3.7 - Winter Storm Hazard Profile

Though not as highly ranked as a number of other hazards at the State level, winter storms and blizzards constitute an important hazard of Local concern because of their frequency and drain on Local response resources.

The profile outlined in this section has been developed from the following sources:

- *Northeast Regional Climate Center (NRCC) based at Cornell University.* A review of the climatic conditions of New York State, and their effects upon persons, property, and economics, this document was obtained from the following Cornell University web site *http://nysc.eas.cornell.edu/climate_of_ny.html*. The Center is a partner of the National Climatic Data Center. The NRCC contact person is Keith Eggleston.

- *NOAA Satellite and Information Services and National Climate Data Center.* http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms . This web-based database maintains the records for many types of disasters dating back to 1950, and allows users to make queries by state, disaster type, time period, etc.

- *Situation Reports issued by the NYS Emergency Management Office (SEMO).* These reports outline the occurrence of significant winter storms as they have occurred within the State.

- *Erie County All-Hazard Mitigation Plan*

The following chart provides the definition of a winter storm:

Term	Definition
Winter Storm	Includes ice storms, blizzards, and can be accompanied by extreme cold. The National Weather Service characterizes blizzards as being combinations of winds in excess of 35 miles per hour with considerable falling or blowing snow, which frequently reduces visibility.

Winter storm hazards in New York State are virtually guaranteed yearly since the State is located at relatively high latitudes and resulting winter temperatures range between 0 degree F and 32 degree F for a good deal of the period from late October until mid-April. In addition, the State is exposed to large quantities of moisture from both the Great Lakes and the Atlantic Ocean. While it is almost certain that a number of significant winter storms will occur during the winter – fall season, what is not easily determined is how many storms will occur during that time frame. For example, during the calendar year 1997, three (3) significant winter storms occurred. In contrast, during the calendar year 2000, sixteen (16) such storms were noted.

A secondary consideration is the occurrence of an *ice storm*. Ice storms deposit layers of ice upon roadways, sidewalks, trees, power, and telephone lines and generally cause major damage, and often some deaths. Luckily, ice storms occur far less frequently than storms that deposit significant quantities of snow and/or sleet. Also, they generally do not last for more than one or two days. As with other winter storms, the frequency of occurrence cannot be predicted.

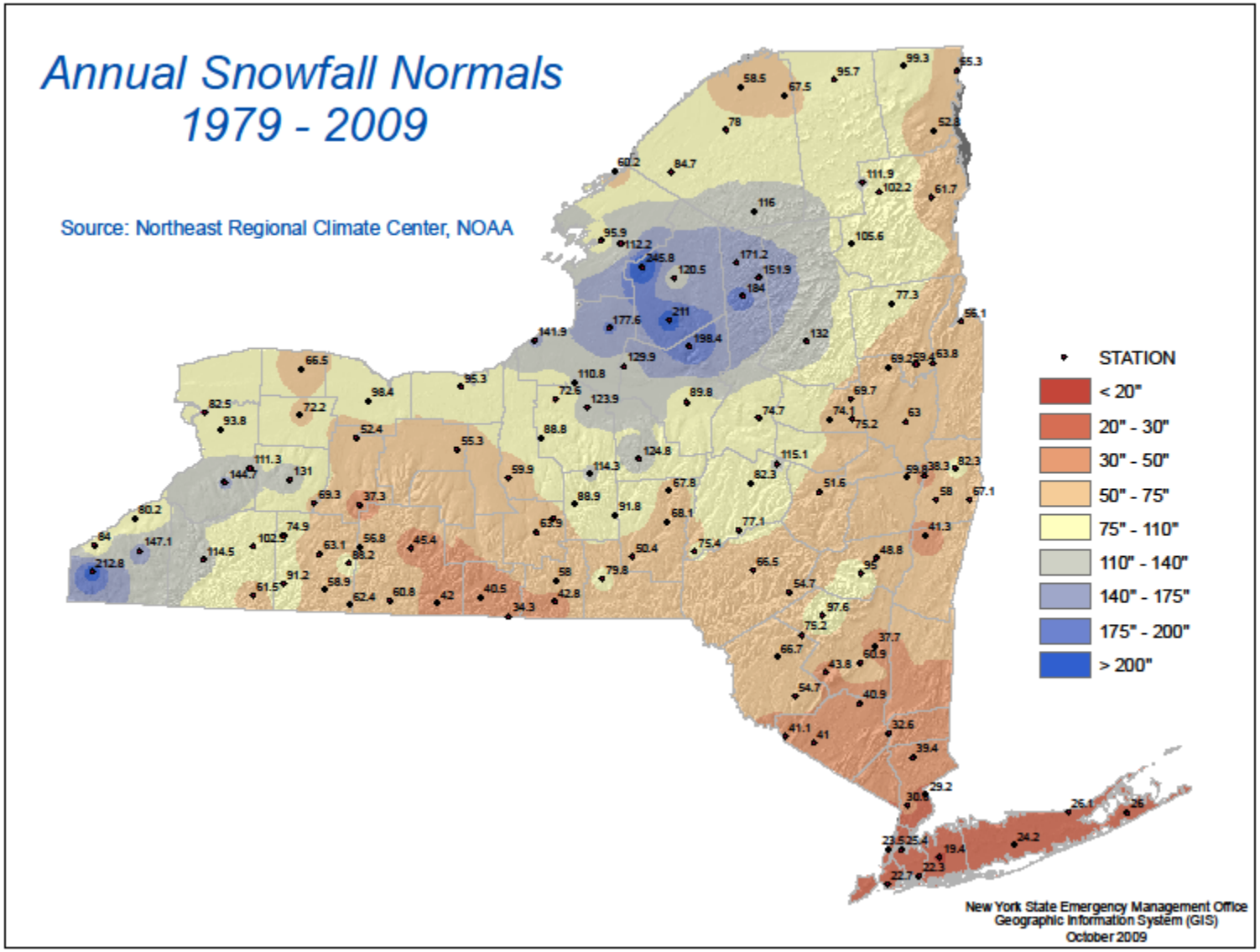
Geographic Location/Extent/Severity:
Communities in New York receive more snow than most other communities in the Nation. Although the entire State is subject to winter storms, the easternmost and west-central portions of the State are more likely to suffer under winter storm occurrences than are other locations and Syracuse, Buffalo, Rochester, and Albany are typically in the top 10 cities in the nation in annual snowfall. The six (6) million-acre Adirondack Park in Northeast NY, including mainly Hamilton and Essex counties, also receives extensive annual snowfall; however, it is also the least populous region of the State. Eastern NY, which includes New York City and Long Island, is vulnerable to storms known as "Nor'easters." These storms usually form off the East Coast near the Carolinas then follow a track northward along the coast until they blow out to sea, hence the term "Northeaster." Occasionally these storms are large enough to encompass almost the entire State. One such storm was the Blizzard of 1993. Most often, however, Nor'easters affect primarily eastern and southern New York. Nor'easters are most notable for snow accumulations in excess of nine (9) inches, accompanied by high, sometimes gale force, winds, and storm surges which cause severe flooding along the Long Island coastline. Major property damage and power outages are not uncommon.

