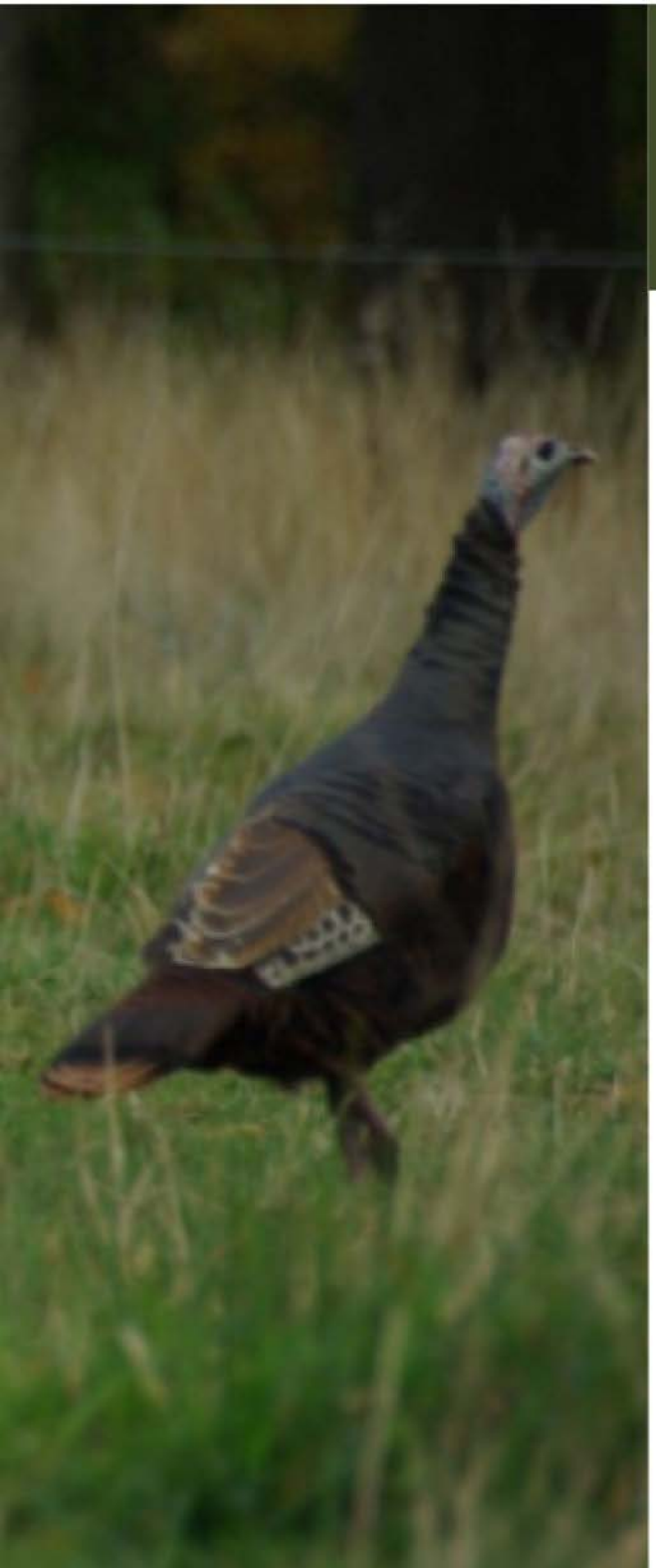
TOWN OF STAMFORD

Hazard Mitigation Plan

MUNICIPAL ADOPTION DATE:

FEMA ADOPTION DATE:

BCRC



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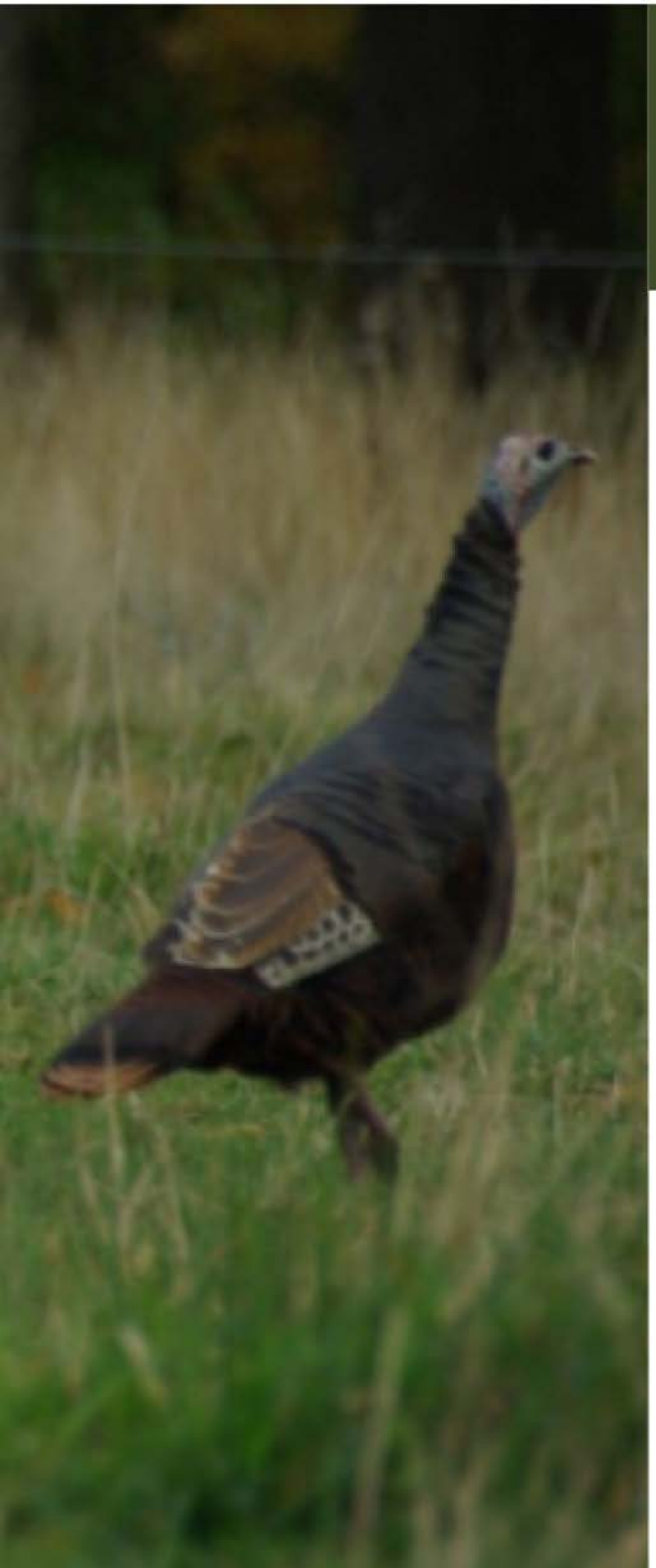

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INTRODUCTION

This single jurisdiction Hazard Mitigation plan is an UPDATE to a plan approved by the Federal Emergency Management Agency (FEMA) effective November 19, 2015 and expired November 19, 2020.

PURPOSE

Hazard mitigation actions are designed to reduce potential losses from natural hazards such as flooding, landslides, wildfire, and similar events. Hazard mitigation plans identify, assess and prioritize those hazards and present actions that a community can undertake to reduce risks and damage from those natural hazards (Federal Emergency Management Agency 2013a).

This plan is intended to identify, describe, and prioritize potential natural hazards that could affect the Town of Stamford in Bennington County, Vermont and provide specific measures to reduce or avoid those effects. The Federal Emergency Management Agency (FEMA), within the U.S. Department of Homeland Security and Vermont Emergency Management advocate the implementation of hazard mitigation measures to save lives and property and reduce the financial and human costs of disasters.

This Hazard Mitigation Plan is funded through a FEMA planning grant under the 2018 Pre-Disaster Mitigation Grant Program.

Parts of the Plan

1

Town Profile

Description of the town within the regional context, its demography and how its land is used, its economic and cultural resources, and its critical facilities.

2

Planning Process

Descibes the planning process along with a list of planning committee members and dates of meetings and public and agency review.

3

Hazard Assessments

Analysis of the following natural hazards:

- Floods, Flash Floods and Fluvial Erosion
- Winter Storms
- High Wind events
- Hail
- Extreme Heat and Extreme Cold
- Drought
- Wildfire
- Earthquake
- Landslide
- Invasive species
- Hazardous Material Spills
- Infections Disease Outbreak

4

Vulnerability Assessment

Review of each hazard to prioritize those that pose the greatest threat to Stamford.

5

Mitigation Measures

A review of past and current plans, mitigation goals, town capabilities, and the mitigation actions Stamford will be focusing on over the next 5 years.

6

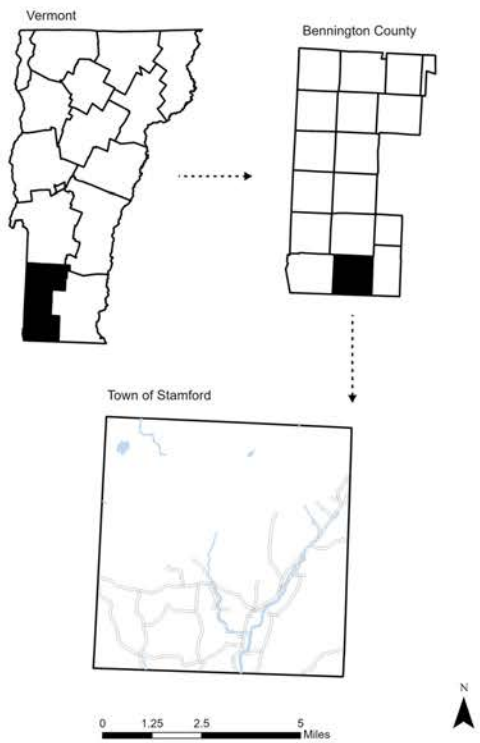
Plan Maintenance & Updates

Maintenance and future updates to the plan.

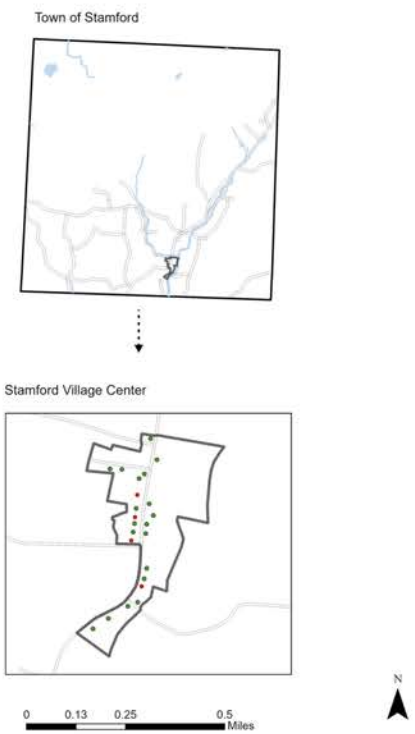
1 Town Profile

REGIONAL CONTEXT

The Town of Stamford is located in the southern part of Bennington County, Vermont (Map 1). The town is bordered by Pownal, Vermont to the west; Woodford, Vermont to the north; Readsboro, VT to the east; and Clarksburg and Florida, Massachusetts to the south. The southeast corner touches the northwest corner of Monroe, Massachusetts. The main road through Stamford is Route 8/100, which follows the Hoosic River valley as the river flows southwest. Most of the town is forested, with the Hoosac Range to the east and the Green Mountains to the north and west.



MAP 1: LOCATION OF TOWN OF STAMFORD (PREPARED BY BENNINGTON COUNTY REGIONAL COMMISSION, AUGUST 2023)



MAP 2: STAMFORD VILLAGE CENTER (SOURCE: BENNINGTON COUNTY REGIONAL COMMISSION, AUGUST 2023)

DEMOGRAPHY AND LAND USE

The population as of 2022 was 1,016. The town population increased 4.5% from 2010. In Stamford, 79% of housing units are owner-occupied, 5% are renter-occupied and 16% are seasonal. The most current estimates indicate that only 82% of the housing stock is occupied, and 5% of those occupied units are rental housing (American Community Survey 5-year estimates 2022). The population of Stamford is largely between 50-69 years of age (Figure 1) indicating an aging population.

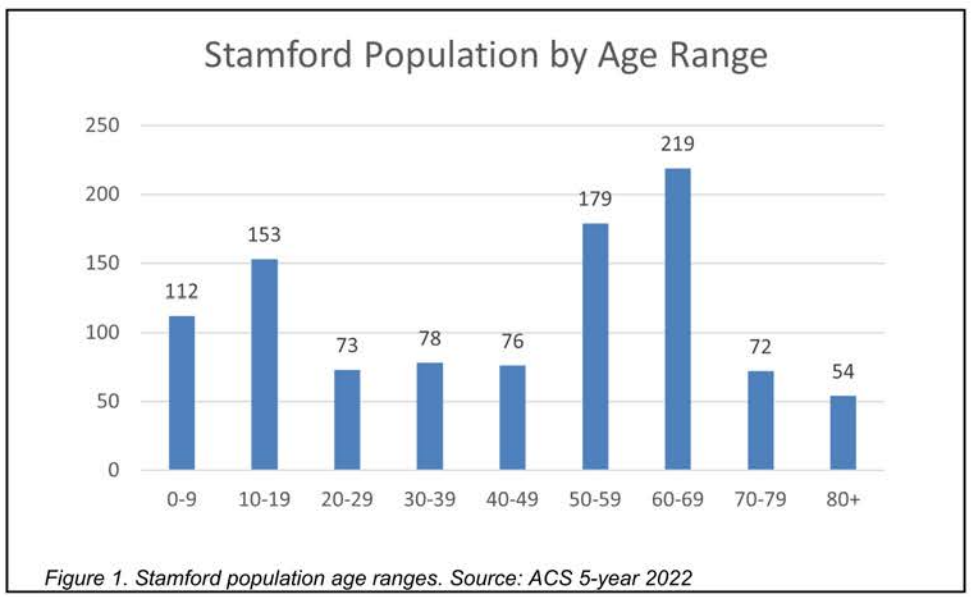


Figure 1. Stamford population age ranges. Source: ACS 5-year 2022

Stamford occupies a total land area of 39.6 square miles. Stamford has a designated Village Center (Map 2), through the Vermont Agency of Commerce and Community Development, which supports the revitalization and economic development of historic centers in Vermont through assistance and funding opportunities. The Village Center is located in the southern part of the community along VT Route 100 (Main Road).

[1] Stamford is located in Census Tract 9706.01 Block 2

The town office complex, consisting of the town hall, library, and elementary school, are all in the Village Center, as well as two churches, the fire department, and a country store. Residential development is mostly along VT Route 100 (Main Road), or the few roads that branch off VT Route 100 (Main Road). The town is mainly scattered residential homes, patches of open fields, and woodland areas among hills and mountains. There has been little to no new recent development in Stamford. Nearly half of the town is under public ownership, either in state lands or part of Green Mountain National Forest.

ECONOMIC AND CULTURAL RESOURCES

Economic resources are best summarized by the types of building uses. The different uses by type found in Stamford are listed in Table 1.

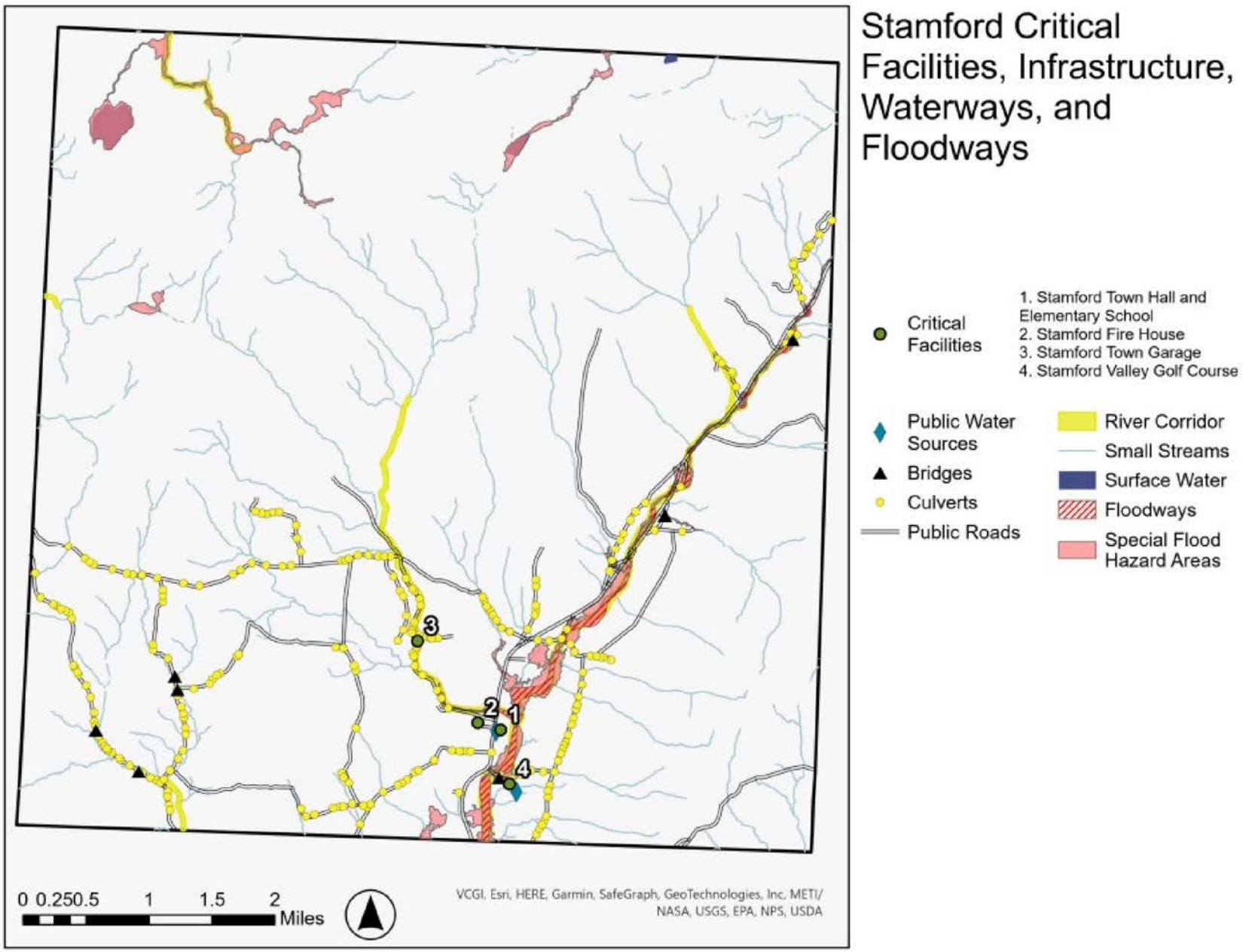
Large commercial businesses, such as grocery stores and large retail stores, are located across the Massachusetts border in North Adams. One general store provides the town with basic necessities such as gasoline and groceries.

Elementary school students attend school at the Stamford School from preschool to grade 8 (Map 3). High school students have school choice and may attend schools in North Adams, Massachusetts, Bennington, Vermont, Whitingham, Vermont, or local private schools throughout the area.

Emergency medical services are provided by Northern Berkshire Emergency Medical Service out of North Adams, Massachusetts. Medical services are accessed at the Berkshire Medical Center in Pittsfield, Massachusetts or in Bennington, Vermont at Southwestern Vermont Medical Center. Both medical centers are located a substantial distance away from Stamford. Stamford has its own volunteer fire department located just off Route 100, approximately a quarter of a mile from the town clerk's office. Vermont State Police provides law enforcement coverage out of the Shaftsbury, Vermont barracks.

Table 1. Stuctures by type in Stamford.
Source: Vermont Geoportal 2023 data

Type	Number of Buildings
Single-family Dwelling	387
Multi-family Dwelling	13
Mobile Home	9
Camp	65
Other Residential	3
Commercial	10
Commercial Farm	3
House of Worship	3
School	1
Recreation	1
Fire Station	1
Library	1
Town Garage	1
Town Office	1
Utility	1
Other	4
Grand Total	**504**



Map 3: Stamford Critical Facilities, Infrastructure, Waterways, and Floodways (Source: Bennington County Regional Commission, August 2023)

CRITICAL FACILITIES

Table 2 lists and describes critical facilities (also shown in Map 3), including the shelter and emergency operations center, located at the Stamford Elementary School and the Stamford Fire House, respectively. The transportation system also represents a set of critical facilities. Stamford has over 30 miles of public roads, with VT Route 8/100 as the only state highway. There are also private roads in some sections. Some road sections are steep and follow streams requiring frequent maintenance. Over half of the town budget goes to road maintenance (Stamford Town Plan 2019). The public water supply is considered a critical facility as well. There are two public water sources, one at the Town Hall and the second at the Stamford Valley Golf Course. Otherwise, property owners are served by on-site wells and septic systems.

Table 2. Stamford Critical Facilities
Source: Stamford Planning Team, and 2022 Local Emergency Management Plan

Name	Description
Stamford Town Hall, Elementary School	This building includes the town hall, school, and library. It also serves as the emergency shelter and is one of two public water sources.
Stamford Fire House	Provides fire protection for the community and mutual aid for nearby towns. This is also the location of the Emergency Operations Center.
Stamford Highway Garage	This also serves as the town's transfer station for solid waste.
Stamford Valley Golf Course	This includes the second public water supply.
Bridges and culverts	Throughout town.

2 Planning Process

PLANNING TEAM

The Town of Stamford signed a contract with the Bennington County Regional Commission to begin work on the Hazard Mitigation Plan update in February 2023. This is the second hazard mitigation plan for Stamford. The previous plan was adopted in 2015. The members of the hazard mitigation planning team are listed in Table 3 below. Many members of the planning team take on multiple roles within the town. The fire chief doesn't just answer to fire calls but other emergency calls throughout the town and interacts with many of the town's most vulnerable residents.

Table 3. Planning team members

Name	Affiliation
Bill Levine	Stamford EMD
Lori Shepard	Stamford Town Clerk
David Tatro	Road Foreman
Paul Ethier	Stamford Fire Department
Nancy Bushika	Selectboard Chair

PUBLIC INVOLVEMENT

A kick-off planning meeting was held in March 2023 during their publicly warned Select Board meeting. During this meeting, the planning team was created. Several meetings where the progress of the plan update was discussed, and public input requested, were publicly warned according to the Vermont Open Meetings Law. Dates are listed in Table 4.

Table 4. Dates of meetings

Meeting	Dates	Notes
Kick-off meeting, planning team created*	March 2, 2023	Several town residents were present. They provided no comments.
Planning team meeting	July 20, 2023	Review the process going forward due to change of hands at BCRC. Several town residents were present. They provided no comments at that time.
Public Meeting	July 28, 2023	Publicly warned planning meeting. Review of stakeholders and the survey was reviewed prior to distribution. Questions were asked to clarify some information for the plan.
Planning team meeting	October 3, 2023	BCRC reviewed the community survey with the team. Potential hazard areas were discussed and a vulnerability assessment was conducted for each hazard,
Public Meeting	November 16, 2023	BCRC reviewed each mitigation action with the group and a cost/benefit analysis was completed for each action. Members of the public attended and provided feedback on the actions.
First draft published	March 11, 2024	First draft made available for public and municipal review by the planning team

Table 4. Dates of meetings		
Meeting	Dates	Notes
Select Board adoption of the Hazard Mitigation Plan		

The plan was posted on The Town of Stamford website, where town information is posted, and on the Bennington County Regional Commission website. The plan was sent to the Select Board Chairs of the surrounding towns of Pownal, Readsboro, and Woodford in Vermont, and Clarksburg, Florida, and Monroe in Massachusetts for comments. The plan was also sent to the Windham Regional Commission, as Readsboro is part of their region. The plan was also sent to the following organizations/agencies that provide services to Stamford: Vermont State Police, Bennington County Sheriff's Department, Green Mountain Power, Consolidated Services, and Bayada Home Health Care. Each were asked to share the plan with appropriate staff and officials. A flier posted at Billmont's Country Store gave information on where to find the plan to review on BCRC's website. Comments were requested to be sent by email to Dara Zink at the Bennington County Regional Commission at dzink@bcrcvt.org by April 8, 2024. Once the comment period ended, and public comment incorporated, the plan was sent to Vermont Emergency Management for review. Following the review by Vermont Emergency Management, the Select Board adopted the plan, dated _____, at their _____ meeting.

