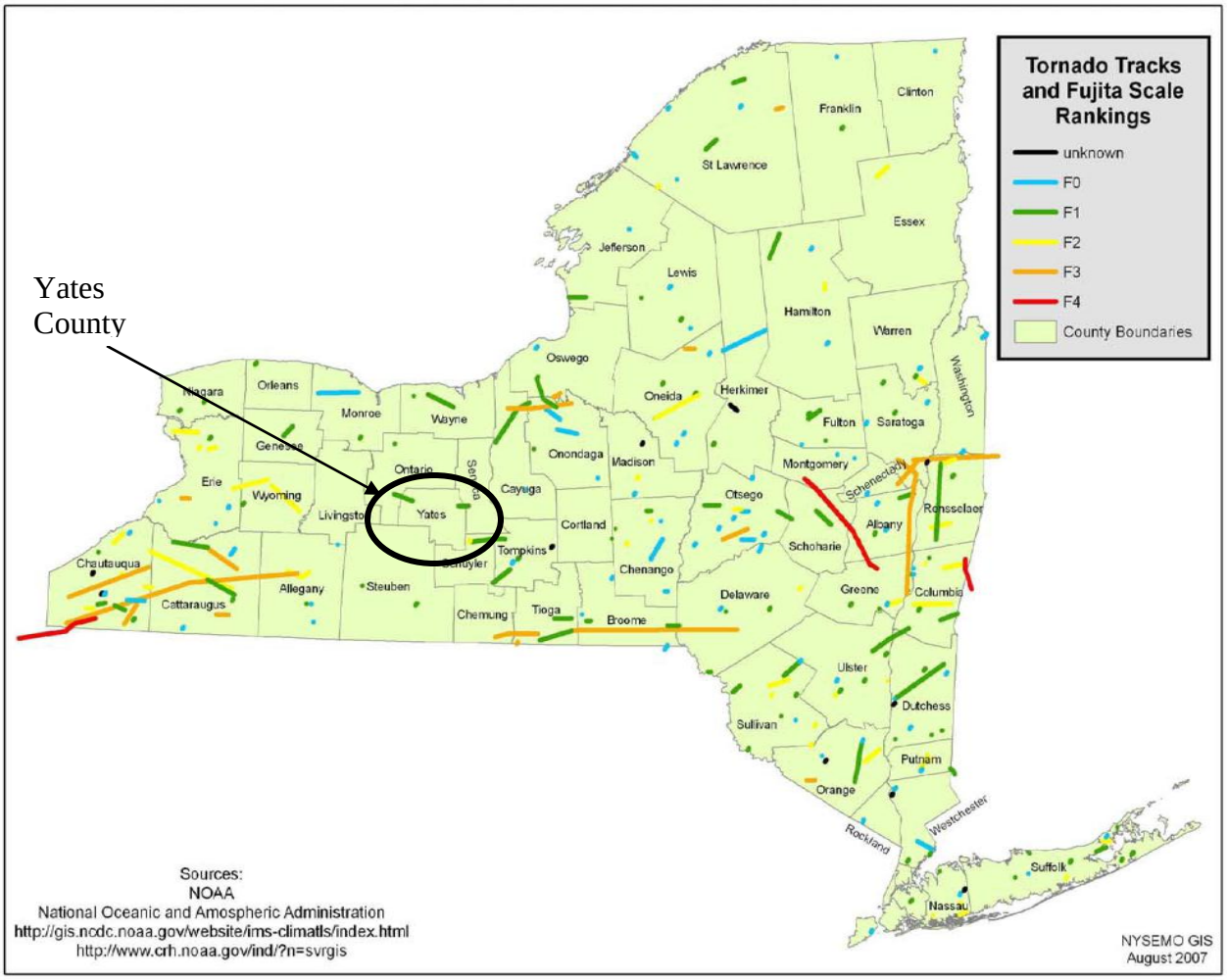


Table 4-3 Hazard Profile - Transportation Accidents

Hazard	Previous Events	Likely Impacts	Probability of Future Event
Definition: Involves multiple casualties or extensive property damage requiring mutual aid response from outside the jurisdiction *Impact Area:* Countywide Increased vulnerabilities on state highways and areas with railways, including the Town of Torrey and Village of Dresden	1 mass casualty event involving a school bus	Deaths and injuries Property damage Emergency medical services fully engaged Mutual aid response required Hospitals implement disaster plans Supporting regional hospitals engaged Traffic, transportation disruptions Mental Health/Crisis counseling Emergency communications support required	1 every ten years

Table 4-3a Transportation Related Accidents

TRANSPORTATION RELATED ACCIDENTS

YATES COUNTY

YEAR	PERSONAL INJURY	FATAL	PROPERTY DAMAGE	VEHICLE-DEER	VEHICLE-2 ANIMAL HIT AND RUN	SNOWMOBILE	BOAT	ATV	AIR	RAILROAD	TOTALS
											0
1996	115	5	365	359	27	16	0	0	0	0	0	887
1997	122	4	366	409	22	13	0	0	0	0	1	937
1998	99	2	329	484	41	19	0	0	0	0	0	974
1999	111	10	392	481	22	24	0	0	0	0	2	1042
2000	55	5	336	425	23	19	1	0	0	0	0	864
2001	165	3	398	500	35	20	0	0	0	0	0	1121
2002	123	3	249	310	13	15	0	0	0	0	0	713
2003	98	3	236	345	12	18	3	7	1	0	0	723
2004	96	3	219	270	9	6	1	5	3	0	0	612
2005	86	1	215	280	9	15	1	1	1	2	0	611
2006	90	2	197	250	10	13	1	4	0	0	0	567
2007	89	4	215	266	10	9	0	3	0	0	1	597
2008	83	2	255	250	15	4	1	3	1	0	1	615
											0

(Source: NYS Depart. of Motor Vehicles)