The other winter storm that generally has major impacts is known as a "Lake Effect" storm. Moisture is picked up from the Great Lakes and then blown across the western - central portion of the State, often leaving huge quantities of snow in its wake. The major effect of lake effect storms are large snow accumulations and high winds. One lake effect storm during February 2004 left a community with over 90 inches of snow in only a few days. Lake effect storms usually occur in the west-central portion of the State, but have been known to affect the eastern portion if the storm becomes large enough.

Average annual snowfall in the State is about 65 inches, but it varies greatly in different areas of the State. Parts of Herkimer, Jefferson, and Lewis counties receive the heaviest snowfall at well over 100 inches, while Long Island has the lightest snowfall. Snow usually falls from October through April. The greatest average snowfall is in the month of February. **Figure 3-105**, the NY annual normal snowfalls map, depicts comprehensive overview of annual average snowfall totals over a 30 year period. The general indication of the average annual snowfall map shows areas that are subject to a consistent risk for large quantities of snow.

Both Nor'easters and Lake Effect storms cause major damages in their wake, usually by disrupting transportation, limiting communications, causing power outages, and under the most severe circumstances, requiring persons to abandon their homes and seek shelter in community centers.

Figure 3-105


Annual Snowfall Normals
1979 - 2009
Source: Northeast Regional Climate Center, NOAA
STATION
< 20"
20" - 30"
30" - 50"
50" - 75"
75" - 110"
110" - 140"
140" - 175"
175" - 200"
> 200"
New York State Emergency Management Office
Geographic Information System (GIS)
October 2009

Previous Significant Occurrences:
A significant winter storm generally occurs over more than a single day, with two days being common and three days being rare. Some Lake Effect storms have been known to continue for more than four (4) days. In the case of the ice storms of 1991 and 1998, the duration of the storm was in excess of four (4) days. Other significant winter storms in the recent past are as follows:

- 1997 – December
- 1998 – February
- 1999 – January
- 2000 – November and December
- 2001 – March
- 2002 – November and December
- 2003 – January, April and November
- 2004 – March
- 2006 – October
- 2007 – February

The National Climatic Data Center (NCDC) provides data on over 1,400 snow and ice events for the State of New York dating back to 1993. Specific event information can be accessed through the following link, http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms.

A variety of winter weather related events can cause significant damage to the tree resources of an area. For instance, in March 1991, in western New York, a severe winter storm caused heavy ice accumulation on tree branches, bending or breaking limbs and tree boles, or toppling trees. The resulting tree debris disrupted power lines, blocked roads, and damaged residential and commercial property. Subsequent disturbance can also occur when broken limbs or whole trees can suddenly break and fall. These "widow makers" are high priority for removal after the event to prevent personal injury.

