FLOOD

HAZARD PROFILE

Description

A flood is a general and temporary condition of partial or complete inundation of normally dry land areas, resulting from:

- Overflow of inland or tidal waters
- Unusual and rapid accumulation of runoff or surface waters
- Mudslides/mudflows caused by accumulation of water
- A situation in which rainfall is so intense and severe and runoff so rapid that is precludes recording and relating it to stream stages and other information in time to forecast a flood condition (FEMA, 2004; NYS Disaster Preparedness Commission, 2004).

Floods are one of the most common hazards in the United States, with effects that can be local, impacting a neighborhood or community, or very large, affecting entire river basins and multiple states. Most communities in the United States have experienced some kind of flooding, after spring rains, heavy thunderstorms, or winter snow thaws.

All floods are not alike, where some develop slowly over a period of days, and others, identified as flash floods, can develop quickly. Flash floods often have a dangerous wall of roaring water that carries rocks, mud, and other debris and can sweep away most things in its path. Flash floods usually result from intense storms dropping large amounts of rain within a brief period. Flash floods occur with little or no warning and can reach their peak in only a few minutes. They normally occur in the summer during the thunderstorm season. Riverine floods are the one of the most common of all floods. They occur when rivers and streams overflow their banks and inundate low-lying areas. This type of flooding usually occurs after spring rains, heavy thunderstorms, or snowmelt. These floods can be slow or fast-rising, and generally develop over a period of days. The most severe flooding conditions usually occur when direct rainfall is augmented by snowmelt. If the soil is saturated or frozen, stream flow may increase due to the inability of the soil to absorb additional precipitation. Flooding can also occur when a dam breaks, producing effects similar to flash floods. Areas that are most susceptible to the effects of floods are low-lying areas that are near water or downstream from a dam. An average of $197.8 million to $682.3 million is spent annually on flood damage throughout NYS (FEMA, 2004).

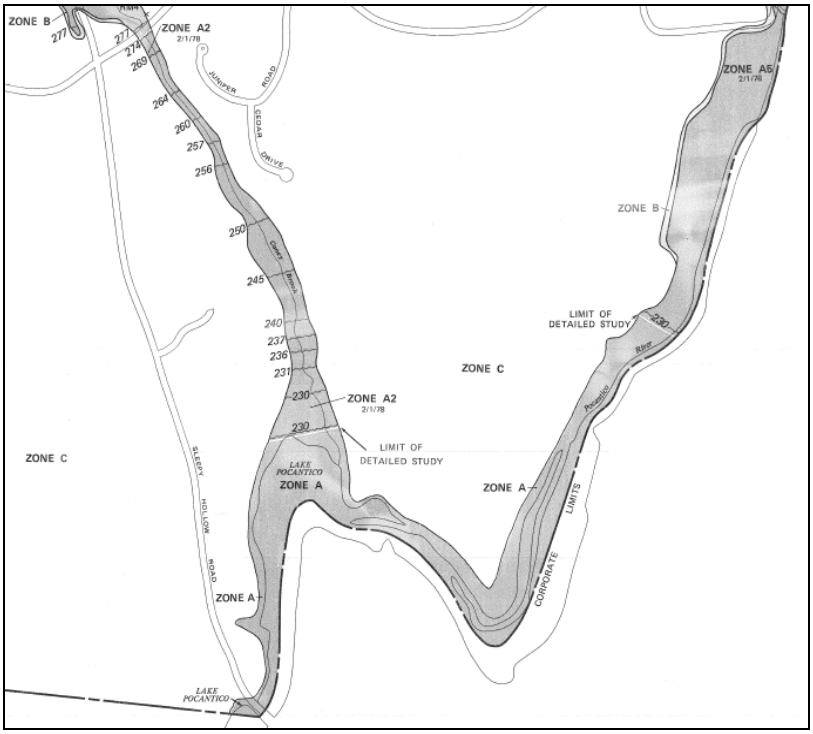
Floods are problematic in numerous ways, including but not limited to: water-related damage to the interior and exterior of buildings, especially homes; destruction of electrical and other expensive and difficult to replace equipment; loss of life; injury and proliferation of disease vectors; disruption 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. Flood events can also require responses (such as pumping of basements and barricading roads) above and beyond the typical daily operations of emergency response organizations and fire departments. Developments and resources at the foot of steep slopes; low-lying lands; and lakefront properties are particularly susceptible to floods.

Location and Extent

Several 100-year and 500-year floodplains are located within WC along the shores of lakes, streams, creeks, rivers and reservoirs. These areas are prone to relatively frequent floods and/or inundation, as WC receives high amounts of precipitation and subsequent run-off.

According to FEMA Flood Insurance Rate Map (FIRM) Community Panel No. 3609040001C and 2C, the Village includes primarily land with a Zone C flood classification (areas with minimal flooding). However, Zone A and B flood classifications are identified within the vicinity of the Hudson River, Caney Brook, Pocantico Lake and the Pocantico River (Figure 5-14). Zone A represents areas that lie within the 100-year flood zone. Zone B represents areas lying between the 100-year flood and 500-year flood zone boundaries or areas of 100-year MRP event shallow flooding with depths of less than one foot. The 100-year flood zones are located within areas along Rt. 9A and the Taconic State Parkway, associated with the Pocantico River.

Figure 5-14. 1978 FEMA FIRM of the Southern Section of the Village of Briarcliff Manor



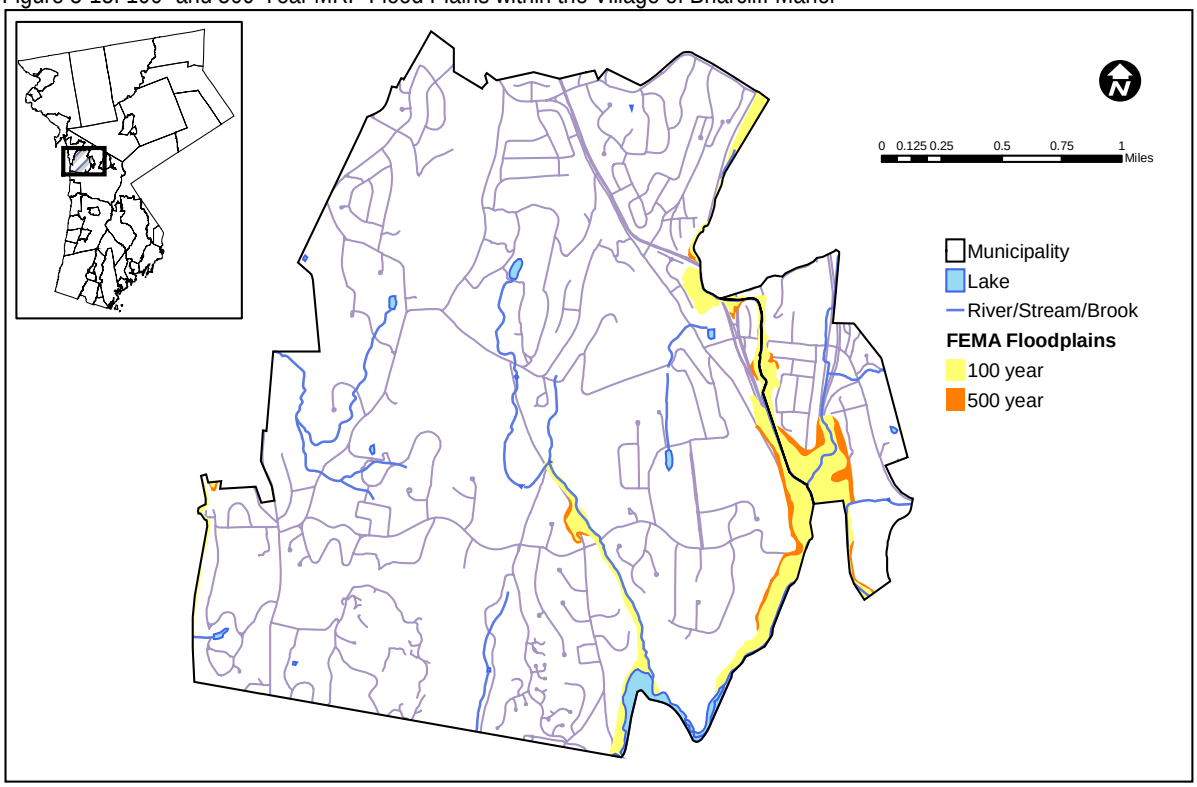
Source: FEMA FIRM Community Panel No. 3609040002C. Southern section of the Village of Briarcliff Manor. February 1978.

When severe thunderstorms or storms associated with hurricanes or tropical storms/depressions occur, they often result in floods in certain sections of the Village. Flood hazard areas are defined as areas that would be inundated by a flood of a given magnitude. These areas are determined using statistical analyses of flood discharge data and hydraulic and topographic analyses. Tools such as the FEMA's FIRM's show street maps with flood hazard areas clearly shown (see figure above).

Designated hazard areas within the Village include those low-lying areas located along streams, rivers and ponds. The Pocantico River and the Hudson River experience the most flooding during heavy rain

events. Figure 5-15 shows the areas within the Village that are within the designated 100-year and 500-year flood zones.

Figure 5-15. 100- and 500-Year MRP Flood Plains within the Village of Briarcliff Manor



Source: HAZUS-MH, 2005.