3 Hazard Assessment

This section addresses each of the potential natural hazards based on data from the following sources:

- Local knowledge
- The National Centers for Environmental Information Storm Events Database
- FEMA lists and descriptions of past disaster declarations
- The Vermont Department of Forests, Parks and Recreation data on wildfires
- HAZUS runs on potential earthquake damage
- The Pownal and North Adams cooperative weather stations for data and temperature and precipitation normals from 1981-2010
- Standardized Precipitation Index calculated from 1985 to 2014 from NOAA on Drought.gov
- Hazardous material spills from VT ANR
- Infectious disease outbreaks listed from the Vermont Department of Health (these fluctuate so only the most recent data are used)
- The 2018 Vermont Hazard Mitigation Plan
- FEMA 2010 Flood Insurance Study, Bennington County, Vermont and Incorporated areas, Federal Emergency Management Agency Study Number 5003CV000A
- Flood Inundation Mapper by the United States Geological Survey, stream gauge information for the stream gauge located on the Hoosic Rover near Williamstown. Available via: https://fim.wim.usgs.gov/fim/?site_no=01332500
- Observations of invasive species compared to the state and federal lists of noxious species
- Vermont Agency of Natural Resources and Vermont Agency of Natural Resources on invasive species
- The probability, impact, and vulnerability for each hazard was based on the rating information in Table 19. This is the same assessment information used in the 2018 State Hazard Mitigation Plan.

Floods, Flash Floods, and Fluvial Erosion

Flooding/Flash Floods

North Branch of the Hoosic River in the Green Mountains. Image from https://hoorwa.org/virtual-tour/

Flooding and associated fluvial erosion are the most frequent and damaging natural hazards in Vermont. The National Weather Service (2010) defines a flood as “any high flow, overflow, or inundations by water which causes or threatens damage.” A flash flood is …” a rapid and extreme flow of high water into a normally dry area, or a rapid water rise in a stream or creek above a predetermined flood level.” These are usually within six hours of some event, such as a thunderstorm, but may also occur during floods when rainfall intensity increases, thereby causing rapid rise in flow.

Floods may reach the following magnitude levels in one or more reaches, but not necessarily all. The NWS impact categories are:

- **Minor Flooding** - minimal or no property damage, but possibly some public threat.
- **Moderate Flooding** - some inundation of structures and roads near a stream. Some evacuations of people and/or transfer of property to higher elevations.
- **Major Flooding** - extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevations.
- **Record Flooding** - flooding which equals or exceeds the highest stage or discharge observed at a given site during the period of record keeping.

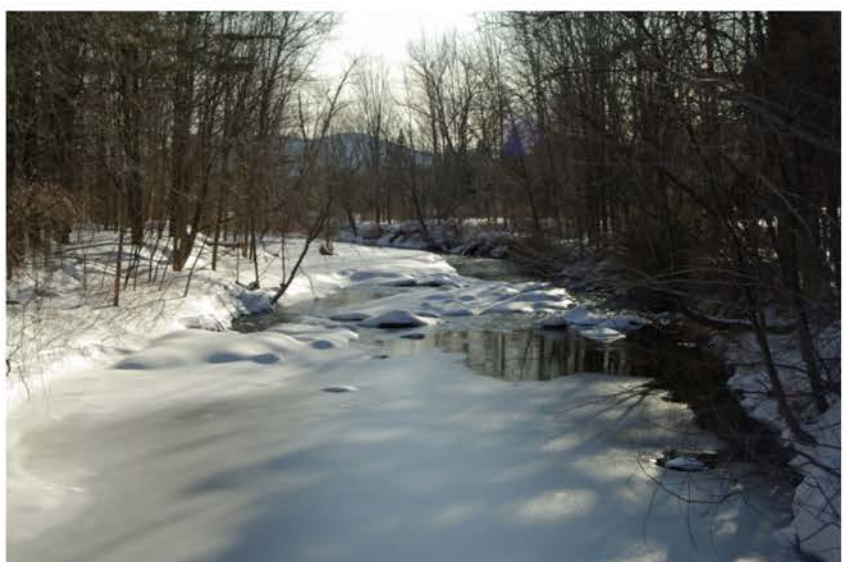
Runoff from snowmelt in the spring, summer thunderstorms, and tropical storms and hurricanes can all result in flooding in Stamford. Ice jam flooding can occur on Vermont rivers when substantial ice forms followed by several days of warmth, snowmelt, and any rainfall leading to ice breakup. As the ice breaks up on the rivers, chunks of ice form jams which cause localized flooding on main stem and tributary rivers. Ice jams are most prevalent during the January thaw (late January) and in March and April as spring approaches.

Flash floods can occur after spring melt of mountain snow, following large storms such as Tropical Storm Irene, or after significant thunderstorms. Digital flood zone maps (DFIRMs) became effective December 2, 2015 and were adopted by Stamford. Map 3 shows the location of both flood hazard areas and river corridors.

Most development along streams in Stamford is along the North Branch of the Hoosic River and the tributaries to it: Basin Brook, Brown Brook, Roaring Brook, Sumner Brook and two unnamed tributaries near the Massachusetts border. These streams can be very flashy during severe weather. While some flood losses are the result of inundation, more often flood losses are caused by fluvial erosion ranging from gradual bank erosion to catastrophic changes in the location of the river channel (Vermont River Management Program 2010).

The closest river gage is along the Hoosic River in Williamstown, MA approximately eight miles downstream of the Stamford/Clarksburg border. This river gage lists thirteen feet as the major flood stage. That was exceeded on the following dates (National Weather Service 2023)[2]:

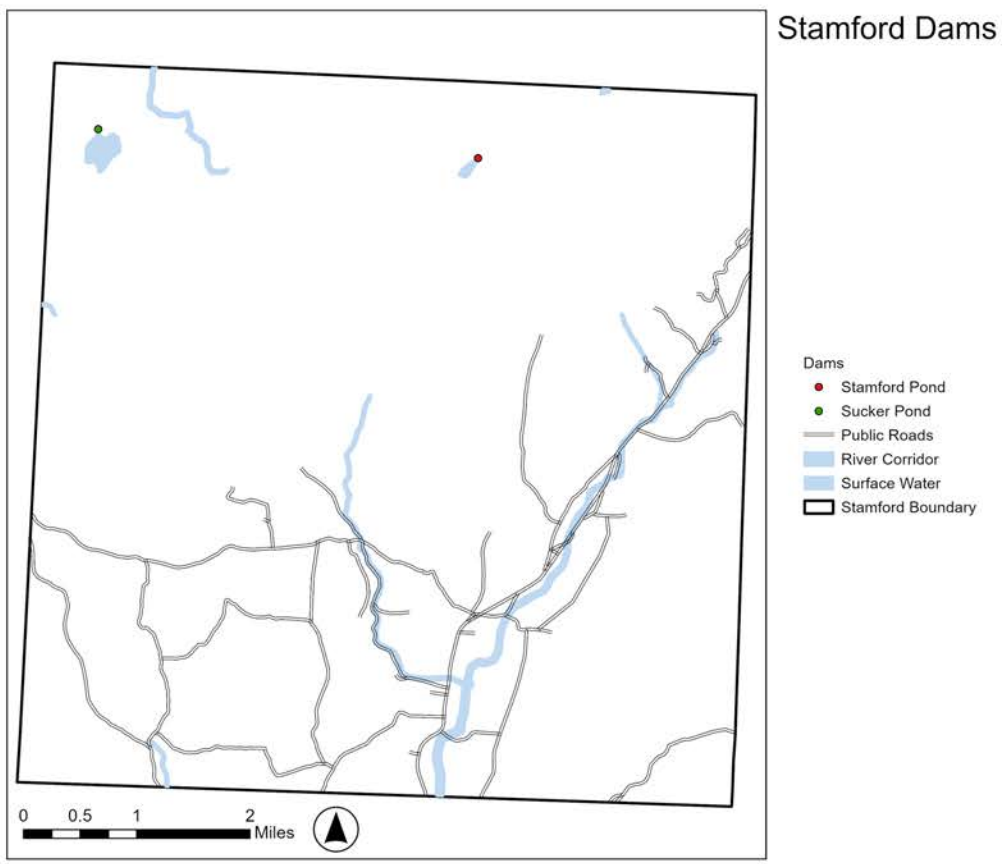
December 31, 1948 – 14.85 feet
November 26, 1950 – 13.85 feet
August 28, 2011 – 13.75 feet
August 10, 1976 – 13.02 feet



Ice melting along river in Stamford. Image courtesy of Jim Sullivan

[2] The Williamstown river gauge does not indicate areas of potential flooding at different stages.

There are two small dams in Stamford (Map 4). The dam named Sucker Pond is on Sucker Pond Brook and Lake Hancock. This dam is owned by the Town of Bennington Water Co. and is classified as low hazard potential by the Vermont Agency of Natural Resources. According to the ANR Dams Inventory[3], the dam is stone and may have been built in 1970. It is extremely difficult to access and is in poor condition however, it is listed as last inspected in 2018. The dam named Stamford Pond is on Reservoir Brook and is listed as being owned by the USDA Forest Service, but ANR records indicate that it may be a beaver dam. Neither pose a hazard to populated areas or infrastructure within the town due to their distance from developed areas.



Map 4: Dams located in Stamford, VT. (Source: Bennington County Regional Commission, August 2023)

[3]Agency of Natural Resources Dams Inventory: https://anrweb.vt.gov/DEC/DamsInventory/ListDams.aspx

Fluvial Erosion

In Vermont, most rivers flow through relatively confined valleys, but still meander over time across the floodplain. The Vermont Hazard Mitigation Plan (2018) states that 75% of flood damages as measured in cost are due to erosion rather than inundation. River corridors provide an area within which a river can move across the landscape as it dissipates energy and transports and deposits sediments. Where rivers are constricted by bridges and other structures, or rip rap, the water moves at higher velocity, resulting in downcutting and collapse of the banks. This may undermine structures within the corridor.

PREVIOUS OCCURRENCES

Ludlum (1996) describes numerous storm events that have affected Vermont since settlement, but the local impacts of these are difficult to trace. The 1927 flood was the largest recorded disaster in the history of the state. The state received over six inches of rain, with some areas receiving 8-9 inches. Following a rainy October, this storm occurred from November 2nd through the 4th causing extensive flooding. Two storms occurred in March of 1936. Heavy rains and snowmelt caused significant flooding. Two years later, the 1938 hurricane caused both flooding and extensive wind damage. The remnants of Hurricane Belle (August 9-10, 1976; DR-518) caused flooding damage in portions of Vermont.

In addition to these events, the Bennington Evening Banner, the local newspaper at the time, recorded three more flood events. The 1869 flood occurred after nearly 36 hours of violent rainfall and flooded downtown Bennington. A storm in 1948 caused downtown Bennington to flood and rendered the North Street and River Street bridges impassable. Lastly, the newspaper mentioned a storm in 1973 that claimed lives, caused property damage and flooded several communities in Vermont.

Figure 2 shows a total of 48 flood events in Bennington County from 1996 to 2022, using NOAA data. These have been primarily minor and affected either specific streams, such as the Walloomsac and Batten Kill, or a specific town or towns.

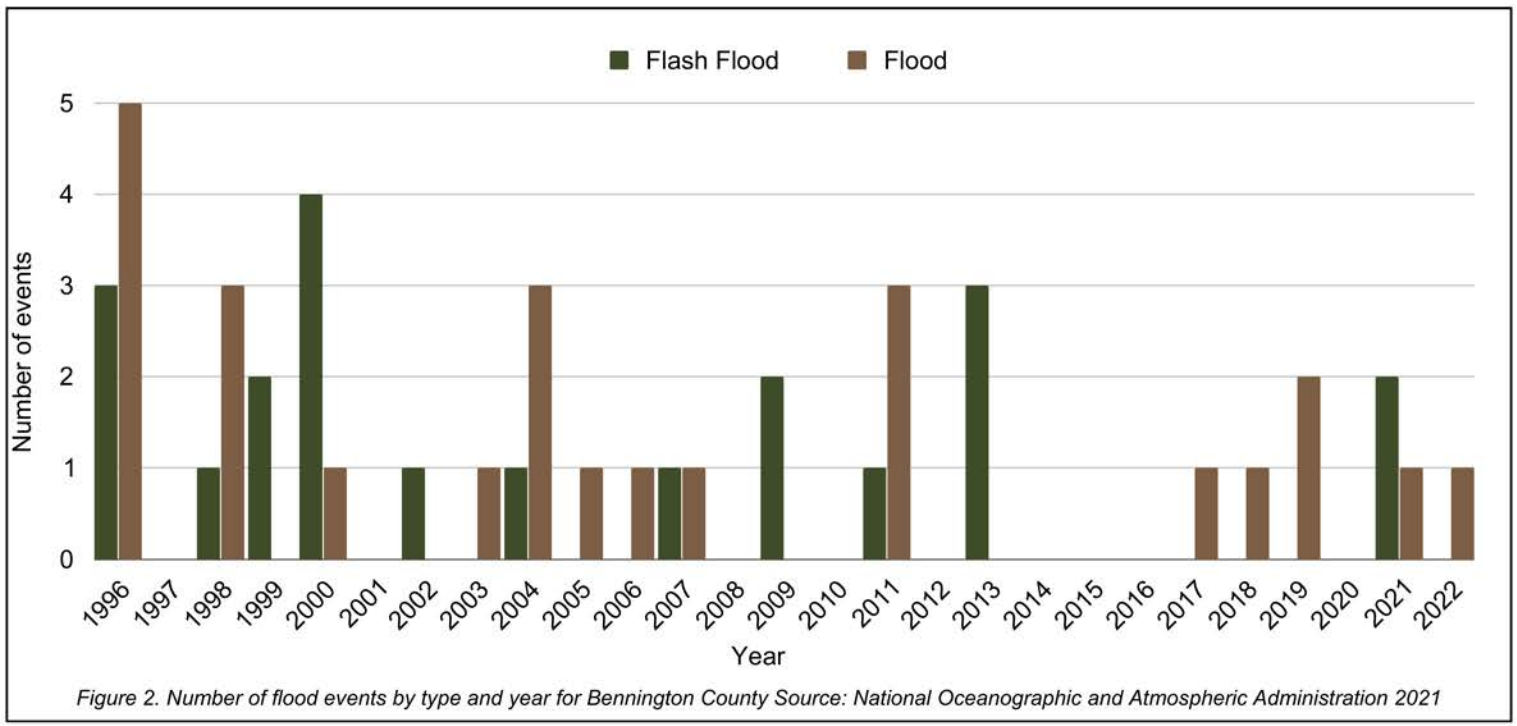


Figure 2. Number of flood events by type and year for Bennington County Source: National Oceanographic and Atmospheric Administration 2021

Hurricanes and tropical storms that form in tropical waters have historically affected New England but are relatively infrequent. Besides the 1938 hurricane previously mentioned, Tropical Storm Belle brought significant rains to Vermont in 1976 and Hurricane Gloria brought rain and wind damage in 1985. Stamford has been subjected to two major tropical storms in the past twenty years. Hurricane Floyd was a Category 4 storm before hitting North Carolina on September 16, 1999, and then was reduced to a tropical storm when it reached southern New England. In August of 2011, Tropical Storm Irene hit New England. This storm was the remnant of Hurricane Irene, which was a Category 1 hurricane. A Category 1 storm has winds of 74-95 miles per hour and could damage roofs, down shallow-rooted trees and damage power lines[4]. The effects of Tropical Storm Irene are below.

[4] The National Hurricane Center and the Central Pacific Hurricane Center: https://www.nhc.noaa.gov/aboutsshws.php

The following describes 29 moderate and extreme events that have occurred since 1996, using the National Weather Service (2010) categories, which affected Stamford or other areas in Bennington County. These events were described in the National Centers for Environmental Information records (2023). It should be noted that only four events occurred in the winter, with all other events in the spring, summer or fall. Ice jam flooding also occurs in one instance discussed below.

Moderate and extreme flood events since 1996. Data from National Center for Environmental Information.

January 19-20, 1996 (DR-1101 1/19 to 2/2 1996): Unseasonably warm weather caused rapid melting of 1 to 3 feet of snow and an additional 1 to 3 inches of rain fell causing numerous road washouts and the flooding of several homes across the region. *Note that this was also categorized as a High Wind event.

April 24, 1996: Significant rains on the evening of April 23 resulted in flooding along the Walloomsac and Batten Kill Rivers. The flooding resulted in several road closures but much of the flooding was minor.

May 1, 1996: Heavy rain on the evening of April 30 caused the Walloomsac River to flood. Flooding occurred at Paper Mill Town in Bennington.

May 11-12, 1996: Rainfall in excess of 2 inches fell during this period over much of western New England. This resulted in flooding along the Walloomsac River and Route 67 in Bennington was flooded during the morning hours of May 12. A Cooperative Weather Observer in Pownal recorded 2.10 inches of rain on May 12.

December 2, 1996: Rainfall during the late fall season resulted in flooding across parts of Bennington County. The Walloomsac River flooded in North Bennington and several homes were flooded along with Route 67A. The Batten Kill at Arlington flooded with several homes affected.

January 24, 1999: The combination of rain and very mild temperatures produced rapid snowmelt in southern Vermont. This runoff and ice jams triggered flooding on the upper Batten Kill near Arlington and on the Walloomsac River near Bennington. The Bennington Morse State Airport recorded 0.69 inches of rain and melted snow.

September 16-17, 1999 (DR-13079/16-21 1999): The remnants of Hurricane Floyd brought high winds and heavy rainfall (3-6 inches) to southern Vermont. A Cooperative Weather Observer recorded 4.60 inches of rain in Pownal and 2.94 inches at Bennington Morse State Airport.

July 14-17, 2000 (DR- 1336 7/14-18 2000): Thunderstorms caused torrential rainfall with flash flooding washing out sections of roadways in northeast Bennington County and southern Bennington County. The Bennington Morse State Airport recorded 2.79 inches of rain.

May 28, 2002: Scattered thunderstorms developed along a quasi-stationary front on the afternoon of May 28 and caused torrential rainfall across southern Vermont. Rainfall amounts reached around 3 inches in a couple of hours in Bennington County resulting in localized flash flooding in Pownal.

March 29, 2003: Up to 2 inches of rain, combined with seasonably mild temperatures, melted much of the remaining snowpack across this area and produced a significant runoff. Both the Walloomsac and Batten Kill rivers briefly went above flood stages in sections.

July 21 to August 18, 2003 (DR-1488 7/21-8/18 2003): Severe storms and flooding affected Vermont including Bennington County. (Note: this event does not appear in the NOAA data). Both Bennington Morse State Airport and the Cooperative Weather Observer in Pownal recorded sporadic and sometimes large amounts of precipitation during this period.

Moderate and extreme flood events since 1996. Data from National Center for Environmental Information.

March 31 to April 2, 2004: As much as 3 inches of rain fell between March 31 through April 2. This rain along with the last of the snowmelt produced an excessive runoff of water.

May 25, 2004: The Walloomsac River exceeded its flood stage of 7.0 feet, cresting at 7.75 feet at the gage in Bennington.

September 18, 2004: The Walloomsac River exceeded its flood stage of 7.0 feet, cresting at 7.21 feet at the Bennington gage.

October 9, 2005: North Bennington Road at Bennington closed due to flooding.

November 30, 2005: The Walloomsac River had minor flooding at Bennington. The river crested at 8.51 feet.

January 18-19, 2006: High wind and 1 to 2 inches of rain fell across eastern New York and western New England. Flooding occurred on the Walloomsac River in Bennington on January 18 and January 19.

April 16-17, 2007 (DR-1698 4/15-21 2007): An intense coastal storm spread heavy precipitation across southern Vermont, starting as a mixture of snow, sleet, and rain which changed to all rain. Liquid equivalent precipitation totals ranged from 3 to 6 inches leading to minor flooding across portions of southern Vermont.

June 15, 2009: Numerous thunderstorms developed across southern Vermont and produced locally very intense rainfall rates leading to flash flooding in some areas.

June 30, 2009: Torrential rain from thunderstorms produced flash flooding in Bennington. Several vehicles were disabled in high water on South Street in Bennington.

August 28-29, 2011 (DR-4022 8/27-29 2011): Tropical Storm Irene produced widespread flooding, and damaging winds across the region. (Further discussion below)

September 7, 2011: Large amounts of moisture from the remnants of Tropical Storm Lee interacted with a frontal system producing heavy rainfall. Total rainfall amounts ranging from 3 to 7 inches led to widespread minor to moderate flooding across southern Vermont.

May 22, 2013: Heavy rainfall from showers and thunderstorms reportedly caused flash flooding along Route 67A in North Bennington. The Bennington Morse State Airport recorded 3.43 inches of rain from May 21 to 22, and a Cooperative Weather Observer in Pownal observed 3.70 inches of rain.

May 29, 2013: Flash flooding was reported as a result of heavy rainfall from thunderstorms in Bennington on North Branch Street. South Street (Route 7) was also reported to be closed due to flooding on the roadway.

June 2, 2013: Severe thunderstorms across southern Vermont produced large hail and wind damage and heavy rainfall which caused flash flooding in Bennington.

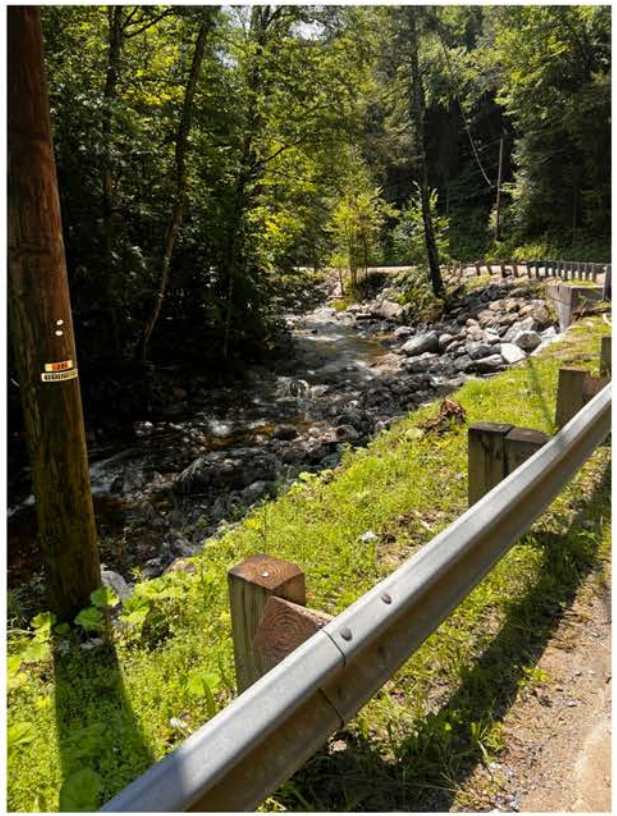
July 1, 2017: Thunderstorms occurring across the region resulted in torrential rainfall in portions of southern Vermont resulting in river flooding along the Walloomsac, including Paper Mill Town in Bennington.

January 19-20, 2019: Melting of snow along with rain and ice jams caused flooding across the county including the Walloomsac.

July 14, 2021: A line of strong to severe thunderstorms resulted in a few wind damage reports and flash flooding in southern Vermont.

July 21, 2022: Heavy rains led to minor street flooding in downtown Bennington.

Tropical Storm Irene in 2011 was one of the largest events in recent history. Rainfall amounts averaged 4 to 8 inches and fell within a twelve-hour period. A Cooperative Weather Observer recorded 4.70 inches of rain in Pownal and Bennington Morse State Airport reported 4.23 inches of rain from August 27 to 28. In Bennington County, widespread flash flooding and associated damage was reported countywide, with many roads closed due to flooding and downed trees and power lines. Strong winds also occurred across southern Vermont, with frequent wind gusts of 35 to 55 mph, along with locally stronger wind gusts exceeding 60 mph. The combination of strong winds, and extremely saturated soil led to widespread long duration power outages. In Bennington County, approximately 5,000 customers were affected by power outages. Record flooding occurred on the Walloomsac River. The Walloomsac gage exceeded its seven-foot flood stage at 8:48 am EST on August 28th, its nine foot moderate flood stage at 9:50 am, its eleven foot major flood stage at 11:46 am, crested at a record 12.82 feet at 2:30 pm, and fell below flood stage at 5:32 am on August 29th. Route 9 was closed from Bennington to Brattleboro due to numerous reports of flooding. Portions of Route 9 remained closed after the floodwaters receded due to damage.



During Irene, the main water source to Bennington was cut off to the town for several days after a bridge collapsed in Woodford damaging the town water line. Many residents and businesses were without power. Storm drainage issues occurred along Northside Drive causing the flooding of several businesses. The wastewater treatment plant was operating near maximum load and couldn't have handled much more water.

In Stamford, power was lost for a half day up to a full day depending on the area within the town. Supplies were difficult to obtain due to main roads being closed off in the surrounding areas such as Route 9 between Bennington and Brattleboro.