Damage from the January 1998 ice storm event was extensive across northern New York, northern New England and Canada. Over 17 million acres were impacted, with 5 million acres experiencing severe damage. The combination of cold surface temperatures, warm air aloft, and several days of rain contributed to the accumulation of more than four inches of ice in some areas. Hardwoods suffered the greatest damage, as was evident in the areas with many sugar maple trees. The magnitude of power disruption, debris removal, emergency tree pruning and removal, and the resulting loss of the resources were unprecedented. Further, the weakening of tree limbs during the storm left open the possibility of similar damage from future weather related events.

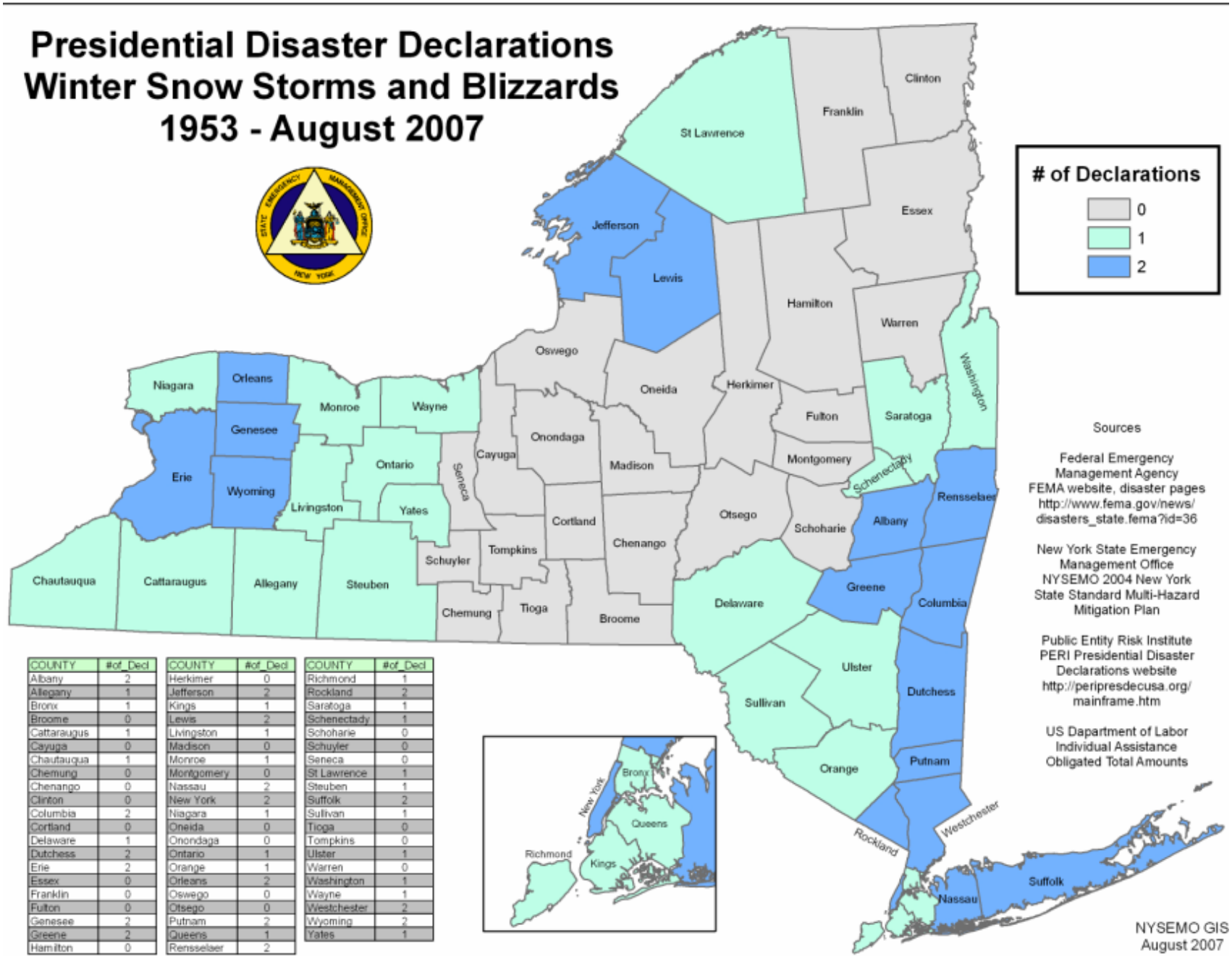
The first column in the following **Table 3-35** indicates the designated disaster declaration number, by placing the "cursor" over the number and pressing the "Ctrl" button you are able to click on this number which will bring you to FEMA's website that will provide disaster related information for each event, specifically designated Counties for each event.

