

Jaffrey Hazard Mitigation Plan Update 2021

Jaffrey, New Hampshire



Prepared by the:

Town of Jaffrey Hazard Mitigation Work Group

&

Southwest Region Planning Commission

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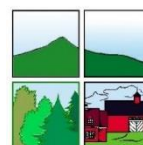
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Executive Summary

The Jaffrey Hazard Mitigation Plan serves as a means to reduce future losses from natural or man-made hazard events before they occur. The Plan was developed by the Jaffrey Hazard Mitigation Work Group.

Natural hazards are addressed as follows:

- Flooding
- High Wind events (Tornado, Downburst)
- Wildfire
- Severe Winter Weather
- Tropical Storms & Hurricanes
- Drought
- Extreme Temperatures
- Lightning
- Infectious Disease, Pandemic
- Conflagration
- Dam Failure
- Known/emerging Contaminants
- Long-term Utility Outage
- Aging Infrastructure
- Transport Accident

The Jaffrey Hazard Mitigation Work Group identified “Critical Facilities” and “Areas at Risk” as follows:

Critical Facilities

- Emergency Operations Center
- Fire Station
- Police Station
- Ambulance Service
- Town Offices
- Department of Public Works
- Emergency Fuel Facilities
- Emergency Electrical Power Facility
- Emergency Shelters
- Dry Hydrants/Fire Ponds/Water Sources
- Evacuation Routes and Bridges (Primary)
- Town Garage/Transfer Station
- Communications
- Hospitals
- Helicopter Landing Sites

Areas at Risk

- Schools
- Day Care Centers
- Vulnerable populations
- Recreation areas
- Religious facilities
- Historic and cultural facilities
- Camp grounds

The Jaffrey Hazard Mitigation Work Group identified existing hazard mitigation programs as follows:

- Town adopted Building Code
- Building Inspector
- Emergency Back-up Power
- Local Road Design Standards
- Local Bridge Maintenance Program
- Local Road Maintenance Program
- Winter Storm Operations Plan
- Town Master Plan
- Mutual Aid - Police, Fire, Ambulance and Highway
- Fire Pond and Dry Hydrant Management Plan
- Hazardous Materials Spill Prevention Control & Counter Measures Plan
- Town Radio System
- Slash Monitoring
- Town Sponsored Safety Awareness Program
- Ambulance Service
- Floodplain Ordinance
- Health Officer
- Tree Maintenance Program
- Emergency Management Plan
- Fire Codes (NFPA)
- Beaver Control /Monitoring

The Jaffrey Hazard Mitigation Work Group prioritized newly identified hazard mitigation strategies as follows:

- Expand education to residents about emergency preparedness and hazard mitigation by adding FEMA and NHHSEM links to the Jaffrey website.
- Identify current and future needs for emergency backup power.
- Review and update the road design standards.
- Conduct public information workshops on emergency preparedness and ways to reduce the impact of hazards and to make emergency preparedness kits.
- Update the EOP in 2021.
- Equip the EOC and emergency shelters with sufficient materials to handle hazardous events.
- Complete bridge repairs in accordance with the CIP; Nutting Road, Letourneau Dr.
- Host a workshop for homeowners to learn of ways to mitigate the effects of extreme temperatures such as insulation, windows, heating & cooling, etc. (NH Saves)
- Develop innovative and creative approach to get voter support for large CIP projects.
- Install lightning protection through installation of grounding equipment on public and historic buildings.
- Inventory culverts and bridges to determine needed upgrades.
- Establish a fund for inspections and new installations of dry hydrants.
- Consider joining the Community Rating System (CRS).
- Consider the inclusion of sediment and erosion control requirements for new construction projects.
- Work to complete a solid waste and hazardous materials inventory; assess threats; develop guidelines.
- Trim tree branches near critical facilities, town structures, and roadways.
- Work with Federal, State, and local agencies to develop a protocol for determining local measures needed to protect the public during infectious disease threats.
- Add this mitigation plan into the Jaffrey Master Plan as a link or appendix.
- Obtain a copy of the Hazard Action Plans for High and Significant Class Dams.
- Continue efforts to remove the Poole Reservoir Dam.

Chapter 1 Introduction

Purpose

The Jaffrey Hazard Mitigation Plan Update 2021 is a planning tool to be used by the Town of Jaffrey, as well as other local, state and federal governments, in their efforts to reduce the effects from natural and man-made hazards. By maintaining an updated Hazard Mitigation Plan, the town is eligible to receive grant funding for mitigation projects.

Authority

This Multi-Hazard Mitigation Plan was prepared pursuant to Section 322, Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (the Act), herein enacted by Section 104 of the Disaster Mitigation Act of 2000 (DMA) (P.L. 106-390). This Act provides new and revitalized approaches to mitigation planning. Section 322 of DMA 2000 emphasizes the need for State, local and tribal entities to closely coordinate mitigation planning and implementation efforts. The development and periodic update of this plan satisfies the planning requirements of the Disaster Mitigation Act (DMA) of 2000 which amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act).

Funding Source

This Plan was funded by the NH Homeland Security and Emergency Management (HSEM), with a grant from FEMA's Pre-disaster Mitigation Program.

Scope of the Plan

The scope of this Plan includes the identification of past and potential natural and manmade hazards affecting the Town of Jaffrey, the determination of vulnerability of existing and future structures to the identified potential hazards, and the identification and discussion of new strategies aimed at mitigating the likely effects of potential hazards before they occur.

Methodology

Using the Local Hazard Mitigation Planning Handbook, the Jaffrey Hazard Mitigation Work Group developed the content of the Jaffrey Hazard Mitigation Plan by following tasks set forth in the handbook. The Work Group held monthly meetings, open to the public, in order to develop the Plan.

Task 1: Determine the Planning Area & Resources: This task was conducted by town staff and the Regional Planning Commission. The results of this research were shared with the Work Group and can be found in Chapter 2, "Community Profile".

Task 2: Building the Planning Team: The Emergency Management Director contacted Town officials, department heads, and residents who might wish to volunteer their time and serve on a Work Group.

Task 3: Create an Outreach Program: This task was used throughout the plan and is a vital part of the plan's success. Many of the proposed actions involve a community outreach component for individuals to use as a means to reduce the risk of loss of life and property from future natural and man-made hazards.

Task 4: Review Community Capabilities: The Work Group brainstormed on the type of hazards and locations that have sustained or could be susceptible to each hazard within the Town. The Work Group then identified and catalogued all of the critical facilities within the Town. The result is found in Chapter 6 with a location map at the end of the plan.

Task 5: Conduct a Risk Assessment: The Work Group conducted several assessments to help determine the gaps in coverage. These include Vulnerability Assessments and Assessing Probability, Severity and Risk. In addition to the assessments, the existing mitigation strategies were reviewed to determine where gaps in coverage exist and areas that need improvement.

Task 6: Develop a Mitigation Strategy: The Work Group identified plans and policies that are already in place to reduce the effects of man-made and natural hazards. Then the Work Group evaluated the effectiveness of the existing measures to identify where they can be improved. The Work Group then developed the Mitigation Action Plan, which is a clear strategy that outlines who is responsible for implementing each project, when each one will begin and the funding source.

Task 7: Keep the Plan Current: It is important to the Town of Jaffrey that this plan be monitored and updated annually or after a presidentially declared disaster.

Task 8: Review & Adopt the Plan: The Work Group members reviewed and approved each section of the plan as it was completed. After acceptance by the Work Group, the plan was submitted to the New Hampshire Homeland Security and Emergency Management (HSEM) for review and Approval Pending Adoption. At a public meeting, the Board of Selectmen formally adopted the plan on July 26, 2021. The plan was then granted formal approval by HSEM August 5, 2021 and the Formal Approval letter from the Federal Emergency Management Agency (FEMA) was received on August 10, 2021.

Task 9: Create a Safe & Resilient Community: The Work Group discussed the mitigation actions in the Action Plan and the ways in which the implementation of the actions will be beneficial to the community. Annual reviews of the Action Plan by the Work Group are needed to maintain the timeframes identified for completion of activities. Incorporation of the plan into other land use plans and the Capital Improvement Plan help to ensure that the goals of the plan are met. Implementation of the actions prior to a hazardous event can be funded through a variety of resources found at the end of this plan in Appendix D.

A final draft of this Plan was made available to the Work Group and the public for review and comment. The document was also provided to HSEM for their review and comment.

Public Work Group Meetings

Work Group meetings were held on-line on July 14, August 12, September 9, October 14, November 4, December 9, 2020, and January 7, 2021.

An email was sent to each Work Group member, prior to each meeting that contained an agenda (Appendix E) and information to be covered. Agendas were posted on the Town website to encourage public participation.

Public Participation

An article was printed in the Southwest Region Planning Commission (SWRPC) newsletter to inform the members of the community as well as surrounding communities and other interested stakeholders about participating in this plan update. Copies of the newsletter were sent to the 34 towns within the region, the Cheshire County Office, businesses, and other interested parties. It was also available on the SWRPC

website. In addition to the SWRPC newsletter and website, an email of the SWRPC electronic newsletter was sent to more than 450 addresses, including neighboring communities, counties, businesses, and academia. The newsletter contained notices of public meetings and events.

The draft plan was made available for public review and input on the Town website to reach a broad range of interested parties from March 19 to April 12, 2021. There were no comments from the public received during the drafting stage of the plan as well as following the public viewing period. Verification of the public viewing period is in Appendix E.

Resource List for Hazard Mitigation Team

Jaffrey's EMD, or designee, reviewed and coordinated with the following agencies in order to determine if any conflicts existed or if there were any potential areas for cooperation. All agencies mentioned below were contacted by Jaffrey's EMD, or designee. All agencies were given the opportunity to attend Work Group meetings or provide valuable input and guidance through telephone conversation or printed data. Training support has been offered by some of those on this resource list.

New Hampshire Homeland Security and Emergency Management:
33 Hazen Drive 1-800-852-3792
Concord, NH 03305

Field Representative: Elizabeth Gilboy (603) 223-3613
State Hazard Mitigation Planner: Kayla Henderson (603) 271-2231

New Hampshire Department of Transportation:
John Kallfelz (District 4), Swanzey, NH 03446 (603) 352-2302

New Hampshire Department of Environmental Services - Dam Bureau:
Nancy Baillargeon (603) 271-3406

New Hampshire Office of Strategic Initiatives:
Samara Ebinger (603) 271-1755

Plan Updates

During the planning process, the Work Group reviewed relevant portions of the previous hazard mitigation plan and updated those portions accordingly. Unchanged sections were incorporated into the plan while other sections were amended to reflect changes. Particular attention was given to the previous mitigation strategies that have been completed to give a status update on those that remain on the list. The previous plan was used as a basis to begin the update. Amendments were made in each chapter to reflect changes that have occurred during the five-year period. Included in the changes were:

- Chapter 1 - Introduction - updated Methodology, Acknowledgements, etc., and added Plan Updates;
- Chapter 2 - Community Profile - NFIP policies updated, added updated demographics;
- Chapter 3 - Assessing Probability, Severity, and Risk - updated risk assessment;
- Chapter 4 - Hazard Identification and Vulnerability Assessment - updated hazards and their location; estimated potential losses;
- Chapter 5 - Critical Facilities - updated locations;
- Chapter 6 - Existing Mitigation Strategies and Proposed Improvements - updated chart and other data, updated chart for Status of Previous Mitigation Action Items;
- Chapter 7 - Proposed Mitigation Strategies - updated STAPLEE chart;

Chapter 8 - Prioritized Implementation Schedule - updated Action Plan;
Chapter 9 - Adoption, Implementation, Monitoring, and Updates - Adoption certificate, updated information.