Figure 4-5 Yates County State Highways

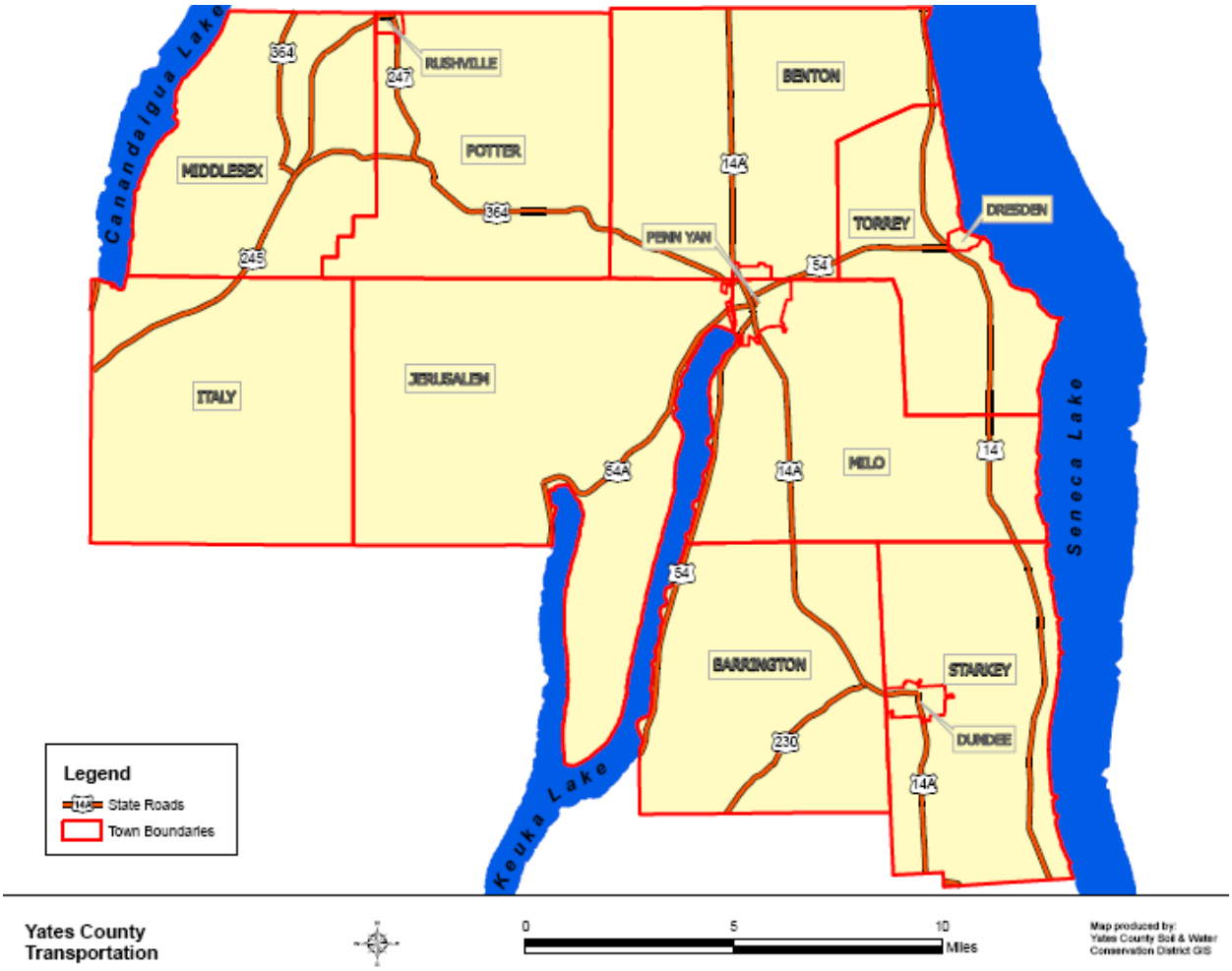


Figure 4-6 Yates County Active Railways

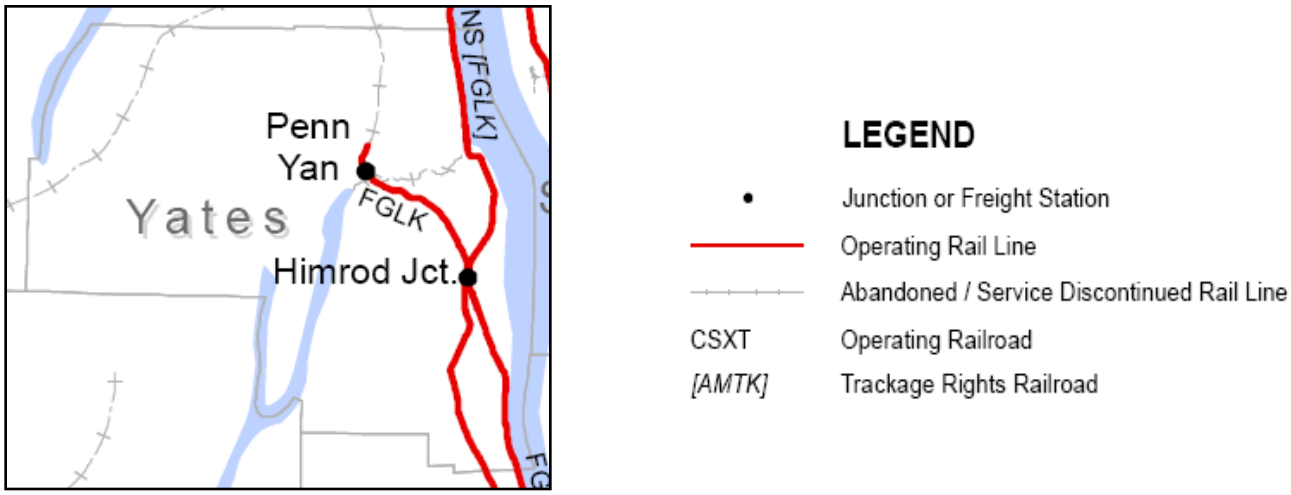


Figure 4-7 Yates County Airport Sites

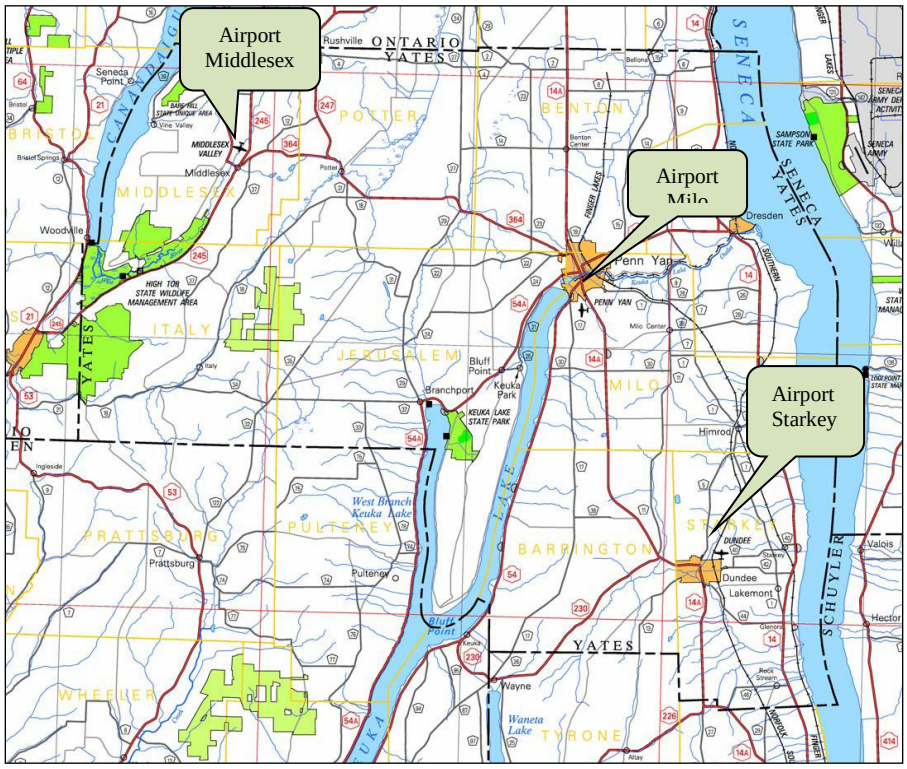


Table 4-4 Hazard Profile – Oil Spill

Hazard	Previous Events	Likely Impacts	Probability of Future Event
Definition: Uncontrolled or accidental discharge of petroleum on land or in water that results in a significant hazard and impacts requiring a complex response and recovery to control, contain, mitigate and cleanup the spill *Impact Area:* Countywide Primarily along highways, in villages and business districts and active rail lines	There were 209, mostly minor, Oil and/or Petroleum spills 2000 to 2008	Environmental contamination Impacts to wildlife Transportation restrictions Fire Private water supply contamination Hazards and restrictions to sewers and drainage Closing of business or public access	Average of 24 spills per year, mostly minor

Table 4-4a Yates County # of Reported Spills Annually

Year	20000	2001	2002	2003	2004	2005	2006	2007	2008
Spills	23	27	24	23	23	25	22	22	20

Source: NYS DEC Spill Incidents Database

Reported spills can involve as little as 1 gallon. Most are spills from vehicles or containers on local highways, or spills at retail or business facilities, fuel transfer operations, marinas and residences. The 209 spills predominantly include gasoline, diesel, kerosene and various oils.

Table 4-5 Hazard Profile - Hazardous Materials-In Transit

Hazard	Previous Events	Likely Impacts	Probability of Future Event
Definition: Event causing significant community threat and disruption that involves a multi-jurisdictional response, multiple victims, significant exposure or damage *Impact Area:* Countywide – Greater threat near state highways through Benton, Torrey, Penn Yan, Milo, Barrington, Starkey and Dundee. Also near industrial sites and utilities in Torrey and Dresden.	2 incidents reported to the National Response Center (NRC) from 1994 to 2009. Local records do not provide specific or adequate detail, but area public safety officials estimate a serious hazardous materials spill involving transportation occurs every five to seven years	Deaths and Injuries Fire / explosion Toxic release / exposure Health and Environmental hazards Agricultural hazards Wildlife hazards Transportation disruption Water supply contamination / disruption	1 every five to seven years

(See Appendix 9 - Tier 2 Chemical Bulk Storage Facilities)

Figure 4-8 Tier 2 Chemical Bulk Storage Facilities

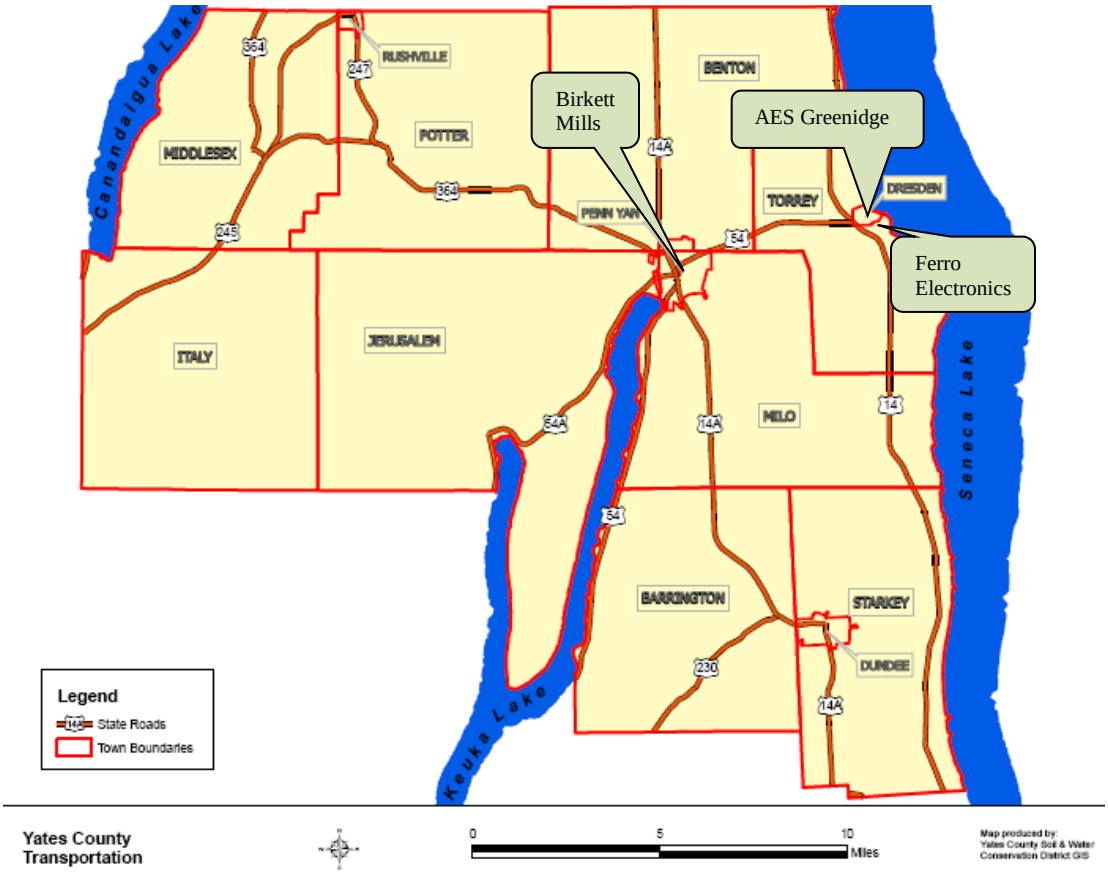


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Table 4-6 Hazard Profile – Severe Winter Storm

Hazard	Previous Events	Likely Impacts	Probability of Future Event
Definition: Severe and/or sustained hazardous winter weather that poses a threat to life and/or property; including any, or a combination of the following: heavy snow, blowing snow, blizzard, freezing rain, sleet, and strong winds. *Impact Area:* Countywide	48 events from 1993 to 2008	Transportation and road disruption/closings School, business and government services disruption/closings Increase traffic accidents, including injuries and deaths Increased health and medical injuries, emergencies and deaths Disruptions and delays in providing fire, medical, and safety services Delays and disruption in providing scheduled medical and pharmaceutical services Roof and structural damage, collapse Stranded motorists, citizens, travelers Power outages and heating disruptions Need for shelters, warming centers, food and transportation for critical workers and services Downed/suspended/unsafe trees, limbs and wires Abandoned vehicles Public access hazards for schools, medical facilities, etc. Generator and power support issues, carbon monoxide hazards Extended snow and ice maintenance operations and materials	Average 3 events per year

Table 4-6a Winter Storms and Winds History

From 1993 to 2010, the National Weather Service has recorded 48 winter snow and wind storms in Yates County. Fifteen (15) of these winter storms were of notable significance and prompted a community-wide response and assessment of impacts and costs.