Previous Occurrences and Losses

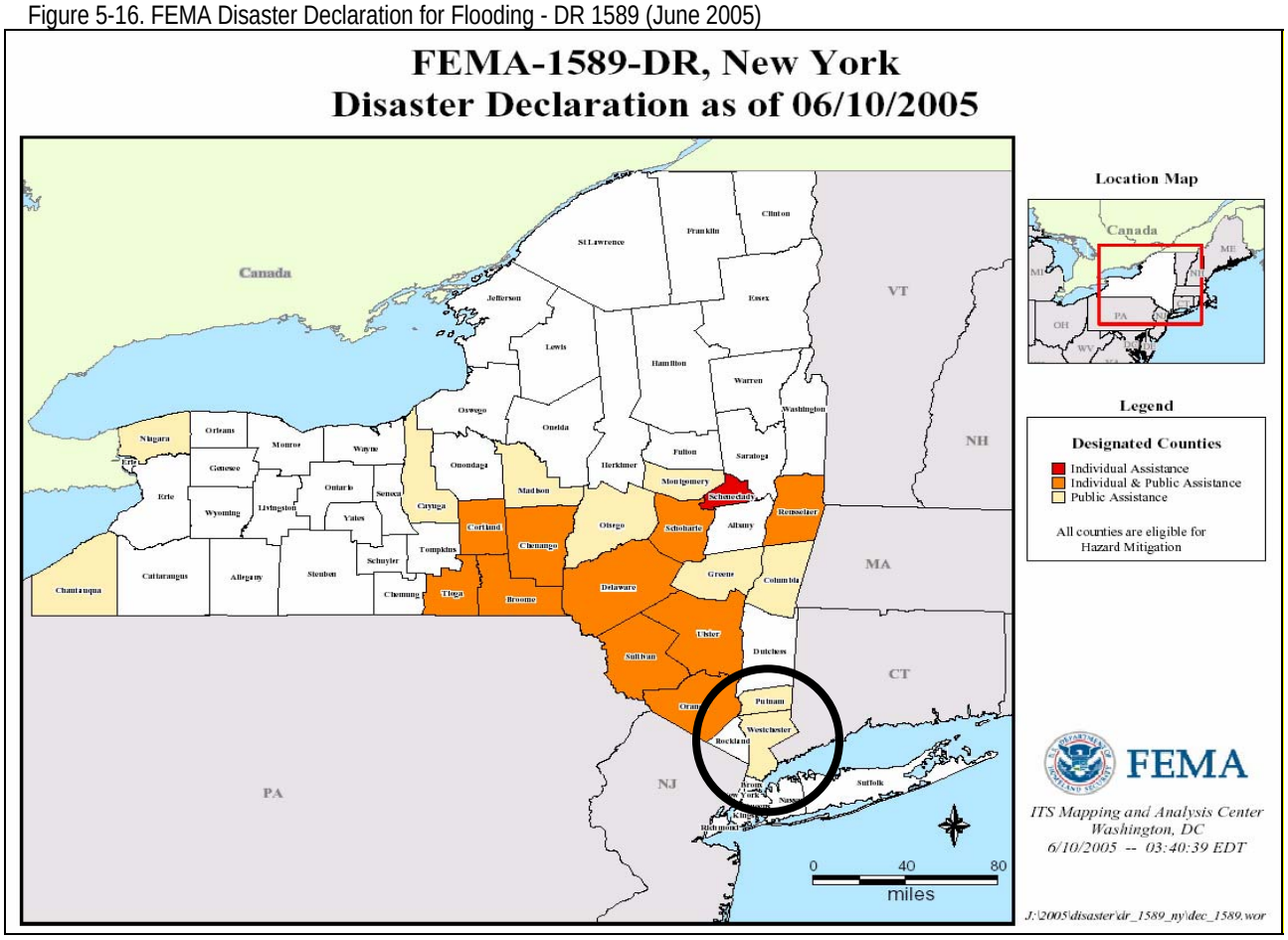
Table 5-15 summarizes Presidential Disaster Declarations for flood events from 1996 to 2006 for the County and Village. As shown on Figure 5-16, public assistance was granted to WC for and April 2005 flood disaster. According to the NFIP, 45 flood-related claims have been made since 1978 by the Village (Table 5-16). Approximately $687,833 in losses has been paid to the Village between January 1, 1978 and April 30, 2006 (FEMA NFIP, 2006).

Table 5-15. Presidential Disaster Declarations for Flooding Events (1996 to 2006)

Type of Event	Date	Declaration Number	Cost of Losses (approximate)
Flooding (Countywide)	November 1996	DR 1146	Total Eligible damages for WC and Suffolk County averaged $16.1 million. Losses to Briarcliff Manor were not documented.
Hurricane Floyd (Countywide)	September 1999	DR 1296 EM 3149	Briarcliff Manor Union Free School District received $27,000 in disaster payments, and the Village of Briarcliff received a total of $898,000.
Severe Storms – Flooding (Countywide)	April 2005	DR 1589	WC received $76,000 in federal reimbursements for losses.

Source: FEMA website (http://www.fema.gov/library/drcys.shtm). Notes: Dollars rounded to nearest thousand. Recorded losses indicate the dollar value of covered losses paid, as available through the public records reviewed. Some of these items overlap with items shown under Severe Storm.

Figure 5-16. FEMA Disaster Declaration for Flooding - DR 1589 (June 2005)



Source: FEMA – 2006 http://www.gismaps.fema.gov/2005graphics/dr1589/dec_1589.pdf.

Table 5-16. FEMA National Flood Insurance Program Loss Cases and Payment Data for the Village of Briarcliff Manor

Community Name	Total Losses	Closed Losses	Open Losses	CWOP Losses	Total Payment
Village of Briarcliff Manor	45	36	0	9	$687,833.82

Source: FEMA, NFIP Website. Notes: (1) Total losses - All losses submitted regardless of the status; (2) Closed losses - Losses that have been paid; (3) Open losses - Losses that have not been paid in full; (4) CWOP losses - Losses that have been closed without payment; and (5) Total Payments - Total amount paid on losses.

The following sources provided data and statistics of historic losses and impacts associated with flooding events within WC, including the Village. These sources indicate that primary flooding events, include but are not limited to, those that took place in September 1974, July 1975, January 1976, August 1990, May 1996, November 1996 (DR 1146), September 1999 (DR 1296 / EM 3149), December 2000, June 2001, October 2005, and January 2006.

- The Journal News provided by Lower Hudson indicated in a storm coverage article that a January 18, 2006, flooding event resulted in major roads being closed throughout WC, including the Saw Mill River Parkway (closed in both directions between exits 27 and 29) in Mount Pleasant; it was also closed in both directions at Route 120 in New Castle. The northbound ramp at exit 25 to Route 9A

was closed. The southbound Bronx River Parkway was blocked at Oak Street in Yonkers/Mount Vernon because of a downed tree. A traffic light was out at Virginia Road on the Bronx River, so there was no crossing traffic. Exit 17, North Avenue, on the northbound Hutchinson River Parkway was closed. Exit 2 on southbound I-684, WC Airport, was closed. Route 118 was closed in both directions at Hanover Street in Yorktown. In Somers, Route 118 was closed southbound at Granite Springs Road. Route 22 was closed in both directions at Seminary Road in Bedford. Route 22 was also closed in both directions at Bedford Center Road. Route 448 in Mount Pleasant was blocked in both directions near Route 117. Also, traffic was diverted from the northbound Taconic Parkway to the Saw Miller River Parkway because of flooding near Marble Avenue. Chappaqua Road in the Village was closed in both directions at Route 9A. Power outages occurred throughout WC.

- DisasterHelp.gov indicates that the January 17-19, 2006 flooding event was issued two Secretarial Designations (S2182 and S2204). Secretarial designation S2182 was issued because of excessive rain, flooding, flash flooding, extreme and unseasonably cold temps, frosts and freezes. Secretarial designation S2204 was issued because of drought and high temperatures, excessive rain, high winds, flooding and flash flooding. Secretarial Designations are authorized by the U.S. Department of Agriculture.

- A U.S. Small Business Administration (SBA) Declaration #10336 was issued for WC for an October 7, 2005, flooding event. Excessive rain, high winds, flooding and flash flooding occurred in WC. Damages or losses were not documented for this event.

- The USACE North Atlantic Division, January 2002 Water Control Management Report, indicates that a December 17–19, 2000, flooding event took place in WC. Damages or losses were not documented for this event. Additionally, a June 17, 2001, flooding event occurred in lower WC as a result of about 4 inches of rainfall.

- The National Atlas and NOAA's NCDC storm events database indicate that WC was indirectly impacted by Hurricane Floyd on September 16-17, 1999. $6.6 million in damages to WC resulted from the torrential record rainfall, which caused serious widespread urban, small stream, and river flooding, preceded the remnants of Hurricane Floyd. Many counties of NYS, including WC, were declared disaster areas. Serious widespread flooding of low-lying and poorly drained areas resulted in the closure of many roads and basement flooding across the entire region. Strong and gusty winds combined with torrential rain downed many trees, tree limbs, and power lines. Significant power outages resulted. Figure 5-5 presents tracking map for Hurricane Floyd. Information regarding losses to the Village was not provided.

- According to a news article generated by Ms. Kimberly Venzke of Pace University on September 21, 1999, Hurricane Floyd resulted in the flooding of the Campus Center kitchen at Pace University. Three inches of water flooded the kitchen, but damage was minimal. The boiler room was damaged and this affected several of the burners and the freezer and steam tables were not working. Apparently, a similar episode took place during and event 15 years prior (1984). The Village issued a warning to residents urging them to boil water before use or to use bottled water because of the potential for water contamination. Run-off from the storm contaminated water in the entire Village.

- According to the September 2004 NYSEMO Comprehensive Emergency Management Plan – NYS Multi-Hazard Mitigation Plan, multiple flooding events took place throughout WC between 1974 and 1996. Three flooding events occurred in September 1974, July 1975, and January 1976; however, information regarding losses to WC was not documented. An August 1990 flood event resulted in $3.5 million in damages and losses throughout multiple NYS counties, including WC. A November 1996 flood resulted in WC and Suffolk County being issued a Disaster Declaration (DR 1146).

Severe coastal storm, flooding, and wind events were resulted in eligible damages of $16.1 million. According to the NYSEMO Comprehensive Emergency Management Plan, WC has identified 617 NFIP repetitive flood loss properties, ranking WC fourth in NYS for experiencing the most losses.