Appendices - agendas, resources, public documentation.

This update was prepared with assistance from professional planners at SWRPC trained in Hazard Mitigation Planning. Data and maps used to prepare this plan are available at their office and should be used in preparing future updates.

Acknowledgements

The Jaffrey Board of Selectmen extends special thanks to the Jaffrey Hazard Mitigation Work Group as follows:

David Chamberlain, Jaffrey Fire Chief/EMD
Jon Frederick, Jaffrey Town Manager
Jo Anne Carr, Jaffrey Director of Planning & Economic Development
Tony Cavaliere, Jaffrey Superintendent of Utilities
Louis Chatel, SAU 47 JRCSD Safety Coordinator
Todd Croteau, Jaffrey Superintendent of Highways and Facilities
Rob Deschenes, Jaffrey Building Inspector/Code Enforcement
Todd Mulenberg, Jaffrey Police Chief
Renee Sangermano, Jaffrey Recreation Director

The Jaffrey Board of Selectmen offers thanks to the New Hampshire Homeland Security and Emergency Management for developing the State of New Hampshire Multi-Hazard Mitigation Plan Update 2018 which served as a model for this plan. In addition, special thanks are extended to the staff of the Southwest Region Planning Commission for professional services, process facilitation and preparation of this document.

HSEM/FEMA Final Approval: August 5, 2021

Hazard Mitigation Goals

The Jaffrey Hazard Mitigation Work Group reviewed the goals set forth in the State of New Hampshire Multi-Hazard Mitigation Plan Update 2018. The Work Group generally concurs with those goals and has amended them to better meet the goals of the town.

Town of Jaffrey, NH

The overall Goals of the Town of Jaffrey with respect to Hazard Mitigation are stipulated here:

To improve upon the protection of the general population, the citizens of the Town of Jaffrey and guests, from all natural, technological and human-caused hazards.

To reduce the potential impact of natural, technological and human-caused hazards on the Town of Jaffrey's emergency response services, critical facilities and infrastructure.

To reduce the potential impact of natural, technological and human-caused disasters on the Town of Jaffrey's economy, natural resources, historic/cultural treasures, and private property.

To improve the Town of Jaffrey's emergency preparedness and disaster response and recovery capability.

To reduce the Town of Jaffrey's risk with respect to natural, technological and human-caused hazards through outreach and education.

To identify, introduce and implement cost-effective Hazard Mitigation measures so as to accomplish the Town's goals and objectives and to raise the awareness of and acceptance of Hazard Mitigation opportunities generally.

To address the challenges posed by climate change as they pertain to increasing risks in Jaffrey's infrastructure and natural environment.

To work in conjunction and cooperation with the State of New Hampshire's Hazard Mitigation Goals and with FEMA.

Chapter 2 Community Profile

Town Overview

The Town of Jaffrey is located in the southern portion of Cheshire County, in Southwest New Hampshire. Jaffrey is bordered by Dublin, Fitzwilliam, Marlborough, Peterborough, Rindge, Sharon, and Troy. The Town population was estimated to be 5,424 according to the 2019 population estimates by NH Office of Strategic Initiatives (NHOSI). Jaffrey has a total land area of 26,048 acres, 768 of which are surface water. The topography of Jaffrey is dominated by Mount Monadnock, which is located in the northwest corner of the Town. The mountain slopes downward in a southeasterly direction towards the center of Jaffrey. Elevations range from 3,165 feet above mean sea level at the summit of Mount Monadnock to 1,000 feet above mean sea level in the town's center. Heavily glaciated terrain surrounding Mount Monadnock is referred to as the Monadnock uplands. Central and eastern portions of town contain small, rolling hills known as drumlins. Average temperature is 21.6°F in January and 70.1°F in July. Average annual precipitation is 40.3 inches.

Location Map of Jaffrey, NH



Disaster Risk

Jaffrey is prone to a variety of man-made and natural hazards. These include: flooding, severe wind events, tropical storms and hurricanes, wildfires, severe winter weather, drought, extreme temperatures, lightning, infectious disease, aging infrastructure, and vehicle accidents.

Flooding, whether from snow run-off, heavy rains or ice jams, carries the greatest risk for Jaffrey. Seasonal flooding of small streams and wetlands has not been recorded.

Severe wind events and hurricane residuals have caused damage to Jaffrey. Over the years hurricanes have resulted in flooding, and unrecorded wind events have caused losses of timber, particularly in the several high points throughout Town.

There have been several documented wild fires throughout Town due to a variety of causes including lightning, camp fires, cigarette litter along roadways and accidents. Areas along heavily traveled roadways and wooded areas are at greatest risk.

Winter weather has proven to be a regular hazard throughout Jaffrey each year. The Town is susceptible to receiving large volumes of snow from Nor'easters due to its geographical proximity to the east coast where these storms track. The Town has also received a fair share of damage from ice storms in winter months. Winter storms and wind events often cause power outages.

Development Patterns and Trends

To better understand the development of the Town, the number of housing units build in each of the past five decades is shown in the next table. During the past 50 years, the largest housing increases occurred between 1970 and 1990 which is a similar pattern seen throughout New Hampshire. Between 1970 and 1980, Jaffrey's housing stock expanded by nearly 45% and again between 1980 and 1990 by 37%. These numbers represent all housing types.

Town	Housing Units						%Change 2000-2010
	1970	1980	1990	2000	2010	2016*	
Jaffrey	1,223	1,770	2,426	2,352	2,547	2,386	8.3%

Source: US Census ACS 2012-2016 estimates

A sizable portion of Jaffrey's population, however, is concentrated near the Town center. The remainder of the population is distributed along the numerous roads that access the rural areas of Town. Therefore, the overall density of 142.1 people per square mile in Jaffrey does not necessarily reflect the community as a whole. To better understand areas such as this, the US Census recognizes denser areas as *Census Designated Places* (or CDP's) and provides additional demographical information specific to these areas. This information is useful in deciding where to place the Town's infrastructure, especially water and sewer. The CDP in Jaffrey encompasses 2.5 sq. miles of land area and holds 2,757 people, or approximately 51% of the town's population. The population density in this area is approximately 1,103 people per square mile. There are 1,329 housing units in the CDP which accounts for 52% of the total housing units.

Consideration for Development

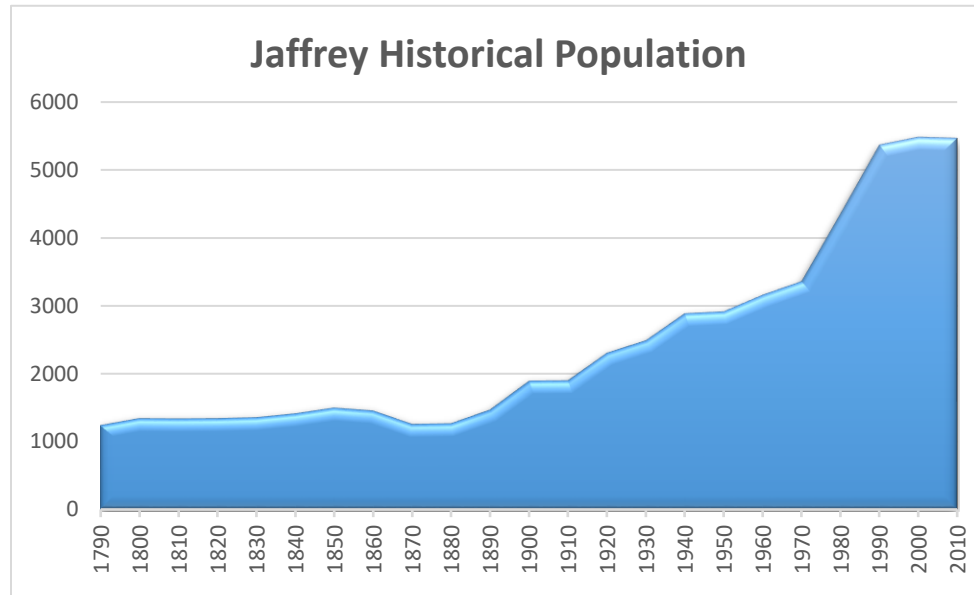
Several factors have played, and will continue to play, an important role in the development of Jaffrey. These include: the existing development pattern and availability of land for future development; the present road network; physical factors such as steep slopes, soil conditions, wetlands, and aquifers; and land set aside for conservation. These factors have an impact, both individually and cumulatively, on where and how development occurs.

Historical Population

The population in Jaffrey was relatively flat from 1790 until 1890, which then became the beginning of a steady increase in residents. From 1960 to 2017, the population change rose dramatically from 3,154 to 5,259 residents over the 57-year time span. Of particular note during this period of growth was an increase

of 30% between 1970 and 1980 and a 23% increase between 1980 and 1990. There has been a decrease in population since the 2000 census.

Decennial Population 1790 to 2010



Source: US Census Bureau

Population Trends

The table below shows population in Jaffrey, Cheshire County, and New Hampshire for each decennial from 1960 to 2010 according to the US Census. The largest increase in population for Jaffrey occurred from 1970 to 1990 when the Town experienced a significant growth spurt. Growth in recent years has been a slow increase from 1990 to 2000 followed by a decline in population from 2000 to 2010.

Jaffrey Population 1960-2010

Population						
	1960	1970	1980	1990	2000	2010
Jaffrey	3,154	3,353	4,349	5,361	5,476	5,457
Cheshire County	43,342	52,364	62,116	70,121	73,825	77,117
New Hampshire	606,400	737,681	920,610	1,109,252	1,235,786	1,316,470
Percentage Change						
	1960-1970	1970-1980	1980-1990	1990-2000	2000-2010	
Jaffrey	6.3%	29.7%	23.3%	2.1%	-0.3%	
Cheshire County	20.8%	18.6%	12.9%	5.3%	4.5%	
New Hampshire	21.6%	24.8%	20.5%	11.4%	6.5%	

Source: US Census Bureau

Population Projections

Population projections are an important component in planning for the future. Projections are beneficial to help communities begin to plan and budget for Capital Improvement projects. Since population projections are based on a set of assumptions, changes can be significant if the assumptions used in the calculations are not met. For example, a tropical storm that destroys a large employer or causes infrastructure damages to that facility that can cause a significant economic hardship to the business that may ultimately result in its closure and loss of jobs. This can then result in an outward migration of residents from the community or region. Therefore, population projections should only be used as a basis to begin planning for the future.