39 Winter Storm event(s) were reported in **Yates County, New York** between **01/01/1993** and **12/31/2009**.
Source: NOAA National Climatic Data Center

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD: Property Damage
CrD: Crop Damage

Date	Type	Mag	Dth	Inj	PrD	CrD
12/21/1993	Heavy Snow	N/A	0	0	50K	0
01/04/1994	Heavy Snow	N/A	0	0	50K	0
02/24/1994	Heavy Snow	N/A	0	0	50K	0
11/14/1995	Heavy Snow	N/A	0	0	20K	0
01/02/1996	Heavy Snow	N/A	0	0	73K	0
03/06/1996	Heavy Snow	N/A	3	10	0	0
11/14/1997	Heavy Snow	N/A	0	0	0	0
12/10/1997	Heavy Snow	N/A	0	0	0	0
12/29/1997	Heavy Snow	N/A	0	0	0	0
03/14/1998	Heavy Snow	N/A	0	0	0	0
03/20/1998	Heavy Snow	N/A	0	0	0	0
01/08/1999	Winter Storm	N/A	0	0	0	0
01/13/1999	Winter Storm	N/A	0	0	0	0
03/06/1999	Heavy Snow	N/A	0	0	0	0
01/12/2000	Heavy Snow	N/A	0	0	0	0
01/20/2000	Heavy Snow	N/A	0	0	0	0
01/25/2000	Heavy Snow	N/A	0	0	0	0
01/30/2000	Heavy Snow	N/A	0	0	0	0
02/18/2000	Heavy Snow	N/A	0	0	0	0
03/04/2001	Heavy Snow	N/A	0	0	0	0
03/16/2001	Heavy Snow	N/A	0	0	0	0
01/31/2002	Winter Storm	N/A	0	0	0	0
12/25/2002	Heavy Snow	N/A	0	0	0	0

01/03/2003	Heavy Snow	N/A	0	0	6.0M	0
02/17/2003	Heavy Snow	N/A	0	0	2.7M	0
12/14/2003	Heavy Snow	N/A	0	0	510K	0
02/03/2004	Heavy Snow	N/A	0	0	170K	0
03/16/2004	Heavy Snow	N/A	0	0	340K	0
01/22/2005	Heavy Snow	N/A	0	0	480K	0
03/01/2005	Heavy Snow	N/A	0	0	360K	0
10/25/2005	Winter Weather/mix	N/A	0	0	0	0
03/02/2006	Heavy Snow	N/A	0	0	0	0
02/13/2007	Winter Storm	N/A	0	0	0K	0K
04/15/2007	Winter Storm	N/A	0	0	0K	0K
12/13/2007	Heavy Snow	N/A	0	0	0K	0K
02/26/2008	Winter Storm	N/A	0	0	0K	0K
12/19/2008	Winter Storm	N/A	0	0	0K	0K
12/31/2008	Winter Storm	N/A	0	0	0K	0K
01/27/2009	Winter Storm	N/A	0	0	0K	0K

9 Strong Winter Wind event(s) were reported in Yates County, New York between 01/01/1993 and 12/31/2009.
Source: NOAA National Climatic Data Center

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD: Property Damage
CrD: Crop Damage

Type	Date	Mag	Dth	Inj	PrD	CrD
Strong Wind	12/23/2004	45 kts.	0	0	90K	0
Strong Wind	11/29/2005	50 kts.	0	0	90K	0
High Wind	01/27/1996	58 kts.	0	4	133K	0
High Wind	11/10/1998	0 kts.	0	0	145K	0
High Wind	11/02/1999	0 kts.	0	0	500K	0
High Wind	12/12/2000	54 kts.	0	0	1.1M	0
High Wind	11/13/2003	58 kts.	0	0	900K	0
High Wind	02/17/2006	60 kts.	0	0	100K	0
High Wind	02/12/2009	56 kts.	0	0	2K	0K

Table 4-6b Jurisdictions Most Threatened by Snow and Vulnerable to Snow Loss - South Central NY

County	Rating Score (Max 25)	Annual Average Snowfall (inches)	*Extreme Snowfall Potential (no/yes)	# of Snow Related Disasters	Population Density (per square mile)	Total # of Structures (HAZUS)
Warren	9	75.6	no	1	68	26234
Herkimer	9	140.4	yes	2	44.2	22928
Montgomery	9	87.1	no	2	121.2	14829
Otsego	9	85.5	no	2	60.8	21815
Schoharie	9	71.3	no	3	56.1	12026
Steuben	8	54.8	no	1	70.3	34710
Washington	8	62.5	no	2	72.6	20361
Cortland	7	95	no	1	97	13599
Essex	7	87.7	no	1	21.2	17157
Hamilton	7	129.2	yes	1	3	6252
Schuyler	7	53.9	no	1	85.4	7378
Tioga	7	61.5	no	1	99.1	17232
Allegany	6	68.4	no	1	48.2	18096
Yates	6	56.5	no	1	65.5	9542
Seneca	5	58.7	no	1	40.6	11423

	Rating Score	Annual Average Snowfall (inches)	Extreme Potential (no/yes)	# of Snow Related Emergencies or Disasters	Population Density (per square mile)	Total # of Structures
Rating Score – Variables Distributions and Point Values	score value 1	1-40 inches		1	1 – 49	1-17K
	score value 2	41-70 inches	Yes	2	50 – 99	18-24K
	score value 3	71-100 inches		3	100 –299	25-40K
	score value 4	101-140 inches		4	300 – 1999	41-80K
	score value 5	141 + inches		5+	2000 – 67,000	81-462K

Extreme snowfall potential areas: We identified counties with extreme snowfall potential as they fit into 2 general categories as follows; 1. Those areas that are historically vulnerable to persistent heavy Lake Effect/Enhanced snow from Lakes Erie and Ontario and those with elevation and latitude snow vulnerability. Counties in these classification include; Erie, Cattaraugus, and Chautauqua counties lee of Lake Erie. Oswego, Jefferson Lewis, Onondaga, Madison, Oneida, and Herkimer, lee of Lake Ontario. Hamilton, also lee of Lake Ontario, is also in an area categorized as potentially vulnerable to extreme snow enhanced by elevation and/or latitude as are St. Lawrence and Franklin counties.

*Sources: National Climatic Data Center NCDC average snowfall data, FEMA disaster declaration data, and HAZUS. Analysis supported by GIS technology.

Figure 4-9 Annual Snowfall Normals 1971 - 2000

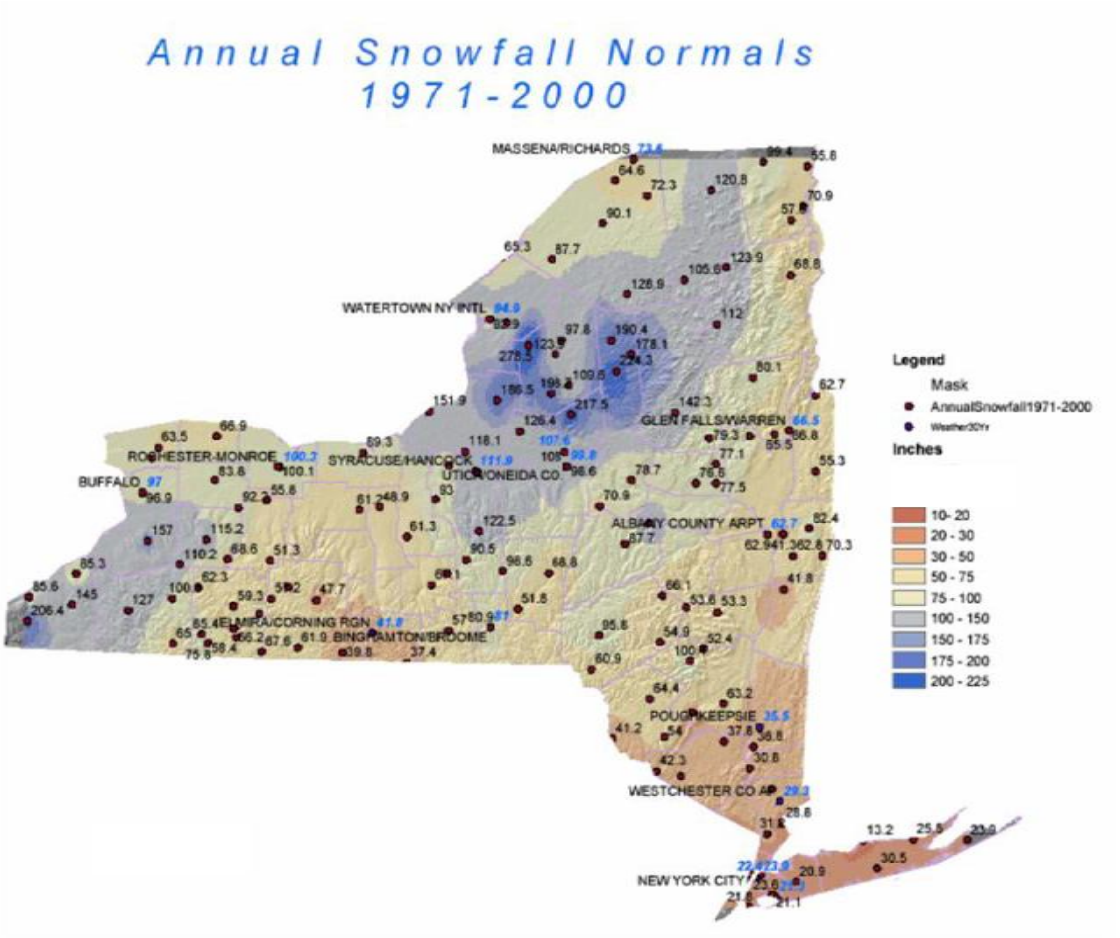

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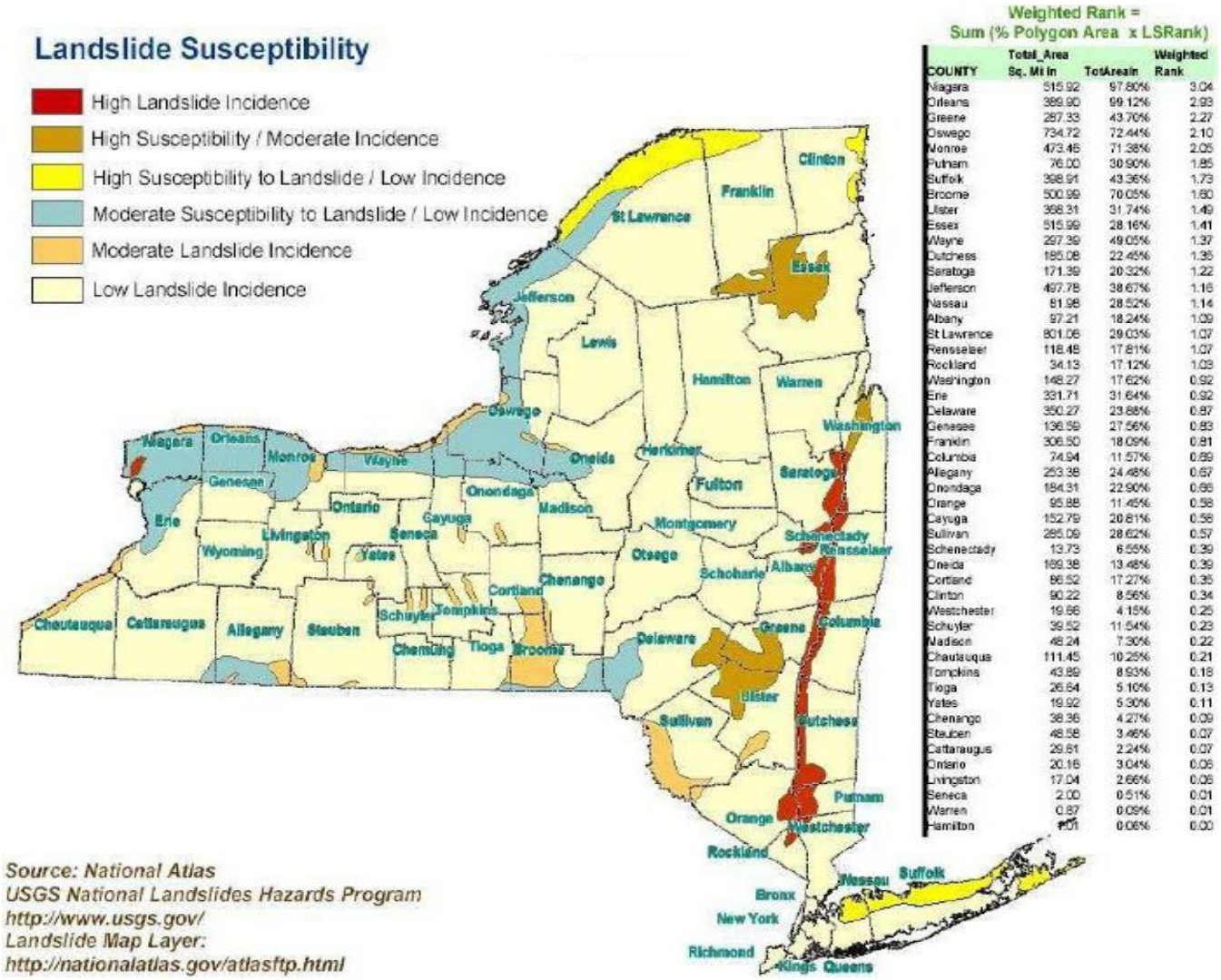
Table 4-7 Hazard Profile – Landslide