- In a Press Release on December 18, 1996, Governor George E. Pataki announces that New York's request for federal public assistance funding for Suffolk County and WC for damages incurred during the October 19-20, 1996, Nor'easter was approved. Public assistance funding was provided for infrastructure repairs, including: damage to roads, bridges and other county and local facilities. Preliminary damage assessments for the two counties totaled more than $3.5 million. This was the Nor'easter to strike the region in years, causing widespread flooding and casing the first game of the World Series to be canceled.

- According to the Northeast Regional Climate Center (Cornell University), flooding and high winds occurred on May 9 through 11, 1996. On May 11, damaging winds were reported in Orange, Westchester, Rockland, Putnam, Ulster, Dutchess, and Columbia Counties. Heavy rains flooded a parkway in WC.

- According to FEMA, the Village has received three Presidential DRs for flood events between 1996 and 2005 (see Table 5-15). DR 1589 took place in April 2005 (Figure 5-16) and resulted in $76,136 in public assistance reimbursements to WC for emergency protective measures responding to storms and flooding, the repair of damaged infrastructure, and debris removal. Information regarding federal funds for the Village was not provided. DR 1296 / EM 3149 resulted from cascade effects associated with Hurricane Floyd. As noted in the Severe Storm section, Hurricane Floyd was classified as a Tropical Storm when it impacted the Village. Severe flooding/severe storm events resulted in the issuance of approximately $9 million in FEMA disaster relief funds to multiple counties throughout NYS, including WC. In February and March 2000, the Briarcliff Manor Union Free School District and the Village received approximately $925,000 in disaster relief funds from Floyd. DR 1146 was issued in November 1996; according to NYSEMO, total eligible damages were $16.1 million. Information regarding reimbursement fund amounts for WC and/or the Village was not provided.

- According to FEMA-NFIP, loss statistics for the Village between January 1, 1978, and April 30, 2006 estimated to be approximately $687,834 (FEMA-NFIP, 2006).

Probability of Future Events

FEMA FIRMs delineate special flood hazard areas and the risk premium zones in a community. These special flood hazard areas identify locations that have a chance of being flooded in any given year. As shown on Figure 5-15, the Village has 100-year and 500-year flood designations along the Hudson River, Pocantico River and Caney Brook. The 100-year flood designation means the area has a one-percent 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. Similarly, the 500-year flood designation means the area has a 0.2-percent chance of flooding in any given year. Earlier in this section, the identified hazards of concern for the Village were ranked. The NYS Hazard Mitigation Plan conducts a similar ranking process for hazards that affect the State. The probability of occurrence, or likelihood of the event, is one parameter used in this ranking process. Based on historical records and the above definitions, the probability of occurrence for flood events in the Village is considered frequent (that is, likely to occur more than once every 5 years).

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 flood plains. The following text evaluates and estimates the potential impact of severe storms on the Village including:

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

Overview of Vulnerability

Flood is a significant concern for the Village. The Pocantico River has been a historic source of flooding for the community. Various areas in the Village are designated as flood zones and the Village has experienced flooding in the past. To assess vulnerability, potential losses were calculated for the Village for flood events for 100-year and 500-year MRP flood events. The flood hazard exposure and loss estimate analysis is presented below.

Data and Methodology

Input data collected and reviewed for the flood hazard includes local damage data from historical flood events, FEMA Quality 3 (Q3) flood polygon data which delineate the 100- and 500-year flood plain boundaries, the Sea, Lake and Overland Surges from Hurricanes (SLOSH) model and input from the residents and the Planning Committee. Population data were taken from HAZUS-MH and are based on the most recent census conducted in 2000 (FEMA 2004). General building stock data was used as provided in HAZUS-MH, supplemented by local data regarding critical facilities and lifelines.

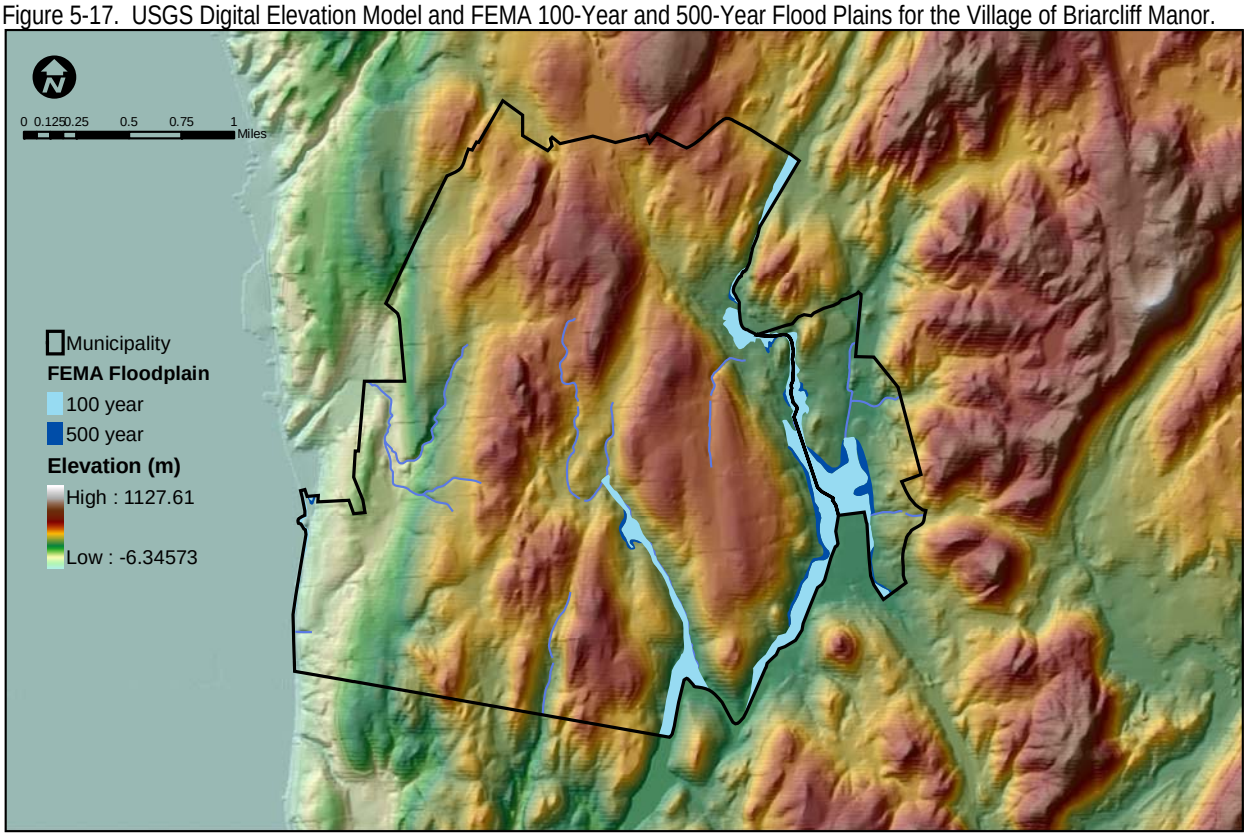
A *flood polygon* is a GIS vector file outlining the area exposed to the flood hazard. HAZUS-MH generates this polygon at the end of the flood computations in order to analyze the at-risk inventory.

A ***GIS shape file*** is a type of GIS vector file that was developed by ESRI for its ArcView software. This type of file contains a table and a graphic. The records in the table are linked to corresponding objects in the graphic.

It should be noted that the Census blocks and tracts in HAZUS-MH for the Village do not align exactly with the Village boundary and the FEMA Q3 flood polygon data provided by WC GIS. The Census blocks and tracts are shifted slightly west (into the Hudson River) and south. This affects where the Q3 flood polygon aligns with streams/rivers in the western, southern and southeastern portion of the Village. To model the 100-year and 500-year flood MRP events in HAZUS-MH, the location of the blocks and tracts were not moved. This should not significantly affect or change the results in this section because no critical facilities are located in the Q3 floodplain in the western and southern portion of the Village. In addition, the eastern portion of the Village does not appear to be affected and this is the along the Pocantico River where flood issues have historically been reported. All figures in this section, with the exception of Figures 5-20 to 5-22, illustrate the Village boundary (study region) as generated by HAZUS-MH.

The modeling approach used FEMA Quality 3 (Q3) flood zone flood polygon data and USGS Digital Elevation Model (DEM) data to estimate the base elevation. Figure 5-17 shows the DEM and FEMA Q3 flood zones used to model the flood event.

Figure 5-17. USGS Digital Elevation Model and FEMA 100-Year and 500-Year Flood Plains for the Village of Briarcliff Manor.

