

May through September 2000 (FEMA DR-1335): Between May and September 2000, multiple severe storm events occurred throughout New York State resulting in significant flooding and over \$34.6 million in damage throughout various New York counties. The storms resulted in a FEMA Declaration Disaster (FEMA DR-1335) on July 21, 2000. Through this declaration, the following Counties were declared eligible for federal and State disaster public assistance funds: Albany, Allegany, Cattaraugus, Columbia, Dutchess, Erie, Essex, Greene, Herkimer, Lewis, Livingston, Madison, Montgomery, Niagara, Oneida, Onondaga, Orleans, Otsego, Rensselaer, Schenectady, Schoharie, Steuben, Sullivan, Tioga, Tompkins, Ulster and Yates (FEMA, 2008). Saratoga County was not declared a disaster area; however it did experience notable flood damage from this event.

The heavy rains between May 14 and 16, 2000 resulted in the Hudson River rising out of its banks around the Stillwater Flats of Saratoga County. The flooding was minor as the waters only spilled onto the flats themselves and did not affect the houses. However, it did flood portions of U.S. Highway Route 4. On June 6, 2000, localized flooding throughout Saratoga resulted in approximately \$15,000 in damages. On August 22, 2000, heavy amounts of rainfall in a short period of time occurred throughout Saratoga County. The axis of heaviest rain fell across the City Mechanicville and Towns of Clifton Park and Half Moon. The result was flash flooding in these areas. Toller Road in the Town of Clifton Park was under 7 feet of water. Tallmadge Park was under water, forcing a concert to be cancelled. The parking lot at the Clifton Country Mall, also in Clifton Park, was completely flooded with several feet of water. Flooding closed roads in Mechanicville and basements were flooded. A twenty-foot-wide section of rail bedding was washed away near U.S. Highway Route 4. In the Town of Halfmoon, Route 4 was closed due to flooding. A portion of Pryun Hill Road, which leads to Mechanicville High School, was washed away and the black-top buckled. The water rushed across the road so hard and fast, that trees even became uprooted. Water on the Adirondack Northway (Interstate-87) closed up to two out of the three lanes in both directions, snarling traffic in the Town of Clifton Park. The heavy rainfall caused about 500 customers to be without power for around an hour. Saratoga County experienced approximately \$80,000 in property damages from this event (NCDC, 2008).

July 21, through August 15, 2003 (FEMA DR-1486): A series of slow-moving thunderstorms accompanied by torrential rainfall created flash flooding throughout much of New York State during this time period, including Saratoga County. These thunderstorms resulted in a FEMA Disaster Declaration (DR-1486) on August 29, 2003. Through this declaration, the following counties were declared eligible for federal and State disaster public assistance funds: Allegany, Cattaraugus, Chemung, Columbia, Delaware, Fulton, Greene, Livingston, Madison, Montgomery, Ontario, Rensselaer, Schuyler, Steuben, Sullivan, Wyoming, and Yates (FEMA, 2008). Saratoga County was not declared a disaster area; however it did experience notable flood damage from this event.

The storms produced torrential rain, with up to five inches falling between the City of Mechanicville, Town and Village of Stillwater and Town of Clifton Park in a two hour period of time. The Anthony Kill overflowed its banks in Mechanicville, flooding most of the village as Central Avenue remained under water for several hours. Thirty basements were flooded. On South Main Street, sections of the railroad were washed away. On Route 67, a guardrail was swept away by the rising water. Three motorists had to be rescued from their vehicles. A State of Emergency was declared in Mechanicville for the first time since the May 31, 1998 tornado outbreak. Johnson Road in the Town of Halfmoon was completely washed out between Cary and Staniak Road. Portions of Staniak were washed out as well. Some roads, including Kellogg Road and Stratton Lane, were flooded in the Town of Stillwater. Water flooded the parking lot at Clifton Country Mall in the Town of Clifton Park. Saratoga County experienced between \$100,000 and \$160,000 in property damages (NCDC, 2008; Hazards and Vulnerability Research Institute, 2008).

June 26—July 10, 2006 (FEMA DR-1650): This storm event resulted in significant flooding throughout much of the Mid-Atlantic and Northeast region of the U.S. The flooding was widespread, affecting numerous rivers, lakes and communities from upstate New York to North Carolina. Rain totals across the affected States ranged between 2 and 16.67 inches. The heavy rains caused rivers from Virginia to Vermont to spill over their banks and caused thousands of evacuations along the banks of the Susquehanna and Delaware Rivers in New York, New Jersey and Pennsylvania. States of emergencies were declared by the governors of New York, New Jersey, Pennsylvania and Virginia (Newman and Gately, 2006). Overall, the storm caused over 16 deaths and millions in damages throughout the affected States (NOAA, 2006).

In New York State, this flooding event was the largest and most costly natural disaster that the State has encountered since Hurricane Agnes in 1972. The NYS HMP indicated that the counties affected throughout the State experienced approximately \$246.3 million in damages (NYSDPC, 2008). This event resulted in a FEMA Disaster Declaration (DR-1650) on July 1, 2006. Through this declaration, the following New York State counties were declared eligible for federal and State disaster public assistance funds: Broome, Chenango, Delaware, Herkimer, Montgomery, Oneida, Orange, Otsego, Schoharie, Sullivan, Tioga and Ulster Counties (FEMA, 2008). Saratoga County was not declared a disaster area; however it did experience notable flood damage from this event. Rainfall totals in the County ranged between 1.39 inches in Saratoga to 3.42 inches in the Town of Hadley. Front Street and Lock 3 of the Eric Canal in Waterford experienced significant flooding. Some residents at the Pine Ridge apartments in the Town of Clifton Park were trapped in their homes after a nearby stream overflowed its banks. It washed out part of an access road they use to get in and out of the Town. Cars became stuck when trying to drive through water on Clifton Country Road. Major power outages occurred throughout the County, including 1,000 residents in Saratoga Springs, 700 residents in Malta and Stillwater and 500 residents in Waterford (NWS, 2006; Weather Underground, 2006; News10Now, 2006; WTEN, 2006). As provided by the Times Union, flooding in Saratoga County is depicted in Figure 5.4.1-17 through 5.4.1-21 (Hornbeck, 2006).