Hazard	Previous Events	Likely Impacts	Probability of Future Event
Definition: The downward and outward gravity slide or movement of slope-forming earthen or fill materials that damage or affect improved property, roads and structures; including rockslides, earth-flow, mud flow, slumps, and similar terms or events *Impact Area:* Communities bordering Canandaigua and Keuka lakes, including the Towns of Barrington, Italy, Jerusalem, Middlesex and Milo	1 recorded by NYS Geological Survey and USGS Local officials estimate a damaging landslide occurs about once every five years and is usually associated with heavy rain or flooding. In these instances there may be multiple locally isolated slides at more than one location, rather than a single large slide.	Damage/loss of residences and improved property Damage to roads and culverts Properties become inaccessible due to damaged roads and driveways Damage/disruption to utilities: water, sewer, gas, electric Prevent access for emergency vehicles, fire and medical Safety hazards for school buses and travelers Restricts evacuations and rescue Damage, disruption or alteration of natural drainage systems and patterns Economic impacts, property value and tax losses Degradation or destruction of natural features and habitat	Insufficient data to calculate a reliable probability. Occurrences parallel heavy rain and flooding, where serious and damaging events occur every 4 to 5 years, or there is a 21% chance each year

Looking at susceptibility of landslides, The USGS National Landslides Hazard program, Figure 4-6 indicates that the majority of Yates County has a 'low' landslide incidence, but also highlights areas adjacent to Canandaigua and Keuka lakes as having a 'moderate' landslide incidence, which can affect 1.5 to 15% of the designated area. As noted by USGS, the moderately steep slopes and glacial deposits along the west-central Finger Lakes increase landslide tendency in the area.

The NYS Geological Survey and USGS have recorded only one landslide event in Yates County from 1837 through 2007 (Figure 4-7), which is identified on the USGS map as occurring in adjacent Ontario County, but other USGS references note the same event affected Yates County as well.

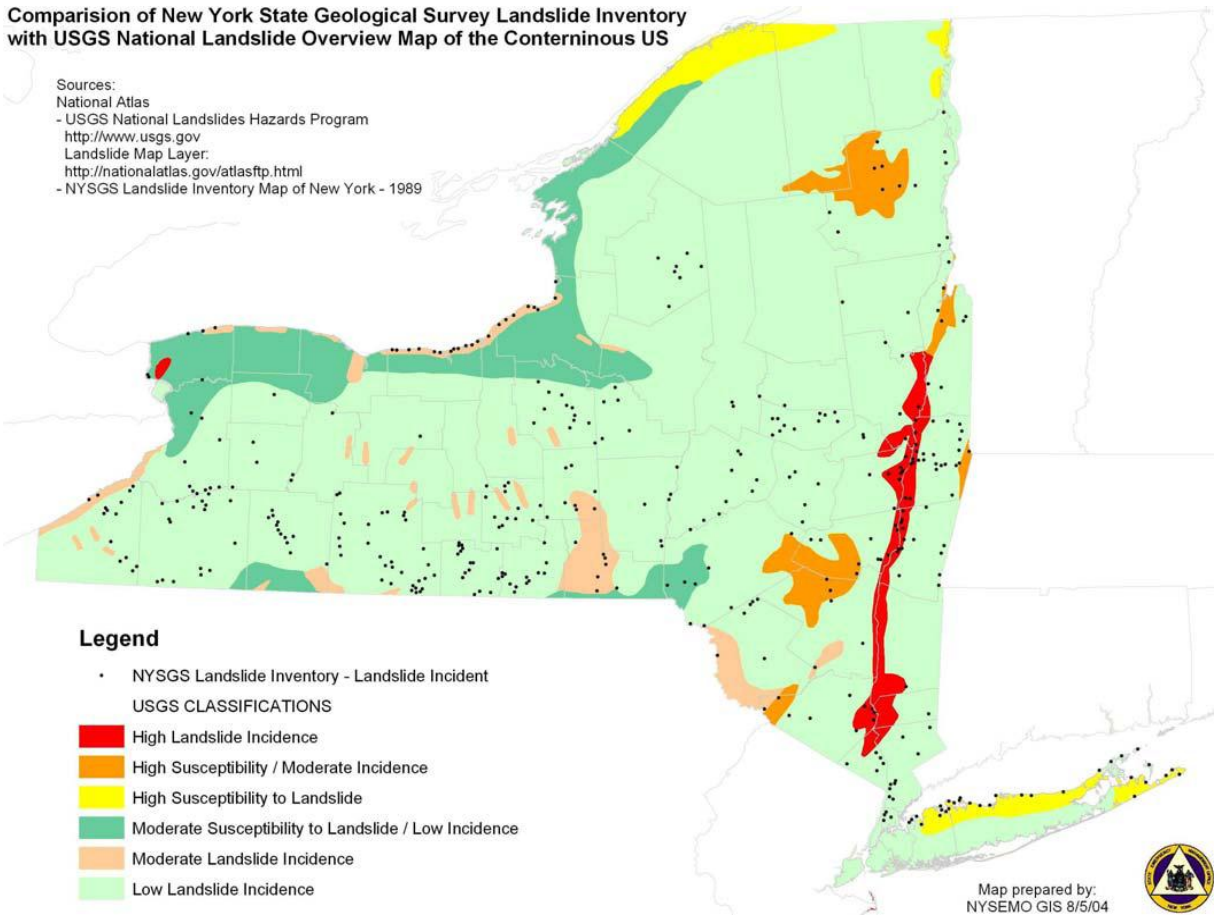
Figure 4-10 Landslide Susceptibility



Weighted Rank = Sum (% Polygon Area x LSRank)

COUNTY	Total_Area Sq. Mi In	TotAreain	Weighted Rank
Niagara	515.92	97.80%	3.04
Orleans	389.90	99.12%	2.93
Greene	267.33	43.70%	2.27
Oswego	734.72	72.44%	2.10
Monroe	473.46	71.38%	2.05
Putnam	76.00	30.90%	1.85
Suffolk	368.91	43.36%	1.73
Broome	500.99	70.05%	1.60
Ulster	368.31	31.74%	1.49
Essex	515.99	28.16%	1.41
Wayne	297.39	49.05%	1.37
Dutchess	185.08	22.45%	1.35
Saratoga	171.39	20.32%	1.22
Jefferson	497.78	38.67%	1.16
Nassau	81.98	28.52%	1.14
Albany	97.21	18.24%	1.09
St Lawrence	801.06	29.03%	1.07
Rensselaer	118.48	17.81%	1.07
Rockland	34.13	17.12%	1.03
Washington	148.27	17.62%	0.92
Erie	331.71	31.64%	0.92
Delaware	350.27	23.88%	0.87
Genesee	136.59	27.56%	0.83
Franklin	306.50	18.09%	0.81
Columbia	74.94	11.57%	0.69
Allegany	253.38	24.48%	0.67
Onondaga	194.31	22.90%	0.66
Orange	95.88	11.45%	0.58
Cayuga	152.79	20.81%	0.58
Sullivan	285.09	28.62%	0.57
Schenectady	13.73	6.55%	0.39
Oneida	189.38	13.48%	0.39
Cortland	86.52	17.27%	0.35
Clinton	90.22	8.56%	0.34
Westchester	19.66	4.15%	0.25
Schuyler	39.52	11.54%	0.23
Madison	46.24	7.30%	0.22
Chautauqua	111.45	10.25%	0.21
Tompkins	43.89	8.93%	0.18
Tioga	26.64	5.10%	0.13
Yates	19.92	5.30%	0.11
Chenango	38.36	4.27%	0.09
Steuben	48.58	3.46%	0.07
Cattaraugus	29.61	2.24%	0.07
Ontario	20.16	3.04%	0.06
Livingston	17.04	2.66%	0.06
Seneca	2.00	0.51%	0.01
Warren	0.87	0.09%	0.01
Hamilton	0.01	0.06%	0.00

Figure 4-11 Landslide Incidences



The New York State Hazard Mitigation Plan, using USGS data, calculates a weighted rank for landslide susceptibility of 0.11 for Yates County. Four counties in New York State have a susceptibility ranking that is less than Yates and 58 counties have a susceptibility ranking higher than Yates. Part of this calculation is based on the total area of the county at risk, and many counties have larger expanses that are vulnerable, where areas at risk in Yates County are generally considered to be the well-defined steep slopes near the lakes.

Yates County has determined that a greater risk and vulnerability from landslide may exist in the lakeshore areas of the county than is represented by USGS documentation and the New York State Mitigation Plan. There is concern that evaluations based on historical incidence, or analysis that was done many years ago, may not reflect the extent of development that has taken place in the lakeshore area over the past 20 years. Existing studies use data and experience representing earlier times when only minimal, low value development existed. Lakeshore communities report that new residential construction is increasingly focused on the lakeshore or hills surrounding the lakes, and many existing structures that were previously seasonal low-value cottages are being upgraded to higher value permanent residences.