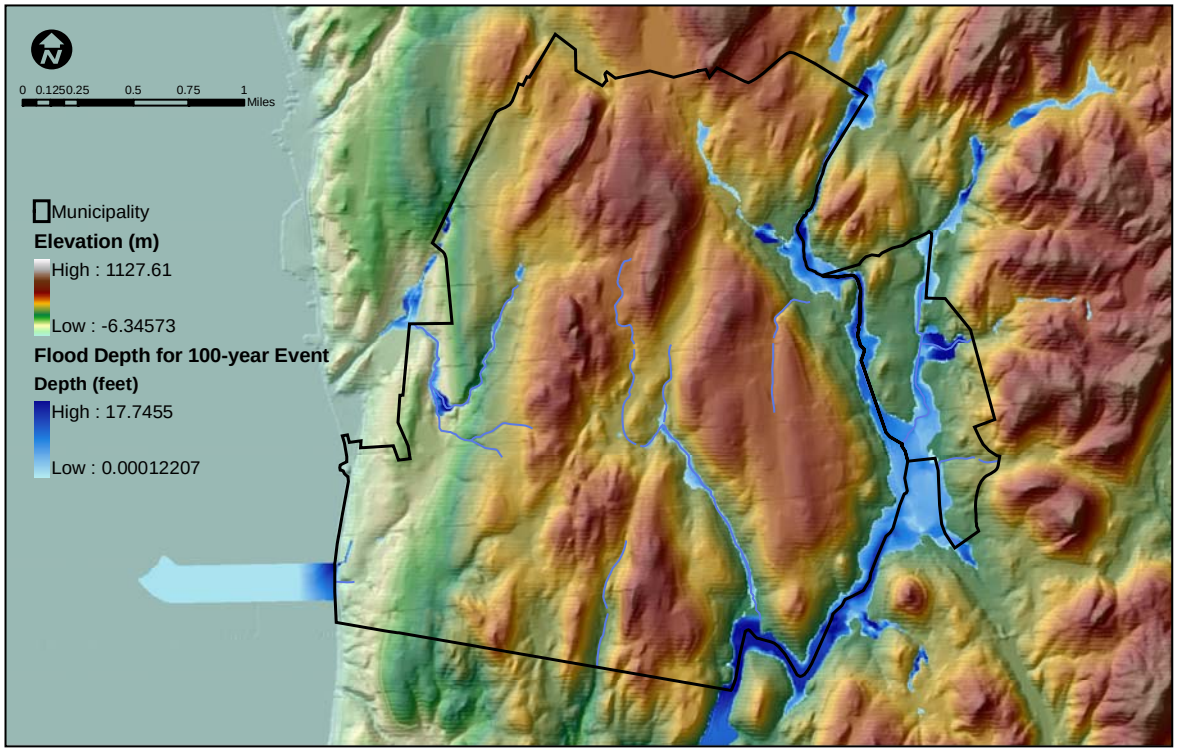


Sources: HAZUS-MH, 2005; USGS Digital Elevation Map.

The HAZUS-MH methodology was customized to analyze the flood hazard for the Village. Losses were estimated for a 100- and a 500-year MRP flood event. The 11 residential and 10 commercial occupancy classes available in HAZUS-MH were condensed into the following occupancy classes (residential, commercial, industrial, agricultural, religious, government, and educational) to facilitate the analysis and the presentation of results. Residential loss estimates address both multi-family and single family dwellings. In addition, impacts to critical facilities were evaluated for the 100-year and 500-year MRP flood events.

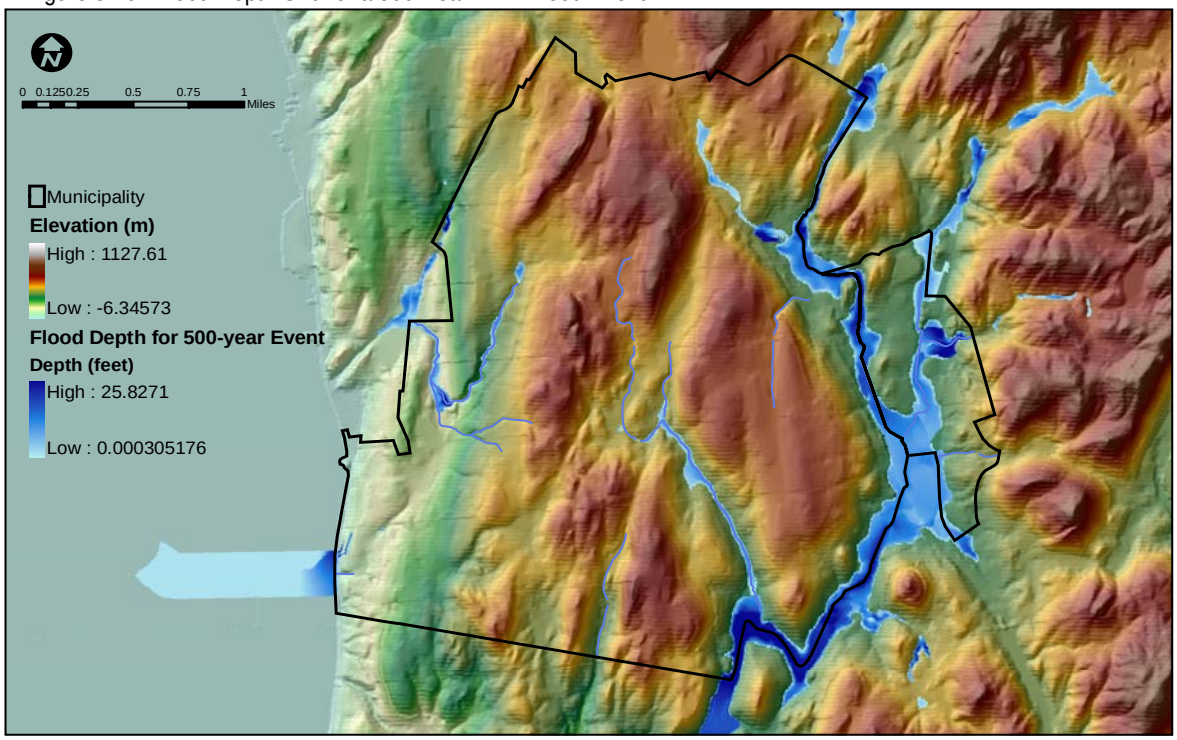
Population data were taken from HAZUS-MH and are based on the most recent Census data included in HAZUS-MH. Impacts to vulnerable populations are considered by evaluating the number of persons that qualify as vulnerable that are living in the flood-prone areas. Also, consideration of those in vulnerable structures (e.g., mobile homes) is conducted using the available data on these types of structures in the Village. Figures 5-18 and 5-19 show the DEM and flood depth grid generated by HAZUS for 100-year and 500-year flood events.

Figure 5-18. Flood Depth Grid for a 100-Year MRP Flood Event



Sources: HAZUS-MH; USGS DEM. Note: To illustrate the correct location of the FEMA floodplains relative to rivers/streams and the Village boundary, the Village boundary provided by WC GIS was used.

Figure 5-19. Flood Depth Grid for a 500-Year MRP Flood Event



Sources: HAZUS-MH; USGS DEM . Note: To illustrate the correct location of the FEMA floodplains relative to rivers/streams and the Village boundary, the Village boundary provided by WC GIS was used.

Impact on Life, Health and Safety

Using the data described above, HAZUS-MH was loaded and used to run flood scenarios, including for 100- and 500-year MRP flood events. These MRP flood events are generally those considered by planners and evaluated under federal programs such as the NFIP. Table 5-17 lists the population exposed to the 100- and 500-year MRP flood events. This is the number of persons living in Census blocks in or partially in an area designated as a flood zone.

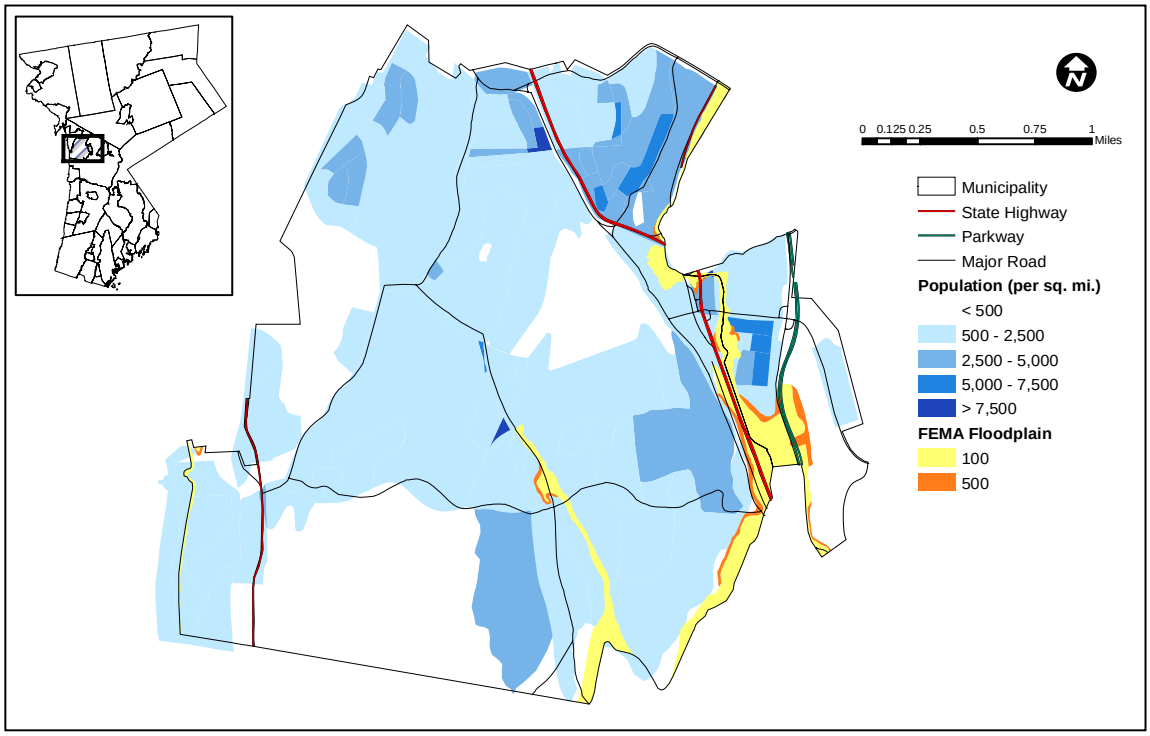
Table 5-17. Population Exposed to the Flood Events in Village of Briarcliff Manor

Population Exposed to 100-year MRP Flood Event	Population Exposed to 500-year MRP Flood Event
490	530

Source: HAZUS-MH, 2005.