Table 3-35

Snow and Ice Related Disaster Events			
Declaration Number and Disaster Info Link	**Date Declared**	**Description**	**2009 Dollar Value**
1827	03/04/2009	Severe Winter Storm	N/A
3299	12/18/2008	Severe Winter Storm	N/A
3273	02/23/2007	Snow	$3,094,970
3268	10/15/2006	Snowstorm	$824,585
3195	03/03/2004	Snow	$3,799,611
1467	05/12/2003	Ice Storm	N/A
3184	03/27/2003	Snowstorm	$39,991,055
3173	02/26/2003	Snowstorm	$19,522,682
1404	03/01/2002	Snowstorm	$8,090,683
3170	01/01/2002	Snowstorm	$20,002,585
3157	12/04/2000	Snow Storm	$6,360,348
3138	03/10/1999	Winter Storm	$4,174,157
3136	01/15/1999	Winter Storm	$6,273,006
1196	01/10/1998	Severe Winter Storms	$93,764,868
1083	01/12/1996	Blizzard	N/A
3107	03/17/1993	Severe Blizzard	$12,800,191
898	03/21/1991	Severe Storm, Winter Storm	$82,081,038
801	11/10/1987	Severe Storm, Winter Storm	$19,992,384
527	02/05/1977	Snowstorms	$131,692,236
3027	01/29/1977	Snowstorms	N/A
494	03/19/1976	Ice Storm, Severe Storms, Flooding	$33,762,953

Source: **FEMA**: http://www.fema.gov/news/disasters.fema and **Public Entity Risk Institute**: http://peripresdecusa.org/mainframe.htm