Jaffrey Population Projection: 2015 to 2040

Population Projections 2015-2040							
	2015 est.	2020	2025	2030	2035	2040	% Change 2015-2040
Jaffrey	5,393	5,308	5,225	5,246	5,262	5,272	-2.3%
Cheshire County	77,345	77,653	78,002	78,315	78,543	78,695	1.7%
New Hampshire	1,330,501	1,349,908	1,374,702	1,402,878	1,422,530	1,432,730	7.7%

Source: American Community Survey, 5-Year Estimates

Development in Hazard Areas

Some of the hazards identified in this plan, such as hurricanes, tornadoes and ice storms, are regional risks and, as such, all new development falls into the hazard area. The exception to this is flooding. Of the future developments known to Jaffrey, none fall into identified flood hazard areas.

National Flood Insurance Program (NFIP)

Jaffrey is a participating member of the National Flood Insurance Program. Jaffrey joined the NFIP on June 2, 1993. Flood Insurance Rate Maps, all bearing the effective date of May 23, 2006, are used for flood insurance purposes and are on file with the Jaffrey Planning Board. According to the FEMA CIS, there were no structures located in FEMA designated Special Flood Hazard Areas (SFHAs) as of September 23, 2020. There are 4 residential flood insurance policies and 2 non-residential policies totaling 6 policies town-wide for \$1,048,100. There have been no repetitive losses.

Continued Compliance with NFIP Requirements

The Town of Jaffrey acknowledges the importance of maintaining requirements set forth in the National Flood Insurance Program. As such, the Town took several steps related to continued compliance with the program that will help to reduce or eliminate the potential for loss of life and property due to flooding.

- The Town promoted awareness of the importance of NFIP as an ongoing mitigation item and to encourage more NFIP policies. Outreach methods included making available additional brochures to display in the Town Office.
- Develop live web access floodplain overlay on the Town's tax maps.
- Install lightning protection measures on all of the Town's critical facilities and schools.

The implementation of these actions as well as others have helped improve Jaffrey's risk of death or injury, and structural damage, from severe weather events. As the intensity in storm events increases, additional actions may need to be added during the annual review or the five-year update.

Chapter 3

Assessing Probability, Severity and Risk

Estimating Potential Losses

The Hazard Mitigation Work Group met to discuss the Towns' risk assessment and assign rating scores. Consideration was given to climate change, current capabilities, Town assets and critical infrastructure, and previous occurrences when determining the scale of impacts and overall risk. The following terms were used to analyze the hazards:

Impacts: The *Impact* is an estimate generally based on a hazard's effects on humans, property and businesses.

Impact Scoring

- 1 - Inconvenience, reduced service/productivity, minor damages, non-life-threatening injuries.
- 3 - Moderate to major damages, temporary closure and reduced service/productivity, numerous injuries, and deaths.
- 6 - Devastation and significant injuries and deaths, permanent closure and/or relocation of services, long-term effects.

Probability of Occurrence: The *Probability of Occurrence* is a numeric value that represents the likelihood that the given hazard will occur within the next 10 years.

Probability Scoring

- 1 - 33% probability of occurring within 10 years (Low)
- 3 - 34-66% probability of occurring within 10 years (Medium)
- 6 - 67-100% probability of occurring within 10 years (High)

Severity: Severity is calculated by taking the average of the vulnerability for human, business and property impacts of each hazard type.

Risk: Risk is an adjective description (High, Medium, or Low) of the overall threat posed by a hazard over the next 10 years. It is calculated by multiplying the probability of occurrence and severity.

Overall Risk: The *Overall Risk* is a representation of the combined *potential impact* and *probability of occurrence* ratings. This is calculated by multiplying the probability of occurrence rating score by the impact rating score (the average of human, property and business impacts). The goal of identifying the overall risk of each identified hazard is to assist the Town in determining which hazards pose the largest potential threat. The overall risk ratings are broken down and color coded into the following categories:

White: values 1 - 6, Low Risk

Yellow: values 7 - 12, Medium Risk

Red: values 13 - 18, High Risk

Risk Assessment Table

Threat/Hazard		Classification	Human Impact	Property Impact	Economic/ Business Impact	Average Impact Score	Probability of Occurrence	Overall Risk
Natural Hazards	Avalanches	Low Risk	1	1	1	1	1	1
	Coastal Flooding	Low Risk	0	0	0	0	0	0
	Inland Flooding	High Risk	3	3	3	3	6	18
	Drought	Medium Risk	3	2	2	2	5	10
	Earthquakes	Low Risk	1	1	1	1	1	1
	Extreme Temperatures	High Risk	3	2	2	2	6	12
	High Wind Events	High Risk	2	4	3	3	5	15
	Infectious Disease	High Risk	6	2	4	4	5	20
	Landslide	Low Risk	1	1	1	1	1	1
	Lightning	High Risk	3	5	2	3	6	18
	Severe Winter Weather	Medium Risk	2	2	2	2	6	12
	Solar Storms & Space Weather	Medium Risk	2	2	3	2	5	10
	Tropical Storms and Hurricanes	High Risk	3	3	3	3	5	15
	Wildfire	High Risk	2	3	3	3	5	15
Technological Hazards	Aging Infrastructure	Medium Risk	5	5	5	5	2	10
	Conflagration	High Risk	5	3	3	4	6	24
	Dam Failure	Medium Risk	5	5	5	5	2	10
	Known & Emerging Contaminants	High Risk	5	3	3	4	6	24
	Hazardous Materials	Low Risk	3	3	3	3	2	6
	Long-term Utility Outage	High Risk	2	2	4	3	6	18
	Radiological	Low Risk	5	5	3	4	1	4
Human-Caused Hazards	Cyber Event	High Risk	1	5	5	4	5	20
	Mass Casualty Incident	Low Risk	6	4	4	5	1	5
	Terrorism/Violence	Low Risk	6	4	4	5	1	5
	Transport Accident	Medium Risk	3	3	3	3	4	12

Chapter 4

Hazard Identification and Potential Hazards

The Jaffrey Hazard Mitigation Work Group discussed hazard events that have occurred within the last five years. They also looked at the type of hazards that could occur within Town. These hazards were identified by using the New Hampshire Hazard Mitigation Plan (2018), the Federal Emergency Management Agency website, the previous Jaffrey Hazard Mitigation Plan, and the Jaffrey Hazard Risk Assessment. From this list, the work group developed a summary for each hazard type to provide information on past and potential events, risk and impact. In some instances, specific locations of hazard events that have occurred within the past five years have been recorded.

Information in this chapter is only given for the medium and high-risk natural hazards identified in the previous chapter. These include: flooding, drought, infectious disease, lightning, severe winter weather, solar storms and space weather, tornado and high wind events, tropical storms and hurricanes, wildfires. Hazards that ranked as low-risk hazards are not included in the remaining chapters of this plan because the Jaffrey Hazard Mitigation Work Group felt that the risk was so minimal that resources and efforts would be better utilized on the higher-ranking hazards. The low-risk natural hazards include: avalanche, coastal flooding, earthquake, and landslide. The Work Group also identified the following medium and high-ranked technological hazards and human-caused hazards that have occurred in Town or have the potential to occur: aging infrastructure, conflagration, dam failure, known and emerging contaminants, long-term utility outage, cyber event, and transport accident.

Existing and future structures have the potential of being affected by some of the hazards identified in this Plan. Some hazards identified in this plan are regional or town-wide risks and, as such, all structures, infrastructure and critical facilities fall into the hazard area. As the population continues to grow, new development has been outside of the flood prone areas which has helped to protect the residents from any increase in vulnerability of hazards. However, as the intensity of storms continues to increase, it is important to review the existing programs and strategies, and improve upon areas that are needed.

Flooding

Risk: Medium

Impact: Medium

Future Probability: High

Floods are defined as a temporary overflow of water onto lands that are not normally covered by water. Flooding results from the overflow of major rivers and tributaries, storm surges, and/or inadequate local drainage. Floods can cause loss of life, property damage, crop/livestock damage, and water supply contamination. Floods can also disrupt travel routes on roads and bridges. Inland floods are most likely to occur in the spring due to the increase in rainfall and melting of snow; however, floods can occur at any time of the year. A sudden thaw in the winter or a major downpour in the summer can cause flooding because there is suddenly a lot of water in one place with nowhere to go.

Floodplains are usually located in lowlands near rivers, and flood on a regular basis. The term 100-year flood does not mean that flood will occur once every 100 years. It is a statement of probability that scientists and engineers use to describe how one flood compares to others that are likely to occur. It is more accurate to use the phrase “1% annual chance flood”. What this means is that there is a 1% chance of a flood of that size happening in any year.

Past Events:

July 1-2, 2017: There was a FEMA Disaster Declaration #4329 for Grafton County. Heavy rains occurred, but no local impact to Town services and no structural damages, injuries, or death were reported due to this event.

October 29, 2017 to November 1, 2017: Heavy rains occurred, but no local impact to Town services and no structural damages, injuries, or death were reported due to this event.

March 2, 2018: Heavy rains occurred, but no local impact to Town services and no structural damages, injuries, or death were reported due to this event.

Potential Occurrences: Potential annual events due to heavy rains and snow melt. Here is a list of areas that have experienced water over the road:

- Annett Road between street number 25 and 61
- Dublin Road between street numbers 224 and 241
- North Street/NH 137 between street numbers 261 and 292
- Nutting Road between street numbers 300 and 317
- River Street/NH 202 between street numbers 109 and 143
- Squantum Road between street numbers 230 and 236
- Squantum Road between street numbers 406 and 432
- Culvert on Town Farm Road
- Culvert on Lehtinen Road
- Heath Road (culvert was replaced, so problem may be resolved)

Potential Impact:

- There is a potential for injuries and loss of life;
- There is potential for structural damage and interruption of services;
- There is potential for flooding of roads due to accumulation of heavy rain and runoff which could cause a delay in the response time of emergency services; and
- There is a potential for damage/repair to the road surface.

Drought

Risk: High

Impact: Low

Future Probability: High

Droughts are a natural hazard that impacts the entire Town. A greater emphasis is placed on responding to these hazards rather than mitigating for them. Outreach and education on methods of dealing with drought are important. The severity of droughts can be found by referring to the Palmer Drought Severity Index and can be viewed at: http://www.cpc.ncep.noaa.gov/products/monitoring_and_data/drought.shtml. Below is the Intensity Scale that is used with the Palmer Drought Severity Index to describe the observed impact with each category.

Category	Intensity	Impact
D0	Abnormally Dry	Crop growth is stunted; fire danger is elevated; lawns brown and gardens wilt; surface water levels are lower.
D1	Moderate Drought	Wildfires and brush fires increase; increased use of irrigation for crops; hay and grain yields are lower; honey production declines; trees and fish are stressed making them susceptible to disease; water conservation is recommended.
D2	Severe Drought	Water quality and quantity declines; irrigation ponds are dry and hay crops are impacted causing economic hardship to farms; crop yields and size of fruit are reduced; outdoor burning is limited; air quality is poor; impact on the health of trees and wildlife is observed.

D3	Extreme Drought	Crop loss, farms are stressed and are experiencing a financial impact; extremely reduced flow or ceased flow of water; river temperatures are warm; wildlife disease is increased; many well are dry; new and deeper wells are needed.
D4	Exceptional Drought	NH has little or no experience in D4, so no impacts have been recorded at this level.