Figure 4-12 Highly Erodible Soils

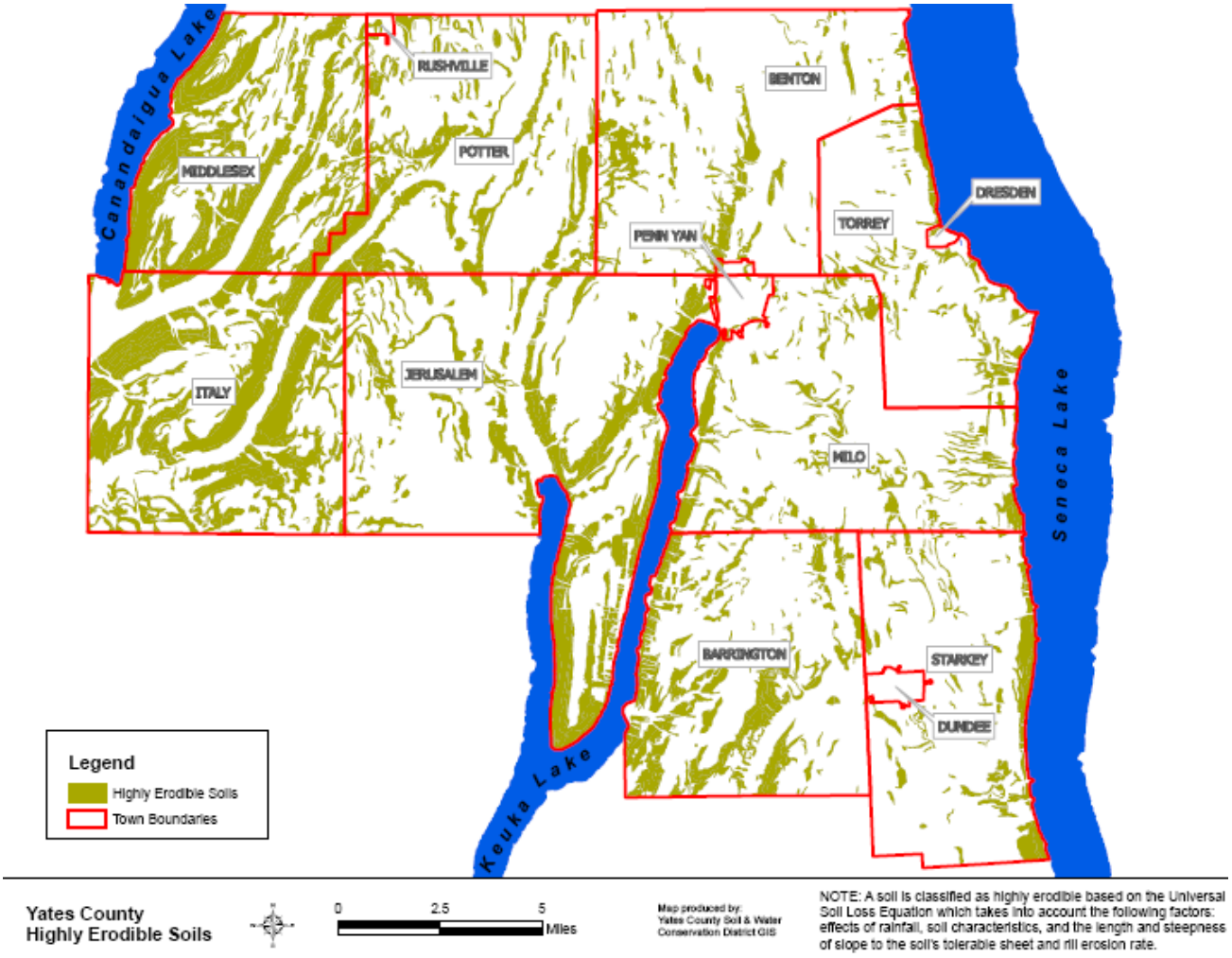


Figure 4-13 NYS Topography Map

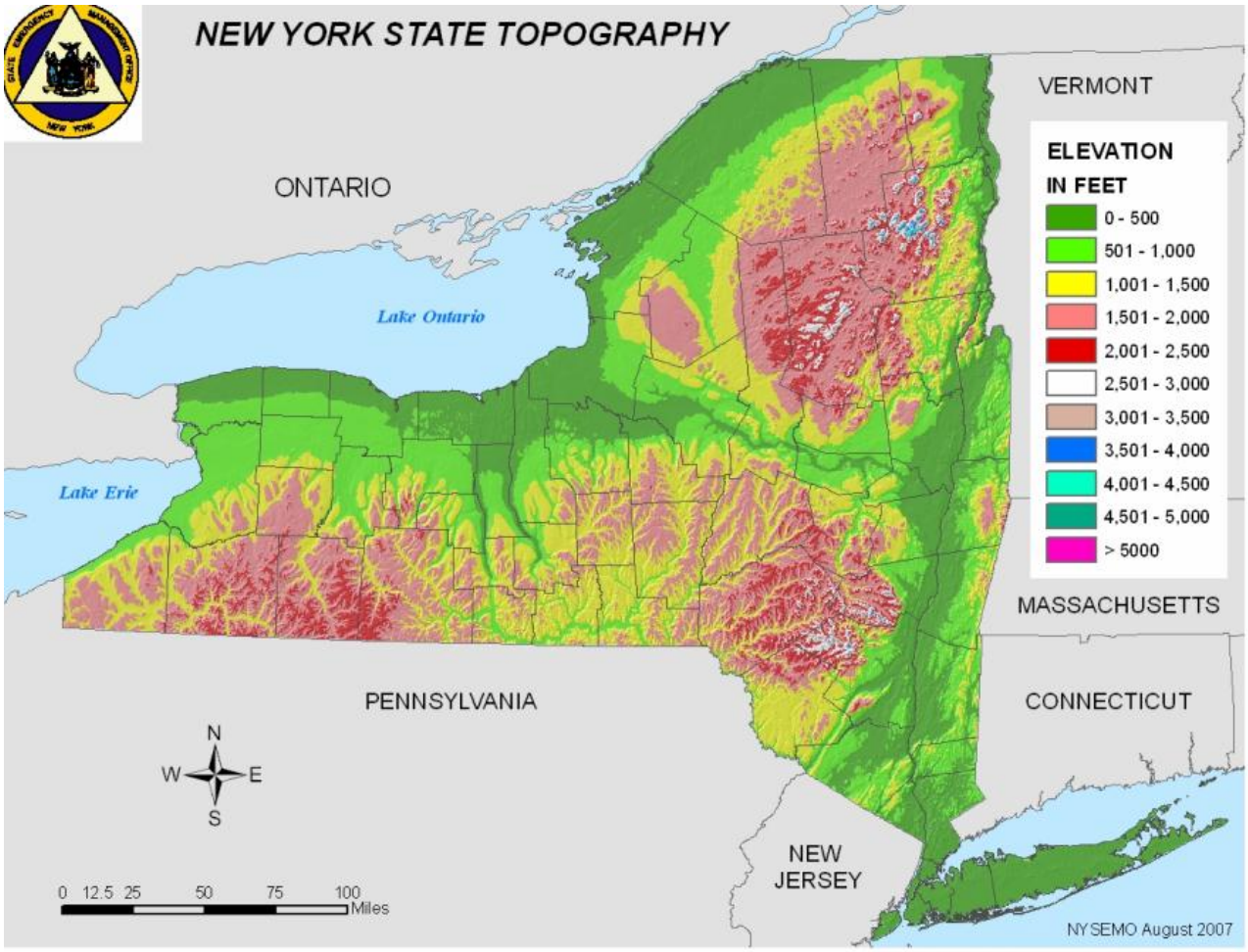


Table 4-8 Hazard Profile - Hurricane and Tropical Storms

Hazard	Previous Events	Likely Impacts	Probability of Future Event
Definition: Yates County is at risk to post-tropical storms, which are violent storms originating over tropical waters, which lose tropical characteristics as they move inland, but still produce severe rains and high winds *Impact Area:* Countywide	6 post-tropical storm events 1952-2010	Severe flooding High winds, downed trees, limbs and wires Debris Structural damage Damage to public infrastructure Utility disruption/damage	Average is 1 every 10 years - or – there is a 10% chance each year that a major post-tropical storm could impact Yates County

In upstate New York and Yates County, tropical storms manifest themselves as severe storms, flooding and high winds; therefore this plan evaluates the risks and vulnerabilities associated with hurricanes and tropical storms in the sections of this plan that address flooding and severe storms.

Since 1952, Yates County has been in the path or exposed to the effects of six (6) post-tropical storms including; Tropical Storms Hazel (1954), Agnes (1972), Eloise (1975), Beryl (1994), Dennis (1999) and Francis (2004).

Yates County was included in presidential major disaster declarations for two post-tropical storms, Agnes (1972) and Eloise (1975).

Figure 4-14 Hurricane Tracking in NY 1990-2006

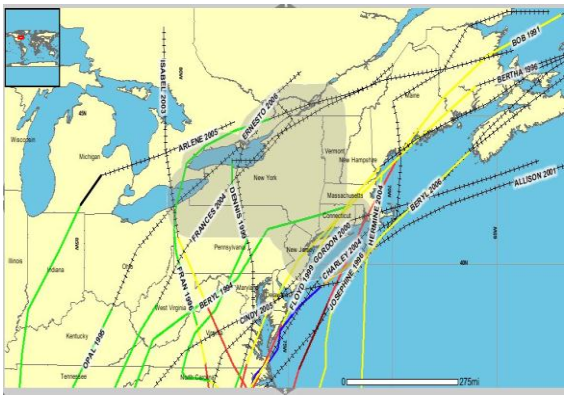


Figure 4-15 Hurricane Tracking in NY 1888 -1989

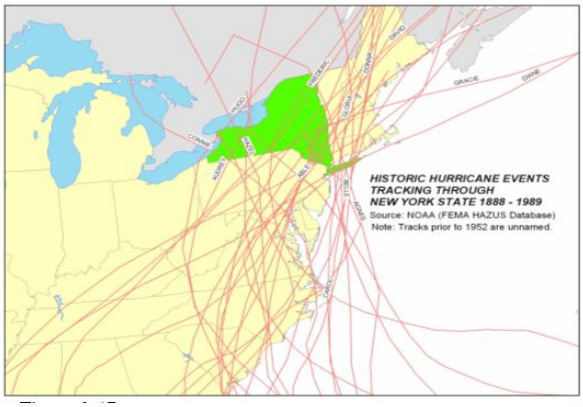


Table 4-9 Hazard Profile - Severe Storms

Hazard	Previous Events	Likely Impacts	Probability of Future Event
Definition: A thunderstorm with winds 58 mph or more, which can include tornados and hail *Impact Area:* Countywide	54 storms from 1973 to 2009	Structural damage Downed trees, limbs, wires and utility poles Power outages Debris Deaths and Injuries Electrical hazards	Average 1 to 2 severe storms each year

NOAA National Climatic Data Center reports that 54 severe storms have occurred in Yates County from 1973 to 2009. Strong winds in thunderstorms can also be straight-line winds, downbursts, or microbursts. Strong winds in thunderstorms often originate high in the atmosphere and are carried to the surface in downdrafts of rain- cooled air. Thunderstorm winds can exceed 100 mph and cause damage equal to a tornado.