Figure 3-106

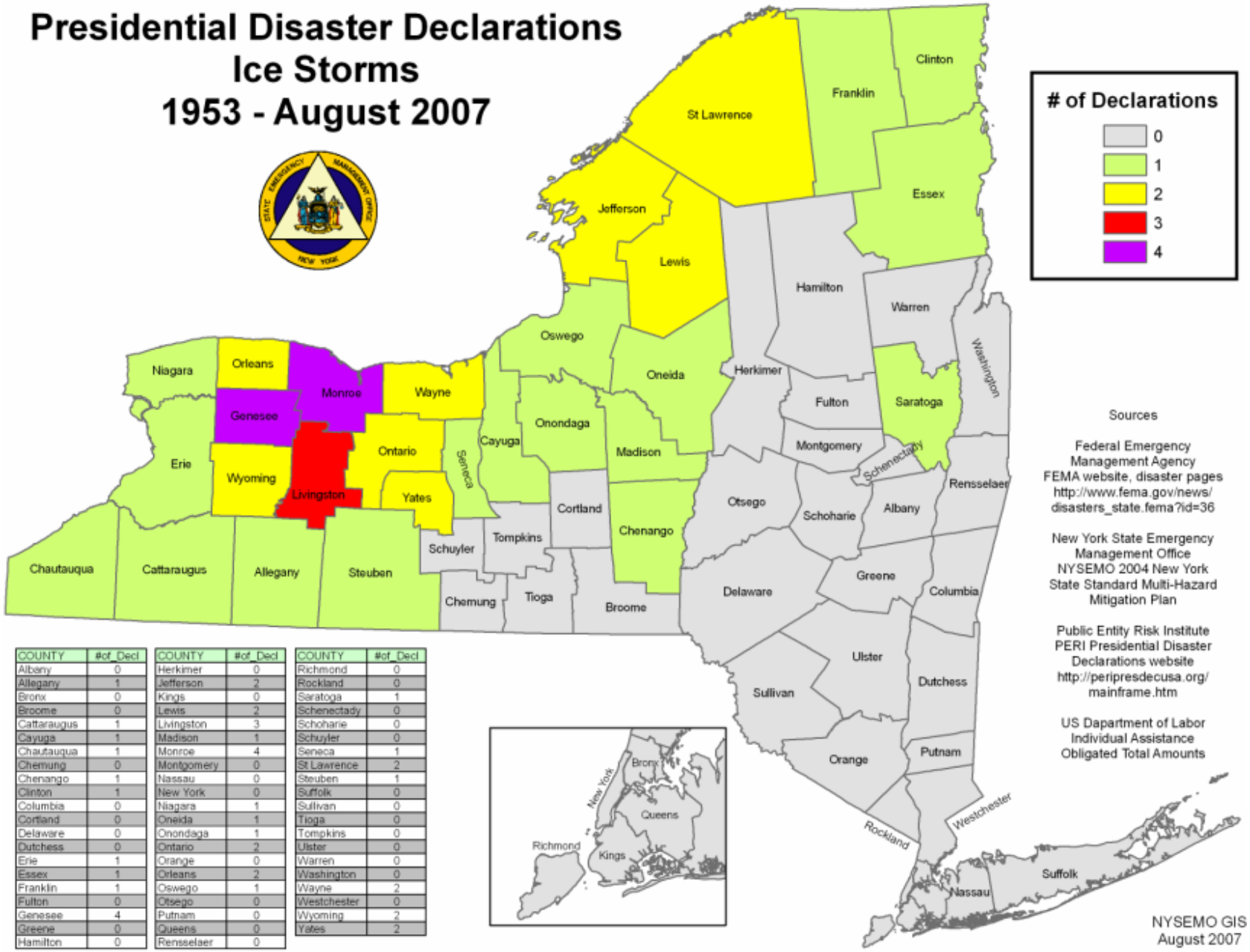


COUNTY	#of_Decl
Albany	2
Allegany	1
Bronx	1
Broome	0
Cattaraugus	1
Cayuga	0
Chautauqua	1
Chemung	0
Chenango	0
Clinton	0
Columbia	2
Cortland	0
Delaware	1
Dutchess	2
Erie	2
Essex	0
Franklin	0
Fulton	0
Genesee	2
Greene	2
Hamilton	0

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

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

Figure 3-107

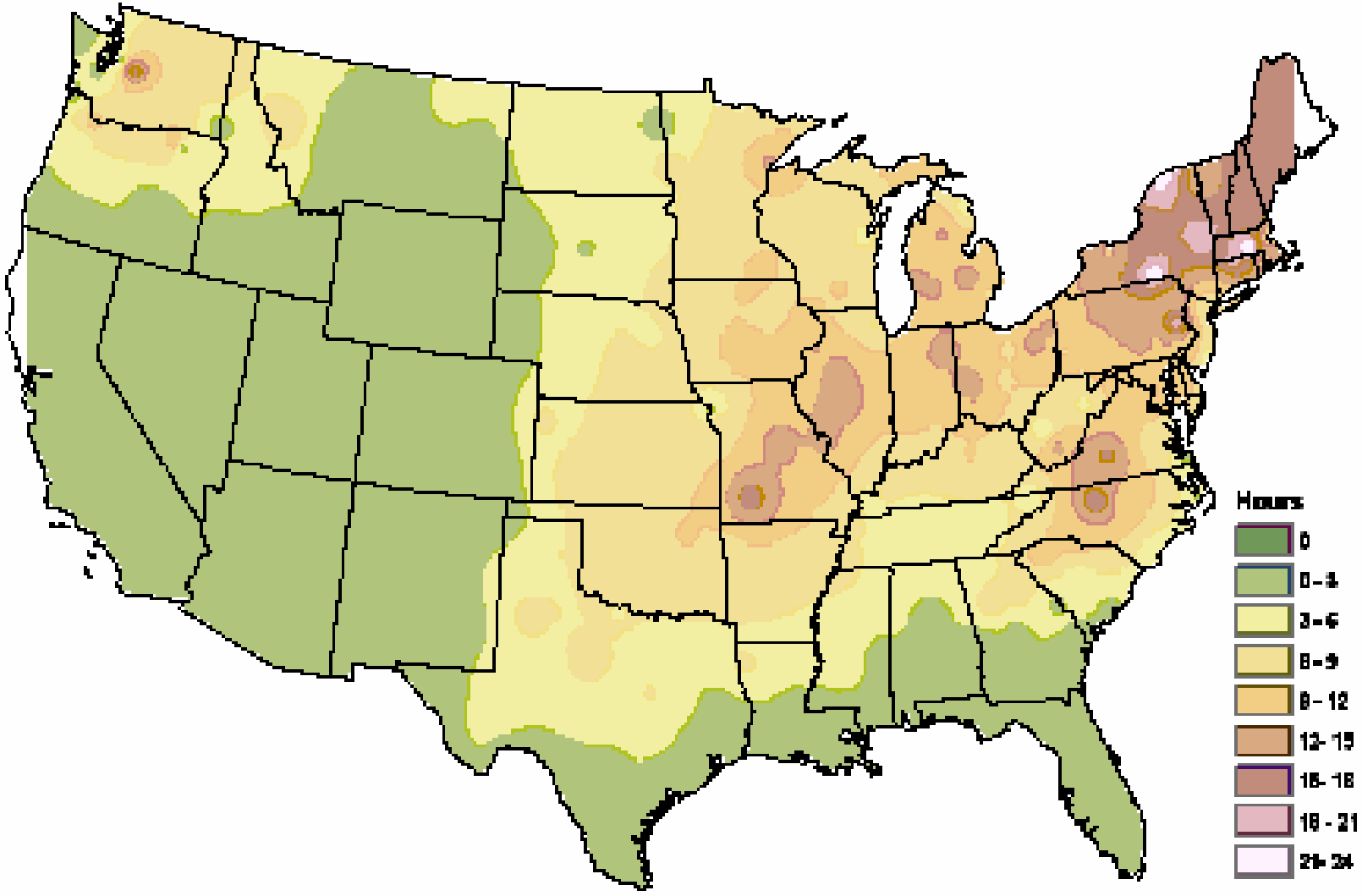


COUNTY	#of_Decl
Albany	0
Allegany	1
Bronx	0
Broome	0
Cattaraugus	1
Cayuga	1
Chautauqua	1
Chemung	0
Chenango	1
Clinton	1
Columbia	0
Cortland	0
Delaware	0
Dutchess	0
Erie	1
Essex	1
Franklin	1
Fulton	0
Genesee	4
Greene	0
Hamilton	0

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
Otsego	0
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
Westchester	0
Wyoming	2
Yates	2

Figure 3-108
Average number of hours per year with freezing rain in the United States.