Source: NOAA

Past Events:

- Summer of 2020 - drought conditions existed throughout New Hampshire. Low water levels caused the Town to run off of 2 out of 3 municipal wells.
- Summer of 2018 - drought conditions existed throughout New Hampshire. There was no local impact.

Potential Occurrences:

- This is a recurring event that impacts the entire Town. Areas that are most impacted from droughts are farms and residents with wells.

Potential Impact:

- Drought will increase the risk of wildfire, especially in areas of high recreational use and as more timberland is set aside as non-harvested timberland.
- Some private wells may run dry;
- Minimal impact to Town services; and
- Approximately half of the Town is served by water through the municipal wells. The Town is currently working on developing a new well due to the limitations of the Squantum well.

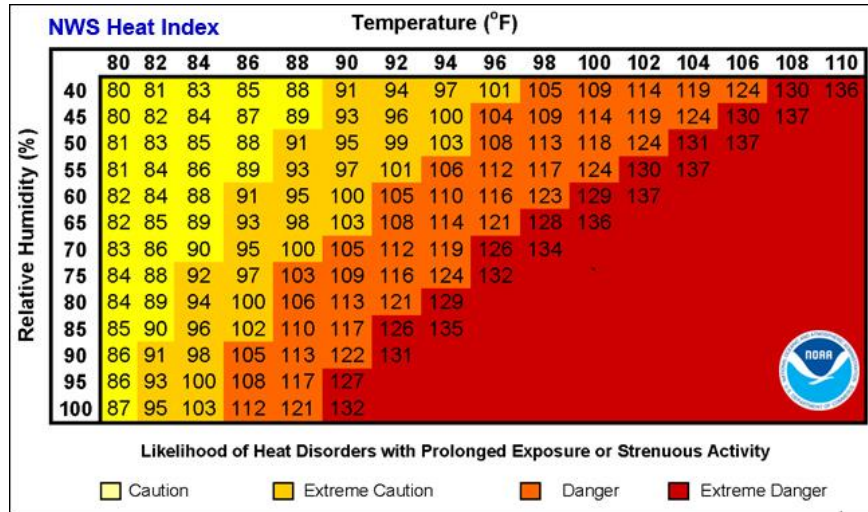
Extreme Temperatures

Risk: High

Impact: Low

Future probability: High

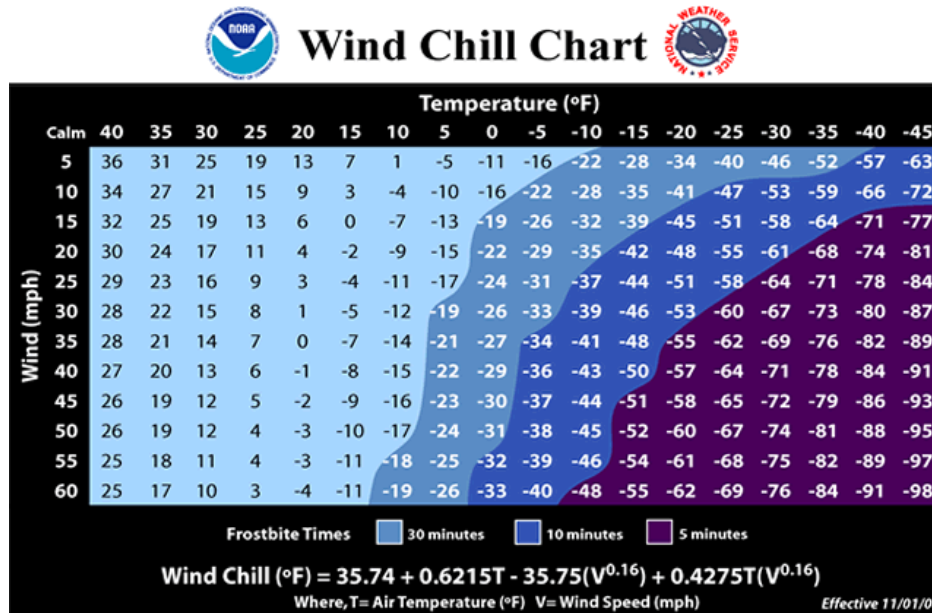
Extreme heat is characterized by abnormally high temperatures and/or longer than average time periods of high temperatures. Although it is an infrequent event, it usually occurs on an annual basis between late July and August and happens town wide. The severity of extreme heat can be dangerous to those residents with medical conditions and the elderly. It is important to have cooling areas and a good supply of water available. Extreme heat can add to the potential for wildfires and depletion of the water supply for firefighting. The Jaffrey Hazard Mitigation Work Group did not recall any impact to the Town services due to this hazard. They also did not recall any death, injuries or structural damage as a result of extreme heat. The NWS Heat Index is an indicator of the likeliness of heat disorders with prolonged exposure or strenuous activity, especially for those with a history of stroke and heart issues.



Source: National Weather Service

Extreme Cold events occur during meteorological cold waves, also known as cold snaps that are caused by the southern transport of arctic airmasses into the Northeast. These events are most common in winter months and increase the likelihood of cold disorders in humans and animals that have prolonged exposure to low ambient temperatures. Cold disorders can include frostbite and hypothermia which can eventually lead to death. Extreme cold can also damage or kill crops and animals (wild, farm, or domesticated), potentially presenting a risk to the economy.

The Wind Chill Chart below shows the impact that wind and cold temperatures can have by indicating the number of minutes until frostbite strikes.



Source: National Weather Service

Past Events:

- There have been no impactful events of extreme heat or cold that the Work Group recalled since the last plan update;

Potential Occurrences:

- Extreme temperatures are a town-wide event.

Potential Impact:

- Higher elevations are impacted more by extreme temperatures.
- Vulnerable populations are at greater risk.

Infectious Disease

Risk: High

Impact: Medium

Future probability: High

Epidemics may be caused by infectious diseases, which can be transmitted through food, water, the environment or person-to-person or animal-to-person; and noninfectious diseases, such as a chemical exposure, that causes increased rates of illness. Infectious diseases that may cause an epidemic can be broadly categorized into the following groups:

- Foodborne (Salmonellosis, E. Coli)
- Water (Cholera, Giardiasis)
- Vaccine Preventable (Measles, Mumps)
- Sexually Transmitted (HIV, Syphilis)
- Person-to-Person (TB, meningitis)
- Arthropod borne (Lyme, West Nile Virus)
- Zoonotic (Rabies, Psittacosis)
- Opportunistic fungal and fungal infections (Candidiasis)

Past Events:

January 20, 2020 and continuing; COVID-19 PANDEMIC (DR-4516-NH) Major Disaster Declaration declared on April 3, 2020. The Covid-19 Pandemic that began in 2020 resulted in numerous residents to become ill and also some deaths in Town. In addition, it created economic hardship for many due to loss of work, school closures and business closures. This pandemic is still occurring, so data will be forthcoming in the next update of this plan.

Potential Occurrences:

- This is a town wide event; therefore, no specific locations are listed.

Potential Impact:

Those with weakened immune systems are at greater risk during these events.

- There is a potential for injury or death;
- There is a potential for injury or death to domestic animals and wildlife;
- There is a potential for risk to waterbodies and wildlife habitat;
- There is a potential for loss of crops and vegetation; and
- There is a potential for economic disparity.

Lightning

Risk: High

Impact: Medium

Future probability: High

Lightning is a natural hazard that is unpredictable. It could strike anywhere during a storm and potentially start a forest fire, especially in periods of drought. High elevations and areas around waterbodies may be more susceptible to lightning strike incidents. The table below categorizes lightning hazards according to the Lightning Activity Level (LAL) using cloud conditions and precipitation, and an estimate of lightning strikes per every 15 minutes.

LAL	Cloud & Storm Development	Lightning Strikes/15 min
1	No thunderstorms.	-
2	Cumulus clouds are common but few reach the towering cumulus stage. A single thunderstorm must be confirmed in the observation area. Light rain will occasionally reach the ground. Lightning is very infrequent.	1-8
3	Towering cumulus covers less than two-tenths of the sky. Thunderstorms are few, but two to three must occur within the observation area. Light to moderate rain will reach the ground, and lightning is infrequent.	9-15
4	Towering cumulus covers two to three-tenths of the sky. Thunderstorms are scattered and more than 3 must occur within the observation area. Moderate rain is common & lightning is frequent.	16-25
5	Towering cumulus and thunderstorms are numerous. They cover more than three-tenths and occasionally obscure the sky. Rain is moderate to heavy and lightning is frequent and intense.	>25
6	Similar to LAL 3 except thunderstorms are dry.	9-15

Source: NOAA

Past Events:

- July 2020 - There was a lightning strike at the Jaffrey Recreation Department which impacted the internet, but there was no structural damage or injuries from this occurrence.

Potential Occurrences:

- Lightning could occur town wide, therefore, no specific locations are identified; however, river corridors and hill tops are more susceptible;
- Antennas and satellites, church steeples, cupolas, and other upward protruding architectural features are at greater risk for lightning strikes; and
- Hikers, fisherman and boaters are at risk during lightning events and should seek safe shelter.

Potential Impact:

- Forested areas with a high fuel load are a high risk for forest fire during lightning storms;
- Telephone and power outages often occur when transformers are hit by lightning or when a tree gets struck and falls onto the lines;
- There is a potential for damage to structures; and
- There is a potential for injury or death.

Severe Winter Weather

Risk: Medium

Impact: Low

Future probability: High

Three types of winter events that cause concern are heavy snow, ice storms and extreme cold. Jaffrey's recent history has not recorded any loss of life due to the extreme winter weather. These random events are difficult to set a cost to repair or replace any of the structures or utilities affected.

To help prepare for these events, the Sperry Piltz Ice Accumulation Index was created.

ICE DAMAGE INDEX	DAMAGE AND IMPACT DESCRIPTIONS
0	Minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages.
1	Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges may become slick and hazardous.
2	Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation.
3	Numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 1-5 days.
4	Prolonged and widespread utility interruptions with extensive damage to main distribution feeder lines and some high voltage transmission lines/structures. Outages lasting 5-10 days.
5	Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed.

Past Events:

- November 26, 2014: Snowstorm - New Hampshire, Thanksgiving Storm. The 4th largest power outage in NH. Some residents lost power for several hours.
- January 26-29, 2015: Snowstorm - FEMA Disaster Declaration # DR-4049; \$4,939,215. Severe winter storm and snowstorm. Residents experienced minor power outages. There was no local impact to the Town other than snow removal.
- March 14-15, 2017 - Heavy snow and wind occurred throughout the state. There storm was severe enough to cause the annual Town Meeting to be postponed until a date that was safer for residents to get to the meeting. There were no injuries or structural damage reported as a result of the storm.
- March 13-14, 2018 - Heavy snow storm but no local impact. FEMA Disaster Declaration # DR-4371 for Carroll, Strafford and Rockingham Counties.

Potential Occurrences:

- This is a town wide event; therefore, no specific locations are listed, however, roads with moderate to steep grades are a concern for driver safety.

Potential Impact:

- There is a potential for interruption of service;
- There is a potential of damage to structures; and
- There is a potential for injury or death.