Figure 5.4.1-17 Waterford Harbor Visitor Center



Source: Photograph taken by Pat Saunders

Figure 5.4.1-18 Sacandaga Riverside – Post Flood



Source: Photograph taken by David Stack

Figure 5.4.1-19 Mohawk River underneath the Waterford train bridge



Source: Photograph taken by Patty Charbonneau

Figure 5.4.1-20 Flood waters on First Street in Village of Waterford



Source: Photograph taken by Luanne M. Ferris

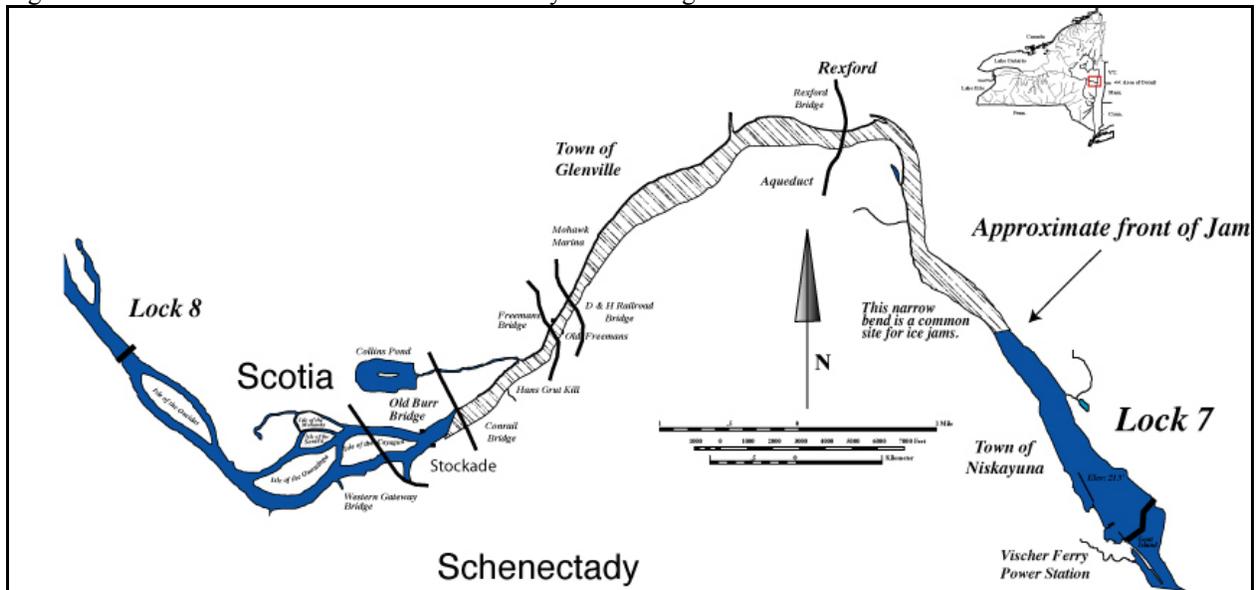
Figure 5.4.1-21 Mohawk River in Waterford, NY



Source: Tug 44, Date Unknown. Photo provided by Dunbar and Reed Lawson

March 15, 2007 Ice Jam: An ice jam formed along the Mohawk River in Schenectady and Saratoga Counties. The ice flows that worked their way through Schenectady were loosened by warming weather that melted a considerable snow pack and relatively well-formed ice cover. This was a moderate ice jam that produced significant flooding in the Stockade district of Schenectady. At the time of maximum backup (maximum stage elevation) in Schenectady, houses in lower areas were evacuated, power was cut, and a state of emergency was declared. The ice jam was approximately 5 to 6 miles long, extending from Scotia (Schenectady County) through Rexford (Town of Clifton Park), New York. The location of the ice jam is indicated in Figure 5.4.1-22 below.

Figure 5.4.1-22 March 2007 Ice Jam in Schenectady and Saratoga Counties



Source: Garver, Date Unknown

Note: Map showing the approximate location of the ice jam that resulted in backed up water and flooding in the Stockade of Schenectady. The front of the ice jam is estimated but is probably within 1 km of its position.

National Flood Insurance Program

According to FEMA's 2002 *National Flood Insurance Program (NFIP): Program Description*, the U.S. Congress established the NFIP with the passage of the National Flood Insurance Act of 1968. The NFIP is a Federal program enabling property owners in participating communities to purchase insurance as a protection against flood losses in exchange for State and community floodplain management regulations that reduce future flood damages. As stated in the NYS HMP, the NFIP collects and stores a vast quantity of information on insured structures, including the number and location of flood insurance policies, number of claims per insured property, dollar value of each claim and aggregate value of claims, repetitive flood loss properties, etc. NFIP data presents a strong indication of the location of flood events among other indicators (NYS DPC, 2008).

There are three components to NFIP: flood insurance, floodplain management and flood hazard mapping. Nearly 20,000 communities across the U.S. and its territories participate in the NFIP by adopting and enforcing floodplain management ordinances to reduce future flood damage. In exchange, the NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in these communities. Community participation in the NFIP is voluntary. Flood insurance is designed to provide an alternative to disaster assistance to reduce the escalating costs of repairing damage to buildings and their contents caused by floods. Flood damage is reduced by nearly \$1 billion a year through communities implementing sound floodplain management requirements and property owners purchasing of flood

insurance. Additionally, buildings constructed in compliance with NFIP building standards suffer approximately 80 percent less damage annually than those not built in compliance (FEMA, 2008).

According to the NFIP insurance statistics for the State, there is an extensive history of flood claims with NFIP which indicates a total of more than 79,715 claims since the inception of the program in the late 1970s. New York State is ranked within the top 5 States of the U.S. with the highest number of claims and is also amongst the highest in repetitive flood claims (as defined by FEMA/NFIP). In Saratoga County, all but two municipalities (one Town and one Village) participate in the NFIP. The non-participating jurisdictions are the Town of Edinburg and the Village of Galway (FEMA, 2009, NYSDPC, 2008). NFIP data for Saratoga County is presented further in Table 5.4.1-11 in the “Vulnerability Assessment” section of this hazard profile.

As an additional component of NFIP, the CRS is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS: (1) reduce flood losses; (2) facilitate accurate insurance rating; and (3) promote the awareness of flood insurance (FEMA, 2007). According to the 2008 Flood Insurance Agent's Manual containing current and historical listings of all CRS communities, no jurisdictions within the County participate in the CRS; therefore specific repetitive loss areas other than those identified by FEMA are not available for Saratoga County (FEMA, 2008; NYSDPC, 2008).