Figure 4-16 Average Number of Thunderstorms Days Per Year

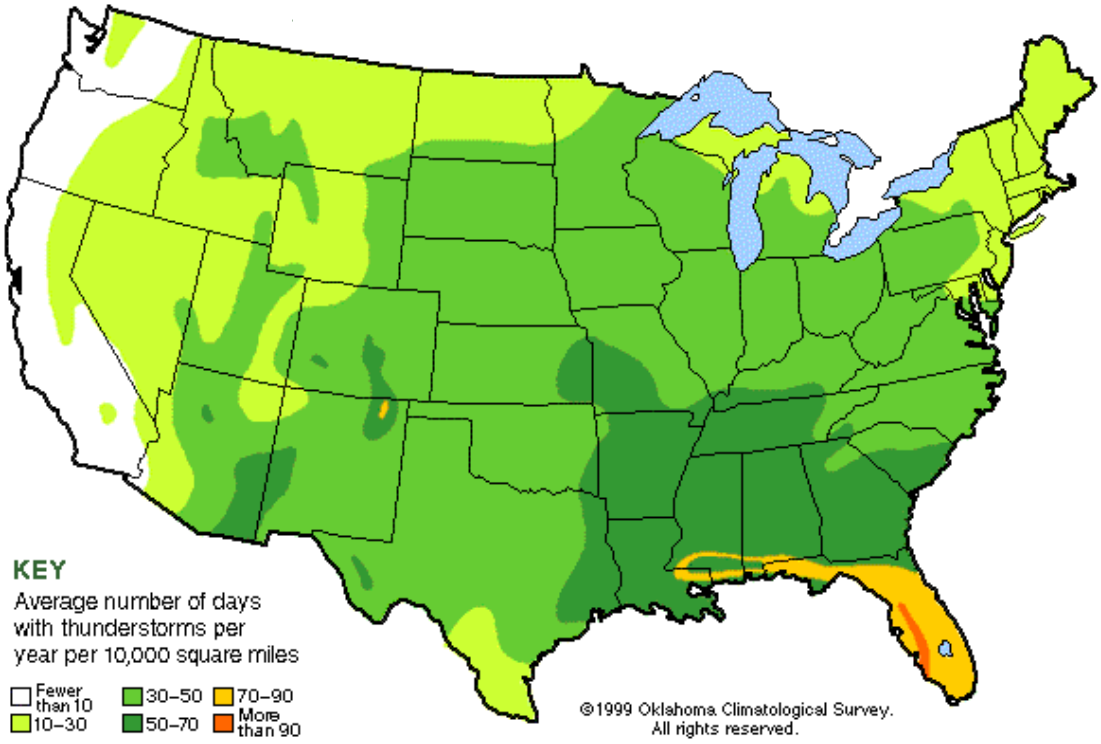


Table 4-10 Hazard Profile - Ice Storm

Hazard	Previous Events	Likely Impacts	Probability of Future Event
Definition: Freezing rain that accumulates on trees, limbs and power lines causing power outages, transportation and community disruption and hazardous conditions *Impact Area:* Countywide	9 ice storms 2 significant	Downed trees, limbs, power lines and utility poles Downed/suspended/unsafe trees, limbs and wires Public access hazards for schools, medical facilities, etc Deaths and injuries Power, generator, electrical and carbon monoxide exposure hazards Debris Shelters, warming centers, food, medical services and transportation for critical workers Increased health and medical injuries and critical care Disruptions and delays in providing fire, medical, and safety services	Average 1 event every 2 years - or - each year there is a 11% chance of a significant ice storm

Nine (9) ice storms were reported in Yates County from 1991 to 2010, with two resulting in significant impacts and costs. Ice storms in 1991 and 2003 resulted in major disaster declarations.

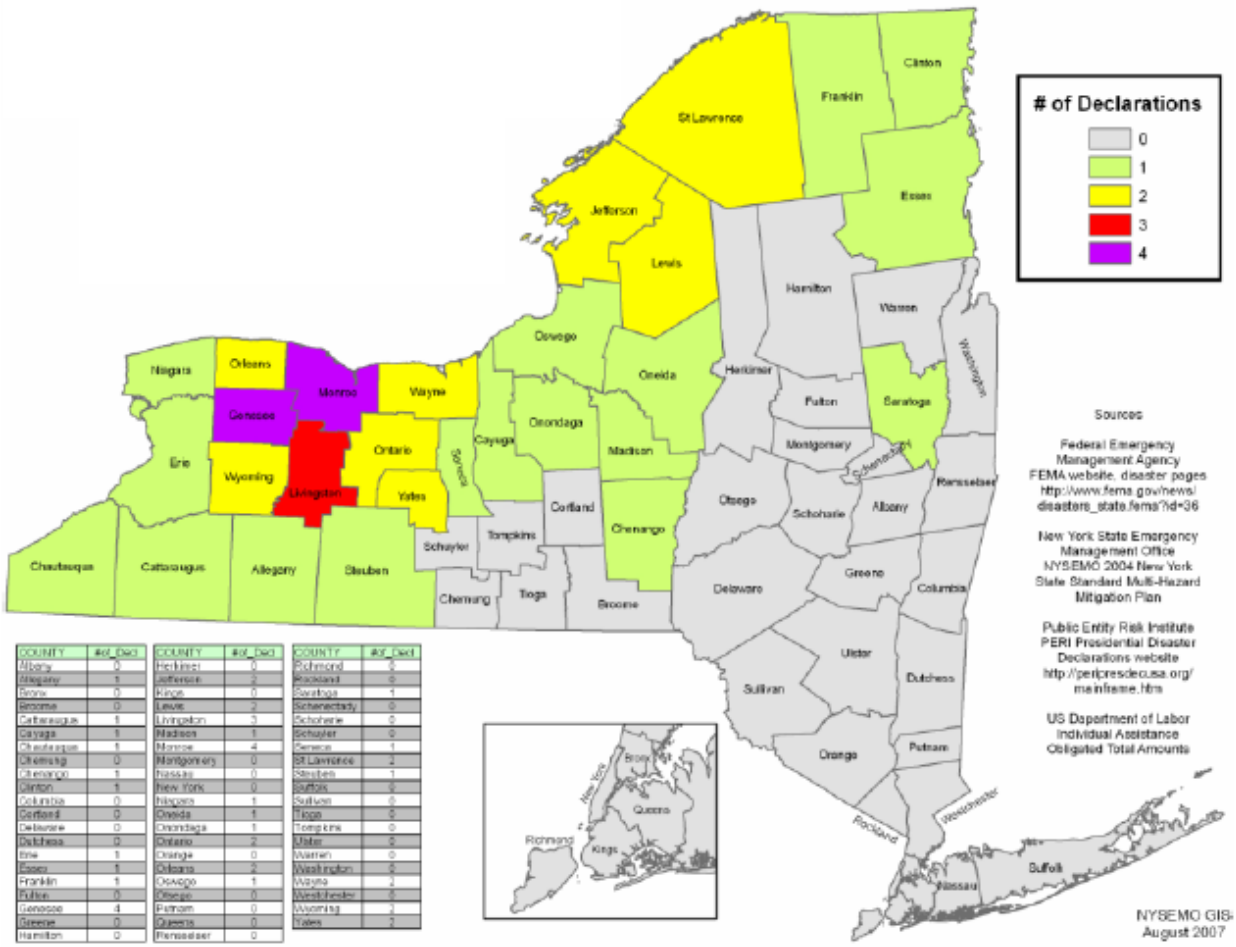
Table 4-10a Ice Storm History

9 Ice Storms and Freezing Rain event(s) were reported in Yates County, New York between 01/01/1991 and 01/31/2010.
Source: NOAA National Climatic Data Center

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD: Property Damage
CrD: Crop Damage

Date	Mag	Dth	Inj	PrD	CrD
3/4/91	Major Disaster Dec	0	0	15.0M	0
1/3/93	NA	0	0	5.0 M	0
1/2/99	NA	0	0	0	0
2/13/00	NA	0	0	0	0
2/24/01	NA	0	0	0	0
4/4/03	Major Disaster Dec	0	0	28.5M	0
1/15/07	NA	0	0	0	0
3/4/08	NA	0	0	0	0
3/7/08	NA	0	0	10.0K	0

Figure 4-17 Presidential Disaster Declarations - Ice Storms 1953 –2007

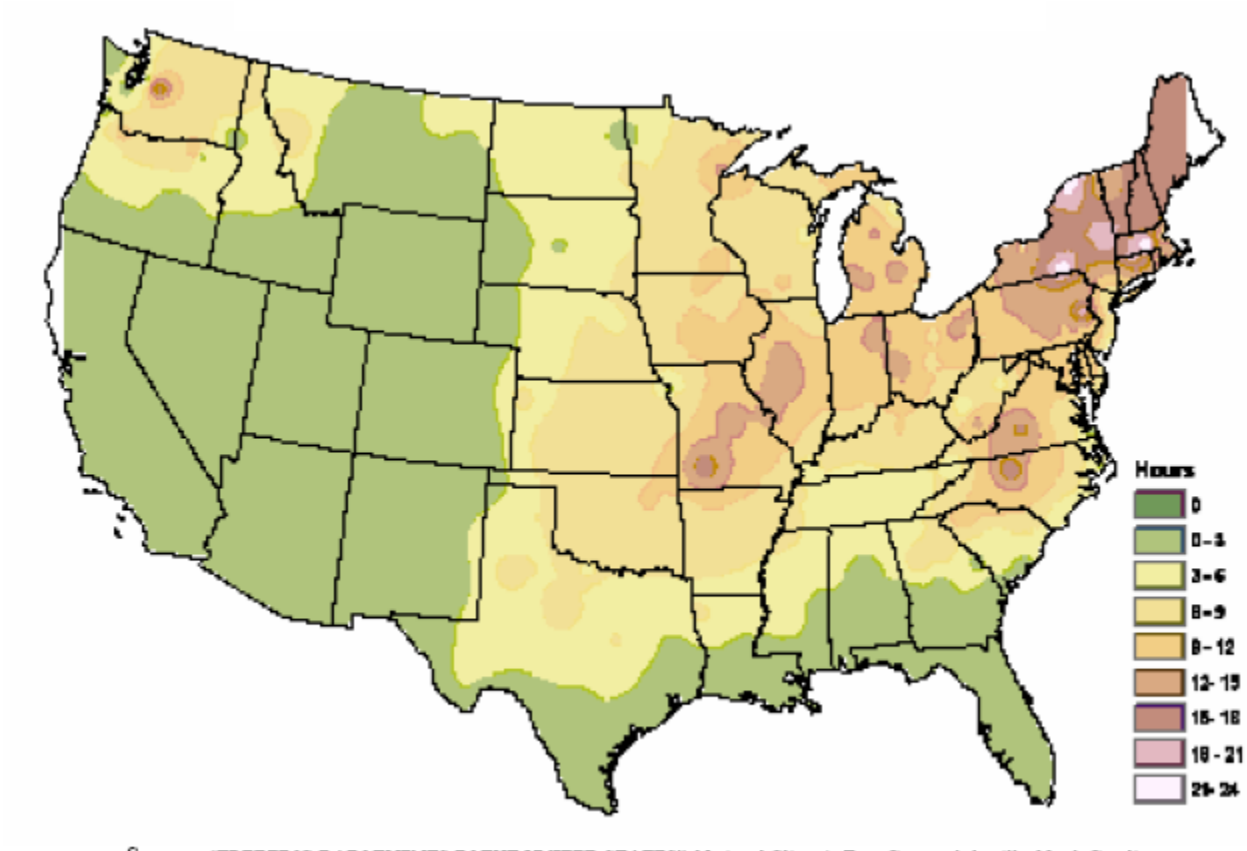


COUNTY	#of_Decl
Albany	0
Allegany	1
Bronx	0
Broome	0
Cattaraugus	1
Cayuga	1
Chautauqua	1
Chemung	0
Chenango	1
Clinton	1
Columbia	0
Cortland	0
Delaware	0
Dutchess	0
Erie	1
Essex	1
Franklin	1
Fulton	0
Genesee	4
Greene	0
Hamilton	0