Solar Storm and Space Weather

Risk: Medium

Impact: Low

Future probability: High

The term space weather is relatively new and describes the dynamic conditions in the Earth's outer space environment, similar to how the terms "climate" and "weather" refer to the conditions in the Earth's lower atmosphere. Space weather includes any and all conditions and events on the sun, in the solar wind, in near-Earth space, and in our upper atmosphere that can affect space-borne and ground based technological systems.

The chart below shows the level of severity of space weather as it relates to the impact on radio communications. The National Oceanic and Atmospheric Administration (NOAA) uses this chart to alert those who depend on radio communications such as first responders and airlines on days that could create life threatening situations if their radios are impacted.

Radio Blackout

Scale	Description	Effect	Physical measure	Average Frequency (1 cycle = 11 years)
R 5	Extreme	HF Radio: Complete HF (high frequency) radio blackout on the entire sunlit side of the Earth lasting for a number of hours. This results in no HF radio contact with mariners and en route aviators in this sector. Navigation: Low-frequency navigation signals used by maritime and general aviation systems experience outages on the sunlit side of the Earth for many hours, causing loss in positioning. Increased satellite navigation errors in positioning for several hours on the sunlit side of Earth, which may spread into the night side.	X20 (2×10^{-3})	Less than 1 per cycle
R 4	Severe	HF Radio: HF radio communication blackout on most of the sunlit side of Earth for one to two hours. HF radio contact lost during this time. Navigation: Outages of low-frequency navigation signals cause increased error in positioning for one to two hours. Minor disruptions of satellite navigation possible on the sunlit side of Earth.	X10 (10^{-3})	8 per cycle (8 days per cycle)
R 3	Strong	HF Radio: Wide area blackout of HF radio communication, loss of radio contact for about an hour on sunlit side of Earth. Navigation: Low-frequency navigation signals degraded for about an hour.	X1 (10^{-4})	175 per cycle (140 days per cycle)
R 2	Moderate	HF Radio: Limited blackout of HF radio communication on sunlit side, loss of radio contact for tens of minutes. Navigation: Degradation of low-frequency navigation signals for tens of minutes.	M5 (5×10^{-5})	350 per cycle (300 days per cycle)
R 1	Minor	HF Radio: Weak or minor degradation of HF radio communication on sunlit side, occasional loss of radio contact. Navigation: Low-frequency navigation signals degraded for brief intervals.	M1 (10^{-5})	2000 per cycle (950 days per cycle)

Source: National Oceanic and Atmospheric Administration (NOAA)

This is a new hazard added to this plan. It is anticipated that this will be discussed further in future plans.

Past Events:

- This is a hazard that is difficult to detect and the Work Group was not aware of any specific dates of occurrence. There have been no incidents of damage or interruption of communication services recorded in Jaffrey.

Potential Occurrences:

- The entire town is at risk for solar storms and space weather. There is a concern for disruption in emergency services communications and businesses that rely on the internet.

Potential Impact:

- There is a potential for interruption of service.

- Solar storms and space weather can impact the connections for emergency services. It can also impact the wells and tanks which communicate by radio.

Tornado, Downburst, High Wind

Risk: High

Impact: Medium

Future probability: High

Risk from tornados is considered to be medium in Cheshire County. The Enhanced Fujita Scale is used to determine the intensity of tornadoes. Most tornadoes are in the F0 to F2 Class. Building to modern wind standards provides significant property protection from these hazard events. New Hampshire is located within Zone 2 for Design Wind Speed for Community Shelters, which is 160 mph, and is also noted as being within a hurricane susceptible region.

Past events (regional):

- The southwestern portion of the state is considered a special wind hazard area as demonstrated by the high proportion of tornadoes and severe wind events that are experienced in this Region annually. On July 3, 1997 several tornadoes struck this section of the State. An F1 tornado caused severe tree loss in Swanzey, destroying a building and damaging the stables at the Cheshire Fairgrounds. Although outside the Southwest Region, the 2008 Barnstead tornado caused significant damage and also involved loss of life. Therefore, this is a real hazard and the damage it could inflict should not to be taken lightly.

Local events:

- Two events occurred in July and August in 2020 that caused downed trees and powerlines, trees on houses and vehicles and short-term power outages. There were no reported injuries. Response was needed by the public works, fire department and police department to assist with rerouting traffic while debris and power lines were removed from unsafe areas. The Work Group did not know the extent of damage to personal property.

Potential Occurrences:

- River corridors and hill tops are more susceptible; and
- This is a town wide event; therefore, no specific locations are listed.

Potential Impact:

- There is a potential for structural damage;
- There is a potential for loss of life and property as well as disruption of utility service; and
- Such events cause small blocks of downed timber.

The **Enhance Fajita Scale** is used to rate the intensity of a tornado by examining the damage caused by the tornado once it has passed.

EF-0: Wind speed 65-85 mph.; frequency 53.5%. Minor damage.

EF-1: Wind speed 86-101 mph.; frequency 31.6%. Moderate damage.

EF-2: Wind speed 111-135 mph.; frequency 10.0%. Considerable damage.

EF-3: Wind speed 136-165 mph.; frequency 3.4%. Severe damage.

EF-4: Wind speed 166-200 mph.; frequency 0.7%. Extreme damage.

EF-5: Wind speed >200 mph.; frequency 0.1%. Total destruction.

Tropical Storm/Hurricane

Risk: High

Impact: Medium

Future probability: High

There is concern for tropical storms and hurricanes to impact Jaffrey. Jaffrey's inland location in southwestern New Hampshire reduces the risk of extreme high winds that are associated with hurricanes. A major hurricane can cause significant damage to a community. Most of the damage is caused by high water and high winds.

Past Events from 2014 to present:

- The Town has experienced small blocks of downed timber and uprooting of trees onto structures in past years, however, there have been no occurrences of tropical storms or hurricanes in the past five years that have impacted Jaffrey.

Potential Occurrences:

- River corridors and hill tops are more susceptible; and
- This is a town wide event; therefore, no specific locations are listed.

Potential Impact:

- There is a potential for injury or death;
- There is a potential for structural damage and disruption of utility service; and
- There is a potential for flooding of evacuation routes and other roads.

Saffir-Simpson Hurricane Wind Scale

The Saffir-Simpson Hurricane Wind Scale is a 1 to 5 rating system based on a hurricane's sustained wind speed. This scale estimates potential property damage. Hurricanes reaching Category 3 and higher are considered major hurricanes because of their potential for significant loss of life and damage. Category 1 and 2 storms are still dangerous, and require preventative measures.

Category 1

Wind Speed: 74 - 95 mph, 64 - 82 kts

Very dangerous winds will produce some damage: Extensive damage to power lines and poles likely will result in power outages that could last a few to several days

Category 2

Wind Speed: 96 - 110 mph, 83 - 95 kts

Extremely dangerous winds will cause extensive damage: Near-total power loss is expected with outages that could last from several days to weeks.

Category 3

Wind Speed: 111 - 129 mph, 96 - 112 kts

Devastating damage will occur: Electricity and water will be unavailable for several days to weeks after the storm passes.

Category 4

Wind Speed: 130 - 156 mph, 113 - 136 kts

Catastrophic damage will occur: Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

Category 5

Wind Speed: 157 mph or higher, 137 kts or higher

Catastrophic damage will occur: Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.

Source: <http://www.nhc.noaa.gov/aboutsshws.php>

Wildfire

Risk: High

Impact: Medium

Future probability: High

The whole Town is at risk for wildfires. There is a substantial amount of debris on the ground from the ice storms of 1998 and 2008, wind shears, heavy winds, and logging practices. As timber harvesting is reduced, wood roads close and debris builds up on the ground, the potential for wildfire increases town-wide. There have been no wildfires in Jaffrey within the past 5 years.

Potential Occurrences:

- The potential for a wildfire is higher in the forested areas of Jaffrey; and
- A lack of direct access to many remote areas within Town adds to the danger.

Potential Impact:

- There is a potential for the risk of life and property loss;
- There is a potential for loss of wildlife habitat and timber; and
- There is a potential for disruption of utility service.

Wildfires are classified according to size: Class A - one-fourth acre or less; Class B - greater than one-fourth acre, but less than 10 acres; Class C - 10 acres or more, but less than 100 acres; Class D - 100 acres or more, but less than 300 acres; Class E - 300 acres or more, but less than 1,000 acres; Class F - 1,000 acres or more, but less than 5,000 acres; Class G - 5,000 acres or more. The wildfires in Jaffrey have mostly been small in nature and caused by lightning strikes (Class A or B).

Technological Hazards

Dam Failure/Breach

Risk: Medium

Impact: High

Future probability: Low

Past Events from 2014 to present:

- There have been no occurrences of dam failure or breach in the past 5 years.

Potential Occurrences (Class H or S Dams):

- Black Reservoir Dam
- Mountain Brook Reservoir Dam
- Jaffrey Sewage Lagoon Dam

Potential Impact:

- There is a potential for the risk of life and property loss;
- There is a potential for loss of wildlife habitat and timber; and

- There is a potential for disruption of utility service.

The State of New Hampshire classifies dams into the following four categories:

NM - Non-menace S - Significant hazard Blank - Non-Active
L - Low hazard H - High Hazard

Detailed Description of Hazard Classification Terms:

Non-Menace structure means a dam that is not a menace because it is in a location and of a size that failure or misoperation of the dam would not result in probable loss of life or loss to property, provided the dam is: less than six feet in height if it has a storage capacity greater than 50 acre-feet; or less than 25 feet in height if it has a storage capacity of 15 to 50 acre-feet.

Low Hazard structure means a dam that has a low hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in any of the following: low economic loss to structures or property; structural damage to a town or city road or private road accessing property; the release of liquid industrial, agricultural, or commercial wastes, septage, or contaminated sediment; and reversible environmental losses to environmentally-sensitive sites.

Significant Hazard structure means a dam that has a significant hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in any of the following: major economic loss to structures or property; structural damage to a Class I or Class II; and major environmental losses.

High Hazard means a dam that has a high hazard potential because it is in a location and of a size that failure or misoperation of the dam would result in probable loss of human life as a result of water levels and velocities.

Generally, all Class H dams need to have Emergency Action Plans, and most Class S dams also require them. According to the Department of Environmental Services Dam Bureau, there are three Class H dams in Jaffrey, for which an Emergency Action Plan is required and an inundation zone has been delineated (see Past and Potential Hazards Map). The table below shows all dams in the Town of Jaffrey. There have not been any incidents recorded of dam failure or breach in town.