Probability of Future Events

Given the history of flood events that have impacted Saratoga County, it is apparent that future flooding of varying degrees will occur. The fact that the elements required for flooding exist and that major flooding has occurred throughout the county in the past suggests that many people and properties are at risk from the flood hazard in the future.

As defined by FEMA, geographic areas within the 100-year floodplain in Saratoga County are estimated to have a 1% chance of flooding in any given year. A structure located within a 100-year floodplain has a 26-percent chance of suffering flood damage during the term of a 30-year mortgage. Geographic areas in Saratoga County located within the 500-year flood boundary are estimated to have a 0.2-percent chance of being flooded in any given year (FEMA, 2003; FEMA, 2006). As noted, Figure 5.4.1-23 illustrates the FEMA Q3 100-year and 500-year flood zones for Saratoga County.

According to NYSEMO, historic flood disaster and emergency declaration records indicate Saratoga County has experienced three (3) federally declared flood related disasters since 1954. Therefore, to estimate the probability of future disasters, on average, the County can estimate one flood event meeting disaster criteria every eighteen (18) years or so (NYSDPC, 2008). However, the period of record indicates smaller flooding events occur more frequently.

In addition to riverine flooding, ice jams frequently occur in New York State and Saratoga County is no exception. According to the New York State HMP, New York State is ranked as the second highest state with the highest number of ice jam events compared to the remainder of the U.S. (NYSDPC, 2008). Dam breaks and beaver dams are also of concern to the County. According to County Officials, beavers are becoming more and more of a problem. Please refer to the Vulnerability Assessment for a complete discussion of vulnerable population, facilities, utilities and infrastructure in Saratoga County.

In Section 5.3, the identified hazards of concern for Saratoga County were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for ranking hazards. Based on historical records, FIRMs provided through FEMA, and the Planning Committee the probability of occurrence for

flood events in Saratoga County is considered ‘frequent’ (likely to occur within 25 years, as presented in Table 5.3-3).

It is estimated that Saratoga County and all of its jurisdictions, will continue to experience flooding annually that may induce secondary hazards such as ground failure and water quality and supply concerns and experience evacuations, infrastructure deterioration and failure, utility failures, power outages, transportation delays/accidents/inconveniences and public health concerns.

The Role of Global Climate Change on Future Probability

Global climate change poses risks to human health and to terrestrial and aquatic ecosystems. Important economic resources such as agriculture, forestry, fisheries, and water resources also may be affected. Warmer temperatures, more severe droughts, storms and floods, and sea level rise could have a wide range of impacts. All these stresses can add to existing stresses on resources caused by other influences such as population growth, land-use changes, and pollution.

Climate is defined not simply as average temperature and precipitation but also by the type, frequency and intensity of weather events. Human-induced climate change has the potential to alter the prevalence and severity of extremes such as heat waves, cold waves, severe storms, floods and droughts. Though predicting changes in these types of events under a changing climate is difficult, understanding vulnerabilities to such changes is a critical part of estimating future climate change impacts on human health, society and the environment.

It is important to understand that directly linking any one specific extreme event (e.g., flood, severe hurricane) to climate change is not possible. However, climate change and global warming may increase the probability of some ordinary weather events reaching extreme levels or of some extreme events becoming more extreme [U.S. Environmental Protection Agency (USEPA), 2006]. It remains very difficult to assess the impact of global warming on extreme weather events, in large part because this analysis depends greatly on regional forecasts for global warming. Global warming will almost certainly have different effects on different regions of the Earth, so areas will not be equally susceptible to increased or more intense extreme weather events. Although regional climate forecasts are improving, they are still uncertain (Climate.org, Date Unknown). These many uncertainties may exist regarding magnitude or severity; however, many sources indicate that future weather patterns and increased intensities are anticipated as a result of climate change, along with atmospheric, precipitation, storm and sea level changes (USEPA, 2007).

VULNERABILITY ASSESSMENT

To understand risk, a community must evaluate what assets are exposed or vulnerable in the identified hazard area. For the flood hazard, areas identified as hazard areas include the 100- and 500-year floodplains. The following text evaluates and estimates the potential impact of flooding in Saratoga County including:

- Overview of vulnerability
- Data and methodology used for the evaluation
- Impact, including: (1) impact on life, safety and health, (2) general building stock, (3) critical facilities and infrastructure, (4) economy and (5) future growth and development
- Further data collections that will assist understanding of this hazard over time
- Overall vulnerability conclusion

Overview of Vulnerability

All types of flooding can cause widespread damage throughout rural and urban areas, including but not limited to: water-related damage to the interior and exterior of buildings; destruction of electrical and other expensive and difficult-to-replace equipment; injury and loss of life; proliferation of disease vectors; disruption of utilities, including water, sewer, electricity, communications networks and facilities; loss of agricultural crops and livestock; placement of stress on emergency response and healthcare facilities and personnel; loss of productivity; and displacement of persons from homes and places of employment (Foster, Date Unknown).

Flood is a significant concern for Saratoga County. To assess vulnerability, potential losses were calculated for the County for riverine flooding for 100-year and 500-year MRP flood events. Historic loss data associated with ice jam events and dam failures is limited. Flooding, impacts and losses associated with ice jam and dam failure events are similar to flash flooding events. The flood hazard exposure and loss estimate analysis is presented below.

Areas identified by participating municipalities as particularly vulnerable to flooding:

- Town of Ballston: Frequent flooding occurs along Outlet Road, Westside Drive and Orchard Terrace.
- Town of Charlton: Heavy rain-events cause localized flooding along private drive-ways resulting in wash-outs and drainage to roadway. The localized flooding along private drive-ways occurs on Newman Road. Additionally, the Town indicates there are a number of homes in an area that can flood with excess rain during snowmelt and summer extreme rain storms of five-inches or more. The residential flooding occurs on both the east and west side of Stage Road on the south side of the Alplaus Creek (see Little Troy Lane).
- Village of Corinth: There are five dams close to the village that are of concern.
- Town of Galway: Damages occur throughout the Town as a result of heavy rain events including the washout of shoulders/ditches and a bridge.
- Town of Hadley: The Town experiences damage to water district pump stations due to flooding.
- Town of Malta: Frequent flooding occurs in the vicinity of Saratoga Lake and Round Lake. Additionally, the entire Silver Beach Road area, extending along Saratoga Lake, is vulnerable to flooding. It is at the bottom of the Drummond Creek watershed within the floodplains. The roads,

with the exception of Silver Beach, are entirely privately owned, and drainage infrastructure is non-existent. The area floods every spring and after heavy storms.