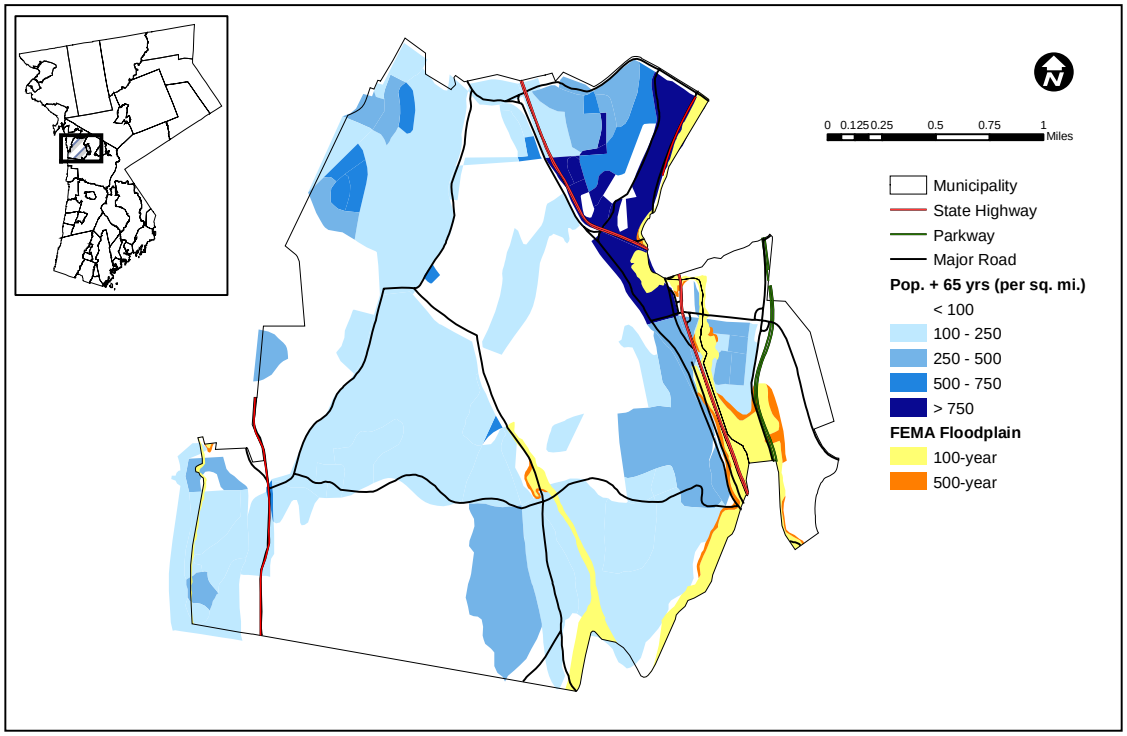
The table shows that approximately 6.4 percent of the total population of 7,696 is exposed to the 100-year flood event and that approximately 6.9 percent of the total population is exposed to the 500-year flood event. Exposure represents the population living in or near flood plain areas that could be impacted should a flood event occur. For this project, the potential population impacted is used as a guide to consider the potential maximum number of persons that may be displaced or require shelter during a flood. 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. Figure 5-20 shows the extent of the 100 and 500-year flood zone in relation to the population density to illustrate areas of the study area where a higher density of population is exposed to the flood hazard. Figures 5-21 and 5-22 show the population densities for the elderly and low-income populations in relation to the 100 and 500-year flood zone, respectively.

Figure 5-20. Distribution of Population Density Relative to 100- and 500-Year MRP Flood Plains in the Village



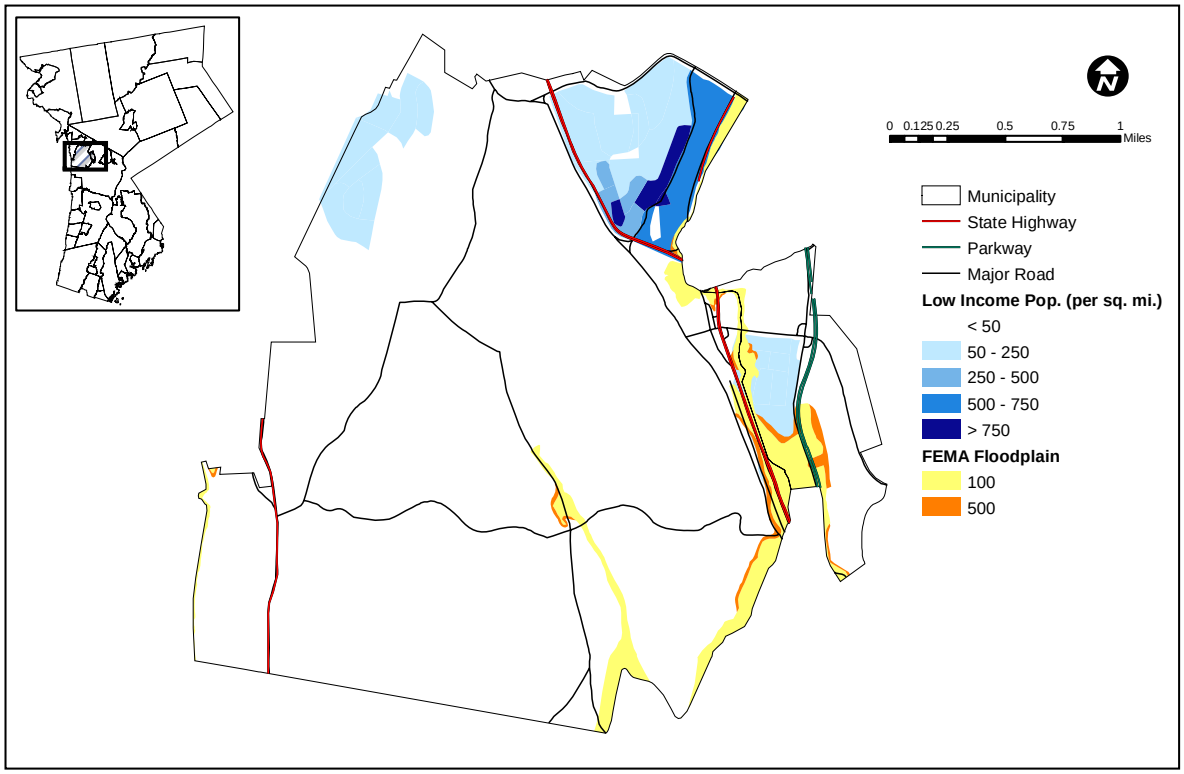
Note: To illustrate the correct location of the FEMA floodplains relative to rivers/streams and the Village boundary, the Village boundary provided by WC-GIS was used. Source: HAZUS-MH

Figure 5-21. Distribution of Elderly Population Density Relative to the 100- and 500-Year MRP Flood Plains in the Village



Note: To illustrate the correct location of the FEMA floodplains relative to rivers/streams and the Village boundary, the Village boundary provided by WC-GIS was used. Source: HAZUS-MH.

Figure 5-22. Distribution of Low-Income Population Density Relative to the 100- and 500-Year MRP Flood Plains in the Village



Note: To illustrate the correct location of the FEMA floodplains relative to rivers/streams and the Village boundary, the Village boundary provided by WC-GIS was used. Source: HAZUS-MH.

Impact on General Building Stock

After considering the population exposed to the flood hazard, the 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. Table 5-18 shows the total number of buildings located in the 100- and 500-year flood zone. Table 5-19 shows the exposed value of building stock for the various categories of building stock and the dollar value of loss associated with the 100- and 500-year MRP flood zones events. Figures 5-23 through 5-26, show the density of flood-related damage within the Village, for the residential and commercial building stock categories, respectively (for the 100- and 500 year MRP flood events).

Table 5-18. Buildings Exposed to the 100- and 500-Year MRP Flood Hazard Event in Village of Briarcliff Manor

Category of Building	100-year Flood	500-year Flood
	Number of Buildings Exposed	Number of Buildings Exposed
Residential Exposure (Single and Multi-Family Dwellings)	145	155
Commercial	3	4
Industrial	0	0
Agricultural	0	0
Religious	0	0
Government	1	1
Education	0	0
TOTAL AT-RISK	**149**	**160**

Source: HAZUS-MH modeling using general building stock data included in the model; US Census Bureau Data, Census 2000 (as updated for HAZUS-MH most recent release). The number exposed is the number located in the flood zone.

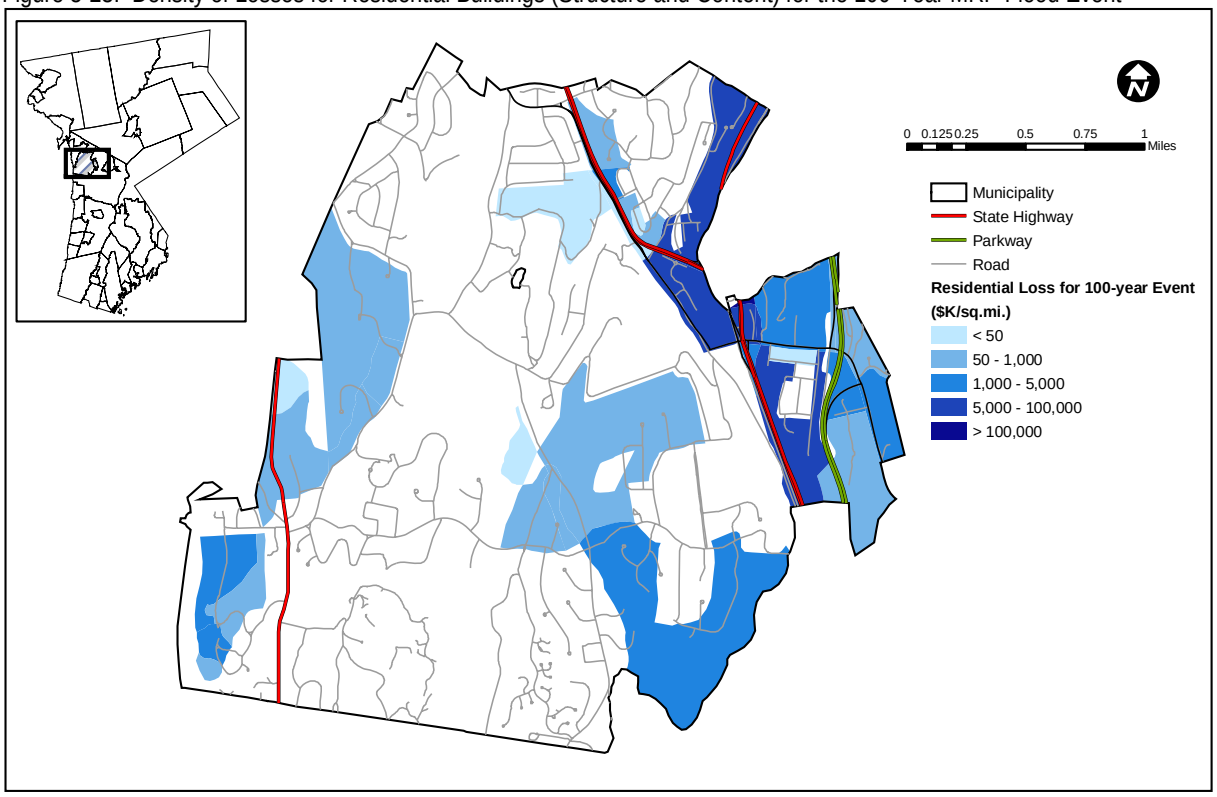
Table 5-19. Total Building Value (Structure and Contents) Exposed and Damaged for the 100- and 500-Year MRP Flood Events in Village of Briarcliff Manor