Dam #	Hazard Classification	Name	Height	Impoundment
D124001	L	SQUANTUM VILLAGE DAM	12	2.1
D124002	L	CONTOOCOOK LAKE DAM	7	443
D124003	S	CONTOOCOOK RIVER DAM	15	5
D124004	L	CHESHIRE POND DAM	13	57
D124006	S	BLACK RESERVOIR DAM	10	48
D124008	NM	MEAD BROOK DAM	9	2
D124010	L	GILSON POND DAM	11.2	16
D124011	NM	ADAMS POND DAM	8.5	3
D124012	NM	UPPER POND	9	0.25
D124013	NM	MILL POND	12	0.75
D124014	L	POOLE RESERVOIR DAM	14	3.8
D124015	NM	ARK POND DAM	8	1
D124017	S	MOUNTAIN BROOK RESERVOIR DAM	18.3	91.4
D124018	NM	FIRE POND	11	4.6
D124020	NM	WILDLIFE POND DAM	10	0.5
D124022	NM	GILMORE POND DAM	5	125
D124023	NM	FARM POND DAM	16	0.3

Dam #	Hazard Classification	Name	Height	Impoundment
D124024	NM	FROST POND DIKE	3	103
D124027	S	JAFFREY SEWAGE LAGOON DAM	25	10.4
D124030	L	CEDARWOOD DEVELOPMENT FIRE POND	11.2	0.75
D124032	NM	SILVER RANCH POND DAM	8.7	0.9

Chapter 5 Critical Facilities

Critical Facilities Within Hazard Areas

Hazards identified in this plan are regional risks and, as such, all critical facilities fall into the hazard area. The exception to this is flooding. There are no identified critical facilities that fall within the 100-year floodplain.

A Critical Facility is defined as a building, structure, or location which:

- Is vital to the hazard response effort
- Maintains an existing level of protection from hazards for the community
- Would create a secondary disaster if a hazard were to impact it

The critical facilities list for the Town of Jaffrey has been identified using a similar list provided by NH HSEM. Jaffrey's Hazard Mitigation Work Group has divided this list of facilities into four categories. The first category contains facilities needed for emergency response in the event of a disaster. The second category contains non-emergency response facilities that have been identified by the Work Group as non-essential. These are not required in an emergency response event but are considered essential for the everyday operation of Jaffrey. The third category contains facilities and populations that the Work Group wishes to protect in the event of a disaster. The fourth category contains potential resources which can provide services or supplies in the event of a disaster.

Category 1 - Emergency Response Services:

The Town has identified the Emergency Response Facilities and Services as the highest priority in regards to protection from natural and man-made hazards.

1. Emergency Operations Center: 138 Turnpike Road
2. Fire Station: 138 Turnpike Road
3. Police Station: 26 Main Street
4. Ambulance Service
Jaffrey-Rindge Memorial Ambulance, Inc. (JRMA) - 119 Main Street
5. Town Offices - 10 Goodnow Street
6. Department of Public Works
Department of Public Works Facility - 23 Knight Street
Water Department - 104 Turnpike Road
Wastewater Treatment Facility - 2 and 70 Old Sharon Road
7. Emergency Electrical Power Facility (Generators): Jaffrey Town Office - 10 Goodnow Street
8. Emergency Shelters
Jaffrey Bible Church (primary shelter) - 133 Turnpike Road

Christian Ministries - 257 Dublin Road
Jaffrey Rindge Middle School, Conant High School, Pratt Gymnasium - 1 and 3 Conant Way
Jaffrey Public Library - 38 Main Street, heating/cooling center and charging station

9. Primary Evacuation Routes

Main Street
NH 137
NH 202
NH 124

10. Transfer Station

Jaffrey Transfer Station and Recycling Center - 110 Old Sharon Road

11. Communications

Town Hall, Police, Fire and Highway have communications antenna
Town Hall, Fire and Police have fiber ethernet
Switching station in Town at River Street
Switching stations throughout Town
Substation on NH 124
Substation on Lehtinen Road

12. Helicopter Landing Sites

Various locations throughout Town

Category 2 – Non-Emergency Response Facilities:

The Town has identified these facilities as non-emergency facilities; however, they are considered essential for the everyday operation of Jaffrey.

1. Water-based Facilities and Utilities

Dry hydrants (see locations at the end of this chapter)
Wellheads (3)
Water supply and distribution systems
Sewer treatment and conveyance systems

2. Problem Culverts and Street Flooding Areas

The Public Works Director should be contacted to identify particular problem culverts at a given time in addition to those listed below:

- Annett Road between street number 25 and 61
- Dublin Road between street numbers 224 and 241
- North Street/NH 137 between street numbers 261 and 292
- Nutting Road between street numbers 300 and 317
- River Street/NH 202 between street numbers 109 and 143
- Squantum Road between street numbers 230 and 236
- Squantum Road between street numbers 406 and 432
- Culvert on Town Farm Road
- Culvert on Lehtinen Road
- Heath Road (culvert was replaced, so problem may be resolved)

Category 3 - Facilities/Populations to Protect:

The third category contains people and facilities that need to be protected in event of a disaster.

1. Special Needs Populations

List available at the Emergency Operations Center. List may include:

- Oxygen-dependent people
- People on a Lifeline
- People assisted by Home Health Care
- Shut-ins and disabled
- Mentally challenged
- Elderly
- Hearing impaired

2. Schools

- Jaffrey-Rindge Middle School/Conant High School - 3 Conant Way
- Jaffrey Grade School - 18 School Street
- Jaffrey Head Start- 35 Oak Street
- Victory High School (private) - 7 Knight Street

3. Day Care Centers

- Kid's Club - 49 Squantum Road
- Monadnock Adult Care Center - 22 North Street

4. Senior Housing/Nursing Homes

- Jaffrey Rehabilitation and Nursing Center - 20 Plantation Drive
- Gilmore Court - 18 Gilmore Pond Road
- Jaffrey Village Apartments- Alder and Polar Courts

5. Recreation Areas

- Mount Monadnock
- Recreation fields and courts
- Beaches

6. Historic Facilities

- Historic District around Jaffrey Center
- East Jaffrey Historic District
- Mill - Routes 137 and 202
- Squantum Village - NB 385 Squantum Road and 103 Prescott Road

7. Cultural Facilities

- Women's Club (Cutter Memorial) - 33 Main Street
- Jaffrey Meetinghouse - 15 Laban Ainsworth Way
- Jaffrey Civic Center - 40 Main Street
- Jaffrey Bible Conference Center - 257 Dublin Road
- Park Theatre - 19 Main Street

8. Religious Facilities

- Redeeming Grace PH Church - 48 Stratton Road
- Harvest Christian Fellowship - 1 Main Street
- Jaffrey Bible Church - 133 Turnpike Road

Jaffrey Presbyterian Church - 33 Main Street
Pilgrim Baptist Church - 388 North Street
St. Patrick's Catholic Church - 87 Main Street
United Church of Christ - 54 Main Street
Quaker Meetinghouse - 3 Davidson Road
Hope Fellowship - 16 Prescott Road
First Church - 14 Laban Ainsworth Way

9. Campgrounds

Gilson Pond Campground - 585 Dublin Road
Monadnock State Park - 169 Poole Road

10. Employment Centers (Shopping areas, large employers)

Belletetes - 51 Peterborough Street
Millipore - 480 Turnpike Road
Teleflex Medical - 50 Plantation Drive

11. Library

Jaffrey Public Library - 38 Main Street

Category 4 - Potential Resources:

Contains facilities that provide potential resources for services or supplies.

1. Food & Water

Dollar General - 95 Peterborough Street, NH 202
Mr. Mike's/All Town - 50 Peterborough Street
New England Everyday Goods - 16 Colls Farm Road
River Street Market - 62 River Street

2. Hospitals/Medical Supplies

Rite-Aid Pharmacy - 14 Peterborough Street, NH 202
Jaffrey Family Medicine - 82 Peterborough Street, NH 202
Hospitals include:
 Monadnock Community Hospital (located in Peterborough)
 Cheshire Medical Center (Keene)
 St. Joseph's Hospital (Nashua)
 Southern NH Medical Center (Nashua)
 Health Alliance (Leominster, MA)
 Nashoba Valley Deaconess Hospital (Ayer, MA)

3. Gravel Pits

JCK Sand and Gravel - Maria Drive

4. Gas

Mr. Mike's/All Town - 50 Peterborough Street
Red's of Jaffrey - 12 River Street
River Street Market - 62 River Street

5. Heating Fuel

Red's of Jaffrey - 12 River Street

6. Airport

Silver Ranch Airport - 190 Turnpike Road

7. Building Material and Heavy Equipment Suppliers

Belletetes - 51 Peterborough Street, NH 202

8. Heavy Equipment Resources

C & C Trucking - 114 North Street Road

Mountainshade Excavation - 35 Sawtelle Road

Digz Excavating - 52 Fitzgerald Drive

9. Miscellaneous Resources

Emergency Broadcast & Television: WMUR

Transportation:

Buses - Peterborough Bus Company (Peterborough)

- Community Transportation (Rindge or Jaffrey)

- Johnson Transportation (Jaffrey)

- City Line Bus

Trucks - Local Contractors, National Guard, Keene

Beds, Cots, Blankets:

National Guard

Red Cross

Dry Hydrant Locations

Crestview Drive

Dublin Road at Monadnock Bible Conference Road

Dublin Road at Pierces Bridge

Fitch Road (canal side)

Fitch Road (pond side)

Fitch Road Fire Pond

Gilmore Pond Road

Hadley Road on Bridge

Ingalls Road Fire Pond

Main Street on bridge (east)

Main Street on bridge (west)

North Street at Gordon Services Pit

110 Old Sharon Road Cistern

Sherwood lane Fire Pond

Thorndike Pond Road

Woodbound Road

Chapter 6

Existing Mitigation Strategies and Proposed Improvements

This step involves identifying existing mitigation strategies and Town programs. This section evaluates their effectiveness and outlines those programs and recommends improvements to ensure the highest quality emergency services possible.

Effectiveness of the existing protection is rated Good, Average, or Below Average: *Good* - meets and sometimes exceeds expectations; *Average*- meets general expectations; *Below Average* - needs improvements.

Existing Mitigation Strategy	Description	Area Covered	Effectiveness	Comments or Improvements Needed
Floodplain Management District	Ordinance has been adopted as part of the Town's Land Use Plan. Overlay of the floodplain map indicates over 300 properties in the floodplain area but a review of participants in the flood insurance program shows only 6 properties in the NFIP. There has been no effort to take advantage of the Community Rating System (CRS) program to help lower flood insurance premiums.	100- and 500-year floodplain	Good	Expand education with website links; look into joining CRS.
Best Management Practices (BMP's)	Jaffrey uses NH State guidelines for Roads, Soil and Erosion.	Town-wide	Good	Evaluate incorporating BMP's into subdivision site plan regulations.
Drainage Maintenance Program	This strategy includes: Grading, vacuuming and clearing debris from culverts.	Town-wide	Good	No changes needed.
Wetlands Protective Measures	Jaffrey maintains a wetlands ordinance as part of their land use plan which is coordinated with current state regulations.	All wetlands	Good	No changes needed.
Town-Adopted Building Codes	Jaffrey maintains a building inspector and has adopted the State Building Codes, including ICC, Life Safety, NFPA and NFPA 101.	Town-wide	Good	Increase enforcement through prevention and annual inspections.
River Stewardship	Implemented by Conservation Commission	Contoocook River	Good	No changes needed.