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

Probability of Future Events

For the winter storm hazard including ice storms, this plan indicates the probability of future occurrences in terms of frequency based on historical events. According to the records at National Climate Data Center (NCDC) there were 923 recorded winter storm events in New York State during the past 10 years (2000-2010), with 6 deaths, 14 injuries, crop damage totaling $8.7 million and total property damage totaling $189 million. Hence, the probability of occurrence of a winter storm event in the future is roughly 90 times each year across the State. (See http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwevent~storms.)

Given the situation as outlined in **Table 3-35,** the probability of at least one winter snow storm of emergency declaration proportions occurring during any given calendar year is virtually certain. The least likely scenario is that a significant winter storm event will not occur. Based on historical snow related disaster declaration occurrences, New York State can expect a snow storm of disaster declaration proportions, on average, once every 3-5 years. Similarly, for ice storms, based on historical disaster declarations, we project future ice storm occurrences of disaster proportions to occur, on average, once every 7-10 years.

Jurisdictions Most Threatened by and Vulnerable to Snow and Ice Storm Hazard and Estimating Potential Losses

The following **Tables 3-36** and **3-37** present the results of our vulnerability assessment which indicate, based on a final rating score, the Counties most vulnerable to the snow and ice storm hazards. Counties accumulated points based on the value of each vulnerability indicator, the higher the indication for snow or ice storm exposure and overall vulnerability, the more points assigned for each County, which resulted in a final rating score (see scoring **Tables 3-36 & 3-37)**. The results of our snow vulnerability assessment present a gross indication of Counties most threatened by and vulnerable to snow and ice storm hazards using readily available data. We acknowledge its limitations for total accuracy, especially at the Local level, and because of this we recognize that its applicability may not be appropriate beyond a general indication and is best used to guide towards targeting communities that would benefit from further analysis.

Our snow hazard vulnerability analysis methodology included support by GIS technology. We created a snow hazard layer developed using National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center (NCDC) annual average snowfall data which allowed us to calculate an estimated average for Counties using a weighted average technique. Using GIS technology also allowed presentation of average annual snowfall amounts spatially. This spatial representation provided a visual indication of those Counties, and more importantly, the grouping areas, of the State typically receiving large amounts of snowfall. Analysis of the grouping has enabled a relationship to be drawn to the climate characteristics which lend to heavy snowfall, and in turn to identify those Counties with a higher potential risk to receive extreme amounts of snow in a single event (see **Table 3-36** indicates those Counties).

Our mitigation strategy includes activities that will advance the accuracy of multi-hazard risk assessment through future more detailed analysis using local risk assessment information, better data, including historical loss information, as it becomes available, and continued application of GIS technology. In summary, **Tables 3-36 & 3-37** below identify jurisdictions by County most vulnerable to snow and ice storm hazards as determined using available vulnerability indicators including the average annual snow fall map.