- City of Saratoga Springs: Streams and lakes over flood stage flood several roads and impact homes and businesses. Antiquated and insufficient stormwater drainage throughout the City leads to localized flooding.
- Town of Wilton: Flooding occurs along U.S. Route 9, at Snook Kill. The Town experiences flooding of streams, low areas and wetlands and has insufficient stormwater drainage capacities. Beaver dams have also been identified as a cause to localized flooding.

Data and Methodology

The 100- and 500-year MRP flood events were examined to evaluate Saratoga County's vulnerability to the flood hazard. These MRP flood events are generally those considered by planners and evaluated under federal programs such as the NFIP.

Saratoga County does not have Digital Flood Insurance Rate Maps (DFIRMs) available to use for analysis. **FEMA Quality 3 (Q3) flood data, a digital representation of certain features of FEMA's Flood Insurance Rate Maps, is available for Saratoga with the exception of riverine reaches in the northwest portion of the County (Towns of Day, Edinburg and Providence) and the Town of Wilton (Figure 5.4.1-23).** According to the NFIP, the Town of Day and Town of Wilton are classified as NSFHA or 'no special flood hazard areas' meaning these communities have been surveyed and found to have no flood risk (FEMA, 2009).

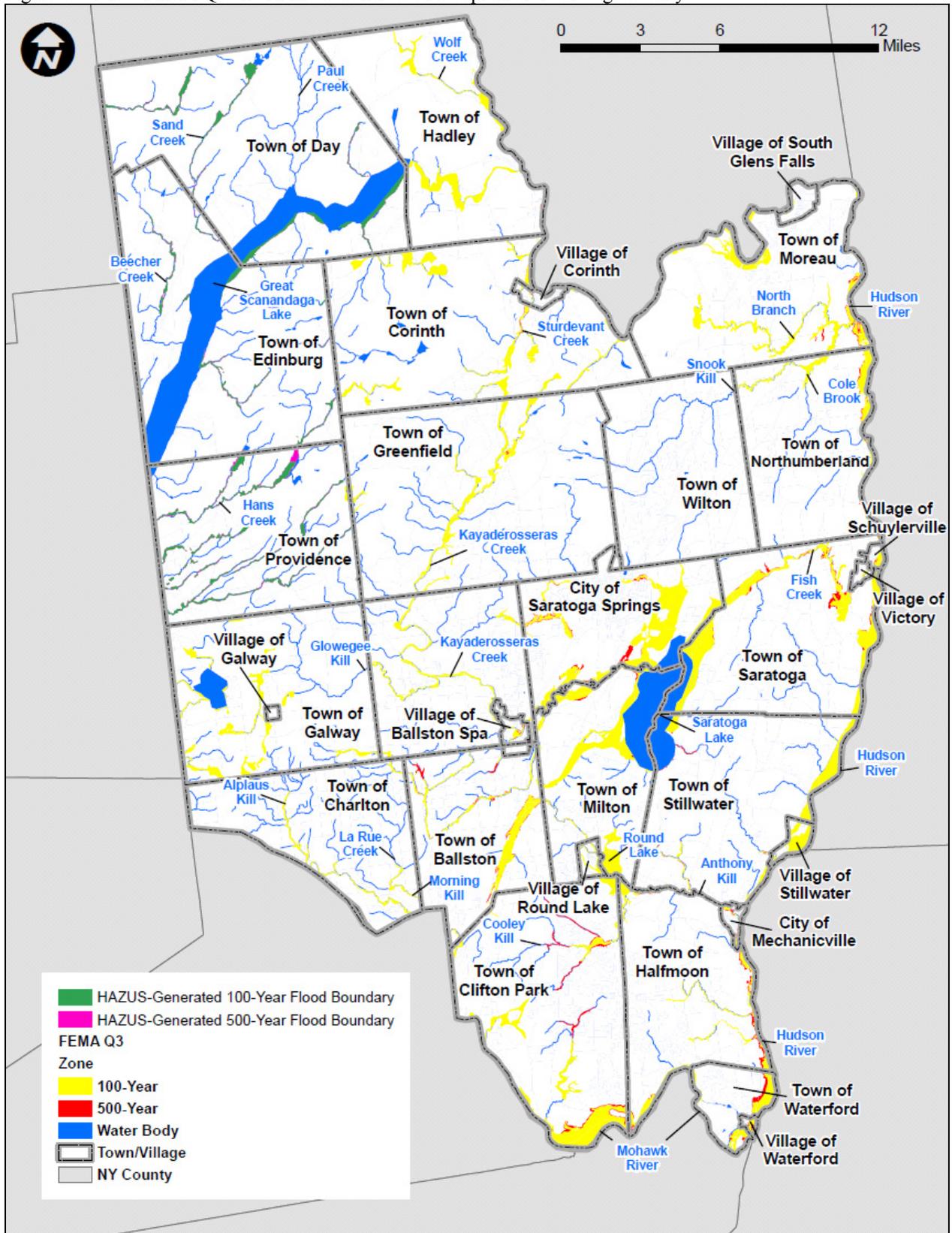
A modified Level 1 analysis was performed to analyze the flood losses for Saratoga County. HAZUS-MH MR3 ran the hydrology and hydraulics for the selected river reaches in the County, using the Q3 as a guide, and generated the flood-depth grid and flood boundary for the specified return periods (100- and 500-year mean return period [MRP]). HAZUS-MH MR3 calculated the estimated damages to the general building stock and critical facilities based on this depth grid. **HAZUS-MH MR3 did not have any discharge data for a portion of the Sacandaga River that flows through the Towns of Edinburg and Day. A discharge of 10,000 cubic feet per second (cfs) and 12,500 cfs (100-year and 500-year MRP, respectively) were supplied to the model for this riverine reach.**

The hydrology would not complete for portions of the Hudson River along the eastern border of the Town of Halfmoon and in the northern portion only of the Town of Northumberland. To complete the loss estimates for these riverine reaches, HAZUS' Enhanced Quick Tool was used to generate the flood depth grid for these reaches and then HAZUS was used to estimate damages.