Existing Mitigation Strategy	Description	Area Covered	Effectiveness	Comments or Improvements Needed
Steep Slopes & Class VI Roads Regulations	Jaffrey has adopted regulations for steep slopes as part of the Land Use Plan limiting where buildings and roads can be located.	Town-wide	Average	Evaluate steep slopes regulations and Class VI road requirements.
Emergency Operations Plan	Jaffrey maintains an Emergency Operations Plan (EOP) which addresses alert, notification and evacuation procedures for emergency notification and routes to be taken. The plan was updated in 2015.	Town-wide	Good	Update EOP in 2021.
Road Design Standards	Jaffrey maintains road design regulations as part of their land use plan and sub-division regulations.	Town-wide	Average	Review and update.
School Emergency Plan	Comprehensive Emergency Response Plan for emergencies and incidents at the School.	School	Good	Continue updates.
Manufactured Homes regulations	Adopted as part of the Land Use Plan and are restricted to being located in only designated zoned areas.	Town-wide	Average	Review and update.
NIMS Training	The Town has provided NIMS 700 and ICS 100 to most emergency response personnel and EOC staff.	Town-wide	Good	Continue NIMS/ICS training.
Dry Hydrant Inventory	The fire department had a water resource study completed for the Town's fire suppression sources of water.	Fire Department	Average	Update is needed.
Solid Waste Disposal and Hazardous Materials Inventory	Work to complete a solid waste and hazardous materials inventory.	Town-wide	Average	Identify locations and develop a policy; assess threats.

Integration of Mitigation Priorities into Planning and Regulatory Tools

Many of the existing strategies as noted above should be regularly reviewed. This review process can lead to revisions that will incorporate mechanisms to assist in the implementation of the hazard mitigation priorities as defined in this Plan. This review will continue to be a priority of the Jaffrey Emergency Management Director and will include yearly requests in the annual budget process when appropriate. Moreover, as suggested in the onset of this document, this Plan is a planning tool to be used by the Town of Marlborough, as well as other local, state, and federal governments, in the effort to reduce future losses from natural, technological and/or human-caused hazardous events before they occur. Under the Prioritized

Mitigation Projects Action Plan (Chapter 8), all parties listed under the Responsibility/Oversight category shall also review this listing annually, and consider the listed (and updated) mitigation projects within their annual budget requests.

Previous Mitigation Action Update

The Hazard Mitigation Work Group reviewed each Mitigation Action Item from the previous plan to determine the status of the proposed actions. A status of **completed, deferred, or deleted** is recorded in the table below.

Mitigation Action	Status	Comment
Install lightning protection measures on all of the Town's critical facilities and schools.	Completed	No action needed.
Coordinate with the school district to ensure the emergency response plans are adequate and up to date.	Completed	Recently completed.
Retrofit the public works building to meet snow load building code.	Completed	No action needed.
Secure Town Office against physical assault.	Completed	No action needed.
Construct the new EOC to meet FEMA 361 standards.	Deleted	Not a priority at this time.
Educate the public regarding dangers of lightning and steps they can take to protect themselves, utilizing the Town's Code Red, website and printed materials.	Completed and ongoing*	Information will be updated as needed. This is ongoing.
Implement projects/ recommendations identified in the NH HSEM school security survey.	Completed	No action needed.
Ensure the school officials, Good Shepherd nursing home and Bible Conference Center are aware of refuge in severe wind incidents.	Completed	No action needed.
Install/upgrade rural fire suppression sources per the RC&D report.	Completed	No action needed.
Educate the public regarding dangers of extreme heat and steps they can take to protect themselves, utilizing the Town's Code Red, website and printed materials.	Completed and ongoing*	Information will be updated as needed. This is ongoing.
Develop live web access floodplain overlay on the Town's tax map.	Completed	Maps are available on the web.
Update floodplain maps to reflect more accurate flood levels in town.	Completed	FEMA update.
Retrofit the Town Office for generator hookup.	Completed	No action needed.
Conduct seismic retrofitting or new construction of the Police Department, Public Works and the EOC.	Completed	No Action needed.
Educate public about the National Flood Insurance Program and benefits of flood insurance through website links and brochures.	Completed and ongoing*	Information on website and at the Town Office.
Join the Community Rating System (CRS).	Deferred	Investigate the benefits and costs.
Educate the public regarding dangers of severe winter weather and steps they can take to protect themselves, utilizing the Town's Code Red, website and printed materials.	Completed and ongoing*	Information on website.
Repair or remove the Poole Reservoir Dam.	Deferred	A plan for removal is currently engineered.

* Ongoing actions have been noted to ensure that they will continue outside of this plan.

Chapter 7

Existing and Potential Strategies: Identifying Gaps in Coverage

In addition to the programs and activities that Jaffrey is currently undertaking to protect its residents and property from natural and manmade disasters, a number of additional strategies were identified by the Hazard Mitigation Work Group for consideration. The process of compiling a comprehensive list of all mitigation strategies currently in place throughout the Town helped the Work Group to identify gaps in the existing coverage and improvements which could be made to the strategies. Existing and potential strategies were identified for each general hazard type using the following categories: Prevention (programs and policies), Property Protection, Emergency Services, and Public Information. Each strategy was discussed to determine realistic strategies to be included in the STAPLEE chart.

Existing and Potential Strategies: Identifying Gaps in Coverage

Hazard Type	Prevention (programs and policies)	Property Protection	Emergency Services	Public Information
Flooding	Town Capital Improvement Plan for bridge/culvert replacement.	Inventory culverts and bridges to determine needed upgrades.	Continue to participate in NFIP trainings/workshops offered by the State and/or FEMA (or in other training) that addresses flood hazard planning and management.	Provide information to the public about NFIP.
		Enforcement of the Floodplain Development Ordinance.	Maintain & update Emergency Operations Plan.	Upgrade website to include NFIP and hazard mitigation information.
Drought	Contact the older residents and special needs populations.	Add a water conservation regulation & water ban if necessary.	Consider locations for a water distribution center.	Provide information to residents on water conservation/drought resistant landscaping and/or rain gardens.
Extreme Temperatures	Contact the older residents and special needs populations.	Update heating and cooling, insulation, windows, etc.	Establish alternative emergency shelters.	Provide information to residents on ways to mitigate the impact of extreme temperatures and maintain health.
Wild Fires		Continue to implement the fire pond management plan.	Continue training for firefighters.	Town-wide safety training: Fire prevention training at school; fire and health safety training; fire prevention outreach at Fire Dept.
Lightning	Continue to enforce Building Codes.	Install grounding equipment on public & historic buildings.		Include a link of FEMA's website on the town website.

Hazard Type	Prevention	Property Protection	Emergency Services	Public Information
Tornados/ Severe Wind/ Downbursts	Coordinate with Eversource to trim tree branches near power lines.	Trim tree branches near critical facilities, town structures and roadways.		Provide information for residents to understand ways to mitigate potential damage during a tornado/severe wind/downburst.
Hurricanes/ Tropical Storms	Coordinate with Eversource to trim tree branches near power lines.	Consider requirement for new construction to withstand severe wind speeds.		Continue to provide information to the public about NFIP.
Severe Winter Weather	Coordinate with Eversource to trim tree branches near power lines.		Review current and future needs for emergency backup power. Town Hall, Library (shelter). Winter Storm Operations Plan.	Disseminate information to residents about proper use of generators and the importance of maintaining the heating system to prevent carbon monoxide poisoning and fires.
Earthquakes			Continue mutual aid pacts with surrounding communities to share resources.	Provide information to the public by including a link of FEMA's website on the town website.
Erosion/ Landslide	Utilize Best Management Practices (BMPs). Erosion & Sedimentation Plans required for new development.	Existing areas of erosion should be monitored, including pictures or other documentation after heavy weather events.		Provide public information on best management practices and stormwater management methods (NHDES).
Infectious Disease	Develop a protocol for determining closures and measures needed to protect the public.		Equip the EOC and Shelters with sufficient materials to handle a wide-spread infectious disease event.	Conduct a public information workshop on emergency preparedness for short- and long-term quarantine.
Dam Failure		Obtain a copy of the Hazard Action Plans for High and Significant Class Dams.		Provide information to residents of evacuation routes.

Hazard Type	Prevention	Property Protection	Emergency Services	Public Information
Transport Accident	Enforcement of the existing traffic laws and seek the potential of additional restrictions. Consider traffic calming options.			Provide alerts on digital display signs.
Aging Infrastructure		Upsize culverts in areas of concern.		Create an outreach campaign to get voter support for large projects.
		Monitor improvements made to the water systems.		
All Hazards	Town-sponsored Safety Awareness Program.	Maintain annual reviews of the Action Plan (chapter 8) and implement the strategies.	Annual training for fire, police and public works staff and volunteers.	

Prioritization of Proposed Mitigation Strategies

The goal of each strategy identified in the previous table is reduction or prevention of damage from a hazard event. In order to determine their effectiveness in accomplishing this goal, a set of criteria was applied to each strategy. The STAPLEE method analyzes the Social, Technical, Administrative, Political, Legal, Economic, and Environmental aspects of a project and is commonly used by public administration officials and planners for making planning decisions. Using this method, changes in priorities of the previous mitigation plan can be made to reflect current trends and conditions. The following questions were asked about the proposed mitigation strategies and discussed in the table below:

- **Social:** Is the proposed strategy socially acceptable to the community? Are there equity issues involved that would mean that one segment of the community is treated unfairly?
- **Technical:** Will the proposed strategy work? Will it create more problems than it solves?
- **Administrative:** Can the community implement the strategy? Is there someone to coordinate and lead the effort?
- **Political:** Is the strategy politically acceptable? Is there public support both to implement and to maintain the project?
- **Legal:** Is the community authorized to implement the proposed strategy? Is there a clear legal basis or precedent for this activity?
- **Economic:** What are the costs and benefits of this strategy? Does the cost seem reasonable for the size of the problem and the likely benefits?
- **Environmental:** How will the strategy impact the environment? Will the strategy need environmental regulatory approvals?

Each mitigation strategy was evaluated and assigned a score (Good = 3, Average = 2, Poor = 1) based on the above criteria. An evaluation chart with total scores for each strategy can be found in the table on the next page. Each strategy was evaluated and prioritized according to the final score. The highest scoring strategies were determined to be of most importance, economically, socially, environmentally, and politically.

An additional factor that is not considered here but should be considered by the Work Group on a project-by-project basis is the ability to find funding.