COUNTY	#of_Decl
Herkimer	0
Jefferson	2
Kings	0
Lewis	2
Livingston	3
Madison	1
Monroe	4
Montgomery	0
Nassau	0
New York	0
Niagara	1
Oneida	1
Onondaga	1
Ontario	2
Orange	0
Orleans	2
Oswego	1
Putnam	0
Queens	0
Rensselaer	0

COUNTY	#of_Decl
Richmond	0
Rockland	0
Saratoga	1
Schenectady	0
Schoharie	0
Schuyler	0
Seneca	1
St Lawrence	2
Steuben	1
Suffolk	0
Sullivan	0
Tioga	0
Tompkins	0
Ulster	0
Warren	0
Washington	0
Wayne	2
Westchester	0
Wyoming	2
Yates	2

Figure 4-18 Average Hours per Year with Freezing Rain



Source: "FREEZING RAIN EVENTS IN THE UNITED STATES", National Climatic Data Center, Asheville, North Carolina

Table 4-11 Hazard Profile - Flooding

Hazard	Previous Events	Likely Impacts	Probability of Future Event
Definition: When water bodies, channels and natural drainage pathways overflow their capacities and cause significant damage and disruption. *Impact Area:* Countywide	14 Flood events 8 had major significance	Property and structural damage Damage and disruption to roads, utilities and other public infrastructure Evacuations and water rescue Disruption of transportation and access for emergency services Damage, disruption or alteration of natural drainage systems and patterns Shelter, feeding and temporary housing requirements Economic impacts, property value and tax losses Employment and business disruption and losses Degradation or destruction of natural features and habitat Increased health risks and demands for health and medical services Increased demand for human, social and mental health services	Average is a flood event every 4 to 5 years in Yates County - or - there is a 21% chance each year of a flood having major impacts

Table 4-11a Flood History

NWS reports 14 flood events occurred in Yates County from 1972 to 2010. Eight (8) of the floods resulted in significant damage and costs and 7 were declared major disasters.

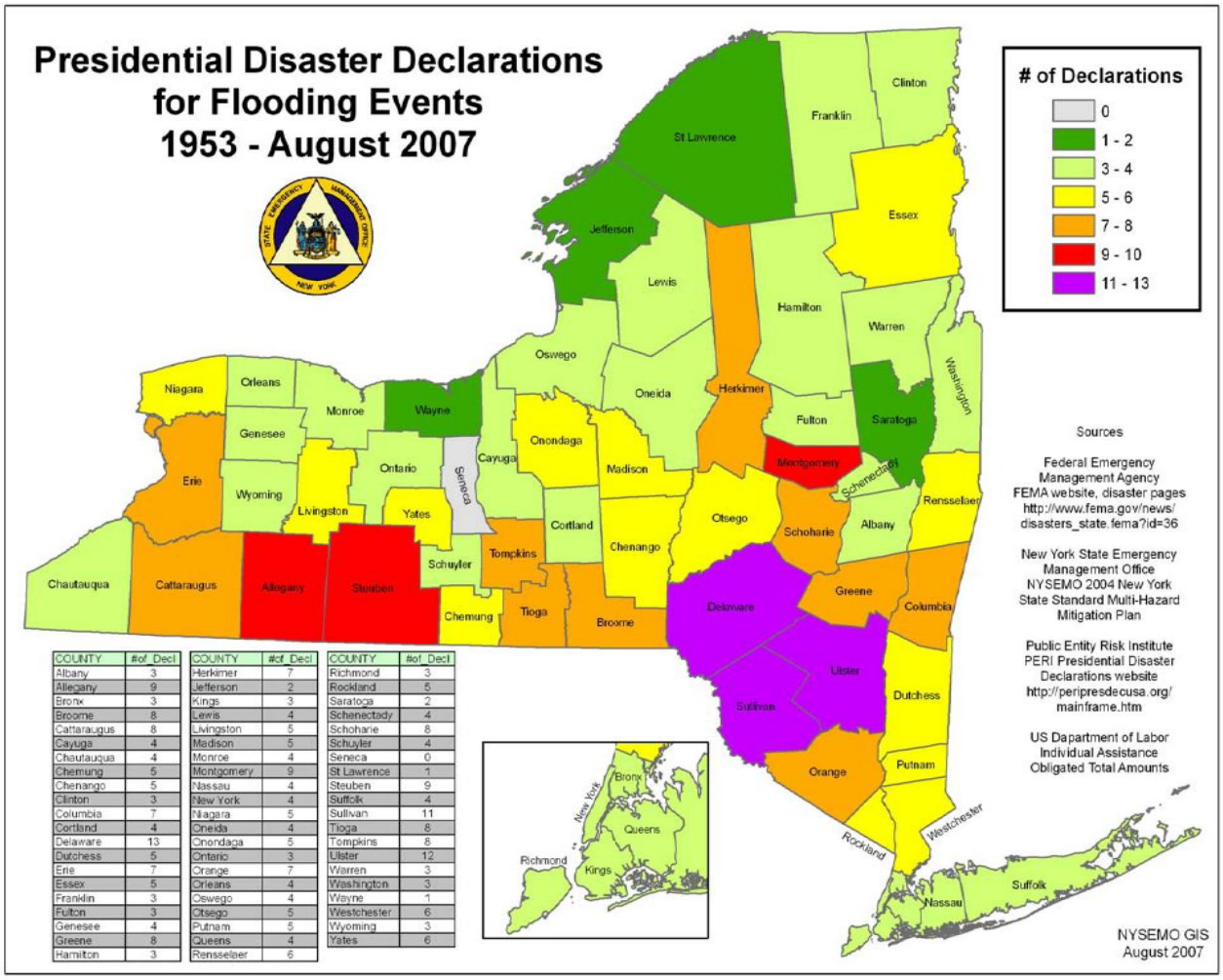
14 FLOOD event(s) were reported in **Yates County, New York** between **01/01/1972** and **01/31/2010**

Mag: Magnitude
Dth: Deaths
Inj: Injuries
PrD: Property Damage
CrD: Crop Damage

Date	Type	Mag	Dth	Inj	PrD	CrD
1972	TS Agnes Flood	Major Disaster Dec				
1975	TS Eloise Flood	Major Disaster Dec				
August 1985	Flood	Major Disaster Dec				
03/04/1993	Flood	N/A	0	0	0	0
03/13/1993	Flood	N/A	0	0	0	0
11/12/1995	Flood	N/A	0	0	5K	0
01/19/1996	Flash Flood	Major Disaster Dec	0	0	7.9M	0
04/30/1996	Flash Flood	N/A	0	0	10K	0
07/31/2000	Flash Flood	Major Disaster Dec	0	0	0	0
09/23/2000	Flash Flood	N/A	0	0	0	0
08/05/2003	Flash Flood	Major Disaster Dec	0	0	100K	0
05/20/2004	Flash Flood	Major Disaster Dec	0	0	30K	0
04/02/2005	Flash Flood	N/A	0	0	100K	0
07/21/2009	Flash Flood	N/A	0	0	3K	0K

Source: NOAA National Climatic Data Center

Figure 4-19 Disaster Declarations for Flooding in NY



COUNTY	#of_Decl
Albany	3
Allegany	9
Bronx	3
Broome	8
Cattaraugus	8
Cayuga	4
Chautauqua	4
Chemung	5
Chenango	5
Clinton	3
Columbia	7
Cortland	4
Delaware	13
Dutchess	5
Erie	7
Essex	5
Franklin	3
Fulton	3
Genesee	4
Greene	8
Hamilton	3

COUNTY	#of_Decl
Herkimer	7
Jefferson	2
Kings	3
Lewis	4
Livingston	5
Madison	5
Monroe	4
Montgomery	9
Nassau	4
New York	4
Niagara	5
Oneida	4
Onondaga	5
Ontario	3
Orange	7
Orleans	4
Oswego	4
Otsego	5
Putnam	5
Queens	4
Rensselaer	6

COUNTY	#of_Decl
Richmond	3
Rockland	5
Saratoga	2
Schenectady	4
Schoharie	8
Schuyler	4
Seneca	0
St Lawrence	1
Steuben	9
Suffolk	4
Tioga	8
Tompkins	8
Ulster	12
Warren	3
Washington	3
Wayne	1
Westchester	6
Wyoming	3
Yates	6

Figure 4-20 Hydrology map

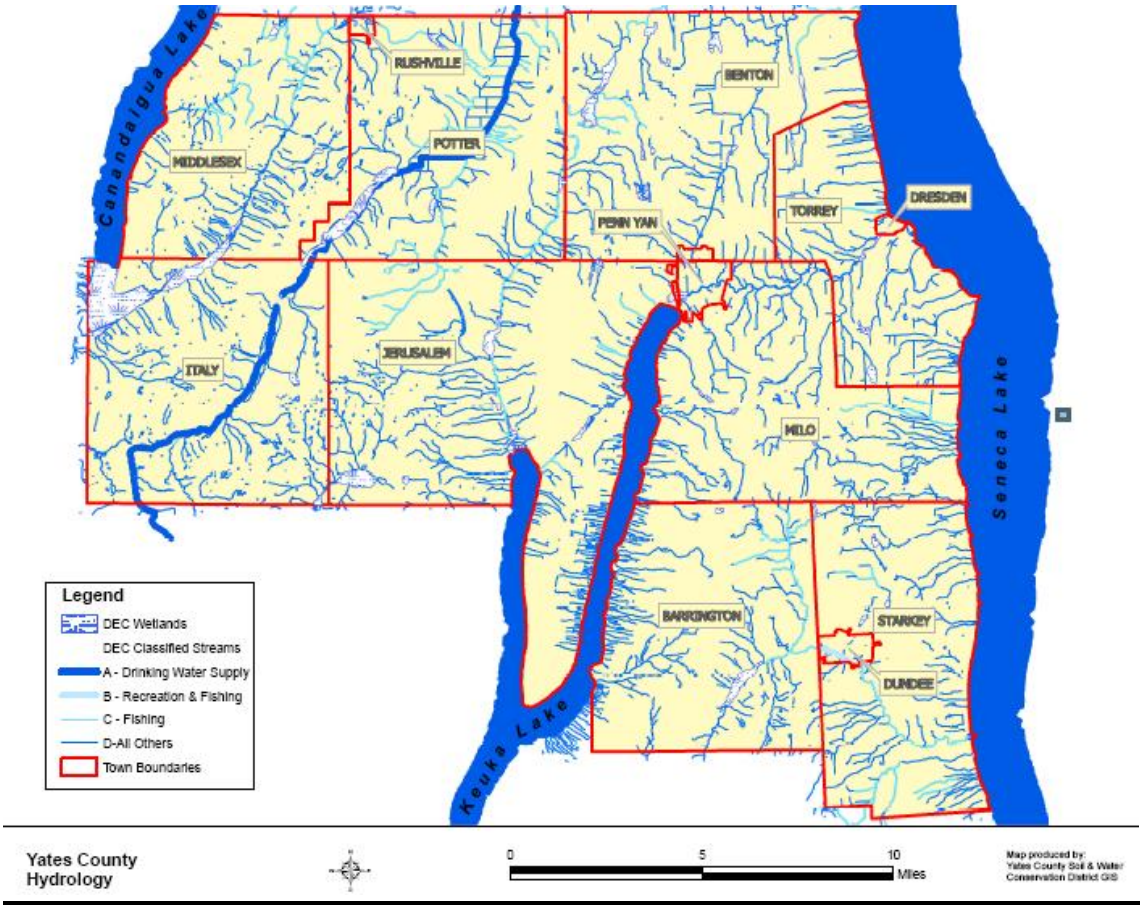
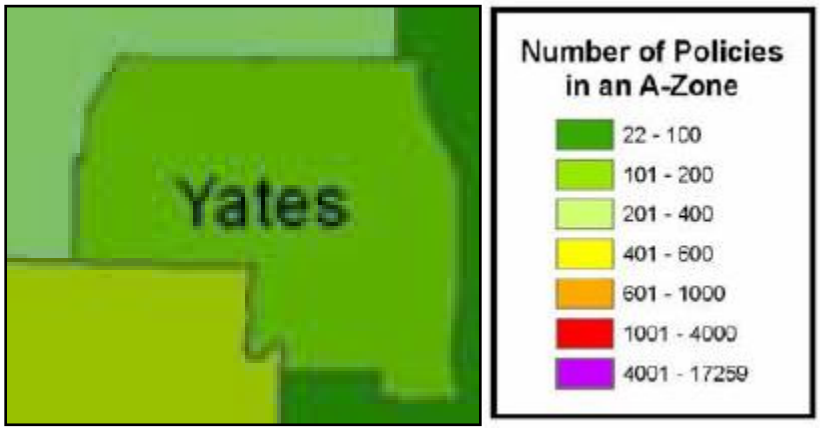