In North Adams, rainfall totals reached 5.10 inches, 100 feet of Route 8 was lost due to fluvial erosion, and roads in Clarksburg, MA became a major connecting thoroughfare for getting supplies in and out of Vermont[5].

[5] https://www.iberkshires.com/lookingbackatirene/

EXTENT AND LOCATION

The primary damages from past events have been from flooding and fluvial erosion with secondary damage from wind. The town joined the National Flood Insurance Program (NFIP) in July 3, 1978. There are three flood insurance policies in effect. Two claims have been made since 1978 totaling $35,180. There have been no NFIP-designated repetitive losses within Stamford.

The USGS high water marks for Tropical Storm Irene were located on portions of the Roaring Branch and Walloomsac in Bennington and along the Hoosic River near Williamstown, Massachusetts, none were in Stamford. Therefore, we relied on the special flood hazard maps for potential flooding extent.

Damage from past floods has been minimal. The North Branch of the Hoosic Rover is parallel to Vermont 8/100, and most development is along or near that road and County, Klondike and Lesure Roads and a few other small roads to the west and near the Massachusetts border. Map 1 shows special flood hazard areas in Stamford. The extent of damage from fluvial erosion has not been recorded as there is no local system to collect and maintain that information.

The average annual precipitation in Vermont has increased 6.71 inches since 1960. This trend is predicted to continue so that Vermont streams will have higher flows and possibly experience more frequent and greater flooding events (Galford et al 2021).

Special Flood Hazard Areas: these are areas mapped by FEMA and using the LIDAR derived zones that were adopted in late 2015. Figure 3 below shows the parts of a typical floodplain.

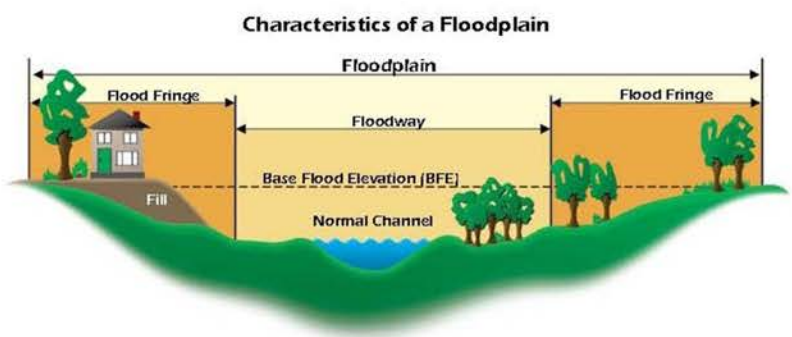


FIGURE 3: TYPICAL FLOODPLAIN

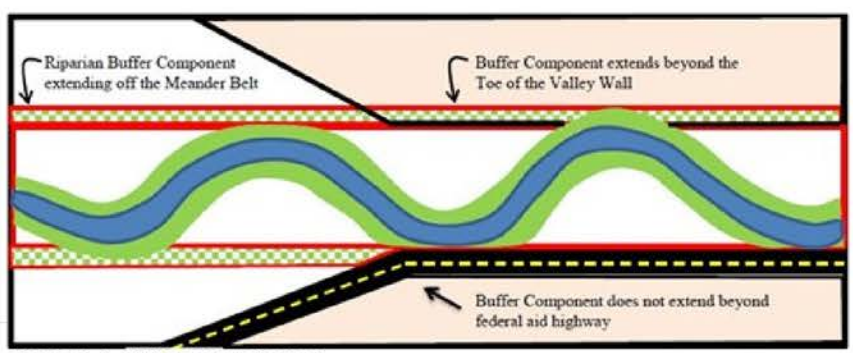


FIGURE 4: RIVER CORRIDORS

River Corridors: River corridors (Figure 4) have been mapped by the Vermont Agency of Natural Resources using geospatial data and modified by VT ANR river scientists using available field data. The data were used to calculate the "meander belt width" or area within which a river would move across the valley. As rivers shift their location both vertically and horizontally, erosion of adjacent lands can occur and threaten properties that may be outside of special flood hazard areas (Vermont River Management Program 2010).

The maps developed by VT ANR show the potential extent of fluvial erosion in Stamford. This is the only information available that shows the amount of fluvial erosion that could occur. Therefore, these maps provide the best data to determine extent of fluvial erosion.

PROBABILITY, IMPACT, AND VULNERABILITY

A moderate or major flood event, with the occurrence of fluvial erosion, in or near Stamford in any given year is highly likely, with >75% probability in a year.

Table 5 tallies the number of structures by type within the river corridor and special flood hazard area. As shown in Table 5, there are 14 structures in the special flood hazard area (A Zone and AE Zone) and 30 in the river corridor recently mapped by VT ANR. Therefore, the potential proportion damaged within the town from severe flooding would range from 1-10% with injuries of 1-10%. Most services recover in less than seven days, though help for specific property owners may take significantly longer.

According to FEMA's National Risk Index for the Stamford region, Stamford's expected annual loss for riverine flooding is relatively low compared to the rest of the nation. However, with the increase in flooding events due to climate change, this may increase even while population and development is expected to remain the same in the town.

Table 5. Structures in flood zones and river corridors in Stamford, VT Source: Vermont Open Geodata Portal

Site Type	A Zone	AE Zone	River Corridor	50-foot Corridor	Grand Total
Single Family Dwelling	1	12	24	2	39
Multi-Family Dwelling					
Mobile Home			1		1
Camp				2	2
Other Residential			1		1
Commercial Farm					
Commercial					
House of Worship					
School					
Recreation					
Fire Station					
Library					
Town Garage					
Town Office					
Utility					
Other		1			1
Grand Total	1	13	26	4	44

Note: Zone A – Area inundated by the Base Flood with no Base Flood Elevation determined

Zone AE – Area inundated by the Base Flood with Base Flood Elevation determined

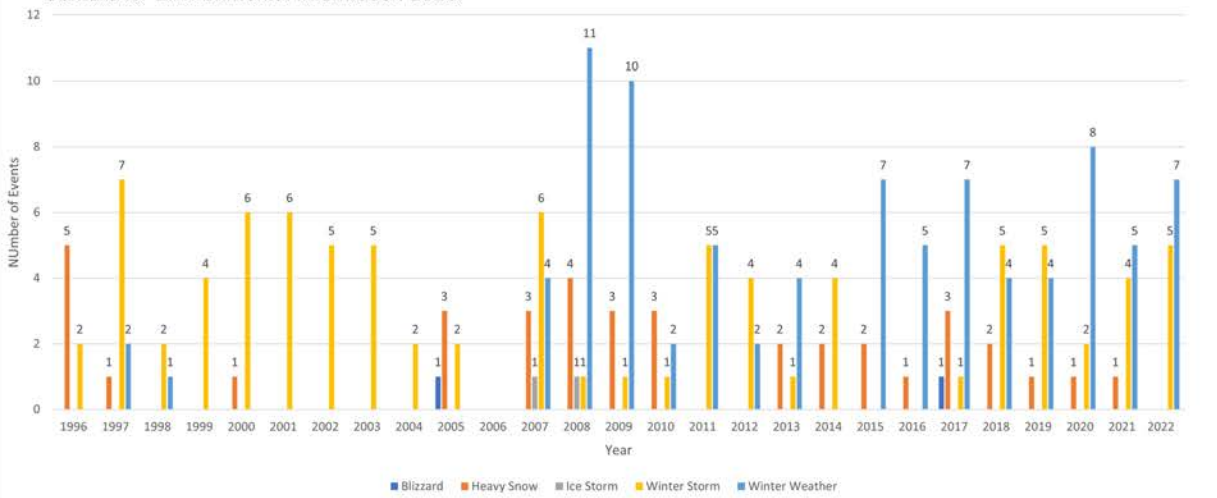
Winter Storms

DESCRIPTION

Winter storms are frequent in Vermont. Winter storms may consist of heavy snow, mixed precipitation, or ice storms and all may be accompanied by strong winds. Potential damages can include power outages, traffic accidents, and isolation of some areas. For example, the October 4, 1987 storm stranded travelers in the area and knocked out power for several days. The "Blizzard of '93," one of the worst storms on record, virtually shut down Vermont on the weekend of March 13-14, forcing the closure of roads and airports. Snowfall amounts ranged from 10 to 28 inches across the state.

In rare cases, the weight of snow may collapse roofs and cause other structural damage. Wind accompanying snowstorms can increase the effect of the snow damages. In addition to snow, ice storms occur when the lower levels of the atmosphere and/or ground are at or below freezing, and rain is falling through warmer air aloft. The precipitation freezes upon contact with the ground, objects on the ground, trees and power lines.

Figure 5. Total number of winter storm events since 1996 by type and year for Bennington County. Source: National Centers for Environmental Information 2023.



PREVIOUS OCCURRENCES

Figure 5 summarizes the 216 winter storm events that have occurred in Bennington County since 1996. As can be seen, a high number of events occurred in 1997, 2007, 2008, 2009, 2011, 2017, 2018, 2019, 2020, 2021 and 2022. The following is a summary of significant events.

Summary of significant winter storm events since 1996. Data from National Center for Environmental Information.

January 2 to 3, 1996 Heavy Snow: A major winter storm developed over the Gulf Ccoast states on January 2 and tracked northeast along the eastern seaboard during January 3. Heavy snow fell across southern Vermont with the average snowfall ranging from 10 to 12 inches.

November 26, 1996 Winter Storm: Over Bennington and Windham Counties, snow and heavy freezing rain downed trees and power lines and caused numerous accidents. Across southern Vermont, approximately 10,000 customers lost power.

December 7 to 8, 1996 Winter Storm: Heavy wet snow fell across southern Vermont resulting in 20,000 customers losing power. Shaftsbury recorded 12 inches of snow and 11 inches was recorded in Pownal. Downed trees caused road closures, and some were without power for several days. A Cooperative Weather Observer in Pownal recorded 14.5 inches of snow during this event.

March 31 to April 1, 1997 Winter Storm: A nor'easter formed bringing rain that changed to snow with totals of 12 inches in Shaftsbury. The wet snow caused power outages and road closures.

December 29 to 30, 1997 Winter Storm: Wet snow and strong winds combined to down trees and power lines causing scattered power outages. Snowfall totals generally ranged from 5 to 10 inches across Bennington and Windham Counties.

January 2 to 3, 1999 Winter Storm: A deep low-pressure area moved from the Mississippi Valley into the Great Lakes region during the night of January 2 and January 3 leading to a wintry mix of sleet and freezing rain and resulting in significant ice accumulations across the region. Total melted precipitation exceeded an inch in portions of southeast Vermont.

January 14 to 15, 1999 Winter Storm: Heavy snow fell across eastern New York and southern New England with 5 inches reported by a Cooperative Weather Observer in Pownal. The storm was accompanied by extremely cold conditions with reported temperatures of -9 F.

February 18 to 19, 2000 Winter Storm: Eight to fourteen inches of snow fell in Bennington and Windham Counties. 14.3" were recorded in Peru and 12.5" in Windam in Windham County.

December 30 to 31, 2000 Winter Storm: A general swath of 6 to 12 inches of snow fell across the region with locally higher amounts across the hills. Specific amounts included 13" in Pownal, and 8" in Bennington.

February 5 to 6, 2001 Winter Storm: A swath of heavy snowfall accumulating a foot or more fell across southern Vermont. Specific accumulations included 12 inches in Bennington and 14 inches in Pownal.

March 5 to 6, 2001 Winter Storm: An extended period of moderate to heavy snow resulted in 26 inches of snow in Pownal. This was one of the largest snowfalls in southern Vermont since the Blizzard of 93.

March 30 to 31, 2001 Winter Storm: Heavy, wet snow resulted in 9.8 inches in Sunderland and 15.0 inches in Peru while Windham County had similar amounts of snowfall.

January 6 to 7, 2002 Winter Storm: Two storm systems managed to produce a swath of snow in excess of a foot across southern Vermont. In Pownal, 15 inches of snow fell.

November 17, 2002 Winter Storm: A storm started with 2-4 inches of snow but changed to sleet, then freezing rain and gusty winds. Up to half an inch of ice accumulated causing power outages from Arlington into New York.

Summary of significant winter storm events since 1996. Data from National Center for Environmental Information.

December 25 to 26, 2002: Winter Storm: Snow fell at a rate of 1-3 inches per hour with 16.2 in Sunderland, 10.5 inches in Pownal and 16.5 inches in Windham County.

December 6 to 8, 2003 Winter Storm: The first major snowstorm of the winter resulted in 20.5 inches of snow reported in Pownal.

January 28, 2004 Winter Storm: Southern Vermont experienced 7-13 inches of snow with 12.6 inches in Sunderland, 9 inches in Pownal and 7.5 inches in Windham County.

January 23, 2005 Blizzard: Frequent whiteout conditions were observed by plow crews. Whiteout conditions were most prevalent across the Green Mountains. Cooperative Weather Observer's recorded 8.0 inches in Pownal and Sunderland and 14.0 inches in Peru.

January 15 to 16, 2007 Ice Storm: Freezing rain and sleet resulted in widespread downed trees and power lines with accompanying widespread power outages. Significant icing, with ice accretions of ½ inch up to 1 inch, occurred from the freezing rain.

February 14, 2007 Heavy Snow: Snowfall amounts ranged from 8 to 16 inches in Windham County and fell in excess of two feet across portions of Bennington County. Strong winds created near blizzard conditions during parts of the event. This resulted in closed schools and businesses and impassable roads.

March 2, 2007 Winter Storm: A mix of snow and sleet fell with over one foot in higher elevations, including in Woodford, and some freezing rain.

March 16 to 17, 2007 Heavy Snow: This storm brought widespread snowfall amounts of 10 to 18 inches across southern Vermont.

April 15 to 16, 2007 Winter Storm: Heavy, wet snow, ranging from 8 to 12 inches, downed trees and power lines causing widespread outages.

December 16 to 17, 2007 Winter Storm: Snow, heavy at times, mixed with sleet Sunday afternoon and evening. Total snow and sleet accumulations ranged from 10 to 14 inches, with 14 inches reported at Woodford. The combination of strong winds, and the extra weight of heavy wet snow on tree limbs also downed trees and power lines in portions of Bennington County during Sunday. The heavy snow and sleet resulted in numerous school and business closings Monday morning, and also created treacherous travel conditions for the morning commute.

December 30, 2007 to January 2, 2008 Heavy Snow: This storm brought heavy snow totaling 6 to 12 inches across southern Vermont. This led to treacherous travel conditions and closings, or delayed openings of numerous schools and businesses. A Cooperative Weather Observer reported just over 12 inches in Sunderland.

February 12 to 13, 2008 Winter Storm: Snow accumulated 4 to 7 inches and was accompanied by freezing rain with ¼ to ⅓ of an inch of ice. Schools and businesses were closed or openings were delayed due to hazardous travel conditions.

March 4 to 6, 2008 Ice Storm: This storm system spread freezing rain and sleet across higher elevations of east central New York and portions of southern Vermont, resulting in significant ice accumulations of one half to up to one inch in the higher elevations of western Windham County and ¼ to less than ½ of an inch in lower elevations.

December 11 to 18, 2008 Winter Storm: A series of snowstorms (two events reported by NCEI from 17-20 December) hit eastern New York and western and southern New England during this period resulting in 3-9 inches per storm and accumulating to over a foot during this period. Nineteen inches were reported by a Cooperative Weather Observer in Sunderland. Icing conditions followed on December 24th.

Summary of significant winter storm events since 1996. Data from National Center for Environmental Information.

February 12-22, 2009 Heavy Snow/Winter Storm: Several events were recorded by NCEI with snowfall amounts of 6-12 inches in higher elevations.

January 1 to 3, 2010 Heavy Snow: A strong storm brought 10 inches to over 2 feet of snow across Bennington and Windham counties. Over this three-day period, a Cooperative Weather Observer reported 13 inches of snow.

February 23 to 24, 2010 Heavy Snow: Heavy snow totaling 1-2 feet fell across southern Vermont with highest amounts at elevations above 1,500 feet. A Cooperative Weather Observer in Pownal reported 9.7 inches of snow on February 24.

February 26 to 27, 2010 Heavy Snow: Just after the storm described above, a second storm brought 1-2 feet in higher elevations with lesser amounts below 1,000 feet in elevation. A Cooperative Weather Observer in Pownal reported 13.4 inches of snow from February 25 to 27.

December 26 to 27, 2010 Winter Storm: Heavy snow falling at rates of 1 to 3 inches per hour resulted in 1-2 feet of snow. Winds were strong and gusted to 35-45 mph. A Cooperative Weather Observer in Pownal reported 20 inches of snow on December 27.

January 12, 2011 Winter Storm: A strong storm resulted in 14 inches to three feet of snow falling at rates of 3 to 6 inches per hour. A Cooperative Weather Observer in Pownal reported 20.6 inches of snow from January 12 to 13.

February 1 to 2, 2011 Winter Storm: Snowfall was generally 10 to 18 inches but ranged to 25 inches in some areas.

February 25, 2011 Winter Storm: Snow fell at rates of 1 to 2 inches per hour with totals of 12 to 17 inches across southern Vermont.

October 29 to 30, 2011 Winter Storm: While not yet winter and with trees with much of their foliage still on, 5 to 14 inches of snow fell across Bennington County. Trees and power lines came down due to the weight of the wet snow. A Cooperative Weather Observer in Pownal reported 9.3 inches of snow on October 30.

February 29, 2012 Winter Storm: A complex storm resulted in 8-16 inches of snow and sleet across southern Vermont between February 29th and March 1st with 4-8 inches across southeastern Bennington County.

March 18 to 19, 2013 Winter Storm: A warm front brought snow to the southern Green Mountains and was enhanced by a coastal storm on the 19th. Together 4-9 inches fell in the valleys with 10-17 inches in higher evaluations.

December 14 to 15, 2013 Heavy Snow: Snow fell at rates in excess of 1 inch per hour over much of the region with snow rates as high as up to 3 inches per hour at times. In addition, there were wind gusts of 40-55 mph. The highest snowfall amounts were up to 18 inches occurring in Woodford.

February 5, 2014 Heavy Snow: Southern Vermont received 6-12 inches of snow, particularly in higher elevations.

February 13 to 14, 2014 Winter Storm: Snow fell at rates of up to 3 inches per hour. Over the two days of the storm, 8 to 21 inches fell in southern Vermont. At times, winds gusted to 40 mph as the storm left the area.

November 26 to 27, 2014 Winter Storm: An early storm affected southern Vermont over the Thanksgiving period with 8 to 15 inches of total snow accumulation.

February 2, 2015 Heavy Snow: Most areas received 9 to 15 inches, although some areas within the high terrain of the southern Green Mountain saw up to 19 inches.

Summary of significant winter storm events since 1996. Data from National Center for Environmental Information.

February 7 to 10, 2015 Heavy Snow: Snow amounts between 1 and 2 feet, with the highest amounts across the high terrain of the southern Green Mountains.

March 14 to 16, 2017 Blizzard: Extremely heavy snow and blizzard conditions with snow fall rates of 1 to 4 inches per hour resulted in 18 inches of snow. High winds resulted in near zero visibility. Most impacts occurred on March 14, but snow continued for several days.

January 3 to 4, 2018 Heavy Snow: Snowfall fell at rates of 1 to 3 inches per hour accumulating to 7 to 15 inches. The storm was followed by high winds of 30 to 40 mph and extreme windchill conditions.

February 4, 2018 Heavy Snow: Heavy snow resulted in totals of 5 to 14 inches in southern Vermont.

March 13 to 15, 2018 Winter Storm: A long duration snow, with observed rates of 1 to 3 inches per hour resulted in 1 to 2 feet of snow with higher amounts at higher elevations.

February 12 to 13, 2019 Winter Storm: Snow changing to sleet and freezing rain resulted in closing and delays including power outages due to accompanying high winds.

December 1 to 3, 2019 Heavy Snow: Snow accumulated to 18 to 28 inches in eastern New York and southern Vermont. Many schools were closed for several days.

December 16 to 17, 2020 Heavy Snow: Snowfall rates of up to 3 to 6 inches per hour were observed with total snowfall in southern portions of Bennington and Windham Counties of 15 to 25 inches.

February 1 to 2, 2021 Winter Storm: Moderate to heavy snow fell, with snowfall rates of 1 inch per hour at times. Storm totals ranged from 7 to 17 inches.

January 17, 2022: Moderate to heavy snowfall of 4 to 14 inches fell across southern Vermont and wind gusts of up to 50 mph.

Feburary 3 to 4, 2022: Precipitation that started as rain and then changed overnight to a wintry mix of sleet, freezing rain, and snow. Flat ice accumulations of 0.10 to nearly 0.50 inches occurred across both Bennington and Windham counties. Thousands were left without power due to downed trees and power lines and many schools were closed on February 4th. State offices had delayed openings and vehicle accidents also occurred.

December 15 to 17, 2022: Heavy, wet snow fall causing downed trees and power lines resulting in scattered power outages. Snow falls of 10 to 24 inches occurred across the region.

EXTENT AND LOCATION

The National Centers for Environmental Information publishes climate normal, or averages, for various stations. The Sunderland station was the closest station with this snowfall data[6]. The data covers a 30-year period from 1991-2020. The average annual snowfall for this period was 75.2 inches for Sunderland. December, January, February, and March are the primary months for snowfall with normal snow fall amounts of 17.4, 18.5, 16.4, and 14 inches respectively. Extreme snowfall events for one-, two-, and three-day events have ranged from 12 to over 20 inches (NOAA/National Climate Data Center Cooperative Weather Observer reports). The areas in Stamford that are most impacted by snow and ice storms are road intersections: primarily the intersection of Mill Road and Main Street (Route 100) that freezes and causes an increase risk of accidents due to the formation of black ice. (See Table 21 and Figure 8) Furthermore, the skill of road crews in Vermont means that only the heaviest snowstorms (>12 inches) or ice storms affect the populations.

Increasing temperatures that are predicted to occur will likely reduce total winter snowfall. If precipitation falls as rain in the winter, river flows will be higher due to the lower evapotranspiration in the winter. Freezing rain may become more frequent, with resulting impacts to the transportation and power systems (Galford et al 2021).

PROBABLITY, IMPACT, AND VULNERABILITY

A moderate or greater snowstorm or ice storm occurring in or near Stamford in any given year is highly likely, with a >75% probability in a year. These are large-scale events, though local impacts may vary greatly. Power lines and roads are most vulnerable, with traffic accidents the most likely to create injuries. Power outages could be short term (a few hours) or last seven or more days. Some roads may remain impassable for long periods as well.

[6] (https://www.ncei.noaa.gov/access/us-climate-normals/#dataset=normals-monthly&timeframe=30&station=USC00438160)

High Wind Events

DESCRIPTION

High wind events can occur during tropical storms, hurricanes, winter storms, and frontal passages. Thunderstorms can produce damaging winds, hail and heavy rainfall, the latter potentially producing flash floods. NOAA recorded 78 thunderstorms with damaging winds in Bennington County since 1996.

Tornadoes are formed in the same conditions as severe thunderstorms. Intense, but generally localized damage can result from the intense winds. The primary period for tornado activity in New England is mid-summer (Zielinski and Keim 2003). Tornadoes will generally follow valleys in the northeast and dissipate in steep terrain. NOAA recorded three tornadoes in Bennington County since 1996.

PREVIOUS OCCURRENCES

Table 6 summarizes the total number of significant wind events including thunderstorms, strong winds, and tornadoes from 1996 to 2022. The 1998 tornado registered F2 on the Fujita damage scale. The 2002 tornado in Bennington County registered F1 while the 2003 tornado was an F0 to F1 (National Centers for Environmental Information 2021). The Fujita scale is based on damage intensity. According to NOAA, an F0 tornado has winds of 40-72 mph and could damage chimneys, branches, and down shallow rooted trees. An F1 tornado has winds of 73-112 mph and could damage roofs, push mobile homes off foundations or overturn them, and blow cars off of roads. An F2 tornado has winds of 113-157 mph and could tear off roofs, destroy mobile homes, uproot or snap large trees, and light objects could become projectiles[7].

[7] https://www.weather.gov/oun/efscale

Table 6. Summary of significant wind events in Bennington County. Source: National Centers for Environmental Information 2022

Year	High Wind	Strong Wind	Thunderstorm Wind	Tornado	Funnel Cloud	Totals
1996	5					5
1997	2	2	4			8
1998	1		4	1		6
1999	2		3			5
2000	1		1			2
2001			2			2
2002	1		3	1		5
2003	1			1		2
2004						
2005	1		3			4
2006	5		4			9
2007	3		4			7
2008		3	3			6
2009	1		1			2
2010	5		3		1	9
2011	1		5			6
2012	2		3			5
2013			4			4
2014			2			2
2015			2			2
2016		1	4			5
2017	4	3	4			11
2018	2	5	2			9
2019	1	9	3			13
2020		3	2			5
2021	1	3	8			12
2022	2	4	4			10
Totals	41	33	78	3	1	156

Wind speed data is available for only a few wind events due to the lack of weather stations. National Centers for Environmental Information (2022) data rarely included estimates of wind speed. Generally, wind speeds of greater than 55 miles per hour are considered damaging (National Oceanographic and Atmospheric Administration 2006). Events that occurred in or near Stamford are described below.