Table 3-36
Jurisdiction Most Threatened by Snow and Vulnerable to Snow Loss

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)
Erie	19	116.1	yes	7	906.3	277470
Chautauqua	17	131.5	yes	5	128.5	45310
Albany	16	56.2	no	5	552.8	83117
Niagara	16	80.8	no	5	416.7	66394
Oswego	16	144.9	yes	3	120.7	40083
Oneida	16	132	yes	4	187.4	69590
Onondaga	15	107	yes	1	569.3	132013
Monroe	14	84.6	no	2	1108.7	210552
Cattaraugus	14	105.2	yes	4	63.4	29499
Dutchess	14	42.3	no	4	339.8	79721
Nassau	14	22.1	no	3	4642.1	395748
Orange	14	40.1	no	4	407.5	92068
Bronx	13	24.4	no	2	31412.5	89896
Jefferson	13	123.7	yes	3	86.8	37938
Kings (Brooklyn)	13	22.2	no	2	34951.2	258603
Queens	13	22.3	no	2	20442.3	343289
Rensselaer	13	64.5	no	3	229.4	44593
Richmond (Staten Is)	13	22.4	no	2	7633.8	111561
New York (Manhattan)	13	22.7	no	3	65309.3	56385
Saratoga	13	68.7	no	3	699.5	66122
Suffolk	13	23.8	no	3	1542.8	461456
Westchester	13	32.3	no	3	1951.4	211689
Broome	13	72.6	no	3	280.4	60079
Genesee	13	85.8	no	5	121.8	17646
Lewis	13	158	yes	5	20.9	11475
Ulster	13	60.6	no	4	153.2	58343
St. Lawrence	12	95.5	yes	2	237.8	36213
Wayne	12	79.3	no	3	154.7	30592
Madison	12	102.5	yes	2	105.1	21705
Orleans	12	73.3	no	5	112.3	13110
Putnam	12	34.5	no	4	389.2	32303
Rockland	12	31.9	no	3	1438.7	73767
Schenectady	12	67.6	no	4	50.5	44729
Cayuga	11	81.6	no	2	111.7	26291
Wyoming	11	98.3	no	5	72.8	12844
Columbia	11	52.3	no	5	97.4	23405
Greene	11	55.2	no	5	73.3	19884
Sullivan	11	55.6	no	4	74.3	33201
Ontario	10	63.9	no	2	151.2	32618
Fulton	10	84	no	2	103.4	20226
Chenango	10	73.9	no	3	57.2	18194
Delaware	10	72.2	no	4	32.8	21904
Chemung	9	45.9	no	1	221.6	26831
Clinton	9	77.9	no	1	75.8	24229
Franklin	9	107.5	yes	1	30.2	17453

Table 3-36
Jurisdiction Most Threatened by Snow and Vulnerable to Snow Loss

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)
Livingston	9	64.8	no	2	100.4	18476
Tompkins	9	66.7	no	1	196.4	24171
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

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

Table 3-36
Jurisdiction Most Threatened by Snow and Vulnerable to Snow Loss

	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.

Table 3-37
Jurisdiction Most Threatened by Ice Storms and Vulnerable to Ice Storm Loss

County	Rating Score	# of Ice Storm Related Disasters	Total # of Structures
Monroe	9	2	210552
Onondaga	8	1	132013
Jefferson	7	2	37938
Oneida	7	1	69590
Ontario	7	2	32618
Oswego	7	1	40083

Table 3-37 Jurisdiction Most Threatened by Ice Storms and Vulnerable to Ice Storm Loss			
County	**Rating Score**	**# of Ice Storm Related Disasters**	**Total # of Structures**
Schenectady	7	1	44729
St. Lawrence	7	2	36213
Wayne	7	2	30592
Cayuga	6	1	26291
Clinton	6	1	24229
Livingston	6	2	18476
Steuben	6	1	34710
Yates	6	3	9542
Albany	5	0	83117
Allegany	5	1	18096
Bronx	5	0	89896
Chenango	5	1	18194
Erie	5	0	277470
Essex	5	1	17157
Franklin	5	1	17453
Genesee	5	1	17646
Kings	5	0	258603
Madison	5	1	21705
Nassau	5	0	395748
Orange	5	0	92068
Orleans	5	2	13110
Queens	5	0	343289
Richmond	5	0	111561
Suffolk	5	0	461456
Westchester	5	0	211689
Broome	4	0	60079
Chautauqua	4	0	45310
Dutchess	4	0	79721
Lewis	4	1	11475
New York City	4	0	56385
Niagara	4	0	66394
Rensselaer	4	0	44593
Rockland	4	0	73767
Saratoga	4	0	66122
Seneca	4	1	11423
Ulster	4	0	58343
Wyoming	4	1	12844
Cattaraugus	3	0	29499
Chemung	3	0	26831
Putnam	3	0	32303
Sullivan	3	0	33201
Tompkins	3	0	24171
Warren	3	0	26234
Columbia	2	0	23405
Delaware	2	0	21904

Table 3-37 Jurisdiction Most Threatened by Ice Storms and Vulnerable to Ice Storm Loss			
County	**Rating Score**	**# of Ice Storm Related Disasters**	**Total # of Structures**
Fulton	2	0	20226
Greene	2	0	19884
Herkimer	2	0	22928
Otsego	2	0	21815
Tioga	2	0	17232
Washington	2	0	20361
Cortland	1	0	13599
Hamilton	1	0	6252
Montgomery	1	0	14829
Schoharie	1	0	12026
Schuyler	1	0	7378

Table 3-37
Jurisdiction Most Threatened by Ice Storms and Vulnerable to Ice Storm Loss

	Rating Score	# of Ice Storm Related Disasters	Population Density (per square mile) (previous declaration counties only)	Total # of Structures (previous declaration counties only)
Rating Score - Variables Distributions and Point Values	score value 1	1	1 - 49	1-17K
	score value 2	2	50 - 99	18-24K
	score value 3	3	100 – 299	25-40K
	score value 4	4	300 – 1999	41-80K
	score value 5	5	2000 – 67,000	81-462K

State Facilities – Assessing Vulnerability and Estimating Loss for Snow Hazard

Table 3-38 presents the result of our snow hazard vulnerability assessment and loss analysis for State facilities. The results present a gross estimate of potential snow losses to those identified vulnerable State facilities in terms of dollar value of exposed property. Our snow hazard vulnerability analysis and loss estimation methodology was supported by GIS technology and involved collaboration with key State agencies. Collaboration resulted in the identification of two (2) State databases that provided key facility information. The NYS Office of General Services (OGS) fixed asset data base and Office of Cyber Security (OCC) database included fields that provide coordinate location information and building replacement value in dollars.