Category of Building	100-year Flood		500-year Flood	
	Total Building Value Exposed	Total Building Value Loss (Structure/Content)	Total Building Value Exposed	Total Building Value Loss (Structure/Content)
Residential Exposure (Single and Multi-Family Dwellings)	$67,543,800	$8,133,300	$72,384,900	$9,452,300
Commercial	$10,472,400	$1,114,500	$10,935,000	$1,245,400
Industrial	$438,000	$52,600	$461,600	$60,100
Agricultural	$84,000	$5,700	$86,200	$6,600
Religious	$177,400	$32,100	$190,800	$36,300
Government	$1,127,800	$68,100	$1,155,800	$77,900
Education	$0	$0	$0	$0
TOTAL AT-RISK	**$79,843,400**	**$9,406,300**	**$85,214,300**	**$10,878,600**

Source: HAZUS-MH, 2005; US Census Bureau Data, Census 2000. Notes: (1) Estimate includes building structure and content exposure for both Pre- and Post-FIRM buildings; (2) Although HAZUS-MH indicates there are zero (0) agricultural and religious buildings present in the 100-year floodplain and zero (0) industrial and religious buildings present in the 500-year floodplain, it estimates building value exposed in these occupancy classes; this results because HAZUS-MH calculates building count and damage based on square footage and compares these values and building valuation to the average for the Census block. In this case, the building value exposed to the flood event is above average for that Census block and a value is reported by HAZUS-MH. Census Bureau Data, Census 2000.

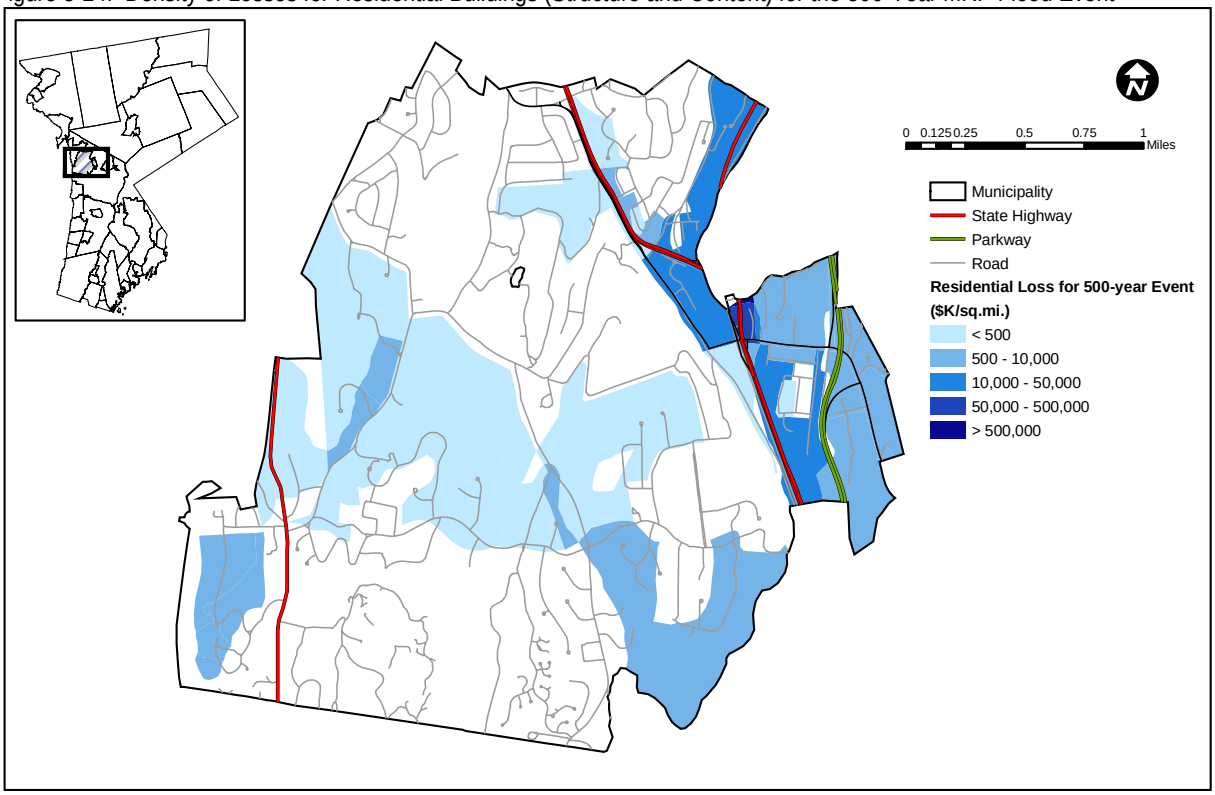
The total loss for the 100-year flood event indicates that 11.8 percent of the total exposed building value could be impacted by the 100-year flood. Approximately 12.8 percent of the total exposed building value could be impacted by the 500-year flood. This shows the significant risk the flood hazard incurs.

Figure 5-23. Density of Losses for Residential Buildings (Structure and Content) for the 100-Year MRP Flood Event



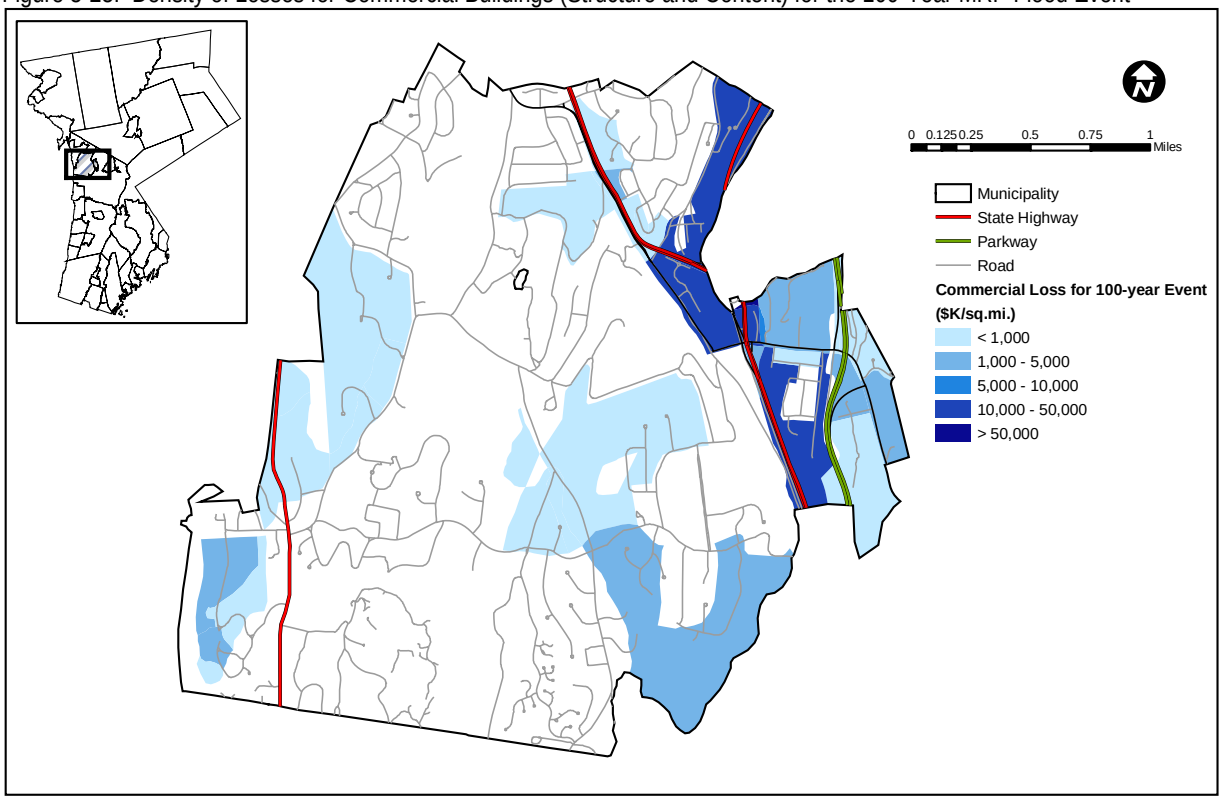
Note: The municipality boundary is the study area generated in HAZUS-MH based on Census blocks and tracts. Source: HAZUS-MH

Figure 5-24. Density of Losses for Residential Buildings (Structure and Content) for the 500-Year MRP Flood Event