To estimate exposure, both the Q3 flood boundaries and the flood boundaries generated by HAZUS-MH MR3 were used. **The flood boundaries generated by HAZUS-MH MR3 were only used for reaches not included in the Q3 which include riverine reaches within the Towns of Day, Edinburg and Providence.** Figure 5.4.1-23 illustrates the flood boundaries used to estimate exposure (boundaries generated by HAZUS-MH MR3 and the boundaries available in the Q3 for Saratoga County).

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Figure 5.4.1-23. FEMA Q3 and HAZUS Generated Floodplains for Saratoga County



Source: FEMA Q3; HAZUS-MH MR3



Impact on Life, Health and Safety

The impact of flooding on life, health and safety is dependent upon several factors including the severity of the event and whether or not adequate warning time is provided to residents. Exposure represents the population living in or near floodplain areas that could be impacted should a flood event occur. Additionally, exposure should not be limited to only those who reside in a defined hazard zone, but everyone who may be affected by the effects of a hazard event (e.g., people are at risk while traveling in flooded areas, or their access to emergency services is compromised during an event). The degree of that impact will vary and is not measurable.

To estimate the population exposed to the 100- and 500-year flood events, the floodplain boundaries provided by the Q3 and the flood boundaries generated by HAZUS-MH MR3 were used. The flood boundaries generated by HAZUS-MH MR3 were only used for reaches not included in the Q3 which include riverine reaches within the Towns of Day, Edinburg and Providence. These flood boundaries were overlaid upon the Census population data available in HAZUS-MH MR3. The Census blocks with their center (centroid) within the flood boundary were used to calculate the estimated population exposed to this hazard. Table 5.4.1-6 lists the estimated population located within the 100- and 500-year flood zones.

Table 5.4.1-6 Saratoga County Population Vulnerable to the 100-Year and 500-Year MRP Flood Hazard (Number in Flood Zone)

Jurisdiction	Population	Population in 100 Year Flood Zone		Population in 500 Year Flood Zone	
	Number	Number	% of Total	Number	% of Total
Town of Ballston	7,548	260	3.4	269	3.6
Village of Ballston Spa	5,556	585	10.5	821	14.8
Town of Charlton	3,954	30	0.8	30	0.8
Town of Clifton Park	32,995	184	0.6	293	0.9
Town of Corinth	3,511	50	1.4	64	1.8
Village of Corinth	2,474	71	2.9	71	2.9
Town of Day	920	0	0.0	0	0.0
Town of Edinburg	1,384	5	0.4	9	0.7
Town of Galway	3,375	111	3.3	111	3.3
Village of Galway	214	0	0.0	0	0.0
Town of Greenfield	7,362	110	1.5	110	1.5
Town of Hadley	1,971	6	0.3	6	0.3
Town of Halfmoon	18,474	193	1.0	334	1.8
Town of Malta	12,401	1,029	8.3	1,029	8.3
City of Mechanicville	5,019	516	10.3	669	13.3
Town of Milton	12,728	199	1.6	199	1.6
Town of Moreau	10,458	257	2.5	257	2.5
Town of Northumberland	4,603	0	0.0	0	0.0
Town of Providence	1,841	19	1.0	19	1.0
Village of Round Lake	604	81	13.4	81	13.4
Town of Saratoga	3,400	556	16.4	591	17.4
City of Saratoga Springs	26,186	443	1.7	486	1.9
Village of Schuylerville	1,197	67	5.6	67	5.6

Jurisdiction	Population	Population in 100 Year Flood Zone		Population in 500 Year Flood Zone	
	Number	Number	% of Total	Number	% of Total
Village of South Glens Falls	3,368	0	0.0	0	0.0
Town of Stillwater	5,878	321	5.5	330	5.6
Village of Stillwater	1,644	485	29.5	485	29.5
Village of Victory	544	115	21.1	115	21.1
Town of Waterford	6,311	345	5.5	358	5.7
Village of Waterford	2,204	1,348	61.2	1,621	73.5
Town of Wilton	12,511	0	0.0	0	0.0
Saratoga County	200,635	7,386	3.7	8,425	4.2

Source: HAZUS-MH MR3, 2007

Table 5.4.1-6 shows that approximately 4-percent of the total population of 200,635 in Saratoga County is exposed to the 100- and 500-year flood events. Please note that this analysis (based on using the centroid of the municipality) indicates the Towns of Day Galway, Northumberland, and Wilton, and the Village of South Glen Falls do not have any population in the 100- or 500-year flood zones; however, floodplains are present in these municipalities (FEMA Q3 flood boundaries for the Town of Northumberland and Village of South Glen Falls and HAZUS-generated flood boundaries for the Town of Day) and subsequent analysis of persons displaced by the flood hazard (see Table 5.4.1-7 Estimated Saratoga County Population Displaced or Seeking Short-Term Shelter from the 100-Year and 500-Year MRP Events) results in measurable population affected by flooding. This indicates that this methodology used may be underestimating the population vulnerable to the flood hazard.

Of the population exposed, the most vulnerable include the economically disadvantaged (households with an income of less than \$20,000) and the population over the age of 65. Economically disadvantaged populations are more vulnerable because they are likely to evaluate their risk and make decisions to evacuate based on the net economic impact to their family. The population over the age of 65 is also more vulnerable because they are more likely to seek or need medical attention which may not be available to due isolation during a flood event and they may have more difficulty evacuating.

HAZUS-MH MR3 estimates the potential sheltering needs as a result of a 100- and 500-year MRP flood event. Table 5.4.1-7 summarizes the estimated number of displaced persons and persons seeking temporary shelter from the 100- and 500-year MRP events. Figures 5.4.1-24 through 5.4.1-26 illustrate the general population density, elderly population density and low-income population density relative to the 100- and 500-year regulatory floodplains in Saratoga County.

The total number of injuries and casualties resulting from flooding is generally limited based on advance weather forecasting, blockades and warnings. Therefore, injuries and deaths generally are not anticipated if proper warning and precautions are in place. Ongoing mitigation efforts should help to avoid the most likely cause of injury, which results form persons trying to cross flooded roadways or channels during a flood.