Summary of high wind events since 1996. Data from National Center for Environmental Information.

January 27, 1996 High Wind: Damaging winds downed trees, limbs, and power lines in Southern Vermont.

August 21, 1997 Strong Wind: Winds gusting up to 40 mph downed trees in Dorset, North Bennington, and Sandgate. Approximately 1,000 customers lost power.

November 1, 1997 High Wind: Strong and damaging winds caused power outages in Windham and Bennington counties with approximately 1,000 customers losing power.

November 27, 1997 High Wind: Passage of a cold front resulted in winds of 40-50 mph and downed trees and power lines in Windham and Bennington counties.

May 31, 1998 Thunderstorm Winds and Tornado: An F2 tornado that originated in Saratoga and Rensselaer Counties followed Route 67 through North Bennington and South Shaftsbury. Damaging winds were reported by a Cooperative Weather Observer in Pownal. Large hail was reported in Shaftsbury.

September 7, 1998 Thunderstorm Wind: A derecho (long-lived and damaging thunderstorm) downed trees in Woodford.

July 6, 1999 Thunderstorm Wind: A cold front generated thunderstorms in southern Vermont causing downed power lines and trees in Pownal and Stamford and significant rain fell in Sunderland. Winds were estimated to gust at 90 mph. Damaging winds were reported by the Pownal Cooperative Weather Observer.

September 16 to 18, 1999 (DR-13079/16-21 1999): Remnants of Hurricane Floyd (see Previous Occurrences under Floods, Flash Floods, and Fluvial Erosion) brought winds gusting to over 60 mph and downed trees and power lines in southern Vermont.

May 31, 2002 Thunderstorm Wind: Thunderstorms caused damage across Bennington County. Cooperative Weather Observers reported damaging winds in Sunderland and Pownal.

June 5, 2002 Thunderstorm Winds and Tornado: Thunderstorms that initially developed in New York produced a macroburst in extreme eastern New York and moved into southern Vermont. The storms spawned two tornados, one in Woodford Hollow. Bennington County assessed as an F1 with winds of 80-100 mph and the other one near Wilmington, Windham County that was stronger with winds of 125-150 mph.

July 21, 2003 Tornado: A supercell producing a long-lived significant tornado in New York, spawned a twister which touched down in Pownal. The twister cut a swath longer than 25 miles and up 150 yards wide. After touching down in Pownal, the tornado moved northeast into Bennington, then continued into the Green Mountain State Forest in western Windham County where it caused significant forest damage largely to trees. There was also some structural damages in Bennington County. A tree collapsed onto a house. Another massive pine slammed into a 100-year-old house's roof in Pownal. A steakhouse in Bennington suffered damage that closed it for a couple of days, including shattered windows and water damage due to an open roof. The owner was slammed against a wall while venturing outside on the open deck but received no injuries. During the height of the storm, power was knocked out to over 2,000 customers in southern Vermont.

Summary of high wind events since 1996. Data from National Center for Environmental Information.

July 2, 2006 Thunderstorm Wind: A thunderstorm at Stamford, Vermont became severe late in the afternoon. Strong wind gusts associated with the thunderstorm blew down trees along Route 100 near the Stamford-Readsboro line.

July 16, 2007 Thunderstorm Wind: Low pressure created strong winds resulting in extensive tree damage in Dorset. Damaging winds were reported by a Cooperative Weather Observer in Sunderland.

August 25, 2007 Thunderstorm Wind: A 50-foot-tall maple tree landed on a van located on Route 8 in Stamford due to strong thunderstorm winds. The van sustained significant damage to the roof and windshield.

December 16, 2007 High Wind: A storm brought sleet and snow as well as high winds resulting in downing of trees and power lines. Damaging winds were reported by a Cooperative Weather Observer in Sunderland.

December 9, 2009 Wind: A strong low-pressure system tracked northeast, into the eastern Great Lakes region creating strong east to southeast winds developed across southern Vermont during Wednesday morning, before gradually diminishing by Wednesday evening.

August 22, 2010 Wind: Strong and gusty east to southeast winds occurred across southern Vermont, with the higher terrain of the southern Green Mountains being impacted the hardest. Trees and wires were reported down due to high winds in Arlington, Sunderland, Shaftsbury and Bennington. Power outages occurred across Bennington County.

May 29, 2012 Thunderstorm Wind: Strong thunderstorm winds affected Southern Vermont. Falling trees blocked a road in Dorset.

July 4, 2012 Thunderstorm Wind: Numerous trees and power lines were reported downed in Manchester.

September 8, 2012 Thunderstorm Wind: Trees and wires were downed as a result of strong thunderstorms in Bennington.

October 29 to 30, 2012 High Wind: Superstorm Sandy brought strong winds of 40-60 mph, with a gust of 41 mph recorded at Bennington Morse State Airport. The highest wind gust in southern Vermont occurred in Woodford, where a wind gust of 58 mph was reported.

June 2, 2013 Thunderstorm Wind: Showers and thunderstorms developed across the region aided by very strong winds. A few storms became severe, producing large hail and wind damage. Multiple trees were reported down and one tree fell on two parked trucks as a result of the thunderstorm winds.

July 19, 2013 Thunderstorm Wind: Trees were downed in Manchester.

June 23, 2015 Thunderstorm Wind: Trees were reported down in Bennington due to thunderstorm winds.

July 1, 2015 Thunderstorm Wind: A large tree was downed in Bennington as a result of thunderstorm winds.

January 10, 2017 High Wind: Wind gusts of 40-60 mph were observed across the area resulting in many downed trees, power poles, and power lines. Some power outages occurred.

May 5, 2017 High Wind: Strong easterly winds of up to 68 mph were observed for 1-2 hours by a trained spotter. The winds caused numerous trees and wires down, resulting in power outages and road closures.

Summary of high wind events since 1996. Data from National Center for Environmental Information.

May 18, 2017 Thunderstorm Wind: Wires were reported down from thunderstorm winds.

August 22, 2017 Thunderstorm Wind: Strong to severe thunderstorms developed and prompted a Severe Thunderstorm Watch in western New England. Multiple trees were downed in southern Vermont due to thunderstorm winds. A large tree branch was reported down in Bennington.

October 30, 2017 High Wind: Thousands of power outages were reported, along with trees down, large tree limbs, and wires down across southern Vermont.

February 24-25, 2019 High Wind: Gusts in excess of 50 mph were common across the area which caused numerous power outages and downed trees. A tree fell onto a home in Bennington.

October 16-17, 2019 Strong Wind: Several trees were down on Route 7 between Bennington and Pownal.

October 7, 2020 Thunderstorm Wind: A line of thunderstorms caused widespread damage: damaged trees, downed trees and powerlines. About 21,000 lost power across southern Vermont. This event was classified as a serial derecho based on the 320-mile-long damage swath and distribution of significant wind gusts of 75 mph and above.

March 1, 2021 High Wind: Wind gusts were recorded from 40-60 mph. Trees and powerlines were downed, and power outages were reported. A 58 mph wind gust was recorded near Old Bennington.

June 30, 2021 Thunderstorm Wind: Several trees and wires were reported down in Shaftsbury.

July 14, 2021 Thunderstorm Wind: A line of strong to severe thunderstorms resulted in a few wind damage reports in Shaftsbury, with multiple trees and wires down around the town.

September 8, 2021 Thunderstorm Wind: Wires were reported down in North Bennington.

September 15, 2021 Thunderstorm Wind: Trees reported down in Shaftsbury.

December 11, 2021 Strong Wind: Widespread wind gusts were between 40-55 mph. Downed wires were reported near Shaftsbury.

EXTENT AND LOCATION

Damaging winds, including the previous occurrences described above, are those exceeding 55 miles per hour (National Oceanographic and Atmospheric Administration 2006 and undated). During a May 2017 event, winds were measured at 68 mph in southern Vermont. Another event, occurring in October 2020, winds gusts were recorded in excess of 75 mph. Higher winds were likely created during the three tornadoes. High wind events can strike anywhere. Where storms are funneled up the valleys, damage can be significant, but most likely less than 10% of structures would be affected. Again, power outages could last up to seven or more days.

PROBABILITY, IMPACT, AND VULNERABILITY

Wind events causing moderate or greater damage occur almost every other year in Bennington County and can range from localized events from thunderstorms to wide ranging events from larger storms. The primary vulnerability would be power outages from downed trees and lines. A moderate or greater damage windstorm occurring in or near Stamford in any given year is likely, with a >10% to <75% probability per year.

Hail

DESCRIPTION

Hail is frozen precipitation that forms in severe thunderstorms. Hailstones can range in size from ¼ inch (about the size of a pea) to over 4 inches (grapefruit sized), though most hail is in the smaller categories of less than 1.5 inches. The strong up and downdrafts within thunderstorms push upwards to freeze and downwards to collect water and this repeated cycle results in accumulation of ice until gravity pulls the hailstone to Earth.

PREVIOUS OCCURRENCES

The National Centers for Environmental Information has 21 reports of hail storms in Bennington County between 1996 and 2022, all associated with thunderstorms. The following were within Stamford or nearby towns.

Summary of hail events since 1996. Data from National Center for Environmental Information.

May 31, 1998 Thunderstorm Winds and Tornado and Hail: Strong thunderstorms generated an F2 tornado in New York, which became an F1 after crossing into Vermont. The tornado followed Route 67 through North Bennington and south Shaftsbury. Hail was reported in Shaftsbury.

July 18, 2000 Hail: Across southern Vermont, scattered thunderstorms developed ahead of a cold front during the midday hours of July 18. In Bennington county, dime size hail fell at Sunderland, and nickel size hail fell at Bennington.

July 4, 2001 Hail: Half dollar sized hail (1.25") fell in Sunderland.

June 27, 2002 Hail: Thunderstorms, developing ahead of a cold front, moved into southern Vermont during the late afternoon and early evening of June 27. One cell became severe as it deposited one inch hail in the North Bennington, Bennington County.

June 6, 2005 Hail: One inch hail was reported by a trained weather spotter.

June 19, 2006 Hail: A trained spotter reported penny-sized hail in Sunderland.

Summary of hail events since 1996. Data from National Center for Environmental Information.

May 10, 2007 Hail: Numerous showers and thunderstorms occurred, some became locally severe, and quarter sized hail in Arlington.

June 21, 2007 Hail: A strong cold front moved through east central New York and western New England producing numerous thunderstorms, some of which were locally severe. Nickel sized hail was reported in Sunderland.

August 3, 2007 Hail: Numerous and strong thunderstorms developed over eastern New York and western New England. Ping pong ball sized hail was reported in Shaftsbury.

June 10, 2008 Hail: A cold front approaching from the west, along with a hot, moist and unstable air mass in place, led to the development of numerous showers and strong thunderstorms across eastern New York and western New England. Nickel size hail was reported near Rupert during a thunderstorm.

June 24, 2008 Hail: The passage of an upper-level trough, and weak cold front produced isolated to scattered thunderstorms during Tuesday afternoon on June 24th. Large hail accompanied some of these thunderstorms. Quarter sized hail was reported in Pownal.

August 6, 2008 Hail: Quarter size hail fell approximately 4 miles north northeast of Arlington during a thunderstorm.

June 15, 2009 Hail: The combination of a passing upper-level trough, and unusually cold air in the mid and upper levels of the atmosphere, led to the development of numerous thunderstorms across southern Vermont, many of which contained large quantities of hail. Quarter size hail was measured at the Bennington Morse State Airport in Bennington during a thunderstorm. In addition, nickel to quarter size hail was also reported in the city of Bennington.

July 7, 2009 Hail: A closed upper level low and pool of unusually cold air in the mid and upper levels of the atmosphere moved over the region leading to the development of thunderstorms across southern Vermont. Penny size hail was reported in Bennington during a thunderstorm.

July 17, 2010 Hail: A pre-frontal boundary and upper-level disturbance moved across the region creating a cluster of strong to severe thunderstorms across southern Vermont. Quarter size hail was reported during a thunderstorm in Bennington.

July 21, 2010 Hail: Quarter size hail was reported during a thunderstorm in Bennington.

June 1, 2011 Hail: Multiple reports of large hail were reported during a thunderstorm in Shaftsbury: hail stones of 3.25 inches and 2.75 inches in diameter were measured; hail the size of a golf ball was reported; hail sizes of greater than 1 inch in diameter were common; reports of greater than baseball size hail, 3 inches, was reported; and quarter size hail was reported near Bennington during this thunderstorm.

June 24, 2013 Hail: Thunderstorms produced quarter sized hail in Manchester.

July 1, 2016 Hail: Severe thunderstorms occurred over eastern New York, producing damaging winds and hail. As these storms reached into southern Vermont, the thunderstorms continued to be severe, producing damaging winds and large, quarter sized hail in the Manchester area.

August 2, 2017 Hail: Isolated strong to severe thunderstorms developed across southern Vermont during the afternoon hours on Wednesday, August 2, 2017. This was due to an upper-level disturbance passing through the area. The severe thunderstorms knocked down trees and produced large, golf ball sized hail in southern Vermont.

July 21, 2022 Hail: Scattered showers and thunderstorms developed ahead of an eastward progressing cold front on July 21, 2022. A few became severe producing damaging wind gusts and hail estimated at one inch in Arlington.

EXTENT AND LOCATION

Hail can cover wide areas and has the potential for damaging crops, automobiles, or glass within structures, as well as causing injury. Generally, however, hail storms affect relatively small areas[6] as they form in thunderstorms, which are localized. Storms with the largest hail stones near Stamford were in Shaftsbury in 2007 and 2011. Ping pong size hail was reported in 2007, and multiple large size hail, from golf ball size to greater than 3 inches, was reported in 2011. Windham County also experienced golf ball sized hail in 2008 in Bellows Falls and again in 2012 in Bellows Falls and Westminster.

PROBABLITY, IMPACT, AND VULNERABILITY

Hailstorms are generally local, affecting subareas within the town, though a group of thunderstorms can cause hail in multiple locations over a wide area. The possibility of hail occurring in or near Stamford in any given year is likely, >10% to <75% probability per year. The potential vulnerability would be localized with damage to structures or automobiles, though there could also be damage to vegetation. In general, these impacts would be localized.

[6] (https://www.ncei.noaa.gov/access/us-climate-normals/#dataset=normals-monthly&timeframe=30&station=USC00438160)

Extreme Heat and Extreme Cold

DESCRIPTION

Extreme heat event is defined by FEMA as a "prolonged period of excessively hot weather, with temperatures about the average high temperature for a particular region for that time of the year, often combined with high humidity." (Extreme Heat | What (fema.gov)) According to the Vermont Department of Health, a "hot day" is one in which the temperature is 87° or hotter. This is also the threshold in which hospitals within the State of Vermont see a rise in heat related emergency room visits. (Extreme Heat Events in Vermont (healthvermont.gov) Extreme heat is recorded at other times but does not have the health consequences of summer periods. The heat index, which factors in the high relative humidity levels of summer, is also a factor. However, relative humidity is not recorded at area weather stations, so the history of heat index can't be calculated.

Heat events are warned by the National Weather Service using the following thresholds:

- Excessive Heat Warning – The maximum heat temperature is expected to be 105°F or higher for at least 2 days and nighttime temperatures will not dry below 75°F.
- Excessive Heat Watch – Conditions are favorable for an excessive heat event in the next 24 to 72 hours.
- Heat Advisory – Issued within 12 hours of the onset of extremely dangerous heat conditions which is when the maximum heat index temperature is 100°F or higher for at least 2 days and nighttime temperatures will not drop below 75°F.
- Excessive Heat Outlook – issued when there is the potential for an excessive heat event within the next 3-7 days.

Extreme cold is not well defined. For those involved in outdoor activities, extreme cold, accompanied by wind, is when exposed skin would be subject to frostbite. However, for periods of power outages that might accompany winter storms, extreme cold could be thought of as when temperatures fall below freezing as that would not only affect personal health and the health of household animals, but could result in pipes freezing, and the loss of water supplies and perishables. Normal temperatures as reported for North Adams, MA are shown in Table 7.

PREVIOUS OCCURRENCES

Excessive Heat

There were only two events documented by the National Center for Environmental Information for excessive heat.

Summary of excessive heat events since 1996.
Data from National Center for Environmental Information.

March 8, 2000 Excessive heat: No additional information was given.

July 1 - 5, 2018 Excessive Heat: A hot and humid airmass brought excessively high heat indices to southern Vermont during the beginning of July through the Independence Day holiday. Temperatures soared as high as the mid-90s on July 1st, the hottest day of the stretch. Combined with dewpoints in the mid-70s, heat indices reached near 105 degrees in the warmest areas. July 5th marked the fifth consecutive day with a high temperature in the 90s at Bennington. In addition to the hot daytime temperatures, overnight low temperatures only falling into the 70s was common, which exacerbated heat-related problems. The extensive heat prompted the opening of many cooling centers across the region.

Table 7. North Adams, MA normal temperatures for 1991 to 2020 Source: National Centers for Environmental Information: https://www.ncei.noaa.gov/access/us-climate-normals/#dataset=normals-monthly&timeframe=30&station=USC00436500

Month	Max Temperature (Degrees F)	Min Temperature (Degrees F)	Average Temperature (Degrees F)	Precipitation (in)
January	32.4	14.3	23.3	2.52
February	35.3	15.5	25.4	1.97
March	43.6	23.5	33.5	3.08
April	56.9	33.5	45.2	3.12
May	68.6	43.9	56.2	3.73
June	76.4	53	64.7	4.41
July	80.9	57.7	69.3	4.13
August	79	56.1	67.5	4.47
September	72.1	48.8	60.5	4.22
October	60	38.4	49.2	4.28
November	48.4	29.7	39.1	3.25
December	37.6	21.5	29.5	3.12
Annual	**57.6 (Avg)**	**36.3 (Avg)**	**47.0 (Avg)**	**42.3**

Extreme Cold

The National Centers for Environmental Information has 14 reports of extreme cold temperatures in Bennington County between 2000 and 2022. The following were within Stamford or nearby towns.

Summary of extreme cold events since 1996. Data from National Center for Environmental Information.

January 23 - 24, 2011 Extreme Cold/Wind Chill: Temperatures of 10 to 25 degrees below were recorded zero across southern Vermont. Brisk westerly winds resulted in wind chill readings of 25 to 35 degrees below zero.

January 7 - 8, 2015 Extreme Cold/Wind Chill: Temperatures recorded overnight we between -9 and -19 degrees in the southern Green Mountains. The wind chill values were from -15 to -35 degrees. Many school districts delayed the start of school however once the winds diminished so wind chill values improved throughout the day.

February 15 - 16, 2015 Extreme Cold/Wind Chill: Northwest winds gusted over 30 mph. Temperatures dropped below zero February 15th and into the 16th with some records showing -20 degrees with wind chill values of -20 to -45 degrees below zero. Many cities and town opened warming shelters.

Summary of extreme cold events since 1996. Data from National Center for Environmental Information.

February 13 - 14, 2016 Extreme Cold/Wind Chill: Brisk northwesterly winds brought very cold temperatures reaching lows of 12 to 28 degrees below zero. Wind gusts of 20 to 40 mph brought wind chill values of 25 to 45 below zero Saturday night and into Sunday morning.

December 27 - 29, 2017 Extreme Cold/Wind Chill: An Arctic air mass paired with gusty northwesterly winds brought low temperatures of -5 to -14 degrees across southern Vermont. Windchill values plummeted to -37 degrees cause by bitterly cold winds.

December 31, 2017 Extreme Cold/Wind Chill: Temperatures ranged from -10 to -18 degrees in Windham and Bennington counties. Dangerous wind chills of -11 to -31 degrees occurred in the early morning hours of New Year's Day.

January 5 - 7, 2018 Extreme Cold/Wind Chill: A heavy band of snow leaving 7-14 inches of snowfall came through southern Vermont along with recorded wind gusts of 30 to 45 mph. As the snow system moved away, cold Arctic air moved southward resulting in an extended period of cold between January 5 and January 7. Westerly winds of 30-40 mph resulted in wind chills of -20 to -40 degrees. High temperatures only climbed to single digits and warming shelters were opened.

January 20 - 22, 2019 Extreme Cold/Wind Chill: Cold temperatures fell after a snow event moved out of the area on January 20th. Freezing temperatures moved in with wind chills causing the temperature to fall to -20 to -40 degrees. Schools were closed and warming shelters were opened throughout the area.

January 30 – 31, 2019 Extreme Cold/Wind Chill: Frigid air with strong westerly winds moved in behind an arctic cold front throughout southern Vermont along with a heavy snow squall. Wind chills fell to 15 to 35 degrees below zero and schools may have closed or been delayed.

January 28 – 29, 2021 Extreme Cold/Wind Chill: An arctic airmass combines with gusty winds brought temperatures of 11 degrees below zero to 5 degrees above zero. Wind chill dropped the temperature to 31 degrees below zero to 3 degrees below zero.

January 14 – 15, 2022 Extreme Cold/Wind Chill: An Arctic high-pressure system brought dangerously cold temperatures to southern Vermont on January 14 and 15. Wind chills fell to -15 to -35 degrees over most areas on the morning of the 15th.

EXTENT AND LOCATION

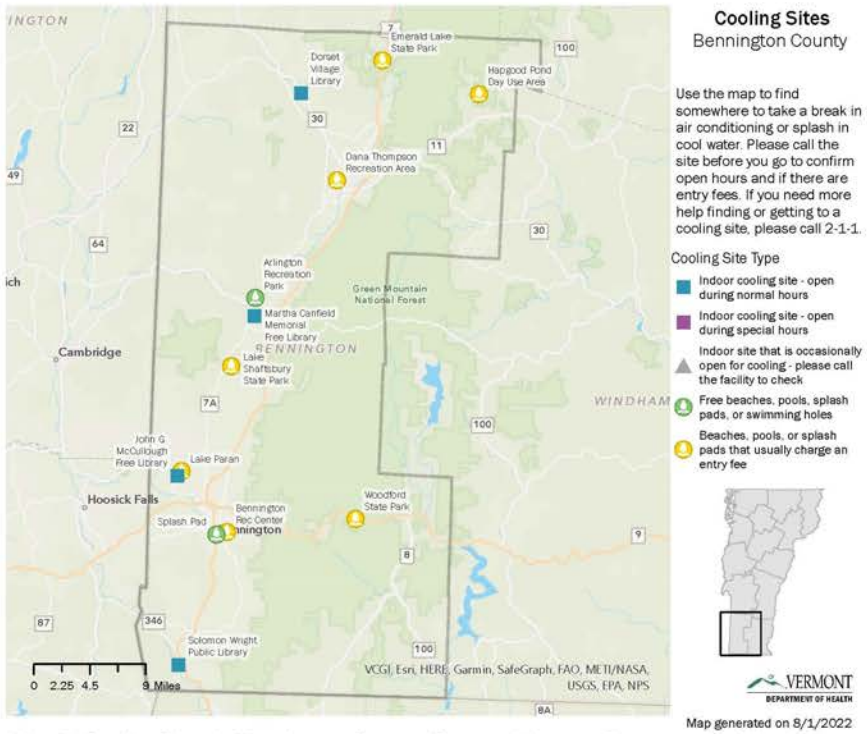
Extreme temperature is a widespread occurrence. The populations affected could be small if one is considering outdoor workers or large for the entire town in a power outage. The highest recorded temperature from the North Adams Cooperative Weather Observer was 96 degrees on July 8, 1988. The coldest recorded temperature from the North Adams Cooperative Weather Observer was -20 degrees on February 6, 2015.

Average temperatures in Vermont have risen 2.7 degrees since 1941 with an increase of 1.5 degrees since 1990. Winter temperatures have risen more than summer temperatures. But if these trends continue, the number of days above 87 degrees will likely increase, and minimum temperatures will also increase (Galford et al 2021).

PROBABILITY, IMPACT, AND VULNERABILITY

Excessive heat occurs approximately less than one day per year. Even though less frequent than extreme cold, excessive heat can be more challenging, as many homes don't have air conditioning and an increase in humidity during the summer can make it difficult to cool down. Farmers, outdoor workers, and those experiencing homelessness are at an increased risk of heat illness, as are infants, young children, older adults, and those with underlying health conditions. According to the Vermont Department of Health, heat kills more people in the U.S. each year than any other extreme weather event. Heat-related deaths are also preventable.