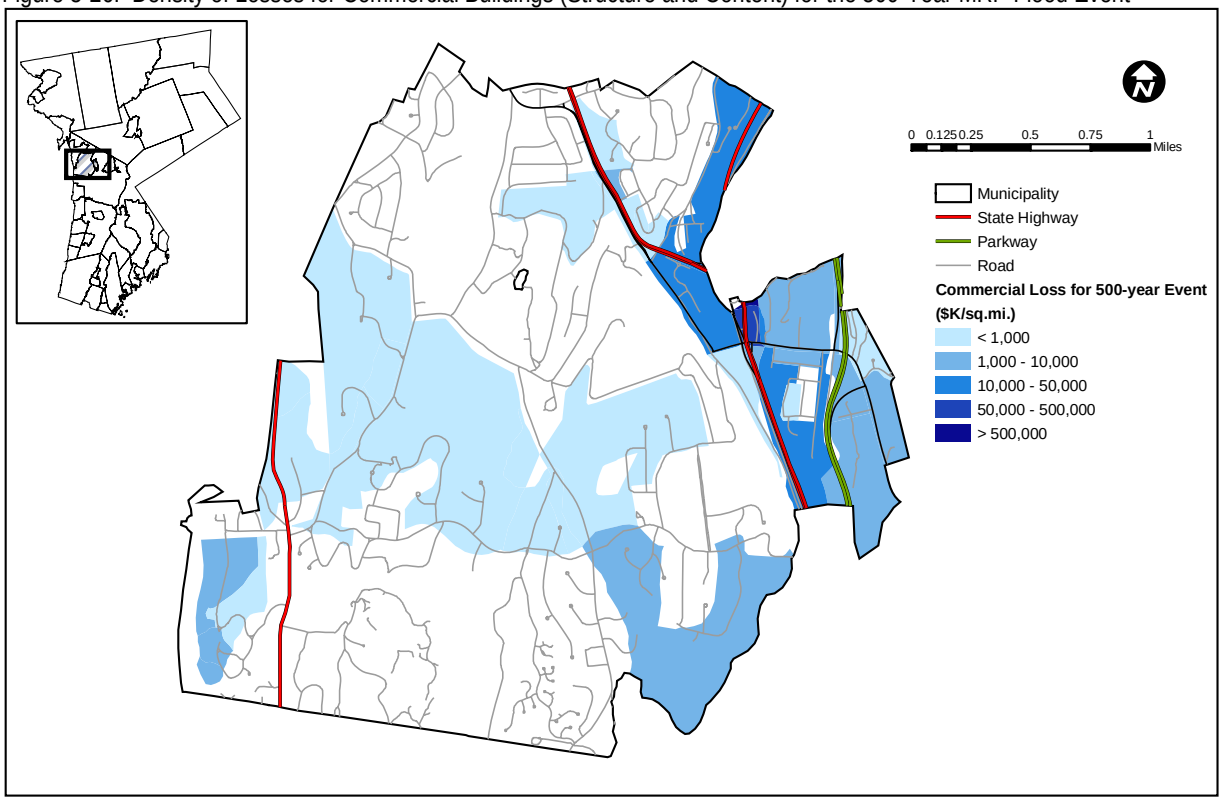
Source: HAZUS-MH, 2005. Note: The municipality boundary is the study area generated in HAZUS-MH based on Census blocks and tracts.

Figure 5-25. Density of Losses for Commercial Buildings (Structure and Content) for the 100-Year MRP Flood Event



Source: HAZUS-MH, 2005. Note: The municipality boundary is the study area generated in HAZUS-MH based on Census blocks and tracts.

Figure 5-26. Density of Losses for Commercial Buildings (Structure and Content) for the 500-Year MRP Flood Event

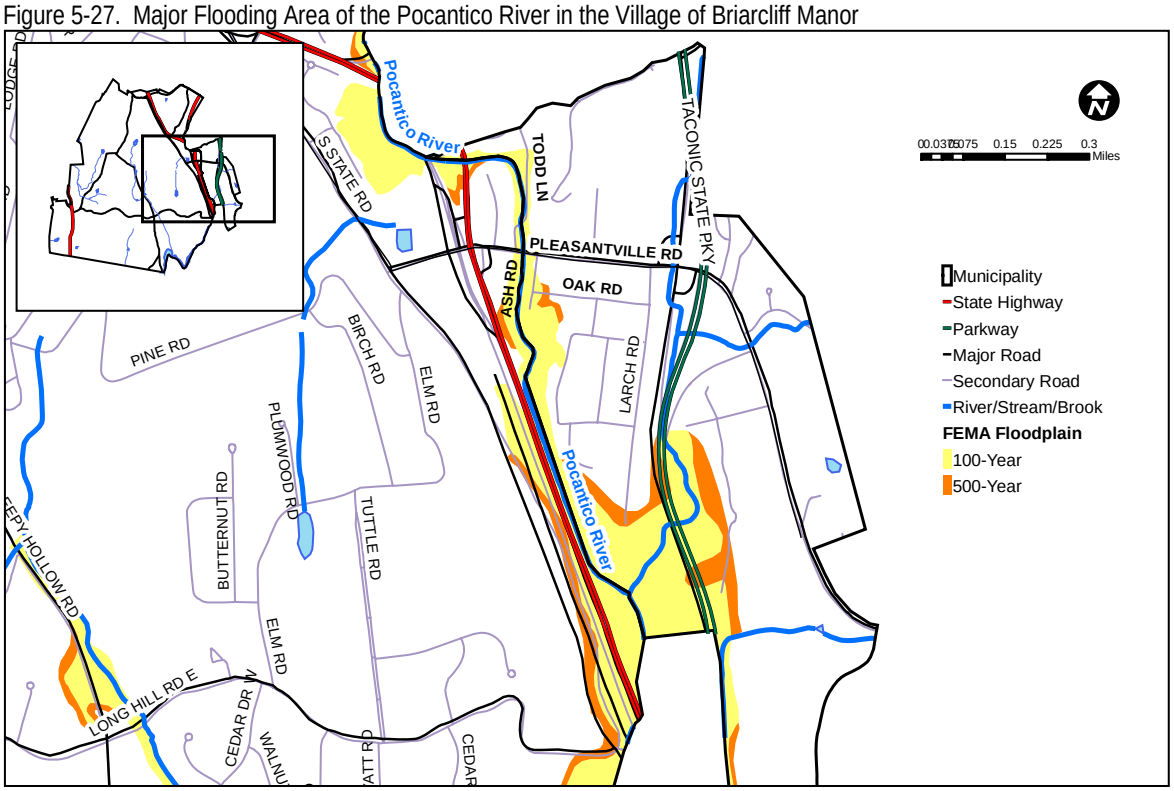


Source: HAZUS-MH, 2005. Note: The municipality boundary is the study area generated in HAZUS-MH based on Census blocks and tracts.

In September 1999, the Village experienced flooding associated with Tropical Storm Floyd. The Pleasantville Road Bridge Enhancement Project HMGP application indicates flooding due to Tropical Storm Floyd was estimated as being greater than a 100-year event and impacted five residential homes. Responses to the Briarcliff Manor Natural Hazards Preparedness Questionnaire indicate serious widespread flooding to a greater number of homes in the Village during this storm. Residents along the following streets indicated flooding in basements/crawlspaces, over first-finished floors and in low-lying and poor drainage areas: Apple Lane, Ash Road, Burns Place, Crest Drive, Elm Road, Fuller Road, Holbrook Road, Juniper Place, Linden Circle, Old Briarcliff Road, Pleasantville Road, Poplar Road, Quinn Road, and Sleepy Hollow Road (Appendix C). In addition, residents along Oak Road, Horsechestnut Road and Todd Lane also experienced flooding. As presented in newsletters by Governor Pataki in February and March 2000, the Briarcliff Manor Union Free School District and the Village received approximately $925,000 in disaster relief funds from the Hurricane Floyd hazard incident.

Local data indicates one major flooding area of the Pocantico River is near Pleasantville Road. Flood-prone residential buildings are located along Ash Road, Oak Road, Pleasantville Road, and Todd Lane. According to the Pleasantville Road Bridge Enhancement Project HMGP application, there are nine houses on Ash Road, two houses on Oak Road, three houses on Pleasantville Road, and two houses on Todd Lane that are subject to flooding by storms as frequent as a 10-year event. Figure 5-27 illustrates the flood-prone areas referred to in the HMGP application. Table 5-20 lists the number of residential buildings impacted by historical flood events as documented in the HMGP application.

Figure 5-27. Major Flooding Area of the Pocantico River in the Village of Briarcliff Manor



Sources: HMGP Grant Application and HAZUS-MH, 2005.

Table 5-20. Number of Residential Buildings Estimated to be Impacted by Flood Events

Flood MRP Event	Number of Residential Buildings
10-Year	14
50-Year	16
100-Year	18
500-Year	20