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Table 5.4.1-7 Estimated Saratoga County Population Displaced or Seeking Short-Term Shelter from the 100-Year and 500-Year MRP Events

Jurisdiction	Total Population	100-Year				500-Year			
		Displaced Persons	Percent Displaced	Persons Seeking Short-Term Sheltering	Percent Seeking Shelter	Displaced Persons	Percent Displaced	Persons Seeking Short-Term Sheltering	Percent Seeking Shelter
Town of Ballston	7,548	108	1.4	11	0.1	113	1.5	13	0.2
Village of Ballston Spa	5,556	290	5.2	141	2.5	299	5.4	149	2.7
Town of Charlton	3,954	94	2.4	13	0.3	107	2.7	16	0.4
Town of Clifton Park	32,995	932	2.8	424	1.3	1,085	3.3	597	1.8
Town of Corinth	3,511	273	7.8	90	2.6	333	9.5	140	4.0
Village of Corinth	2,474	166	6.7	38	1.5	191	7.7	54	2.2
Town of Day	920	18	2.0	1	0.1	17	1.8	1	0.1
Town of Edinburg	1,384	25	1.8	0	0.0	27	2.0	0	0.0
Town of Galway	3,375	109	3.2	8	0.2	119	3.5	10	0.3
Village of Galway	214	1	0.5	0	0.0	1	0.5	0	0.0
Town of Greenfield	7,362	213	2.9	45	0.6	227	3.1	54	0.7
Town of Hadley	1,971	67	3.4	6	0.3	79	4.0	8	0.4
Town of Halfmoon	18,474	358	1.9	163	0.9	435	2.4	189	1.0
Town of Malta	12,401	296	2.4	72	0.6	321	2.6	93	0.7
City of Mechanicville	5,019	724	14.4	530	10.6	980	19.5	702	14.0
Town of Milton	12,728	263	2.1	74	0.6	304	2.4	95	0.7
Town of Moreau	10,458	300	2.9	136	1.3	306	2.9	149	1.4
Town of Northumberland	4,603	120	2.6	28	0.6	131	2.8	34	0.7
Town of Providence	1,841	59	3.2	1	0.1	65	3.5	1	0.1
Village of Round Lake	604	11	1.8	0	0.0	12	2.0	0	0.0
Town of Saratoga	3,400	336	9.9	80	2.4	310	9.1	72	2.1
City of Saratoga Springs	26,186	720	2.7	437	1.7	723	2.8	426	1.6
Village of Schuylerville	1,197	53	4.4	23	1.9	71	5.9	49	4.1
Village of South Glens Falls	3,368	85	2.5	73	2.2	92	2.7	76	2.3
Town of Stillwater	5,878	197	3.4	67	1.1	216	3.7	77	1.3
Village of Stillwater	1,644	249	15.1	170	10.3	270	16.4	191	11.6
Village of Victory	544	55	10.1	47	8.6	76	14.0	64	11.8



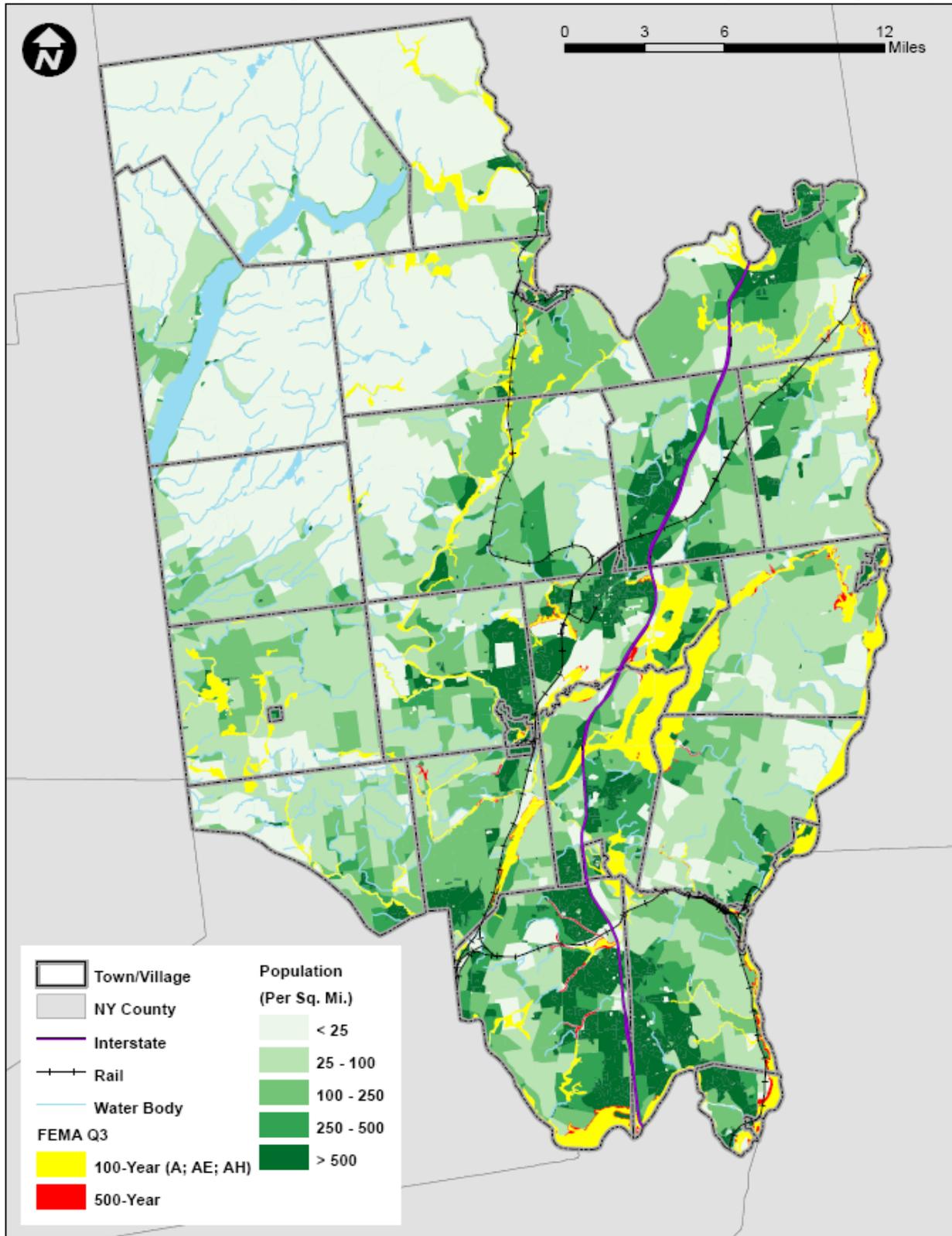
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Jurisdiction	Total Population	100-Year				500-Year			
		Displaced Persons	Percent Displaced	Persons Seeking Short-Term Sheltering	Percent Seeking Shelter	Displaced Persons	Percent Displaced	Persons Seeking Short-Term Sheltering	Percent Seeking Shelter
Town of Waterford	6,311	259	4.1	175	2.8	337	5.3	255	4.0
Village of Waterford	2,204	1,019	46.2	888	40.3	1,336	60.6	1,245	56.5
Town of Wilton	12,511	24	0.2	1	0.0	21	0.2	1	0.0
Saratoga County	200,635	7,424	3.7	3,742	1.9	8,604	4.3	4,761	2.4