To help Vermont prepare for extreme heat, the Vermont Department of Health Cooling Site Map (Map 5) was created to show areas where people could cool off during periods of extreme heat. There are no cooling sites listed in Stamford. The closest recreational swimming area listed as a cooling site is Woodford State Park.



Map 5: Cooling Sites in Bennington County. (Source: Vermont Department of Health, August 2022)

Heat becomes more dangerous the longer it lingers. A multiple day event with warm nights can make it difficult for homes to cool down, making it difficult for people to cool down. During these events, it is important to check on friends, family, neighbors, and vulnerable populations. Residents should know where to follow weather forecasts and alerts, such as the National Weather Service and Vermont Alert, and recognize the signs of heat stroke and heat exhaustion. It is also important to stay hydrated and refrain from vigorous activity during the hottest parts of the day. If possible, people should stay in air-conditioned areas during extreme heat events, as it is a major protective factor against heat-related illness (Vermont Department of Health 2022). Extreme heat affecting Stamford in any given year is likely, with a >10% to <75% probability per year.

Extreme cold, here defined as less than freezing temperature, is a frequent occurrence in Vermont. Extreme cold typically has less of an impact on the population, unless it is accompanied by high winds or a power outage. Many in the state are familiar with the cold and have homes with adequate heat and have the proper attire and gear to deal with extreme cold. However, there is a risk of hypothermia and frostbite for those that venture outside during extreme cold, and heart attacks when shoveling snow or other vigorous activities. Those experiencing homelessness are also at a greater risk of developing hypothermia and frostbite during extreme cold. The primary shelter, Stamford Elementary School, is a warming shelter. However, warming shelters are usually not opened unless there is a long-term power outage or other issue affecting the community during an extreme cold weather event. Extreme cold is highly likely, with a >75% probability each year.

Impacts of either type of event could be widespread and vulnerability is dependent on the populations exposed.

Drought

DESCRIPTION

According to the National Integrated Drought Information System at drought.gov, drought is defined as “a deficiency of precipitation over an extended period of time (usually a season or more), resulting in a water shortage.” Droughts are the absence of precipitation instead of the presence of an event. Droughts tend to develop slowly, cover an extensive area, and have a long-lasting impact after the event has ended leaving these types of events difficult to predict, monitor, and assess.

There are five types of drought: meteorological, ecological, agricultural, socioeconomic, and hydrological. The latter is based on stream flow and groundwater availability and, from a natural hazard perspective, is probably the most important. Reductions in rainfall over extended periods, especially during the growing season when plants need moisture in order to grow, can result in hydrologic drought.

PREVIOUS OCCURRENCES

The Standardized Precipitation Index (SPI) is a widely used index which measures water supply, specifically precipitation. Using this scale, red hues indicate drier conditions while blue hues indicate wetter conditions. The National Climate Data Center calculates this index back to 1895 in Bennington County. See Figure 6 (below). Since then, severe droughts occurred in 27 years or 22% while extreme drought occurred in 8 years or 6%. Severe and extreme droughts have been of short duration, except during the early 1910s and another occurrence in the early 1960s. Mild to moderate droughts have been more frequent. Members of the planning team reported that some wells were low in 2015, which did have some months with moderate drought conditions, but only minor drought conditions have been observed since 2015, and with little impact to the town.

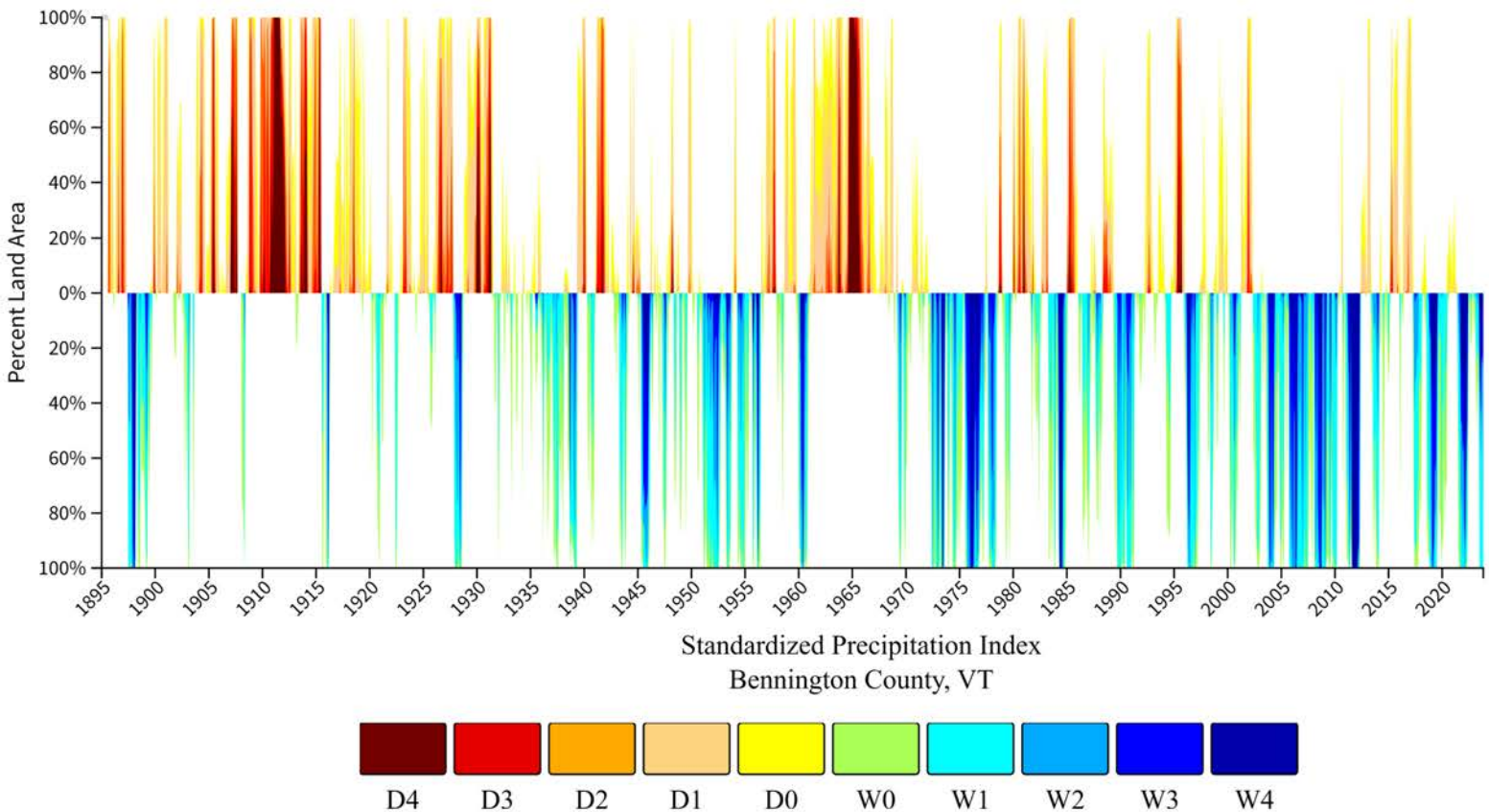
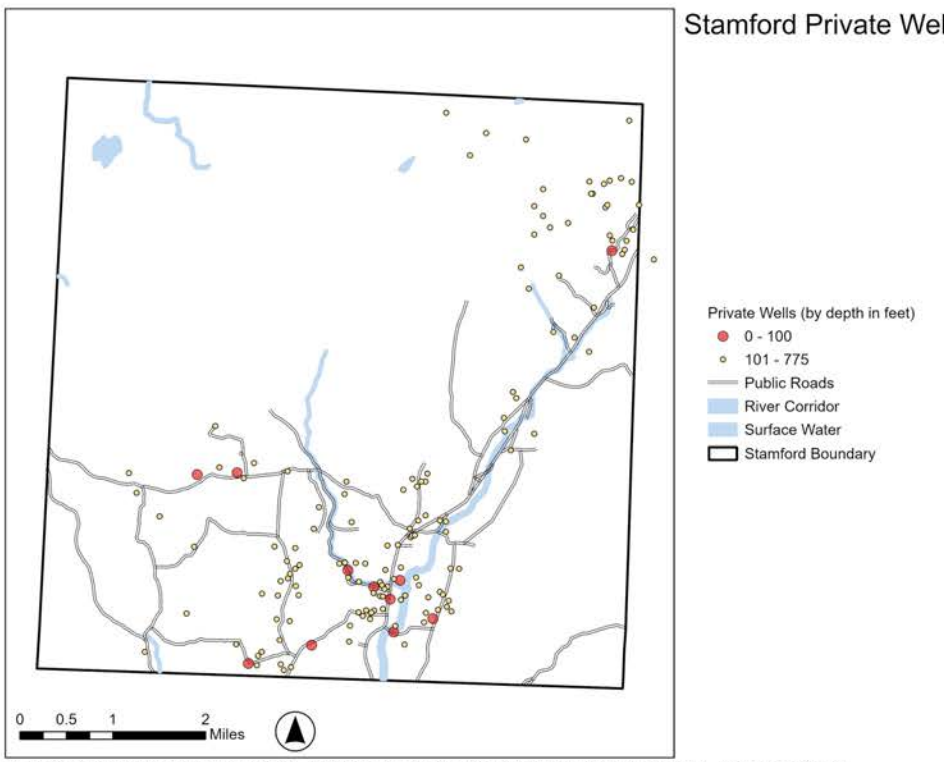


FIGURE 6: HISTORICAL CONDITIONS FOR BENNINGTON COUNTY. SOURCE:"BENNINGTON COUNTY CONDITIONS | DROUGHT.GOV." DROUGHT.GOV, WWW.DROUGHT.GOV/STATES/VERMONT/COUNTY/BENNINGTON.

EXTENT AND LOCATION

As shown in Figure 4 (below), since 2000, Bennington County has seen far wetter conditions than dry conditions but with rising minimum and maximum temperatures, drought may pose risk in the future. Those residences with shallow wells will be more likely to experience severe and extreme droughts. Risk to structures within Stamford is negligible however, there may be risk to some agriculture which may cause monetary losses.



Map 6: Stamford Private Wells. Bennington County Regional Commission, January 2024.

PROBABILITY, IMPACT, AND VULNERABILITY

Figure 6 shows drought history from the U.S. Drought Monitor for Vermont. From about 2018 to more recently, much of Southwestern Vermont, including Stamford, had been under the D0 category (Abnormally dry). The planning team had not observed the types of conditions listed in Figure 7 (below) for that category, though they may have occurred at times and in scattered locations. Currently (April 2023) the U.S. Drought Monitor shows no drought conditions in Stamford or Bennington County.

A severe or extreme drought occurring in or near Stamford in any given year is likely, with >10% to <75% probability per year. Except for long-term drought, most wells should supply sufficient water, though structures with shallow wells are most likely to be affected. Drought may affect the potential for wildfire, which is discussed below. Increasing temperatures or changes in precipitation patterns due to climate change may affect the frequency, length and degree of drought. Based on well data from the Vermont Center for Geographic Information, there are a total of 150 wells located in Stamford. Of the wells in Stamford, eight of them have depths of less than 100 feet. There are two public wells in Stamford, one at the elementary school and one at Stamford Valley Golf Course.

D0 (Abnormally Dry)	D1 (Moderate Drought)	D2 (Severe Drought)	D3 (Extreme Drought)	D4 (Exceptional Drought)
• Crop growth in stunted; planting is delayed • Fire danger is elevated; spring fire season starts early • Lawns brown early; gardens begin to wilt • Surface water levels decline	• Irrigation use increases; hay and grain yields are lower than normal • Honey production declines • Wildfires and ground fires increase • Trees and landscaping are stressed; fish are stressed • Voluntary water conservation is requested; reservoir and lake levels are below normal capacity	• Specialty crops are impacted in both yield and size • Producers begin feeding cattle; hay prices are high • Warnings are issued on outdoor burns; air quality is poor • Golf courses conserve water • Trees are brittle and susceptible to insects • Fish kills occur; wildlife move to farms for food • Water quality is poor; groundwater is declining; irrigation pods are dry; outdoor water restrictions are implemented	• Crop loss is widespread; Christmas tree farms are stressed; dairy farmers are struggling financially • Well drillers and bulk water haulers see increased business • Water recreation and hunting are modified; wildlife disease outbreak is observed • Extremely reduced flow to ceased flow of water is observed; river temperatures are warm; wells are running dry; people are digging more and deeper wells	• Vermont has had little or experience in D4 so no impacts have been recorded at that level in the Drought Impact Reported

FIGURE 7: DROUGHT CATEGORIES ACCORDING TO U.S. DROUGHT MONITOR AND THE POTENTIAL IMPACYS IN VERMONT. SOURCE:"BENNINGTON COUNTY CONDITIONS | DROUGHT.GOV." DROUGHT.GOV, WWW.DROUGHT.GOV/STATES/VERMONT/COUNTY/BENNINGTON.

Wildfire

DESCRIPTION

Wildfire or wildland fire is any unplanned fire affecting open lands including forests, grasslands or other features. The potential for wildland fire is dependent on fuel types, which vary with vegetation, topography, and weather. Fire intensity measured by the amount of energy released in a fire and exhibited by the length of flames and rates of spread dictate the degree of wildland fire hazard and methods of control. Table 8 shows how wildfires can be categorized based on size.

In Vermont, forests tend to be dominated by northern hardwood species such as sugar maple (Acer saccharum), birch (Betula spp.), white pine (Pinus strobus), and hemlock (Tsuga canadensis). These species tend to create relatively low flammability fire, so that surface fires have low intensity and rates of spread, thereby limiting fire hazard (Anderson 1982). Most of the land area in Stamford is covered by broadleaf litter fuels that exhibit fires of low intensity and slow rates of spread (U.S. Forest Service 2010).

In both forested and open settings, structures may be threatened by even small wildfires. These wildland-urban interface areas are the most likely areas where resources will be needed to suppress wildland fire and to reduce potential hazards.

Table 8. Wildland fire size classes Source: National Wildfire Coordinating Group 2011

Magnitude (Size)	Description	Probability
Class A	< ¼ acre	High
Class B	¼ to 10 acres	High
Class C	10 to 100 acres	Moderate
Class D	100 to 300 acres	Low
Class E	300 to 1000 acres	Very low
Class F	1000 to 5000 acres	Very low
Class G	>5000 acres	Very low

Fire behavior is most extreme during periods when the relative humidity is low, generally less than 35-45%. These conditions are most prevalent in the spring, following snowmelt, between March and late May or early June. After that, vegetation becomes increasingly green, and the resulting moisture in the live vegetation (fuel) reduces flammability significantly. Precipitation and evapotranspiration increase ambient relative humidity levels so that fires in the summer are generally rare and limited in size.

Fall again brings drying fuels and weather conditions increasing fire hazard. However, relative humidity levels increase after dark, and shorter days also limit the amount of time for fuels to dry and intense, fast moving fires to occur (North Central Research Station 2005).

Stamford likely has some structures within the “wildland-urban interface,” which represents areas where structures are directly adjacent to wildland fuels (Federal Register 2001). These areas have not been mapped.

PREVIOUS OCCURRENCES

According to records from the Vermont Department of Forests, Parks and Recreation from 1992 to 2022, 207 wildfires occurred in Bennington County. Stamford Town Reports show that there have been 4 wildland fires since 2019: one in 2021 which burned approximately one acre of land.

EXTENT AND LOCATION

Low intensity fires with slow rates of spread could occur in forested areas, large portions of which are in the National Forest, throughout the town, though there may be pockets of heavier fuel loads, such as brush, or more flammable fuels, such as cured herbaceous vegetation and shrubs.

PROBABILITY, IMPACT, AND VULNERABILITY

The areas deciduous and coniferous forests create litter that is relatively low in flammability so that wildfires have relatively low intensity and rates of spread. The main hazard is for wildland fire fighters working in steep terrain. The natural fire return intervals in most forests in Vermont are greater than 50 years (Malamud et al 2005) though fires can be more frequent in old fields. Recurrence is likely related to precipitation rather than the buildup of fuels, so drought recurrence is already factored into these interval estimates. Therefore, the potential for large fires is very limited due to the fuel characteristics of the land cover in Stamford.

Brush and wildland fires occurring in Stamford in any given year is highly likely, with a >75% probability in a year, but these are most likely to be small. However, as climate change increases temperatures, it may increase drought recurrence and the probability of larger wildfires may increase, as well.

Earthquake

DESCRIPTION

According to the Agency of Natural Resources Department of Environment Conservation, due to Vermont's location within the North American Plate, this area will only experience intraplate earthquakes which are generally lower in magnitude than interplate earthquakes. However, due to sediment types, the effects of an earthquake that occurs in this area may be felt over larger distances. Many intensity scales have been developed over the years to rank the effects of earthquakes. The Modified Mercalli Intensity (MMI) Scale is used within the United States and is ranked using roman numerals. The ranking is described in Table 9 below.

Table 9. The Modified Mercalli Intensity (MMI) Scale

CIIM Intensity	People's Reaction	Furnishings	Built Environment	Natural Environment
I	Not felt			Changes in level and clarity of well water are occasionally associated with great earthquakes at distances beyond which the earthquakes felt by people.
II	Felt by a few.	Delicately suspended objects may swing.		
III	Felt by several; vibration like passing of truck.	Hanging objects may swing appreciably.		
IV	Felt by many; sensation like heavy body striking building.	Dishes rattle.	Walls creak; window rattle.	
V	Felt by nearly all; frightens a few.	Pictures swing out of place; small objects move; a few objects fall from shelves within the community.	A few instances of cracked plaster and cracked windows with the community.	Trees and bushes shaken noticeably.
VI	Frightens many; people move unsteadily.	Many objects fall from shelves.	A few instances of fallen plaster, broken windows, and damaged chimneys within the community.	Some fall of tree limbs and tops, isolated rockfalls and landslides, and isolated liquefaction.
VII	Frightens most; some lose balance.	Heavy furniture overturned.	Damage negligible in buildings of good design and construction, but considerable in some poorly built or badly designed structures; weak chimneys broken at roof line, fall of unbraced parapets.	Tree damage, rockfalls, landslides, and liquefaction are more severe and widespread wiht increasing intensity.
VIII	Many find it difficult to stand.	Very heavy furniture moves conspicuously.	Damage slight in buildings designed to be earthquake resistant, but severe in some poorly built structures. Widespread fall of chimneys and monuments.	
IX	Some forcibly thrown to the ground.		Damage considerable in some buildings designed to be earthquake resistant; buildings shift off foundations if not bolted to them.	
X			Most ordinary masonry structures collapse; damage moderate to severe in many buildings designed to be earthquake resistant.	

PREVIOUS OCCURRENCES

Data from the Weston Observatory at Boston College (Northeast Earthquake Maps and Catalog 2015) was used to identify earthquakes occurring within 100 miles of Bennington County from January 1990 to February 2014. No earthquakes occurred in either Stamford or Bennington County during that period. Figure 8 plots the number of earthquakes by year by magnitude from that data. Updated data from this source was unavailable. However, data from the New England Seismic Network (NESN) shows that 24 earthquakes occurred in Vermont from February 2014 (when the Weston Observatory data ended) to December 2022. None of these earthquakes were in Stamford, but one was reported to be near Manchester, VT, in the northern portion of Bennington County. This earthquake occurred in 2017 and had a magnitude of 1.1.

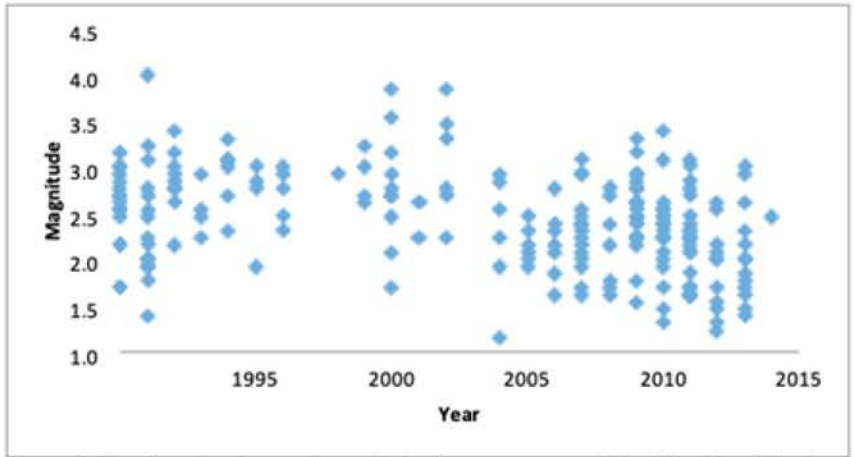


Figure 8: Plot of earthquakes and magnitude for occurrences within 100 miles of North Bennington, VT (Source: Northeast Earthquake Maps and Catalog 2015)

Table 10. Earthquakes in Vermont Source: Vermont Geological Survey (Ebel et al 1995) http://www.anr.state.vt.us/dec/geo/EBEL.htm consisting of excerpts from: A Report on the Seismic Vulnerability of the State of Vermont by John E. Ebel, Richard Bedell and Alfredo Urzua, a 98 page report submitted to Vermont Emergency Management Agency in July, 1995.

Location	Date	Magnitude	Mercalli Intensity
Swanton	6-Jul-43	4.1	Felt by nearly everyone; many awakened with some dishes and windows broken and unstable objects overturned
Brandon	31-Mar-53	4	Felt indoors by many, but by few outdoors. Sensation would be similar to a heavy truck striking a building.
Middlebury	10-Apr-62	4.1	Felt by nearly everyone; many awakened with some dishes and windows broken and unstable objects overturned

EXTENT AND LOCATION

Table 10 shows earthquakes that have occurred in Vermont based on the 1995 report. Those occurring within 100 miles have ranged in magnitude from barely registered to 3.9, with most in the range of 0.5 to 3.0 (Figure 8). No damage was recorded by any of these in Bennington County.

In 2012, the Hazus Analyses of Eleven Scenario Earthquakes in New England was prepared for FEMA by several agencies using FEMA's loss estimation software HAZUS. This analysis reviewed earthquakes within New England Bennington County based on a 500-year recurrence earthquakes centered in Middlebury, VT, Tamworth, NH and Goodnow, NY. The results indicated minimal damage and injury from any of these events in Bennington County[8].

PROBABILITY, IMPACT, AND VULNERABILITY

Based on the 2003 HAZUS analyses and that there has not been an earthquake on record in Stamford, an earthquake occurring with a magnitude large enough to cause substantial damage in the area is unlikely, with a <1% probability per year. However, earthquake prediction science is very limited.

[8] https://dec.vermont.gov/sites/dec/files/geo/StatewidePubs/HAZUS_VTScenarios_NE.pdf

Landslide

DESCRIPTION

Landslides are typically associated with periods of heavy rainfall or rapid snow melt and tend to worsen the effects of flooding that often accompanies these events. Some landslides move slowly and cause damage gradually, whereas others move so rapidly that they can destroy property and take lives suddenly. Gravity is the force driving landslide movement. Factors that allow the force of gravity to overcome the resistance of earth material to landslide movement include saturation by water, steepening of slopes by erosion or construction, and alternate freezing or thawing. Table 11 shows how landslides can be categorized.

Table 11. Landslide and debris flow types. Source: U.S. Geological Survey 2006

Magnitude	Description	Probability
Localized	Falls: abrupt movements of rocks and boulders, generally on steep slopes.	Low to moderate.
Topples	Topples: movements involving some forward rotation as material moves downhill.	Low to moderate.
Flows	A range of land movement generally involving a mass of loose soil, rock, organic matter, air and water moving downhill rapidly and possibly covering a wide area. One form called creep involves slow movement of material and is often recognizable by trees growing so as to remain vertical while bent near the ground as they grow to keep up with the slow material flow.	Highly variable but can be fairly common.

PREVIOUS OCCURRENCES

Mill Road has had periodic landslides and is a difficult area to maintain. There are also areas along that road where rip rap and other measures are needed[9] and/or need regular repair. All of the landslides would be categorized as localized. The Vermont Agency of Natural Resources Landslide Inventory does not have any mapped landslides located in Stamford.

[9] https://dec.vermont.gov/sites/dec/files/geo/StatewidePubs/HAZUS_VTScenarios_NE.pdf

EXTENT AND LOCATION

There have been no rockslides and landslides are relegated to an area along Mill Road.

PROBABILITY, IMPACT, AND VULNERABILITY

A landslide occurring in Stamford in any given year is likely, with a >75% probability per year. The primary area affected in Stamford has been small and, while this is a recurring problem, the resulting impact and vulnerability are minimal.