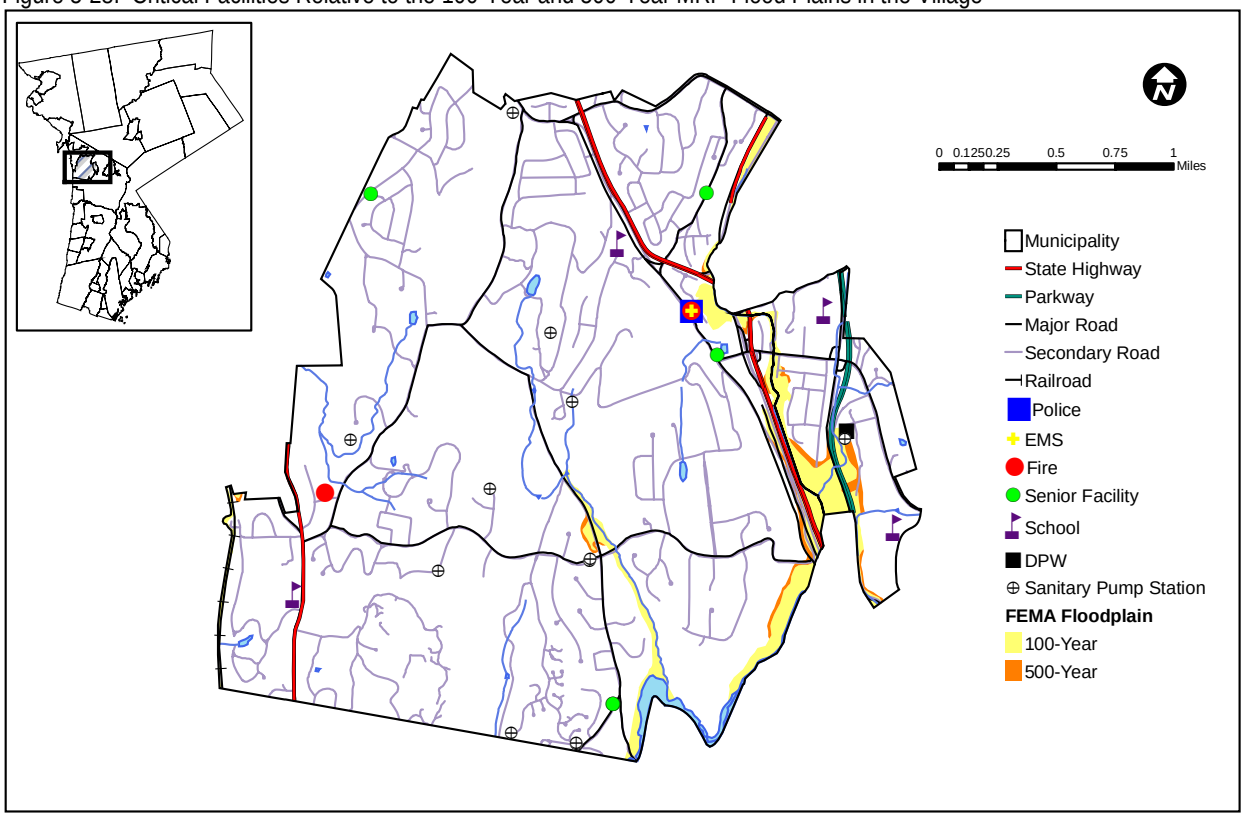
Source: Pocantico River Channel Widening Project HMGP Application, 2000.

FEMA records indicate that one single family building and one "non-resident" building are considered repetitive loss properties in the Village. As of July 2006, Village repetitive loss payments total $52,639.25 ($44,811.75 for building and $7,827.50 for contents). In total, the Village has had 36 losses with $687,833 paid in losses. Currently, there are 44 policies in place for a total of $11,449,400.

Impact on Critical Facilities and Infrastructure

In addition to considering general building stock at risk, the risk of flood to critical facilities was evaluated. Critical facilities for this plan include police, fire, EMS, schools, hospitals, senior facilities and transportation systems. Figure 5-28 shows critical facilities and their location in relation to the 100- and 500-year floodplains.

Figure 5-28. Critical Facilities Relative to the 100-Year and 500-Year MRP Flood Plains in the Village

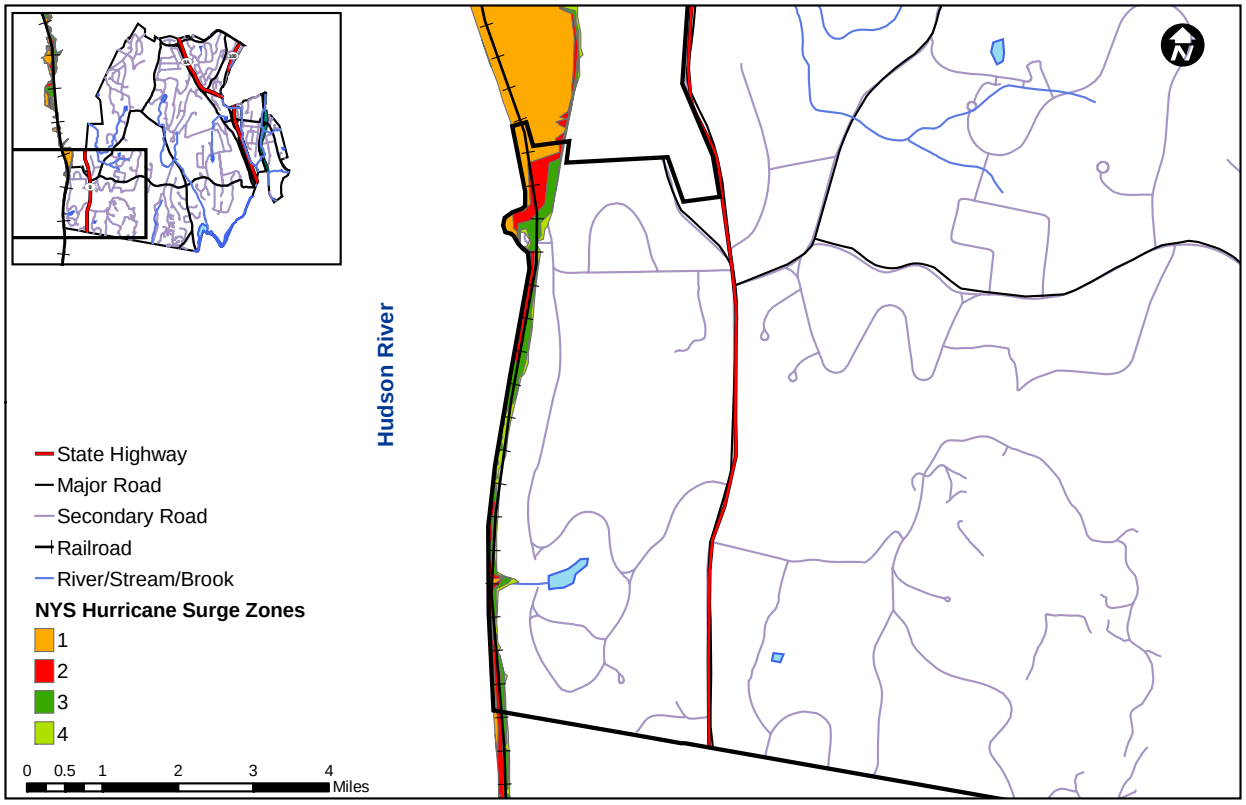


Source: Local Data and HAZUS-MH, 2005.

According to HAZUS-MH, no critical facilities are impacted by the 100- and 500-year flood. However, the Department of Public Works, Metro-North Commuter Railroad line, and one sewer pump station are located in the floodplain. The Scarborough Train Station is located in the 100-year floodplain; however the calculated loss as a result of a 100-year flood is not known given limited valuation data for this structure. The Village DPW building is located in the 500-year floodplain, with most of the yard located in the 100-year floodplain. The Village salt supply and equipment are vulnerable to flooding. HAZUS-MH indicates flood depth in the DPW area would be 0.02 to 2 feet for a 100-year event and 0.08 to 2.5 feet for a 500-year event. Flood depth increases to the west and south of the building.

The National Hurricane Center SLOSH model computes storm surge heights from tropical cyclones. The model indicates the western portion of the Village along the Hudson River can be affected by increased storm surge elevation. Critical facilities that may be impacted include the Metro-North Commuter Railroad line and the Scarborough Train Station (Figure 5-29).

Figure 5-29. SLOSH Model Western for the Portion of the Village of Briarcliff Manor



In cases where short-term functionality is impacted by a hazard, other municipal facilities of neighboring municipalities may need to support response functions during a disaster event. Mitigation planning should consider means to reduce impact to critical facilities and ensure sufficient emergency and school services remain when a significant event occurs.

HAZUS-MH estimates that 1,485 tons and 2,234 tons of debris will be generated by a 100-year and 500-year MRP flood events, respectively. The debris estimates includes three general categories: (1) Finishes (dry wall, insulation, etc.); (2) Structural (wood, brick, etc.); and (3) Foundations (concrete slab, concrete block, etc.). Finishes comprises 73% and 65% of the 100-year and 500-year event total debris estimates, respectively.

HAZUS-MH estimates 36 households will be displaced due to a 100-year MRP flood event and 15 people will seek temporary shelter in public shelters. For a 500-year event, HAZUS-MH estimates 47 households will be displaced and 53 people will seek temporary shelter. These estimates are based on the number of households impacted, average persons per household, and historic data on the number of persons that seek shelter compared to those that arrange to stay with relatives or otherwise obtain temporary housing.

Impact on Economy

Sufficient information was not available to perform a detailed assessment of estimated losses to the economy.

Impact on New Buildings, Critical Facilities and Infrastructure

As identified in Section 4, "Village Profile – Future Development", at this time the Village anticipates residential and limited business development within the Scarborough Road Corridor, which will require improvements to stormwater management systems in the area. While there are no identified floodways or floodplains within those tracts most likely for development, proper stormwater facilities would be needed to manage stormwater runoff. The presence of steep slopes throughout this area could exacerbate sheet-flow of stormwater which could lead to flash flood problems.

Additional Data Needs and Next Steps

Over time, the Village will continue to work together to learn more about the flood hazard, enhance participation in FEMA's NFIP, and support further mitigation efforts as discussed in Section 6 to reduce the losses should future flood events occur. Refinement of floodplain maps and improvement of local inventory data will support refined analyses using the flood model over time. Future evaluations may apply the HAZUS-MH model to study particular reaches of concern in greater detail. Also, the model may be used to estimate the impact of particular mitigation activities that could be implemented to reduce flood risk. Also, as new or refined flood maps are created and development and mitigation efforts occur, future evaluations will consider any changes to the flood loss estimates presented in this plan.

For the final report, Census blocks and tracts can be shifted to align with the proper Village boundary and the 100-year and 500-year models rerun. In addition, building and utility valuation data can be updated to reflect current/true values for a more accurate exposure and damage estimate.

Overall Vulnerability Assessment

The flood hazard is evaluated as a significant threat, which was ranked overall as a "high" risk (see Table 5-7). This hazard can be managed and planned for through the mitigation strategy and specific activities outlined in Section 6, which build on efforts already undertaken by this community.