Source: HAZUS-MH MR3, 2007

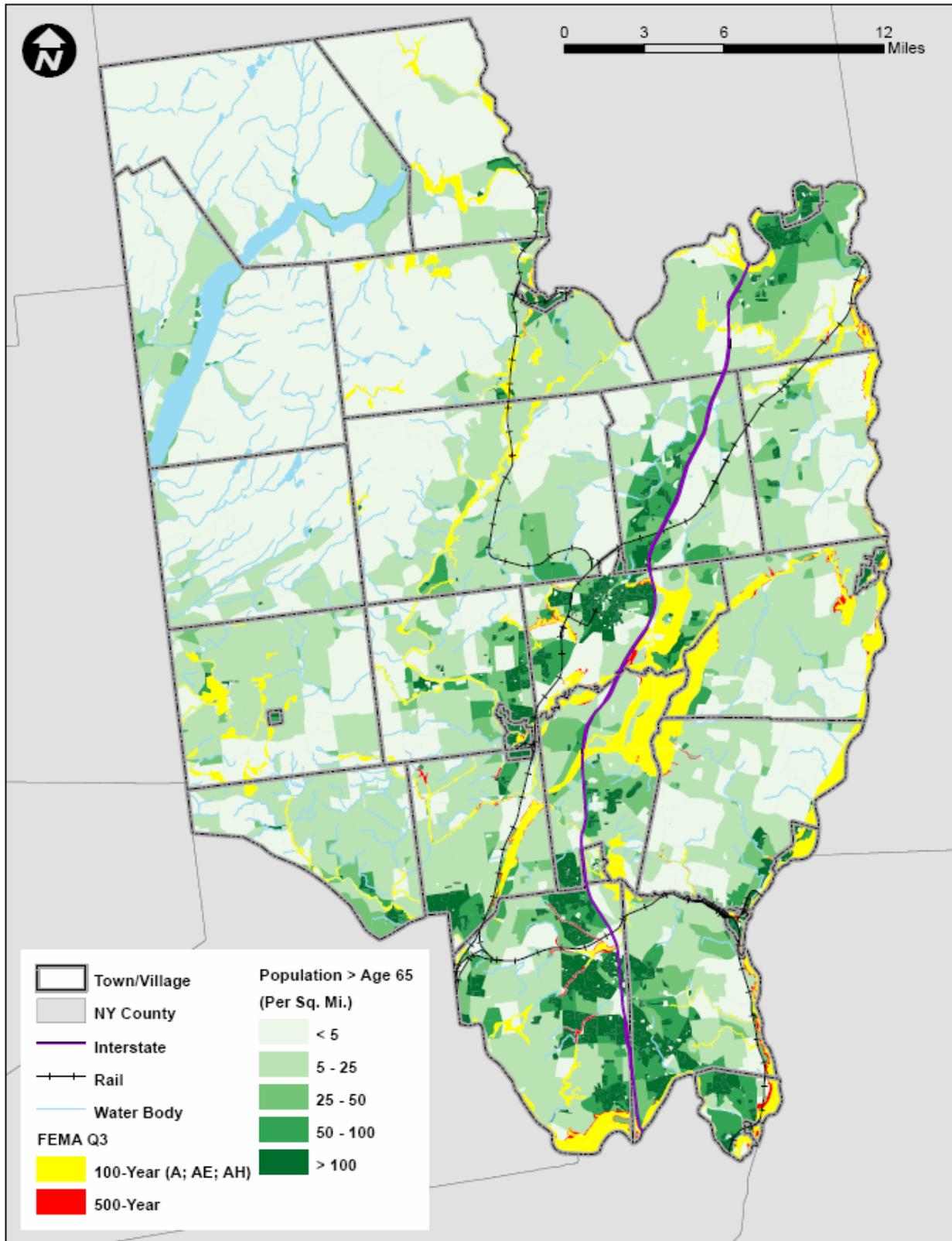
Note: Estimated Town population does not include the total for their Village(s).

Figure 5.4.1-24. Distribution of Population Relative to the 100- and 500-Year Q3 Floodplains in Saratoga County