Invasive Species

DESCRIPTION

Invasive species are organisms that are not native to a geographic area and which can or do cause economic or environmental harm. Invasive species are characterized by organisms that spread rapidly, can displace native species, and have few or no predators to keep their populations in check. At the same time, they have characteristics that may reduce the value and use of natural resources. For example, bush honeysuckle can become a dominant shrub in some forests reducing the potential for tree regeneration. Japanese knotweed colonizes stream banks, and does not hold soil well, leading to increased streambank erosion. Bush honeysuckle can become a dominant shrub in some forests, reducing the potential for tree regeneration (Vermont Invasives 2021).

Vermont has two invasive species lists: Class A species are on the Federal Noxious Weed List but are not known to occur in Vermont. These are listed in 7 C.F.R. 360.200, a section of the Code of Federal Regulations. Class B species are known to occur in the state and are considered a threat (Table 12). Table 13 shows aquatic invasive species listed by the Agency of Natural Resources.

Table 12. Designated Class B noxious weeds in Vermont Source: Vermont Agency of Agriculture, Food and Markets: https://agriculture.vermont.gov/public-health-agricultural-resource-management-division/plant-health-and-pest-management/plant-0.
Those with a * have been identified in Bennington County. Source: Early Detection and Mapping System http://www.eddmaps.org/tools/query/.
Those marked with an (A) are also on the aquatic invasive species list (Table 15).

Scientific Name	Common Name
Acer ginnala*	Amur maple
Acer platanoides*	Norway maple
Aegopodium podagraria*	Bishop's goutweed or goutweed
Ailanthus altissima	Tree of heaven
Alliaria petiolata*	Garlic mustard
Berberis thunbergii*	Japanese barberry
Berberis vulgaris*	Common barberry
Butomus umbellatus (A)	Flowering rush
Celastrus orbiculatus*	Oriental bittersweet
Euonymus alatus*	Burning bush
Fallopia japonica*	Japanese knotweed
Hydrocharis morsus-ranae (A)	Frogbit
Iris pseudacorus* (A)	Yellow flag iris
Lonicera japonica	Japanese honeysuckle
Lonicera maackii	Amur honeysuckle
Lonicera morrowii*	Morrow honeysuckle
Lonicera tatarica*	Tartarian honeysuckle
Lonicera x bella*	Bell honeysuckle
Lythrum salicaria* (A)	Purple loosestrife
Myriophyllum spicatum* (A)	Eurasian watermilfoil
Najas minor	European naiad
Nymphoides peltata (A)	Yellow floating heart
Phragmites australis* (A)	Common reed
Potamogeton crispus (A)	Curly leaf pondweed
Rhamnus cathartica*	Common buckthorn
Rhamnus frangula*	Glossy buckthorn
Trapa natans* (A)	Water chestnut
Vincetoxicum nigrum	Black swallow-wort

Table 13. Aquatic invasive species in Vermont. Source: Watershed Management Division, Department of Environmental Conservation: http://dec.vermont.gov/watershed/lakes-ponds/aquatic-invasives/gallery

Scientific Name	Common Name
Dreissena polymorpha	Zebra mussel
Alosa pseudoharengus	Alewife
Orconectes rusticus	Rusty crayfish
Bythotrephes longimanus	Spiny Waterflea
Corbicula fluminea	Asian clam
Didymosphenia geminata	Didymo
Nitellopsis obtusa	Starry Stoneword
Myriophyllum heterophyllum	Variable-leaved Watermilfoil

In addition to the species listed above, the following should be considered invasive species: Wild parsnip (*Pastinaca sativa*) also known as poison parsnip, is abundant along roadsides in Stamford and many areas in Bennington County (figure 9). This plant can cause skin burns when chemicals in the plant transfer to exposed skin, then interacts with the sun. This can cause harm to those who work on or along roads or utility rights of way. Cow parsnip or wild chervil (*Anthriscus sylvestris*) also dominate roadways and can invade meadows. Reed canary grass (*Phalaris arundinacea)* can invade wetlands and crowd out native plants and has been observed in Bennington County.

Figure 10: Japanese Knotweed (Fallopia japonica) (Source: VT Invasives)

Figure 9: Wild Parsnip (Pastinaca sativa) (Source: VT Invasives)

The bush honeysuckles (*Lonicera spp.*) have also been observed along roadsides. It is likely that buckthorn (*Rhamnus cathartica*) and barberry (*Berberis thunbergi*i) have invaded forests and wetland edges and that Japanese knotweed (*Fallopia japonica*) has invaded stream banks and other disturbed areas. Japanese knotweed has been mentioned by the planning team as being an issue in the town (Figure 10). Japanese and Common barberry (*Berberis thunbergii* and *Berberis vulgaris*) promote Lyme disease by harboring high populations of mice, one of the hosts of deer ticks. Recently didymo (*Didymosphenia geminate*) was determined to be native, but this status may change.

Other invasives mentioned by the planning team that have been issues in the town are garlic mustard (*Alliaria petiolate*), poison ivy (*Toxicodendron radicans*), multiflora rose (*Rosa multiflora*) (seen in figure 11), and hogweed (*Heracleum mantegazzianum*).

PREVIOUS OCCURRENCES

Invasive species are present and represent a continuous hazard that will vary with their abundance and their impacts on structures and infrastructure.

EXTENT AND LOCATION

The extent of invasive plants in Stamford and in Bennington County has not been fully mapped.

Figure 11: Mulitflora Rose (Rosa multiflora) (Source: VT Invasives)

Insects and pathogens have the potential for dramatically altering the composition and structure of forests as well as affecting trees in settled areas. Hemlock wooly adelgid (*Adelges tsugae*) has dramatically reduced hemlock trees south of Vermont and has been found in Pownal. The emerald ash borer (*Agrilus planipennis*) is also a significant threat to forests as it kills all ash species (Figure 12).

The emerald ash borer was recently found in Stamford and Pownal (see Figure 13). Unfortunately, once the emerald ash borer is established, it cannot be eradicated and most ash trees die in 3-5 years (Vermont Department of Forests, Parks, & Recreation 2021). This will result in a large number of trees that need to come down, creating a loss of canopy and large expense for municipalities due to river and road blockages.

In addition to the above insects, there are other insects and pathogens that are affecting Vermont forests. These may constitute an emerging hazard (Schultz et al 2015). Climate change may increase the abundance and ranges of forest pest species such as hemlock wooly adelgid and invasive species currently found in more southerly locations (Rustad 2012).

PROBABILITY, IMPACT, AND VULNERABILITY

The likelihood of increased abundance of invasive species in Stamford is highly likely, with >75% probability in a year. Potential impacts to forested areas are very high. Invasive insects that can cause tree death, particularly the emerald ash borer, could result in road closures, power outages and property damage due to dead and falling trees.

Increases in the abundance of invasive plant species could limit regeneration of native trees and shrubs and affect the long-term integrity of the forests (Vermont Department of Forests, Parks and Recreation 2010; Vermont Invasives 2021).

Figure 12: Emerald Ash Borer (Agrilus planipennis) (Source: VT Invasives)

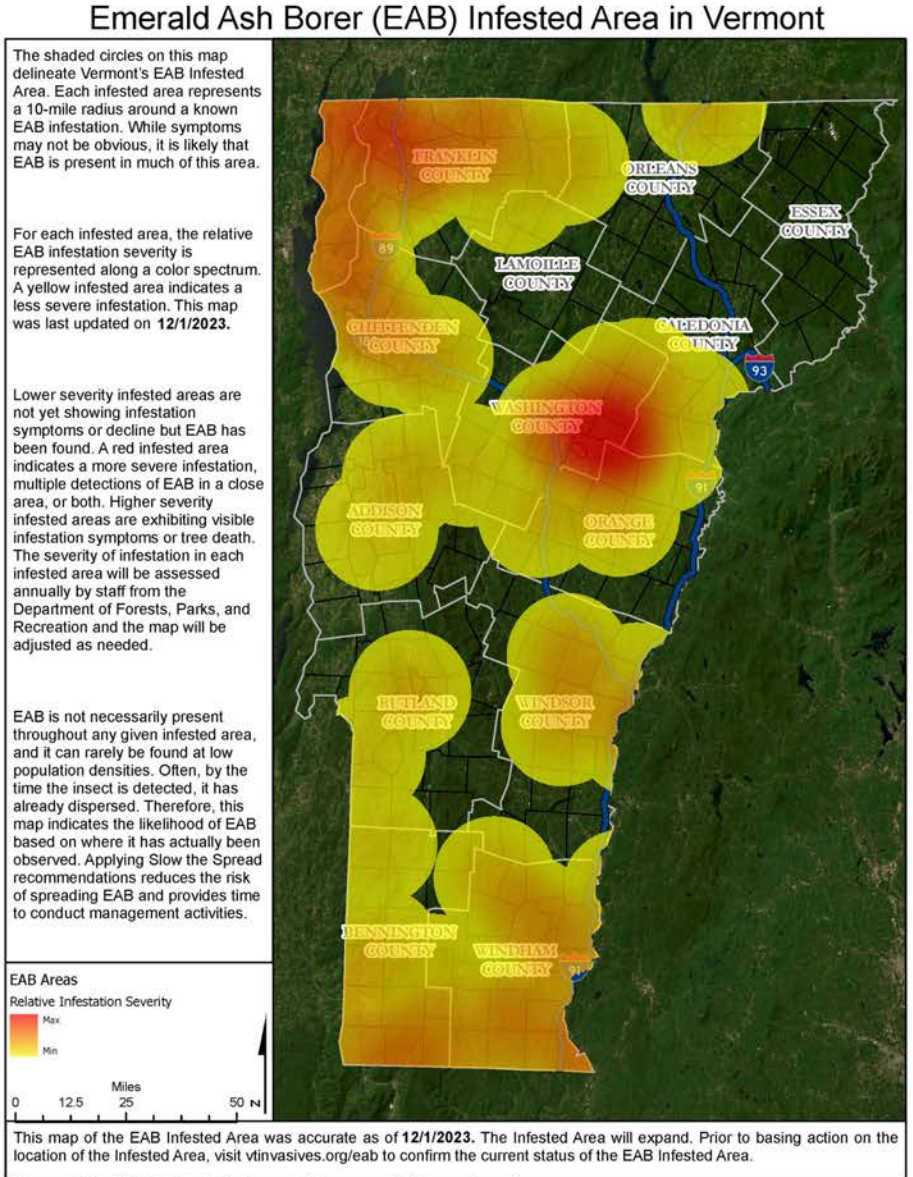


Figure 13: EAB Infested Areas (Source: VT Invasives)

Hazardous Material Spill

DESCRIPTION

Hazardous wastes are materials that are flammable, corrosive, toxic, or labeled with warning or caution labels. These materials are used in industry, in the home, or on farms and are transported regularly.

PREVIOUS OCCURRENCES

Vermont Agency of Resources maintains a hazardous materials spills list. Reviewing the list indicates that there were eight spills in Stamford from 2000 to 2022 (Table 14).

Table 14. Hazardous Materials spills in Stamford. Source: https://anrweb.vt.gov/DEC/ERT/Spills.aspx

Report #	Year	Facility Name	Address	Responsible Party	Date Reported	Date Closed	Incident
WMD009	2000	Stamford AOT Garage	Rt 100 and Rt 8	VT AOT	1/8/2000	1/11/2000	25 gallon spill from tank leak; chloride recovered
WMD366	2002	Regulator Structure	River Road	Green Mountain Power	11/18/2002	11/21/2002	84 gallons of oil from electrical regulator leak
WMD312	2005	N/A	5172 Main Rd	Ginsburgs Food	8/31/2005	10/11/2005	50 gallon diesel spill from truck rollover
WMD495	2011	roadside	County Rd	US Forest Service	8/24/2011	Not indicated	Two cylinders of anhydrous ammonia found
WMD477	2013	Roadside	153 East Road	GMP	10/17/2013	10/17/2013	Release of 1 gallon of hydraulic fluid from GMP vehicle
WMD292	2017	Roadway	558 Klondike Road	KP Power Inc.	6/19/2017	6/19/2017	3 gallons of hydraulic oil from broken TT hydraulic line.
WMD365	2019	Roadside	RT 100 SB MM 223	JMS Services	8/12/2019	8/27/2019	5-8 gallons of hydraulic oil from hydraulic equipment failure
WMD262	2020	Roadway/ roadside	Rt 100 (800ft from Mill Rd.)	VTrans	6/22/2020	6/22/2020	2-4 gallons of hydraulic oil from hose failure

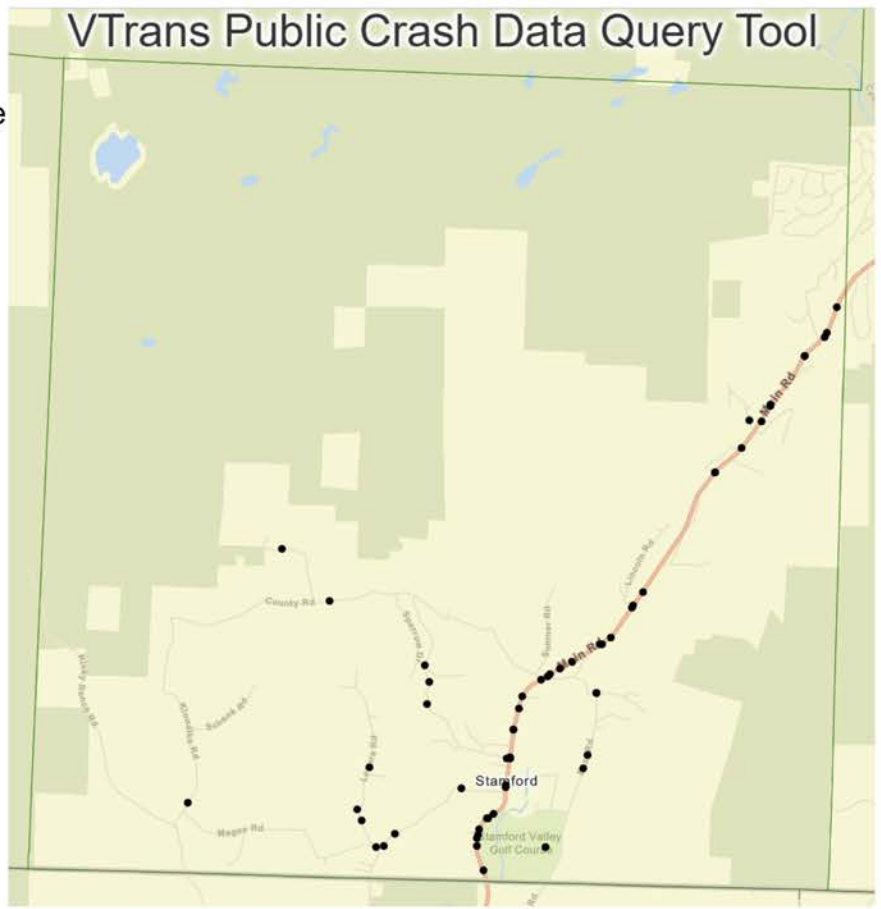
EXTENT AND LOCATION

All of the spills affected small sites or areas. The main highways that would be affected by a spill in Stamford would be VT Route 100 and Route 8. These roads are the main arteries through the town, so a spill could affect many properties and travelers.

One particular concern in any hazardous materials spill would be the impact on water resources. If an incident occurred along VT Route 100/Main Road, several of the brooks that follow the road could be affected due to the proximity of the road to the water.

Hazardous roads have been identified by the Vermont Agency of Transportation and the planning team. The road with the most accidents from January 2013 to December 2022, according to the VTrans Public Crash Data Query Tool[10], was VT Route 8/100/Main Road, with 43 out of a total of 64 accidents. This makes sense as it is the most heavily traveled road in town (Map 6). The majority of accidents along VT Route 8/100/Main Road were single vehicle crashes. According to the planning team, drainage issues along the Mill Rd. and Main Street cause vehicles to hydroplane during rain events. During winter months, this intersection may freeze causing vehicles to slide into the intersection. Alcohol and drugs may also play a part in vehicle accidents as well as speed during weather events.

Roads with average grades greater than 10% also present hazards, particularly when roads are wet or during winter storms. The planning team identified 3 roads with steep grades in Stamford: Lesure Road, County Road and Sumner Road however, these roads are not main truck routes so the possibility of a hazardous spill occurring along these roads is minimal at most.



Map 6: Crash location from 2013 to 2022 (VTrans Public Crash Query)

[10] http://apps.vtrans.vermont.gov/CrashPublicQueryTool/

PROBABILITY, IMPACT, AND VULNERABILITY

Hazardous material spills occur more than annually, though typically affect small areas. Stamford has a moderate amount of truck traffic, which can increase the possibility of a spill. Many areas are vulnerable due to the proximity of surface and groundwater resources to roads. Local roads carry materials that could spill and harm aquatic resources as well as individual wells. The Stamford Fire Department has the ability to respond to small hazardous materials spills. The State Hazardous Materials Response Team is called to assist for larger incidents.

The overall likelihood of a hazardous materials spill occurring in Stamford is likely, with a >10% to <75% probability per year. Injuries, except in the case of direct injuries from a traffic accident, are likely low. However, the long-term impacts of a spill could be extensive if aquatic resources and/or water supplies were affected.

Infectious Disease Outbreak

DESCRIPTION

Infectious diseases are caused by bacterial infections, viruses, fungi, and other organisms that can spread through the human population. Two of the most well-known infectious diseases currently occurring are COVID and Lyme disease. Until COVID, Lyme disease had been the most prevalent infectious disease in Bennington County. Lyme Disease is very common in this region, as well as other tick-born illnesses.

PREVIOUS OCCURRENCES

Infectious diseases are caused by bacterial infections, viruses, fungi, and other organisms that can spread through the human population. Two of the most well-known infectious diseases currently occurring are COVID and Lyme disease. Until COVID, Lyme disease had been the most prevalent infectious disease in Bennington County. Lyme disease is very common in this region, as well as other tick-born illnesses.

COVID is currently still an active virus within the town and the world. In the beginning, when there was little known about COVID, people were required to wear face masks and physically distance themselves from others to reduce transmission. As a result, businesses were disrupted with some closing, schools were closed for prolonged periods with students learning remotely, and many workers switched to working remotely. The United States and Vermont went through several case surges where transmission in communities was increased. Several vaccines have now been developed and distributed. Currently in the United States, anyone age 6 months and over can receive a COVID vaccine. COVID and the vaccination progress is ongoing.

Lyme disease, carried by and transmitted by ticks is widespread in Vermont and New England. The symptoms can range from minor to very severe and is a clear threat to anyone in the region. In addition to Lyme disease, ticks in the region can carry multiple diseases and infect people with anaplasmosis and babesiosis as well.

Figure 14 shows the diseases and conditions tracked by the Vermont Department of Health. These numbers indicate the total number of cases from 2006-2022. However, tracking numbers for certain diseases and conditions were low in 2021 this may be due to the increased tracking of COVID-19 casing a disruption in the tracking of other diseases.

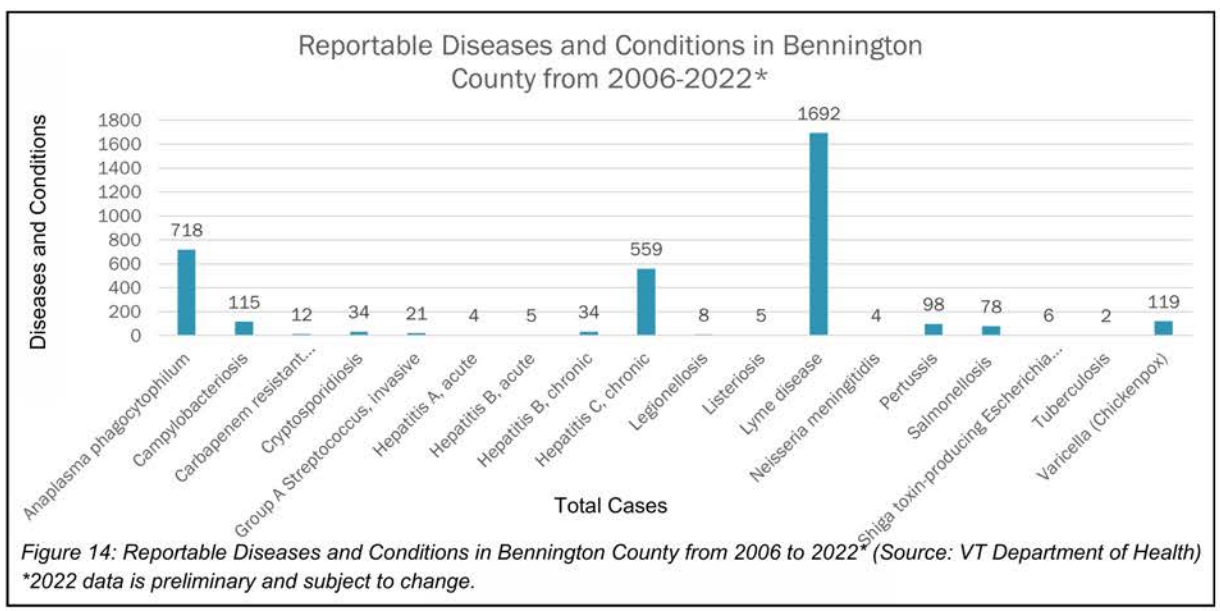


Figure 14: Reportable Diseases and Conditions in Bennington County from 2006 to 2022 (Source: VT Department of Health)*
**2022 data is preliminary and subject to change.*

EXTENT AND LOCATION

In general, individuals and families are most affected by infectious diseases, but schools and businesses could be affected as well, as seen with COVID.

PROBABILITY, IMPACT, AND VULNERABILITY

COVID-19 has affected Stamford, the region, state, country, and world. It is highly likely that this infectious disease will continue to occur in Stamford, with a >75% probability per year.

Lyme disease, and other tickborne diseases will continue to affect residents, those using recreational trails, and visiting natural and forested areas. It is highly likely that Lyme disease will continue to occur in Stamford, with a >75% probability per year.

Many of the carriers of infectious disease, such as ticks and mosquitoes, may be exacerbated by climate change and lead to an increased abundance of invasive species (Vermont Hazard Mitigation Plan 2018). Invasive plant species have been known to increase tick populations in certain areas, such as along roadways and in forests. In addition, forest segments that are broken up and separated from larger forested areas promote the increase in certain animal populations that are main carriers of ticks. Promoting healthy forest practices can help keep the animal and tick populations at more balanced levels.

4 Vulnerability Assessment

Prioritization of Hazards

The hazard assessment information was used to prioritize hazards using criteria from the Vermont Hazard Mitigation Plan and is described in Table 15. The frequency of occurrence (probability) and the potential impact of each event were taken into account to determine which hazards posed the greatest threat to the town of Stamford.

Table 15. Vulnerability assessment factors (Vermont Hazard Mitigation Plan 2018)
Frequency of Occurrence: Probability
1 = Unlikely: <1% probability of occurrence per year
2 = Occasionally: 1–10% probability of occurrence per year, or at least one chance in next 100 years
3 = Likely: >10% but <75% probability per year, at least 1 chance in next 10 years
4 = Highly: Likely >75% probability in a year
Potential Impact: Severity and extent of damage and disruption
1 = Negligible: Isolated occurrences of minor property damage, minor disruption of critical facilities and infrastructure, and potential for minor injuries
2 = Minor: Isolated occurrences of moderate to severe property damage, brief disruption of critical facilities and infrastructure, and potential for injuries
3 = Moderate: Severe property damage on a neighborhood scale, temporary shutdown of critical facilities, and/or injuries or fatalities
4 = Major: Severe property damage on a metropolitan or regional scale, shutdown of critical facilities, and/or multiple injuries or fatalities

List of Hazards

The planning team assessed each of the hazards thoroughly then scored the hazards based on the criteria in Table 15 to determine which hazards would need mitigation actions. Table 16 shows the results of the scoring, with Floods, Flash Floods, and Fluvial Erosion; Winter Storms; Invasive Species; and Infectious Disease Outbreak ranking highest followed by High Wind Events and Extreme Heat and Extreme Cold. In the previous plan all hazards were selected to have mitigation actions. However, with new data and new vulnerability assessment criteria, Hail, Landslide, and Earthquake were not selected by the planning team as they were extremely low in overall score.