Figure 4-21 Number of Policies in an A Zone 2007



Source: NYS HAZMIT Plan

Table 4-11b Areas of Flood Concern

This is a general description of areas of greatest concern and is included to assist with hazard planning. It does not include all high-hazard flood zones. Refer to FEMA Flood Insurance Rate Maps (FIRM) to determine if specific sites or properties are in a flood zone. This list addresses flood threats associated with recognized lakes, creeks, streams and basins and does not include areas susceptible to landslide or steep slope failure during heavy rains. (* widespread or multiple locations)

Jurisdiction	Areas of Flood Concern	Location on Figure 4-22 (Next Page)
Barrington	The shoreline of Keuka Lake	10
	Areas along Big Stream, including and Chubb Hollow and Crystal Springs	14, 15, *
Benton	The shoreline of Seneca Lake	1
	Areas along Kashong Creek and its branches and collectors	*
	Areas of Jacobs Brook	4
Italy	The area of West Av and Sunnyside Rd on West River	18
	Areas along Flint Creek and the Italy Valley	*
Jerusalem	The shoreline area of Keuka Lake	10
	The north end of the east branch of Keuka Lake near Penn Yan	8
	The north end of the west branch of Keuka Lake near Branchport	9
	Along Sugar Creek and branches, including Guyanoga, and Five Mile Creek	17, *
Middlesex	The shoreline of Canandaigua Lake	19
	The inlet at Willow Grove Point and Vine Valley	20
	Areas along West Valley	21, *
Milo	The shorelines of Seneca and Keuka Lakes	1, 10
	Areas along the Keuka Outlet	11
	Areas along Plum Point Creek	*
	The Seneca Lake inlet at Plum Point Creek	12
Potter	n/a	
Starkey	The shoreline of Seneca Lake	1
	Areas along Big Stream and at the Glenora Point outlet	16, *
Torrey	The shoreline of Seneca Lake	1
	Areas along Keuka Outlet	3
	The inlets at Long Point and Perry Point	2
Dresden	The shoreline of Seneca Lake and at Seneca St.	1
	Areas along the Keuka Outlet and tributaries	3
Dundee	Areas along Big Stream, its branches and collectors and watershed	*
	Southeast village streets east of the railway	13
Penn Yan	The areas bordering Keuka Lake and the Kimball Gulley	7
	Along the Keuka Outlet and tributaries	6
	Along Jacobs Brook and Sucker Brook	5

Figure 4-22 Areas of Flood Concern

This is a general description of areas of greatest concern and is included to assist with hazard planning. It does not include all high-hazard flood zones. Refer to FEMA Flood Insurance Rate Maps (FIRM) to determine if specific sites or properties are in a flood zone. This map addresses flood threats associated with recognized lakes, creeks, streams and basins and does not include areas susceptible to landslide or steep slope failure during heavy rains.

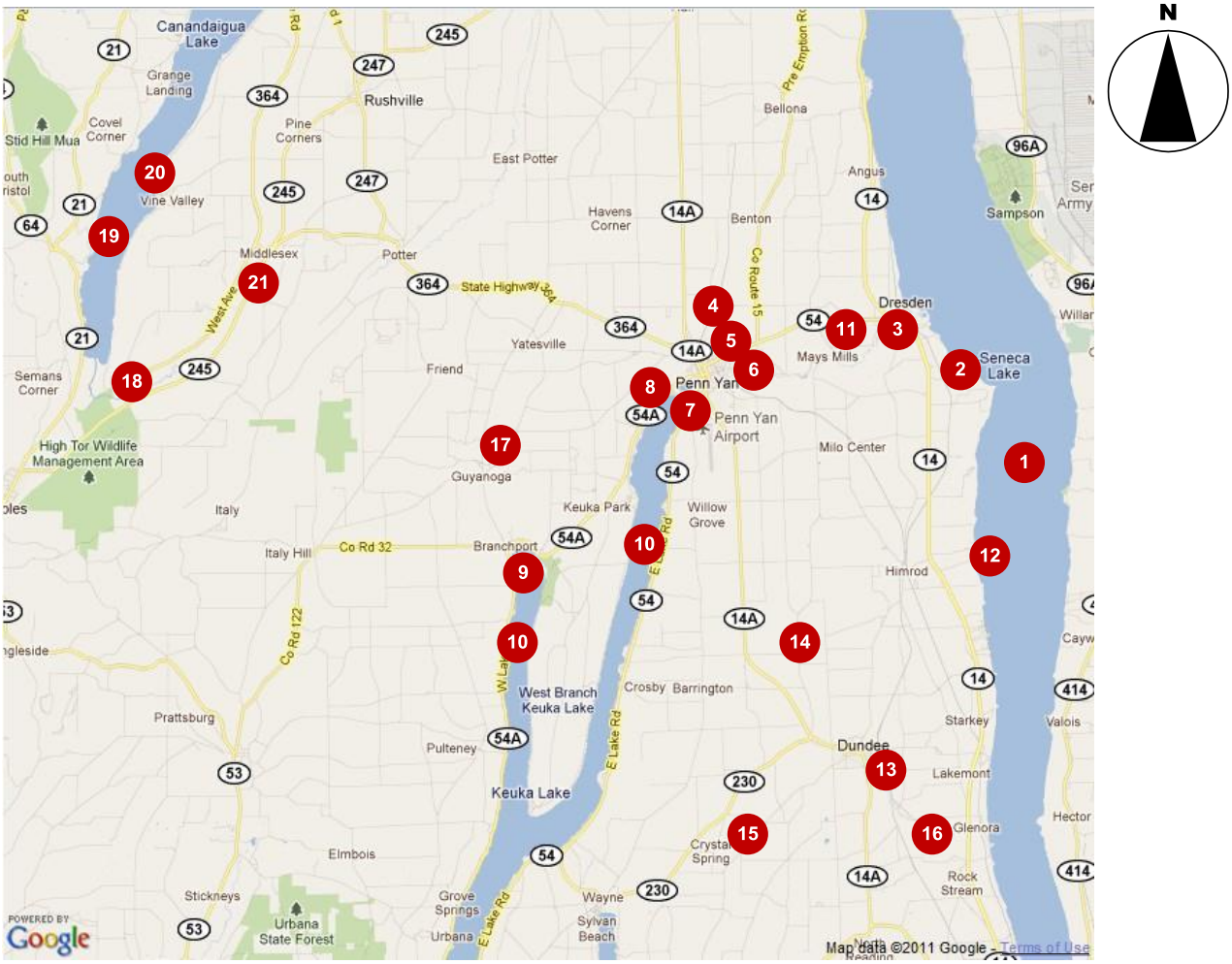


Table 4-12 Hazard Profile - Utility Failure / Power Outage

Hazard	Previous Events	Likely Impacts	Probability of Future Event
Definition: Any sustained, long-term interruption or loss of electrical, natural gas, telecommunications and/or water supply service; caused by accident, sabotage, natural hazards, technological or equipment failure. *Impact Area:* Countywide	Statewide and northeast power outage of August 2003	Power outages or reduction Natural gas disruption Public water supply disruption Communications services disruption Impacts on emergency services Temporary water supply resources Temporary heating and generators Shelters and warming centers Food and medical services Impacts on hospitals and medical care facilities Impacts on schools, business and government Emergency operations and services Economic impacts Fire protection 911 service disruption Carbon Monoxide threats	Data is insufficient to calculate a reliable local probability From 1990 to 2010, there have been three widespread and long-term power outages in New York State, the statewide outage in 2003 and regional storm outages in 1991 and 1998.

Power outages are typically one of three types and can vary in their duration and effects.

A **transient fault** is a momentary (a few seconds) loss of power typically caused by a temporary fault on a power line. Power is automatically restored once the fault is cleared.

A **brownout** or **sag** is a drop in voltage in an electrical power supply. The term brownout comes from the dimming experienced by lighting when the voltage sags.

A **blackout** refers to the total loss of power to an area and is the most severe form of power outage. Blackouts that result from or result in power stations tripping are particularly difficult to recover from quickly. Outages may last from a few minutes to a few weeks depending on the nature of the blackout and the configuration of the electrical network.

Yates County was affected by the northeast power outage of August 2003 and was included in the federal emergency declaration for the event. The massive power outage swept across the Northeast United States. New York was severely affected by this power outage and on August 23, 2003, FEMA declared an Emergency Declaration for the State of New York to aid measures to save lives, protect public health and safety, and protect improved public and private property. The entire State of New York was included in the declaration and adversely affected by this emergency. As a result of this event, communities and power companies have recognized high priority vulnerabilities and risks related to power outages.

Natural gas disruptions are most commonly related to an accident or interference that disrupts supply. Water supply is affected by accidents, flooding, contamination, drought, freezing,

equipment failure and sabotage. Communications systems could be affected by storms, technical or equipment failure, accidents or sabotage.

Figure 4-23 Municipal Water Supply Service Areas