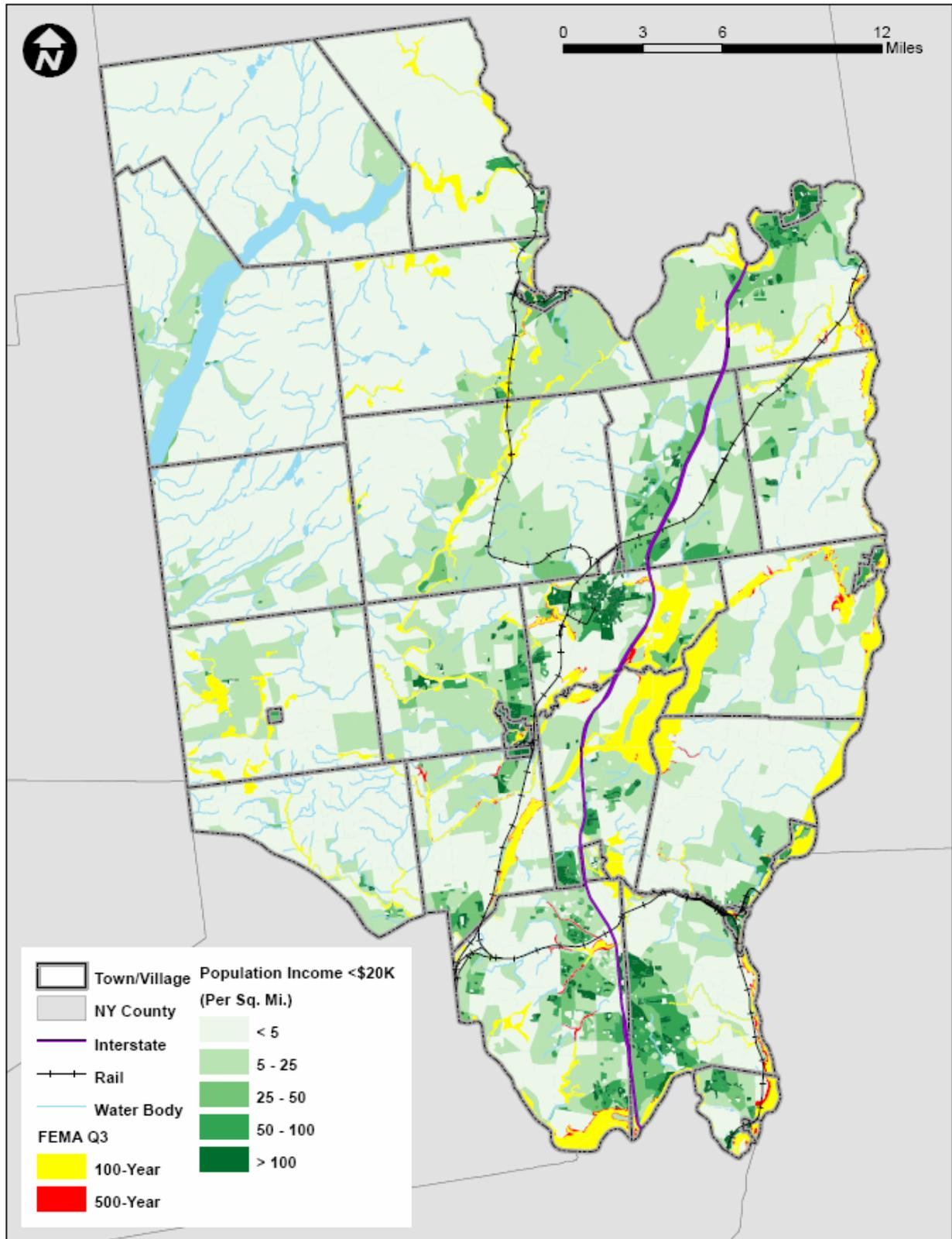
Source: HAZUS-MH MR3, 2007; FEMA Q3

Figure 5.4.1-25. Distribution of Elderly Population Relative to the 100- and 500-Year Q3 Floodplains in Saratoga County



Source: HAZUS-MH MR3, 2007; FEMA Q3

Figure 5.4.1-26. Distribution of Low-Income Population Relative to the 100- and 500-Year Q3 Floodplains in Saratoga County



Source: HAZUS-MH MR3, 2007; FEMA Q3

Impact on General Building Stock

After considering the population exposed to the flood hazard, the HAZUS-MH MR3 default value of general building stock exposed to, and damaged by, the 100- and 500-year MRP flood events was evaluated. Exposure in the flood zone includes those buildings located in the flood zone that are exposed to the flood hazard. Potential damage is the modeled loss that could occur to the exposed inventory, including structural and content value.

The NYS HMP analyzed property exposure to the 100-year floodplain using FEMA's Q3 digital flood maps and NYS Real Property System parcel centroids. This analysis provides an indication of the extent and distribution of a community's flood risk. According to this analysis, Saratoga County has 1,992 residential properties with an estimated property value of nearly \$33 Million located in a 100-year flood zone. Figure 5.4.1-27 illustrates the residential properties exposed to the 100-year floodplain in Saratoga County (NYSDPC, 2008).

The HAZUS-MH MR3 flood model does not estimate general building stock exposure to the flood hazard. To provide a general estimate of building count and structural/content replacement value exposure, the Q3 100- and 500-year flood zones were overlaid upon the HAZUS-MH MR3 general building stock data inventory. The Census blocks with their center within the flood boundary were used to estimate the building count (for residential single-family dwellings and manufactured housing only) and replacement cost value exposed to this hazard (Tables 5.4.1-8 and 5.4.1-9). Only RES1 and RES2 occupancy class building counts are used because they are based on census housing unit costs. All other occupancy class building counts are calculated in HAZUS-MH MR3 based on regional average square footage values for specific occupancy class/building types, and may significantly over- or under-estimate actual structure counts and therefore, those building counts were not included in the summary table.

Figures 5.4.1-28 and 5.4.1-29 illustrate the residential and commercial building stock density relative to the 100- and 500-year regulatory floodplains in Saratoga County.

There are approximately 2,435 RES1 and RES2 buildings located in the 100-year flood zone, or approximately 3.5 percent of the total RES1 and RES2 buildings in the County. In the 500-year flood zone, there are an estimated 2,664 RES1 and RES2 buildings, or nearly 4% of the total in the County.

There is nearly \$1 billion of building/contents exposed to the 100-year flood in Saratoga. This represents approximately 4.0-percent of the County's total general building stock replacement value inventory (nearly \$25 billion; see Section 4). For the 500-year event, it is estimated there is approximately \$1.1 billion of buildings/contents exposed in Saratoga County. This is approximately 4.5-percent of the County's total general building stock replacement value inventory (Table 5.4.1-9). Please note that this analysis indicates the Town of Day and Village of South Glen Falls do not have any general building stock inventory in the 100- or 500-year flood zones; however, floodplains are present in these municipalities (FEMA Q3 flood boundaries for the Village of South Glen Falls and HAZUS-generated flood boundaries for the Town of Day). This indicates the methodology used may be underestimating the general building stock vulnerable to the flood hazard.

The potential damage estimated to the general building stock inventory associated with the 100-year flood is approximately \$242 million or 1.0-percent of the County's general building stock inventory. For the 500-year event, the HAZUS-MH MR3 potential damage estimate is approximately \$308 million (structure and contents) or 1.2-percent of the County's general building stock inventory. HAZUS-MH damage assessments for Saratoga County are displayed in Table 5.4.1-9.