Table 16. Prioritization of hazards

Hazard	Number of Events	Frequency of Occurrence	Potential Impacts	Total Score
Floods, Flash Floods, and Fluvial Erosion	48 events from 1996 to 2022	4	3	7
Winter Storms	216 events from 1996 to 2022	4	3	7
Infectious Disease Outbreak	Ongoing	4	3	7
Invasive Species	Ongoing	4	3	7
High Wind Events	156 events from 1996 to 2022	3	3	6
Extreme Heat and Extreme Cold	Annual >90 F: 1 day on average annual maximum <32 F: 40 days annual minimum < 32 F: 160 days	3-4	2	5-6
Hazardous Material Spills	8 events from 2000 to 2022	3	2	5
Drought	Severe droughts have occurred in 27 years from 1895 to 2022	3	2	5
Wildfire	4 events from 2019 through 2022	4	1	5
Hail	25 events from 1996 to 2022	3	1	4
Landslide	Small scale events along MIll Rd.	2	2	4
Earthquake	No events	1	1	2

Map 7 is a composite map showing areas identified by the planning team as vulnerable to flooding, steep grades, and areas needing major culvert upgrades. Other priority hazards were not mapped either as adequate surveys have not been completed, or they could affect the entire town. Table 20 lists the hazard areas, shown on Map 7.

Map 7: Hazard areas in Stamford VT Source: Bennington County Regional Commission, 2023

Table 20. Hazard areas identified by the planning team.
1. Mill Road and Route 100 intersection – poor drainage leads to cars hydroplaning during rain events and this intersection may freeze during cold weather events leading to car crashes
2. Bilmont's Country Store – potential gas leaks from pumps
3. Town Garage – located within River Corridor of Roaring Brook
4. Lesure Road/Lesure Hill – steep grade
5. Sumner Road – steep grade
6. Mill Road – small landslides

5 Mitigation Measures

Mitigation Goals

The seven Hazard Mitigation Goals as outlined below were agreed upon by consensus among the Planning Committee during plan development meetings:

1. Reduce injury and loss of life resulting from natural disasters.
2. Reduce damage to public infrastructure, minimize disruption to the road network and maintain both normal and emergency access.
3. Establish and manage a program to proactively implement mitigation projects for roads, bridges, culverts and other municipal facilities to ensure that community infrastructure is not significantly damaged by natural hazard events.
4. Design and implement mitigation measures so as to minimize impacts to rivers, water bodies, and other natural features, historic structures, and neighborhood character.
5. Increase the economic resiliency of Stamford by reducing the economic impacts incurred by municipal, residential, agricultural and commercial establishments due to disasters.
6. Incorporate hazard mitigation planning into other community planning projects, such as the Town Plan, Capital Improvement Plan, and Local Emergency Management Plan.
7. Ensure that members of the general public continue to be part of the hazard mitigation planning process.

Implementation of the actions in this plan to achieve the above goals would also help achieve the statutory requirements of 24 V.S.A. Chapter 117 requirements including those to protect natural and cultural resources, provide affordable housing, support economic development, and maintain a working landscape. These are also expressed in the Town Plan (Town of Stamford Amended Town Plan 2019).

The following section reviews plans already established that support hazard mitigation planning activities, as well as previous hazard mitigation plans, for Stamford. Priorities for this 2023 plan are largely the same as for the previous plan, as the population and development of the town have remained mostly the same. There have been more storms, but nothing more severe than before. However, the town has seen the impacts from infectious disease since the previous plan. Priorities for hazard mitigation planning reflect the new data and lived experiences collected as part of this plan update.

Existing Plans & Regulations

2015 HAZARD MITIGATION PLAN

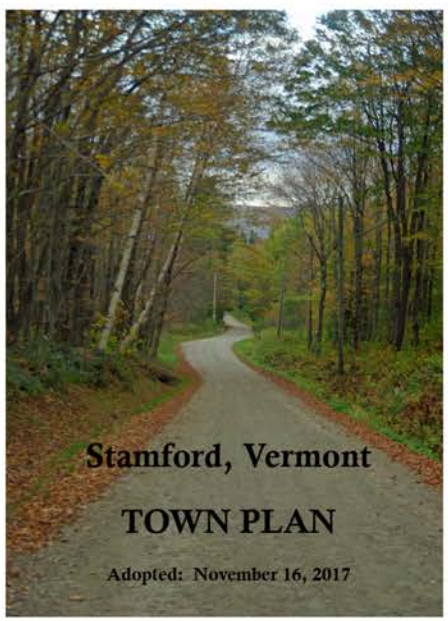
In 2015, Stamford adopted a stand-alone plan that assessed and developed mitigation measures for all natural hazards. Actions from that plan and the status of those actions can be found in Appendix I. The vulnerability assessment in this plan has been updated to reflect the scoring used in the 2018 Vermont Hazard Mitigation Plan as seen in Table 16.

TOWN PLAN

The Stamford Town Plan (Stamford 2019) includes several objectives that support hazard mitigation. These objectives focus on flood hazard areas, hazard preparedness, and stormwater management.

The Flood Resilience section of the plan addresses the need to limit the risk from flooding by using elements of the natural environment such as upland forests to decrease the erosive forces and wetlands in floodplain areas to retain storm water. The lack of appropriately sized culverts and bridges is addressed and the plan directs the town to remain consistent with the most current “VTrans Orange Book” Town Road and Bridge Standards to provide the correct size replacement structures.

The plan also lists several steps for effective flood resilience: assessing hazards, reducing risks, preparing for an emergency, and insuring residual risk. Flood hazard areas and river corridors are discussed and a table showing the structures in each zone is included. The previous hazard mitigation plan is mentioned and discusses some aspects of that plan as well.



The plan also explains that the town has adopted land use regulations to control development in hazard-prone areas and mentions that the hazard mitigation plan further reduces risk by prioritizing specific mitigation actions, and by expanding access to FEMA mitigation funds. The plan includes information about the Local Emergency Operations Plan (now the Local Emergency Management Plan) and mentions that the town is a part of the National Flood Insurance Program (NFIP) since 1978, making flood insurance available to all residents. Lastly, the Flood Resilience section discusses the Emergency Relief and Assistance Fund and the requirements that the town will need to maintain in order to take advantage of additional state funding.

TOWN BYLAWS

The Stamford Zoning Bylaws were adopted in October 2020 and include as an appendix the Flood Hazard Area Regulations as of December 8, 2014. The bylaws ensure that proposed uses do not adversely affect surface or subsurface water resources, including floodplains, wetlands, streams, ponds, and groundwater. Stormwater management must comply with state standards, and not lead to adverse impacts on the municipal drainage system, surface or groundwater, or any other property in the area. The bylaws also prohibit fill in the floodway.

For structures and development, base flood elevation and floodway data is used to determine that the lowest floor (including basement) of residential buildings is elevated to be two feet or more above the base flood elevation and the floodway be kept free of obstructions. Encroachments or development above grade and below the elevation of the floodway is prohibited. No existing building in the floodway may be enlarged by greater than 500 square feet to create a greater encroachment on the floodway.

The Zoning Administrator determines that all development is: reasonably safe from flooding; designed and anchored to prevent flotation, collapse, or lateral movement of the structure; constructed of materials and utility equipment that are resistant to flood damage; constructed using methods and practices that will minimize flood damage; consistent with the need to minimize flood damage; and designed so that public utilities and facilities, such as sewer, gas, electrical, and water systems, are located, elevated, and constructed to minimize or eliminate flood damage.

The Zoning Administrator also makes sure that: electrical, heating, ventilation, plumbing, and air conditioning equipment, and other service facilities are designed and/or located so as to prevent water from entering or accumulating within components during conditions of flooding; adequate drainage is provided so as to reduce exposure to flood hazards; the lowest floor (including basement) of any substantially improved non-residential buildings and other structures, shall be elevated or flood-

proofed to at least one foot above the 100-year flood level, or be designed with floodproofing measures; structures be substantially improved in Zones A, A1-30, AE, and AH, and shall be located such a that the lowest floor is at least one foot above base flood elevation, which must be documented in as-built condition with a FEMA Elevation Certificate; enclosures below grade on all sides (including below grade crawlspaces and basements) are prohibited except for certain uses identified in the bylaws.

Additionally, new or replacement water supply systems, and/or sanitary sewage systems, are designed to minimize or eliminate infiltration of flood waters into the systems and discharges from the systems into flood waters, and that on-site disposal systems are located so as to avoid impairment of them or contamination from them during flooding.

The Zoning Administrator also ensures NFIP compliance by reviewing any proposed development and making sure the plans are consistent with bylaws and state statute.

The Flood Hazard Area Regulations within the Zoning Bylaws address the substantial improvement process under Section VI.D: Conditional Use Review. For any substantial improvement (SI), elevation, relocation, or flood proofing of existing structures, conditional use review and approval by the Zoning Board of Adjustment (ZBA) is required prior to the issuance of a permit by the Administrative Officer (AO).

Substantially damaged (SD) structures are addressed sunder Section VI.G.2: Nonconforming Structures and Uses. This section indicates that the

“ZBA may, after public notice and hearing, approve the repair, relocation, replacement, or enlargement of a nonconforming structure within a flood hazard area provided that:

2. A nonconforming structure that is substantially damaged or destroyed may be reconstructed only in circumstances when the structure cannot be relocated to a less hazardous location on the parcel. The lowest floor of the reconstructed structure must be rebuilt to one foot or more above the base flood elevation, and the structure must otherwise comply with all requirements of the National Flood Insurance Program.”

LOCAL EMERGENCY MANAGEMENT PLAN

Stamford annually updates their Local Emergency Management Plan (LEMP). This plan lists points of contacts to be used during hazardous weather events or other emergencies, positions and duties, emergency operations center staff members and locations, local resources, typed resources, public information and warning locations, vulnerable populations, vulnerable locations, and shelters. This plan is reviewed and/or readopted annually. The last plan was adopted on May 4, 2023.

VERMONT HAZARD MITIGATION PLAN (2018)

The Vermont Hazard Mitigation Plan (2018) identified a series of hazards shown in Table 22 below along with those we considered in this plan. The planning team used the state plan as a starting point and local knowledge to create a more specific set of hazards that they addressed. Table 18 shows how the Stamford plan tracks the state plan.

BENNINGTON COUNTY REGIONAL PLAN (ADOPTED MARCH 19, 2015, AMENDED WITH THE REGIONAL ENERGY PLAN MARCH 23, 2017)

The Bennington County Regional Plan (Bennington County Regional Commission 2015) lists the following policies and actions supporting hazard mitigation including several policy recommendations emphasizing protecting natural resources, maintaining town and urban centers, and avoiding development on sensitive lands including areas of steep slopes and wetlands along with the protection of surface and

Table 18. Comparison of hazards considered in the 2018 Vermont Hazard Mitigation Plan vs. the Stamford Hazard Mitigation Plan

2018 VT Hazard Mitigation Plan	Town Hazard Mitigation Plan
Hazards	**Natural Hazards**
Drought	Drought
Earthquake	Earthquake
Inundation Flooding and Fluvial Erosion	Floods, Flash Floods, and Fluvial Erosion
Hail	Hail
Wind	High Wind Events
Hurricane/Tropical Storm	Addressed in High Wind Events and Floods, Flash Floods, and Fluvial Erosion sections
Infectious Disease	Infectious Disease Outbreak
Invasive Species	Invasive Species
Landslides	Landslides
Severe Thunderstorm	Addressed in High Winds and Floods, Flash Floods, and Fluvial Erosion sections
Snowstorm and Ice Storm	Winter Storms
Extreme Heat	Extreme Heat and Extreme Cold
Extreme Cold	Extreme Heat and Extreme Cold
Wildfire	Wildfire

groundwater resources and forested lands. The regional plan also includes a flood resilience section, which is required by Vermont statutes describing potential hazards from flooding and fluvial erosion. The section encourages avoiding development in flood hazard areas, reconstruction of bridges and culverts that impede flows, undisturbed buffer areas along streams to provide for lateral movement and attenuation of overland flow, participation in the National Flood Insurance Program, updating of flood bylaws, adoption of up-to-date road and bridge standards and participation in the community rating system.

VERMONT AGENCY OF NATURAL RESOURCES

The Vermont Agency of Natural Resources (VT ANR) has worked with Stamford and other communities to adopt updated flood and river corridor regulations. VT ANR also has mapped river corridors and can regulate activities within those that are not subject to review by municipalities. VT ANR also reviews municipal permit applications for development within the special flood hazard area, permit applications for stream alterations, regulated activities within wetlands, and permits for transporting hazardous materials.

ACT 250

The Act 250 program provides a public, quasi-judicial process for reviewing and managing the environmental, social, and fiscal consequences of major subdivisions and developments in Vermont. During Act 250 proceedings, agencies and the public can offer comments on such proposed developments.

CURRENT PROGRAMS

Vermont municipalities have the authority to regulate development in flood hazard areas under 24 Vermont Statutes Annotated (VSA), Chapter 91. Under 10 VSA, Chapter 32, the Secretary of the Agency of Environmental Conservation has the authority to designate flood hazard areas and to assist the towns with flood hazard regulations. Stamford participates in the National Flood Insurance Program (NFIP) and has bylaws in place to implement that program, as previously discussed.

Town Capabilities

The town of Stamford has a Select Board, Planning Commission, Zoning Administrator, Zoning Board of Adjustment, Highway Department, and Fire Department.

The Select Board has five members. The trustees appoint members to the other boards and commissions, adopts the Town Plan and Bylaws, proposes the budgets, and approves expenses. The Planning Commission has nine members with the primary purpose of reviewing and updating the Zoning Bylaws and the Town Plan on an ongoing basis to ensure that they are current and in conformity with the Vermont Statutes and Regulations. There is one Zoning Administrator for the town. This individual is tasked with issuing zoning permits. The Zoning Board of Adjustment, consisting of five members, reviews site plans, subdivisions, variances, conditional uses and the appeals of the Zoning Administrator. It is important to note here that the Town of Stamford, like many small towns in Vermont, does not have building codes and it relies on the state to administer building codes for commercial and multifamily buildings.

The Highway Department, consisting of two full-time employees maintains roads, bridges, culverts, catch basins, ditches and sidewalks, repairs damaged areas and monitors any sensitive road infrastructure in the town. The Stamford Fire Department consists of 25 volunteer fire fighters. All are volunteers and on-call. The fire department has two engines, one tanker, one rescue truck, and one 4x4 service truck. The fire station is the primary emergency operations center (EOC) location. The Town School operates as the primary local emergency shelter.

Upon completion of this Hazard Mitigation Plan update, Stamford will have all requirements completed to receive the highest Emergency Relief and Assistance Fund amount. The town has adopted the most current Road and Bridge Standards, has an updated Local Emergency Management Plan, they are a part of the National Flood Insurance Program, have a current Hazard Mitigation Plan, and have (interim) River Corridor Protection measures in place.

Table 19 summarizes other important town capabilities. Areas needing improvement and suggestions to maintain or enhance those capabilities are also included.

Table 19. Capabilities of the Town of Stamford			
Plans/Policies/Ordinances	**Description/Responsible Agent**	**Effectiveness**	**Improvements Needed/Suggestions**
Town Plan	• Planning Commission • Emergency Management Director • Select Board	• Effective • 2018 update includes flood resiliency information	• None
Local Emergency Management Plan (LEMP)	• Emergency Management Director • Select Board	• Effective • Annually Updated	• None • Continue to keep updated
Flood Hazard Area Regulations in Zoning Bylaws	• Planning Commission • Zoning Board of Adjusted • Zoning Administrator (permitting) • Select Board (approval of bylaws)	• Effective • Adopted new flood hazard area regulations in 2015	• None • Continue to monitor FEMA regulations and new local flood hazards
Zoning Bylaws	• Planning Commission • Zoning Board of Adjusters • Zoning Administrator (permitting) • Select Board (approval of bylaws)	• Effective	• None • Continue to monitor regulations and maintain training of volunteer board members to ensure effective permitting
Soil and Water Resources/Streams and Water Courses/Protection of Shoreland/Water Resources	• Planning Commission • Zoning Administrator (permitting) • Select Board (approval of bylaws)	• Effective	• None • Continue to monitor regulations and maintain training of volunteer board members to ensure effective permitting
Road Maintenance Programs and Standards	• Road Foreman • Select Board	• Effective • Town has adopted most recet VTrans Road and Bridge Standards	• Make sure culverts in flood areas are updated when needed
School Emergency Response	• Stamford Elementary School • Emergency Management Director • Fire Chief	• Needs some improvements	• Update and review school emergency plans • Schools should conduct onsite training with Police and Fire Departments

Table 22. Capabilities of the Town of Stamford			
Plans/Policies/Ordinances	**Description/Responsible Agent**	**Effectiveness**	**Improvements Needed/Suggestions**
Vulnerable Populations	• Emergency Management Director	• Effective • Vulnerable populations listed in LEMP	• Maintain current training for emergency personnel on responding to vulnerable populations
Mutual Aid Agreements – Emergency Services	• Emergency Medical Services are provided by Northern Berkshire EMS • Belong to Berkshire County, MA Mutual Aid Association	• Effective	• Maintain Mutual Aid Agreements
Mutual Aid Agreements – Road Crews	• Road Foreman • Select Board	• Not established	• It would be beneficial to have formalized agreements for the sharing of equipment and services between towns after hazardous weather events
Maintenance Programs – Bridge and Culvert Inventory	• Road Foreman	• Effective • Completed recently	• Maintain current bridge and culvert inventory on an ongoing basis

Stamford is a small town with limited abilities to expand services. However, in many cases, outside contractors can be used to implement specific construction programs and members of the Select Board can assist the Town Clerk in developing outreach materials. The Emergency Management Director participates as a member of the Bennington County Regional Emergency Management Committee and receives information and training on emergency and disaster management. The town can get support from the Vermont Department of Homeland Security, Vermotn Emergency Management, and the Bennington County Regional Commission. In addition, the U.S. Forest Service has capabilities in wildfire management and the Vermont Agency of Transportation provides training and maintains state roads. All of these support the programs of Stamford in serving their residents.

Mitigation Actions

There are four categories of mitigation actions (Table 20) that need to be identified for the priority hazards selected in Table 17. Table 21 lists the mitigation actions identified by the planning team at a public meeting and are listed by the type of hazard they address and by order of priority. Some of these actions have been carried over from the previous plan.

Table 20. Types of Mitigation Actions

Mitigation Action Categories	Description of Category	Example of Actions
Local Plans and Regulations	These actions include government authorities, policies, or codes that influence the way land and buildings are developed and built.	Comprehensive plans, land use ordinances, building codes, capital improvement programs, open space preservation, stormwater management, municipal plans, and master plans.
Structure and Infrastructure Projects	These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure.	Acquisitions and elevations of structures in flood prone areas, undergrounding utilities, structural retrofits, floodwalls and retaining walls, detention and retention structures, culvert and bridge upgrades.
Natural Systems Protection	These actions minimize damage and losses and also preserve or restore the functions of natural systems.	Sediment and erosion control, stream corridor restoration, forest and land management, and conservation easements.
Education and Awareness Programs	These actions inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them.	Websites with information and maps, trainings and meetings, and information to residents on potential hazards in the community.

The actions were ranked as high, medium, or low priority to the town. High priority actions have a significant benefit to the community and significantly reduce the risk or vulnerability. Medium priority actions moderately benefit the community and moderately reduce the risk or vulnerability. Low priority actions minorly benefit the community and minorly reduce the risk or vulnerability. The feasibility of mitigation actions is also taken into consideration by identifying if each action has political or community support, is consistent with state policies, has a funding source, and is technically or logistically feasible. Some actions will be implemented by Stamford and others by state agencies.

The criteria below were used to establish priorities during a public meeting for the development of the plan and guided by a BCRC planner. These criteria were ranked based on the best available information and best judgement as many projects are not fully scoped at this time.

- Does the action reduce damage?
- Does the action contribute to community objectives?
- Does the action meet existing regulations?
- Does the action protect historic structures or structures critical to town operations?
- Can the action be implemented quickly?
- Is the action socially acceptable?
- Is the action technically feasible?
- Is the action administratively possible?
- Is the action politically acceptable?
- Is the action legal?
- Does the action offer reasonable benefits compared to its cost of implementation?
- Is the action environmentally sound?

COST-BENEFIT ANALYSIS

A cost-benefit analysis was also undertaken for each mitigation action listed in Table 21 during a public discussion. The below tables illustrate how the cost and benefits were categorized. Priority was assessed slightly independently of the cost and benefit and was instead based largely on the perceived need of each action and the availability of funding.

At the time of applying for FEMA's PDM-C, FMA or HMGP grant programs, each project listed below will undergo full benefit-cost analysis (BCA) methodology, version 5.1 or higher to maximize savings. Whenever possible, Stamford will utilize FEMA 406 Mitigation Funding.

Cost Estimate	
High	> $100,000
Medium	$25,000 - $100,000
Low	< $25,000

Benefit Estimate	
High	Public Safety
Medium	Infrastructure/Functionality
Low	Aesthetics/General Maintenance

Table 21. Mitigation Actions							
Hazard	Action Category	Action	Responsible Party	Time Frame	Cost/Benefit	Funding Souce(s)	Priority
All Hazards	Local Planning and Regulations	Assess need for driveway standards to assure adequate emergency access particularly to assure adequate access in winter storms, floods and for wildfire protection	Town Planning Commission	2024 to 2026	Low/High	Town general fund	High
All Hazards	Local Planning and Regulations	Maintain the Local Emergency Management Plan (LEMP) annually and develop a continuity of operations plan.	Town Select Board; EMD	2024 to 2025 and annually	Low/High	Town general fund	High
All Hazards	Local Planning and Regulations	Integrate this hazard mitigation plan into the Town Plan	Town Select Board; Planning Commission	Update when updating plan	Low/Medium	Town general fund	Medium
All Hazards	Education and Awareness Programs	Provide a “be prepared” section of the Town website with links to information for residents	VT Alert, Town Select Board EMD	2024 to 2025	Low/Medium	Town general fund	Medium
All Hazards	Education and Awareness Programs	Identify and develop methods to communicate with populations vulnerable to potential hazards, particularly drought, extreme temperatures and infectious diseases, but also those in need of assistance for evacuation and/or sheltering	EMD	2024 to 2026	Low/High	Town general fund	High
All Hazards	Education and Awareness Programs	Encourage vulnerable residents to sign up with the Citizens Assistance Registry for Emergencies (CARE) at https://e911.vermont.gov/care	EMD	Ongoing	Low/High	Town general fund	High
Floods and Flash Floods	Education and Awareness Programs	Educate owners on importance of securing propane tanks and other items that could float or blow away in storms (provide VT Alert pamphlet)	Town Zoning Administrator	2024 to 2026	Low/Medium	Town general fund	Medium
Floods and Flash Floods	Local Planning and Regulations	Maintain current flood resiliency section, including sections addressing the protection of surface waters, land adjacent to streams, wetlands and water bodies, upland forests and other lands necessary to provide flood resiliency into the Town Plan, as required by Vermont statutes	Planning Commission; BCRC	Completed for current Town Plan; Update when updating the plan	Low/Medium	Town general fund Municipal Planning Grant	Medium
Floods and Flash Floods	Local Planning and Regulations	Encourage appropriate stormwater and erosion control measures in new developments	Town Planning Commission	2024 to 2029 as ongoing program	Low/High	Town general fund	High

Table 21. Mitigation Actions							
Hazard	Action Category	Action	Responsible Party	Time Frame	Cost/Benefit	Funding Souce(s)	Priority
Floods and Flash Floods	Local Planning and Regulations	Complete Phase I, II and III studies of the Hoosic and selected tributaries to identify river alterations, areas of potential ice and debris jams, and other factors and develop recommendations to reduce flooding hazards and improve habitat	Town Select Board VT ANR BCCD BCRC	2027 to 2028	High/Medium	VT Watershed Grants or Ecosystem Restoration Grant	Medium
Floods and Flash Floods	Structure and Infrastructure Projects	Implement a long-term program to improve and upgrade culverts to Road and Bridge Standards	Town	2024 to 2029 as ongoing program	Low/High	Town VT AOT FEMA Hazard Mitigation Grants	High
Floods and Flash Floods	Structure and Infrastructure Projects	Where possible, upgrade culverts both for storm flows and for aquatic organism passage.	Town Trout Unlimited	2024 to 2029 as ongoing program	High/Medium	Town; VT AOT FEMA Hazard Mitigation Grants Trout Unlimited	High
Floods and Flash Floods	Structure and Infrastructure Projects	Road crew should regularly survey culverts for blockages including photographs and records of damages and costs	Town Road Foreman	Annually on a rotating basis	Low/Medium	Town Highway Fund	Medium
Floods and Flash Floods	Structure and Infrastructure Projects	Encourage property owners in flood or river corridor areas (fluvial erosion hazard zones) to consider selling their properties (buy out) or implementing flood proofing including elevating structures	Town Select Board	2024 to 2029 as ongoing program	Low/Medium	FEMA HMPG PDM FMA	High
Floods and Flash Floods	Structure and Infrastructure Projects	Increase the height and length of span of Roaring Brook Bridge to eliminate constriction causing ice jams	VT AOT	2026 to 2028	High/High	VT AOT	High
Floods and Flash Floods	Structure and Infrastructure Projects	Properly size culverts along Route 8/100	VT AOT	2026 to 2027	High/High	VT AOT	High
Floods and Flash Floods	Natural Systems Protection	Acquire lands or work with conservation organizations to acquire lands subject to frequent flooding or wetlands within or adjacent to flood prone areas to provide flood storage	Town Select Board; Vermont Land Trust	2024 to 2029 as ongoing program	High/High	State of Vermont Watershed Grants, Vermont Ecosystem Restoration Program, Nonprofit organizations	Medium
Winter storms	Education and Awareness Programs	Provide materials and post on website on methods to shelter in place including preparation for long-term power outages or transportation disruptions (provide VT Alert pamphlet)	EMD	2024 to 2027	Low/High	Town FEMA HMPG	High