The analysis involved creation of a GIS layer for State facilities using the coordinate information and overlay onto a snow hazard layer developed using NOAA NCDC annual average snowfall data. The intention of this analysis is to assess vulnerability and provide an aggregate exposure of State facilities as a proxy for potential loss estimate. The analysis methodology has its limitations for complete accuracy and applicability of results may not be appropriate beyond a general indication. Instead, the analysis results may best be used as a guide to help target those facilities that might benefit from further analysis.

We have established activities in our mitigation strategy that will advance the accuracy of the State risk assessment through further analysis. Future analysis may include expressing potential loss based on historical snowstorm loss information, continued application of GIS technology, and data gathering to include building attribute information which will allow targeting of high vulnerability facilities.

Table 3-38
Snow Hazard Exposure New York State Agency Facilities

NY State Agency	Total Facilities	Total # and % in area **100-150** inches avg. annual snowfall	Critical facilities total # and % in area **100-150** inches avg. annual snowfall	Total # and % in area **>150** inches avg. annual snowfall	Critical facilities total # and % in area **>150** inches avg. annual snowfall	Total # and % in ***extreme** snowfall potential areas	Critical facilities total # and % in ***extreme** snowfall potential areas
Department of Environmental Conservation	1880	570 (30.3%)	0	147 (7.8%)	0	593 (31.5%)	0
	$104,611,361	$25,622,654 (24.50%)	0	$11,963,361 (11.4%)	0	$33,241,955 (31.8%)	0
Department of Transportation	908	212 (23.3 %)	0*	8 (0.9%)	0*	92 (10.1%)	0*
	$232,514,852	$44,881,463 (19.3%)	0*	$1,012,223 (0.4%)	0*	$15,875,151 (6.8%)	0*
Office of General Services	130	11 (8.5%)	11 (8.5%)	0	0	2 (1.5 %)	2 (1.5 %)
	$2,133,659,048	$59,418,328 (2.8%)	$59,418,328 (2.8%)	0	0	$13,611,701 (0.6%)	$13,611,701 (0.6%)
State Emergency Management Office	4	0	0	0	0	0	0
	$3,365,434	0	0	0	0	0	0
Number of facilities Total	**2922**	**793 (27.1%)**	11 (.4%)	**155 (5.3%)**	**0**	**687 (23.5%)**	2 (.1 %)
~ Replacement Value of Structure ($)	**$2,472,819,244**	**$129, 522,445 (5.3%)**	$59,418,328 (2.4%)	**$12,975,584 (0.5%)**	**0**	**$62,728,807 (2.5%)**	$13,611,701 (0.6%)

Source: NYS Fixed Asset information –Office of General Services and Office of Cyber Security data bases, National Climatic Data Center (NCDC) data.
Extreme snowfall potential areas: We identified counties with extreme snowfall potential as they fit into 2 general categories as follows. 1. Those area that are vulnerable to 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.

Estimating Potential Loss for Snow Hazard by Jurisdiction

This version of the NYS Hazard Mitigation Plan does not include a description of potential dollar loss estimations to structures by jurisdiction for the snow hazard because of the absence of certain essential information as described in the following text. Additionally, unlike flood or earthquake hazard, there are no standard loss estimation models or methodologies for the snow hazard. A preliminary dollar loss estimate could have been calculated based on known information such as total structures for general occupancy class, indicated higher snow hazard areas (average annual and extreme snowfall potential map and data) as determined earlier in this plan, and use of residential structure dollar value estimates. However, many assumptions and generalizations would need to be made for several unknowns.

Unknowns or data that are available but not prepared or analyzed include: inventory estimates of the more vulnerable structures such as those pre-code structures, flat roof structures, and historical or critical structures and the type of damage and dollar damage figures. The many generalizations and guess work would result in figures with little accuracy, and potentially misleading indications of a Jurisdiction's vulnerability and potential loss to the snow hazard.

Therefore, this version of the NYS risk assessment instead includes an identification of needed data and establishes actions necessary to gather data needed to estimate potential losses. As local mitigation plans with snow hazard risk assessment data become available, this information will be incorporated into a State risk assessment repository for integration into the State vulnerability analysis. Additionally, application of GIS technology will continue, including exploring the possibility of obtaining and incorporating certain data that may better define the high hazard areas characteristics such as more comprehensive snowfall extremes data, and real property data layers in support of future snow hazard vulnerability analysis.