Table 24. Mitigation Actions							
Hazard	Action Category	Action	Responsible Party	Time Frame	Cost/Benefit	Funding Souce(s)	Priority
Winter storms	Education and Awareness Programs	Provide materials for residents on methods to protect property from wind events	EMD Zoning Administrator	2024 to 2027	Low/High	Town general fund FEMA HMGP PDM FMA	High
Winter storms	Local Planning and Regulations	Develop agreements with adjacent towns for sharing of highway equipment	Town Select Board; Town Road Foreman	2024 to 2025	Low/Medium	Town general fund	High
Winter storms	Structure and Infrastructure Projects	Place utilities underground for critical facilities (town hall, fire house, highway garage)	Town Select Board	2026	High/Medium	FEMA HMGP PDM; FMA	Medium
Winter storms	Structure and Infrastructure Projects	Improve drainage at the intersection of Mill Road and Route 100 (Main St.)	VT AOT Town Road Commissioner	2024 to 2026	High/High	VT AOT General Fund	High
High Wind Events	Local Planning and Regulations	Encourage boats, propane tanks and other items stored outdoors to be secured	Town Planning Commission; Zoning Administrator	2024 to 2025	Low/Medium	Town general fund	Medium
High Wind Events	Education and Awareness Programs	Provide educational materials on sheltering in place and preparation for high wind events, including long-term power outages	EMD	2024 to 2025	Low/High	Town general fund	High
High Wind Events	Structure and Infrastructure Projects	Place power lines underground to the Town Hall/School/Shelter and the Highway Garage	Town	2024 to 2027	High/Medium	Town FEMA HMGP	Medium
High Wind Events	Structure and Infrastructure Projects	Coordinate with VT AOT and Green Mountain Power on maintaining rights-of way for both power lines and roads	Town GMP	2024 to 2029 as ongoing program	Low/medium	Town VT AOT Green Mountain Power	Medium
High Wind Events	Local Planning and Regulations	Encourage appropriate plantings to avoid future damage from downed trees	EMD Town Planning Commission	2024 to 2025	Low/Low	Town general fund	Low
High Wind Events	Structure and Infrastructure Projects	Retrofit existing buildings to withstand high winds including protection of power lines and other utilities	Town Select Board Private Owners	2025 to 2026	High/Medium	FEMA HMGP, PDM	Medium
Extreme Heat & Cold	Education and Awareness Programs	Identify vulnerable community members through a survey and outreach	EMC	2024 to 2025	Low/High	Town general fund FEMA HMGP PDM	High

Table 24. Mitigation Actions							
Hazard	Action Category	Action	Responsible Party	Time Frame	Cost/Benefit	Funding Souce(s)	Priority
Extreme Heat & Cold	Education and Awareness Programs	Provide information on insulation, protecting pipes and other measures to prevent damage during extreme cold	EMC	2024 to 2025	Low/High	Town general fund FEMA HMGP PDM	High
Drought	Local Planning and Regulation	Monitor drought conditions	EMD	2024 to 2029 as ongoing program	Low/High	Town general fund	High
Drought	Education and Awareness Programs	Provide information for residents on preparing for drought	Town	2024 to 2025	Low/High	Town	Low
Drought	Natural System Protection	Develop improved assessment of groundwater sources and amend bylaws to ensure their protection	VGS; Town Planning Commission	2026 to 2028	Low/High	FEMA HMGP PDM State of VT	Medium
Drought	Local Planning and Regulation	Incorporate planning for droughts in the emergency management plan	EMD	2024 to 2025	Low/High	Town general fund	High
Wildfire	Education and Awareness Programs	Provide information on outdoor burning safety prior to the spring and fall fire seasons	Fire wardens	2024 to 2029 as ongoing program	Low/High	Fire wardens	High
Wildfire	Structure and Infrastructure Projects	Ensure adequate water supplies are available	Fire Department; EMD	2024 to 2029 as ongoing program	Medium/High	Town general fund; State of Vermont grants for dry hydrants; Vermont Department of Parks, Forestry and Recreation	High
Landslide and Debris Flow	Structure and Infrastructure Projects	Continue to maintain Mill Rd.	Town Road Commissioner	2024-2029 and ongoing	High/High	Town	High
Landslide and Debris Flow	Structure and Infrastructure Projects	Assess alternative designs to provide a more lasting solution on Mill Rd.	Town Road Commissioner	2024-2026	High/High	Town	High
Landslide and Debris Flow	Structure and Infrastructure Projects	Stabilize and replant stream corridor areas subject to landslides	Hoosic River Watershed Association	2024 to 2029 as ongoing program	Low/High	State of VT Watershed grants	High
Landslide and Debris Flow	Structure and Infrastructure Projects	Implement visual monitoring in potential landslide areas	Town Emergency Management Director; Road Foreman	2025 to 2026	Low/Medium	Town general fund	High

Table 24. Mitigation Actions							
Hazard	Action Category	Action	Responsible Party	Time Frame	Cost/Benefit	Funding Souce(s)	Priority
Landslide and Debris Flow	Education and Awareness Programs	Educate property owners on proper construction techniques to reduce potential for creating or suffering damage from landslides	Town Zoning Administrator	2024 to 2027	Low/Medium	Town general fund	Medium
Hazardous Materials Spill	Local Planning and Regulation	Provide hazardous materials awareness training for the fire department	Fire Department	Annually on a rotating basis	Low/High	Town general fund	Medium
Hazardous Materials Spill	Natural Systems Protection	Identify groundwater source areas and develop ordinances to protect those areas	Vermont Geological Survey	2025 to 2028	Medium/High	VGS funds	Medium
Infectious Disease Outbreak	Local Planning and Regulations	Monitor disease occurrences and potential outbreaks, partnering with the Vermont Department of Health	Town Health Officer VDH	2024 to 2029 as ongoing program	Low/High	Town general fund	High
Infectious Disease Outbreak	Education and Awareness Programs	Provide educational materials in printed form and on the town web site on potential infectious diseases	Town Health Officer	2024 to 2027	Low/High	Town general fund State of Vermont Health Department	High
Invasive Species	Local Planning and Regulations	Monitor extent of invasive species, particularly forest invasive species such as Emerald Ash Borer	Town Select Board	2024 to 2029 as ongoing program	High/Medium	Town general fund	Medium
Invasive Species	Local Planning and Regulations	Survey for invasive species (e.g., Japanese knotweed)s along streams to identify potential erosion areas	Batten Kill Watershed Alliance	2024 to 2027	Medium/Medium	State of Vermont Department of Parks, Forestry and Recreation	Medium
Invasive Species	Local Planning and Regulations	Encourage use of native species in plantings for commercial and residential development	Town Planning Commission	2024 to 2029 as ongoing program	Low/Medium	Town general fund	Medium
Invasive Species	Education and Awareness Programs	Provide outreach materials for landowners on using native plants and controlling invasive species	Bennington County Conservation District	2024 to 2027	Low/Medium	Town general fund State of Vermont Department of Parks, Forestry and Recreation	High

Mitigation Acronym List

- HMGP - FEMA Hazard Mitigation Grant Program
- FMA - Flood Mitigation Assistance Program
- PDM - Pre-Distater Mitigation Grant
- VDH - Vermont Department of Health
- VGS - Vermont Geological Survey

6 Plan Maintenance

Annual Monitoring

The plan will remain available on the Bennington County Regional Commission (BCRC) website under the tab for Stamford. This will make the plan accessible to all officials and the public. When other plans are updated, the Hazard Mitigation Plan will be integrated into those planning efforts when appropriate.

The Select Board Members intend to involve the public in the implantation, review, and update of this plan. Tracking of actions will take place during the annual budgeting process, when funds are allocated for various programs in the town, including capital improvements.

Plan Evaluation

The Stamford Select Board Members will be responsible for serving as or creating a planning team for evaluating and updating the plan.

The effectiveness of the plan will be determined by whether or not actions listed in Table 21 are implemented. Therefore, the Select Board members should annually evaluate the plan to assess if the goals and actions are being achieved.

1. Prior to town meeting in March, the planning team lead (assigned by the Trustees) and Emergency Management Director will review each of the actions in Table 21 to determine their status. Status categories are: completed, in progress, scheduled, no progress.
2. The evaluation will be presented to the Select Board members at a public meeting to allow for a discussion on progress in implementing the actions and possibly applying for funding, or to address program and budgeting priorities.

If requested, the Bennington County Regional Commission will provide advice and assistance on the plan evaluation.

Plan Update

Toward the end of the five-year period covered by this plan, the Trustees and planning team will initiate a review of the plan by:

1. Updating the descriptions and analyses of events using new information since completion of the 2023 draft.
2. Identification of any new buildings or infrastructure or changes in critical facilities.
3. Estimation of potential probability and extent of hazards based on any new information since completion of the 2024 plan.
4. Review of completed hazard mitigation projects.
5. Identification of new projects and actions given the revised hazard evaluation.
6. Review of any changes in priorities since adoption of the 2024 plan.
7. Revision of the assessment of risks and vulnerability from identified hazards.
8. Development and use of criteria to assess the potential benefits and costs of identified actions for use in prioritizing those actions.
9. Integration of the updated plan into the Stamford Town Plan and other plans and programs.

The planning team will hold open meetings to solicit opinions and to identify issues and concerns from members of the public and stakeholders. The planning team and the Town Trustees will update the Hazard Mitigation Plan or hire a consultant or the Bennington County Regional Commission (BCRC) to complete the plan update. The draft plan will be made available to the public, sent to the State Hazard Mitigation Officer (SHMO), and sent to neighboring towns and organizations for review and input. The revised plan will be submitted for review by the SHMO a second time. Once all questions and comments have been addressed, the SHMO will send the plan to FEMA. Following approval by FEMA, the Town Trustees will adopt the completed plan.

Should a declared disaster occur, Stamford may undertake special review of this plan and the appropriate updates made. After Action Reports, reviews, and debriefings should be integrated into the update process. The plan should also be updated to reflect the findings of any other studies completed, such as the Stormwater Master Plan, culvert and bridge studies, river corridor plans, and other studies.

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Appendix I. Mitigation Actions from 2015 Stamford Hazard Mitigation Plan							
Hazard	**Type****	**Action**	**Responsible Party**	**Time Frame**	**Status**	**Funding Souce(s)**	**Priority**
All Hazards	Local Planning and Regulations	Assess need for driveway standards to assure adequate emergency access in winter storms, floods and for wildfire protection.	Town Planning Commission	2015 to 2017	Carried to 2023 plan and ongoing	Town general fund	High
All Hazards	Local Planning and Regulations	Encourage proper construction techniques and use of appropriate materials to address hazards, particularly flooding, winter storms, wind events, earthquakes, landslides and wildfire	Town Planning Commission; Zoning Administrator	2015 to 2016	Carried to 2023 plan and ongoing	Carried to 2023 plan and ongoing	Town general fund
All Hazards	Local Planning and Regulations	Maintain the Local Emergency Operations Plan annually and develop a continuity of operations plan	Town Select Board Emergency Management Director	2015 to 2016 and annually	Completed, Carried to 2023 plan and ongoing	Completed, Carried to 2023 plan and ongoing	Town general fund
All Hazards	Education and Outreach	Provide a “be prepared” section of the Town website with links to information for residents	VT Alert, Town Select Board Emergency Management Director	2015 to 2016	Carried to 2023 plan and ongoing	Carried to 2023 plan and ongoing	Town general fund
All Hazards	Education and Outreach	Identify and develop methods to communicate with populations vulnerable to potential hazards, particularly drought, extreme temperatures and infectious diseases, but also those in need of assistance for evacuation and/or sheltering	Town Emergency Management Director	2015 to 2017	Ongoing	Ongoing	Town general fund
Floods and Flash Floods	Education and Awareness	Educate owners on importance of securing propane tanks and other items that could float or blow away in storms (provide VT Alert pamphlet)	Town Zoning Administrator	2015 to 2017	Ongoing	Ongoing	Town general fund
Floods and Flash Floods	Local Planning and Regulations	Adopt and enforce updated flood hazard and river corridor (fluvial erosion hazard zone) bylaws	Town Select Board Town Planning Commission Zoning Administrator	2015 to 2016	Ongoing	Ongoing	Town general fund
Floods and Flash Floods	Local Planning and Regulations	Encourage appropriate stormwater and erosion control measures in new developments	Town Planning Commission	2015 to 2020 as ongoing program	Ongoing	Ongoing	Town general fund
Floods and Flash Floods	Local Planning and Regulations	Participate in the Community Rating System to help reduce flood insurance premiums	Town Select Board	2017 to 2018	Carried to 2023 plan	Carried to 2023 plan	Town general fund

** Follows FEMA 2013 Mitigation Idea: A Resource for Reducing. Federal Management Agency, U.S. Department of Homeland Security, Washington, DC

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Floods and Flash Floods	Local Planning and Regulations	Complete Phase I, II and III studies of the Hoosic and selected tributaries to identify river alterations, areas of potential ice and debris jams, and other factors and develop recommendations to reduce flooding hazards and improve habitat	Town Select Board VT ANR BCCD BCRC	2018 to 2019	Ongoing	VT Watershed Grants or Ecosystem Restoration Grants	Medium
Floods and flash floods	Structure and Infrastructure Projects	Implement a long-term program to improve and upgrade culverts to Road and Bridge Standards	Town	2015 to 2020 as ongoing program	Carried to 2023 plan and ongoing	Town VT AOT FEMA Hazard Mitigation Grants	High
Floods and flash floods	Structure and Infrastructure Projects	Where possible, upgrade culverts both for storm flows and for aquatic organism passage.	Town Trout Unlimited	2015 to 2020 as ongoing program	Carried to 2023 plan and ongoing	Town VT AOT FEMA Hazard Mitigation Grants Trout Unlimited	High
Floods and flash floods	Structure and Infrastructure Projects	Road crew should regularly survey culverts for blockages including photographs and records of damages and costs	Town Road Foreman	Annually on a rotating basis	Carried to 2023 plan and ongoing	Town highway fund	High
Floods and flash floods	Structure and Infrastructure Projects	Encourage property owners in flood or river corridor areas (fluvial erosion hazard zones) to consider selling their properties (buy out) or implementing flood proofing including elevating structures	Town Select Board	2015 to 2020 as ongoing program	Carried to 2023 plan and ongoing	FEMA HMGP PDM FMA	High
Floods and flash floods	Structure and infrastructure projects	Construct salt/sand shed so material does not wash into streams	Town	2015 to 2018	Completed	Town VT AOT	High
Floods and flash floods	Structure and infrastructure projects	Increase the height and length of span of Roaring Brook Bridge to eliminate constriction causing ice jams	VT AOT	2017 to 2018	Carried to 2023 plan	VT AOT	High
Floods and flash floods	Structure and infrastructure projects	Properly size culverts along Route 8	VT AOT	2017 to 2018	Carried to 2023 plan	VT AOT	High

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Floods and flash floods	Natural Systems Protection	Acquire lands or work with conservation organizations to acquire lands subject to frequent flooding or wetlands within or adjacent to flood prone areas to provide flood storage	Town Select Board; Vermont Land Trust	2015 to 2020 as ongoing program	Ongoing	State of Vermont Watershed Grants, Vermont Ecosystem Restoration Program, Nonprofit organizations	Medium
Winter storms	Education and Outreach	Provide materials and post on website on methods to shelter in place including preparation for long-term power outages or transportation disruptions (provide VT Alert pamphlet)	Town Emergency Management Director	2015 to 2018	Carried to 2023 plan and ongoing	Town FEMA HMGP	High
Winter storms	Education and Awareness	Provide materials for residents on methods to protect property from wind events	Town Emergency Management Director; Zoning Administrator	2017 to 2018	Carried to 2023 plan and ongoing	Town general fund FEMA HMGP PDM FMA	High
Winter storms	Local Planning and Regulations	Develop agreements with adjacent towns for sharing of highway equipment	Town Select Board; Town Road Foreman	2015 to 2016	Carried to 2023 plan	Town general fund	High
Winter storms	Structure and Infrastructure Projects	Acquire generator for Town Hall/School/Shelter	Town	2015 to 2018	Completed	Town FEMA HMGP	High
Winter storms	Structure and Infrastructure Projects	Place utilities underground for critical facilities (town hall, fire house, highway garage)	Town Select Board	2017 to 2017	Carried to 2023 plan	FEMA HMGP, PDM, FMA	Medium
High wind events	Local Planning and Regulations	Require boats, propane tanks and other items stored outdoors to be secured	Town Planning Commission; Zoning Administrator	2015 to 2016	Carried to 2023 plan	Town general fund	High
High wind events	Education and Outreach	Provide educational materials on sheltering in place and preparation for high wind events, including long-term power outages	Town Emergency Management Director	2015 to 2016	Carried to 2023 plan and ongoing	Town general fund	High
High wind events	Structure and Infrastructure Projects	Place power lines underground to the Town Hall/School/Shelter and the Highway Garage	Town	2015 to 2018	Carried to 2023 plan	Town FEMA Hazard Mitigation Grant	Medium

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High wind events	Structure and Infrastructure Projects	Coordinate with VT AOT and Green Mountain Power on maintaining rights-of way for both power lines and roads	Town Green Mountain Power	2015 to 2020 as ongoing program	Carried to 2023 plan and ongoing	Town VT AOT Green Mountain Power	Medium
High wind events	Local Planning and Regulation	Encourage appropriate plantings to avoid future damage from downed trees	Town Emergency Management Director Planning Commission	2015 to 2016	Carried to 2023 plan and ongoing	Town general fund	Medium
High wind events	Structure and Infrastructure Projects	Retrofit existing buildings to withstand high winds including protection of power lines and other utilities	Town Select Board Private Owners	2016 to 2017	Carried to 2023 plan	FEMA HMGP, PDM	Medium
Hail	Structure and Infrastructure Projects	Retrofit existing buildings to minimize hail damage	Town Select Board; Private Owners	2017 to 2018	Removed	FEMA HMGP, PDM	Low
Temperature extremes	Education and Awareness	Identify vulnerable community members through a survey and outreach	Town Emergency Management Director Coordinator	2015 to 2016	Carried to 2023 plan and ongoing	Town general fund FEMA HMGP, PDM	High
Temperature extremes	Education and Awareness	Provide information on insulation, protecting pipes and other measures to prevent damage during extreme cold	Town Emergency Management Director Coordinator	2015 to 2016	Carried to 2023 plan and ongoing	Town general fund FEMA HMGP, PDM	High
Drought	Local Planning and Regulation	Monitor drought conditions	Town Emergency Management Director	2015 to 2020 as ongoing program	Carried to 2023 plan and ongoing	Town general fund	High
Drought	Education and Awareness	Provide information for residents on preparing for drought	Town	2015 to 2016	Carried to 2023 plan and ongoing	Town	Low
Drought	Natural System Protection	Develop improved assessment of groundwater sources and amend bylaws to assure their protection	Vermont Geological Survey; Town Planning Commission	2017 to 2019	Carried to 2023 plan and ongoing	FEMA HMGP, PDM, State of VT	Medium
Drought	Local Planning and Regulation	Incorporate planning for droughts in the emergency management plan	Town EMD	2015 to 2016	Carried to 2023 plan and ongoing	Town general fund	High

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Wildfire	Education and Outreach	Provide information on outdoor burning safety prior to the spring and fall fire seasons	Fire wardens	2015 to 2020 as ongoing program	Carried to 2023 plan and ongoing	Fire wardens	High
Wildfire	Education and Outreach	Acquire materials from Firewise for homeowners and make available for landowners	BCRC; Town Emergency Management Director	2015 to 2016	Carried to 2023 plan	BCRC	High
Wildfire	Local Planning and Regulations	Work with BCRC and the U.S. Forest Service to complete a community wildfire protection plan	BCRC; US Forest Service	2017 to 2020	Carried to 2023 plan	FEMA HMGP, PDM, State of VT	Medium
Wildfire	Structure and Infrastructure Projects	Assure adequate water supplies are available	Town Select Board; Emergency Management Director	2015 to 2020 as ongoing program	Carried to 2023 plan and ongoing	Town general fund /State of Vermont grants for dry hydrants/ Vermont Department of Parks, Forestry and Recreation	High
Landslide and debris flow	Local Planning and Regulations	Following receipt of river corridor maps from VT ANR, consider adopting fluvial erosion hazard bylaws	Town Select Board; Town Planning Commission	2015 to 2018	Completed	Town general fund	High
Landslide and debris flow	Structure and Infrastructure Projects	Continue to maintain Mill Rd.	Town Road Commissioner	2015 to 2020 and ongoing	Carried to 2023 plan and ongoing	Town	High
Landslide and debris flow	Structure and Infrastructure Projects	Assess alternative designs to provide a more lasting solution on Mill Rd.	Town Road Commissioner	2016 to 2018	Carried to 2023 plan	Town	High
Landslide and debris flow	Structure and Infrastructure Projects	Stabilize and replant stream corridor areas subject to landslides	Hoosic River Watershed Association	2015 to 2020 as ongoing program	Carried to 2023 plan	State of VT Watershed grants	High
Landslide and debris flow	Structure and Infrastructure Projects	Implement visual monitoring in potential landslide areas	Town Emergency Management Director; Road Foreman	2016 to 2017	Carried to 2023 plan	Town general fund	High
Landslide and debris flow	Structure and Infrastructure Projects	Implement visual monitoring in potential landslide areas	Town Emergency Management Director; Road Foreman	2016 to 2017	Carried to 2023 plan	Town general fund	Medium

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Earthquake	Education and Awareness	Educate property owners on proper construction techniques to reduce potential damage from earthquakes	Town Zoning Administrator	2015 to 2016	Removed	Town general fund	Medium
Hazardous materials spill	Local Planning and Regulation	Provide hazardous materials awareness training for the fire department	Fire Department	2015 to 2016 and ongoing	Carried to 2023 plan and ongoing	Town general fund	Medium
Hazardous materials spill	Natural Systems Protection	Identify groundwater source areas and develop ordinances to protect those areas	Vermont Geological Survey	2016 to 2019	Carried to 2023 plan and ongoing	VT Geological Survey funds	Medium
Infectious disease outbreak	Local Planning and Regulations	Monitor disease occurrences and potential outbreaks	Town Health Officer	2015 to 2020 as ongoing program	Carried to 2023 plan and ongoing	Town general fund	High
Infectious disease outbreak	Education and Outreach	Provide educational materials in printed form and on the town web site on potential infectious diseases	Town Health Officer	2015 to 2018	Carried to 2023 plan and ongoing	Town general fund /State of Vermont Health Department	High
Invasive species	Local Planning and Regulations	Monitor extent of invasive species, particularly forest invasive species such as Emerald Ash Borer	Town Select Board	2015 to 2020 as ongoing program	Carried to 2023 plan and ongoing	Town general fund	High
Invasive species	Local Planning and Regulations	Complete surveys for ash trees vulnerable to Emerald Ash Borer	BCRC; Bennington County Conservation District	2015 to 2018	Completed and Carried to 2023 plan and ongoing	FEMA HMGP, PDM, VT Department of Forests, Parks and Recreation	Medium
Invasive species	Local Planning and Regulations	Survey for invasive species (e.g., Japanese knotweed)s along streams to identify potential erosion areas	Batten Kill Watershed Alliance	2015 to 2018	Carried to 2023 plan and ongoing	State of Vermont Department of Parks, Forestry and Recreation	Medium

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Invasive species	Local Planning and Regulations	Encourage use of native species in plantings for commercial and residential development	Town Planning Commission	2015 to 2020 as ongoing program	Carried to 2023 plan and ongoing	Town general fund	Medium
Invasive species	Education and Awareness	Provide outreach materials for landowners on using native plants and controlling invasive species	Bennington County Conservation District	2015 to 2018	Carried to 2023 plan and ongoing	Town general fund /State of Vermont Department of Parks, Forestry and Recreation	High