Proposed Mitigation Strategy	Is it Socially acceptable?	Is it Technically feasible?	Is it Administratively workable?	Is it Politically acceptable?	Is there Legal authority to implement?	Is it Economically beneficial?	Is it Environmentally beneficial?	Total Score
Expand education to residents about emergency preparedness and hazard mitigation by adding FEMA and NHHSEM links to the Jaffrey website.	3	3	3	3	3	3	3	21
Provide education regarding ways to mitigate and react to droughts.	3	3	3	3	3	3	3	21
Review and update the road design standards.	3	3	3	3	3	3	3	21

Proposed Mitigation Strategy	Is it Socially acceptable?	Is it Technically feasible?	Is it Administratively workable?	Is it Politically acceptable?	Is there Legal authority to implement?	Is it Economically beneficial?	Is it Environmentally beneficial?	Total Score
Identify current and future needs for emergency backup power.	3	3	3	3	3	3	3	21
Conduct public information workshops on emergency preparedness and ways to reduce the impact of hazards and to make emergency preparedness kits.	3	3	3	3	3	3	3	21
Update the EOP in 2021.	3	3	3	3	3	3	3	21
Equip the EOC and emergency shelters with sufficient materials to handle hazardous events.	3	3	3	3	3	3	3	21
Complete bridge repairs in accordance with the CIP; Nutting Road (red listed) and Letourneau Drive (primary evacuation route for those in the neighborhood-39 homes).	3	3	3	3	3	3	3	21
Host a workshop for homeowners to learn of ways to mitigate the effects of extreme temperatures such as insulation, windows, heating & cooling, etc. (NH Saves)	3	3	3	3	3	3	3	21
Develop innovative and creative approach to get voter support for large CIP projects.	3	3	3	3	3	3	3	21
Add this mitigation plan into the Jaffrey Master Plan as a link or appendix.	3	3	3	3	3	3	3	21
Obtain a copy of the Hazard Action Plans for High and Significant Class Dams.	3	3	3	3	3	3	3	21
Continue efforts to remove the Poole Reservoir Dam.	3	3	3	3	3	3	3	21
Install lightning protection through installation of grounding equipment on public and historic buildings.	3	3	3	3	3	3	2	20
Inventory culverts and bridges to determine needed upgrades.	3	3	2	3	3	3	3	20
Establish a fund for inspections and new installations of dry hydrants.	3	3	2	3	3	2	3	19
Consider joining the Community Rating System (CRS).	3	3	1	2	3	3	3	18
Consider the inclusion of sediment and erosion control requirements for new construction projects.	3	3	2	2	3	2	3	18
Work to complete a solid waste and hazardous materials inventory; assess threats; develop guidelines.	3	3	1	2	3	2	3	17
Trim tree branches near critical facilities, town structures, and roadways.	2	3	2	2	2	2	2	15
Work with Federal, State, and local agencies to develop a protocol for determining local measures needed to protect the public during infectious disease threats.	2	2	2	2	2	2	3	15

Chapter 8

Prioritized Implementation Schedule and Action Plan

The Jaffrey Hazard Mitigation Work Group developed an action plan that outlines who is responsible for implementing each of the prioritized strategies determined in the previous chapters, as well as when and how the actions will be implemented. The following questions were asked to develop an implementation schedule for the identified priority mitigation strategies:

WHO? Who will lead the implementation efforts? Who will put together funding requests and applications?

WHEN? When will these actions be implemented, and in what order?

HOW? How will the community fund these projects? How will the community implement these projects? What resources will be needed to implement these projects?

A fourth consideration was the cost/benefit of each proposed action. Comments regarding the cost/benefit of each project are included, along with the “who,” “when,” and “how” in the table below.

As additional information becomes available regarding project leadership, timeline, funding sources, and/or cost estimates, the plan will be reviewed and amended accordingly.

Mitigation Actions that were identified in Chapter 7 but did not score as a priority, will remain in the plan. As additional funding and staff becomes available, these strategies should be considered in future plan updates.

Once the plan is formally approved by FEMA, the Town will begin working on the actions listed below with an estimated completion date as noted in the Timeframe (When) column.

Implementation/Action Plan

Mitigation Action	Who (Leadership)	When (Deadline)	How (Estimated Cost and Funding Source)
Expand education to residents about emergency preparedness and hazard mitigation by adding FEMA and NH HSEM links to the Jaffrey website.	Town Manager	Short-term	Town budget
Provide education regarding ways to mitigate and react to droughts.	Superintendent of Utilities	Mid-term	Town budget
Review and update the road design standards.	Superintendent of Highways and Facilities	Mid-term	Town budget
Identify current and future needs for emergency backup power.	Emergency Management Director	Short-term	Town budget

Mitigation Action	Who (Leadership)	When (Deadline)	How (Estimated Cost and Funding Source)
Conduct public information workshops on emergency preparedness and ways to reduce the impact of hazards and to make emergency preparedness kits.	Emergency Management Director	Short-term	SWRPC grant
Update the EOP in 2021.	Emergency Management Director	Short-term	FEMA grant
Equip the EOC and emergency shelters with sufficient materials to handle hazardous events.	Emergency Management Director	Short-term	Town budget and grants
Complete bridge repairs in accordance with the CIP; Nutting Road (red listed) and Letourneau Drive (primary evacuation route for those in the neighborhood - 39 homes).	Superintendent of Highways and Facilities	Short-term	Town budget and NHDOT grants
Host a workshop for homeowners to learn of ways to mitigate the effects of extreme temperatures such as insulation, windows, heating & cooling, etc. (NH Saves)	Building Inspector	Short-term	Town budget and grants
Develop innovative and creative approach to get voter support for large CIP projects.	Town Manager	Short-term	Town budget
Add this mitigation plan into the Jaffrey Master Plan as a link or appendix.	Planning and Economic Director	Long-term	Town budget
Obtain a copy of the Hazard Action Plans for High and Significant Class Dams.	Emergency Management Director	Long-term	Town budget
Continue efforts to remove the Poole Reservoir Dam.	Superintendent of Highways and Facilities	Short-term	Town budget and grants
Install lightning protection through installation of grounding equipment on public and historic buildings.	Superintendent of Highways and Facilities	Mid-term	Town budget
Inventory culverts and bridges to determine needed upgrades.	Superintendent of Highways and Facilities	Short-term	Town budget / SWRPC potential
Establish a fund for inspection, maintenance and new installations of dry hydrants.	Fire Chief	Mid-term	Town budget and grants
Consider joining the Community Rating System (CRS).	Planning and Economic Director	Mid-term	Town budget

Mitigation Action	Who (Leadership)	When (Deadline)	How (Estimated Cost and Funding Source)
Consider the inclusion of sediment and erosion control requirements for new construction projects.	Planning and Economic Director and Superintendent of Highways and Facilities	Mid-term	Town budget
Work to complete a solid waste and hazardous materials inventory; assess threats; develop guidelines.	Fire Chief and Superintendent of Utilities	Mid-term	Town budget
Trim tree branches near critical facilities, town structures, and roadways.	Superintendent of Highways	Mid-term	Town budget
Work with Federal, State, and local agencies to develop a protocol for determining local measures needed to protect the public during infectious disease threats.	Emergency Management Director and Health Officer	Short-term	Town budget and grants

Chapter 9

Adoption, Implementation, Monitoring, and Updating

The Jaffrey Board of Selectmen adopted the Jaffrey Hazard Mitigation Plan Update 2021 on July 28, 2021. A copy of the resolution can be found at the end of this chapter. Adopted policy addresses the actions for implementation set forth in the chart “Implementation Strategy for Priority Mitigation Actions” in Chapter 8 and in the “Monitoring & Updates” sub-section contained in this chapter. All other sections of this Plan are supporting documentation for information purposes only and are not included as the statement of policy.

A copy of the public hearing notice for the Board of Selectmen meeting at which the plan was adopted is included in **Appendix E**. The plan was available to the public via a hard copy at the town offices prior to the Board of Selectmen meeting. Any comments were considered and addressed prior to adoption of the plan.

Monitoring & Updates

Recognizing that many mitigation projects are ongoing, and that while in the implementation stage communities may suffer budget cuts, experience staff turnover, or projects may fail altogether, a good plan needs to provide for periodic monitoring and evaluation of its successes and failures and allow for updates of the plan where necessary.

In order to track progress and update the mitigation strategies identified in the Action Plan (Chapter 8), the Hazard Mitigation Work Group will revisit the Jaffrey Hazard Mitigation Plan Update 2021 annually, or after a hazard event. The Emergency Management Director is responsible for initiating this review and should consult with the Board of Selectmen and other key local officials. Changes should be made to the plan to accommodate for projects that have failed or are not considered feasible after a review for their consistency with the timeframe, the community’s priorities and funding resources. Priorities that did not make the implementation list, but are identified as potential mitigation strategies, should also be reviewed during the monitoring and update of this plan to determine feasibility of future implementation. In keeping with the process of adopting the Jaffrey Hazard Mitigation Plan Update 2021, a public hearing to receive public comment on plan maintenance and updating will be held during the annual review period and the final product adopted by the Board of Selectmen.

Monitoring of the plan shall include periodic reports, meetings, site visits, and phone calls. The projects identified in this plan will be evaluated to make sure they are still applicable and practical. When the plan is evaluated, any changes should be incorporated into the plan in the annual update.

Appendix F is meant to assist in the monitoring and evaluation of the plan on an ongoing basis.

The Town of Jaffrey, NH Hazard Mitigation Plan Update 2021 must be reviewed, revised as appropriate and resubmitted to FEMA for approval every five years in order to maintain eligibility for Hazard Mitigation & Assistance Grants (HMA Grants).

This plan received NH HSEM/FEMA final approval on August 5, 2021.

Implementation of the Plan Through Existing Programs

The previous hazard mitigation plan was not integrated into other planning documents, however, two mitigation actions in this plan are to review and update road design standards and to include this plan as a link or appendix to the next Master Plan update.

Continued Public Involvement

On behalf of the Hazard Mitigation Work Group, the Emergency Management Director (EMD), under direction of the Board of Selectmen, will be responsible for ensuring that Town departments and the public have adequate opportunity to participate in the planning process. Administrative staff may be utilized to assist with the public involvement process. For the yearly update process, techniques that will be utilized for public involvement may include:

- Provide personal invitations to Budget Committee members;
- Provide personal invitations to Town department heads;
- Post notices of meetings at the Town Office, library, and local businesses;
- Put notice on public access television;
- Submit newspaper articles for publication in appropriate newspapers and Town newsletter; and
- Information added to the Town website.

A number of Implementation Action items which will be undertaken relate to public education and involvement. Additionally, members of the public including area business owners, schools, communities, and organizations will be invited to participate in the yearly process of updating the Jaffrey Hazard Mitigation Plan Update 2021. These outreach activities will be undertaken during the Plan's annual review and during any Hazard Mitigation Work Group meetings the Board of Selectmen calls to order. For all meetings regarding the Jaffrey Hazard Mitigation Plan Update 2021, the public will be noticed and the meetings will be open to the public.

JAFFREY, NEW HAMPSHIRE
BOARD OF SELECTMEN
A RESOLUTION ADOPTING THE
JAFFREY HAZARD MITIGATION PLAN UPDATE 2021

WHEREAS, the Town of Jaffrey has developed and received conditional approval from the Federal Emergency Management Agency (FEMA) for its Hazard Mitigation Plan Update 2021 under the requirements of 44 CFR 201.6; and

WHEREAS, public and committee meetings were held between July 14, 2020 and January 7, 2021 regarding the development and review of the Jaffrey Hazard Mitigation Plan Update 2021; and

WHEREAS, the Plan specifically addresses hazard mitigation strategies and Plan maintenance procedure for the Town of Jaffrey; and


WHEREAS, the Plan recommends several hazard mitigation actions/projects that will provide mitigation for specific natural hazards that impact the Town of Jaffrey, with the effect of protecting people and property from loss associated with those hazards; and

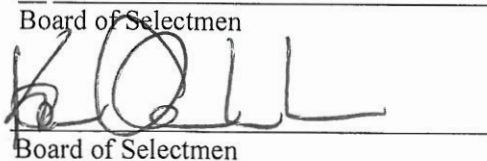
WHEREAS, adoption of this Plan will make the Town of Jaffrey eligible for funding to alleviate the impacts of future hazards; now, therefore, be it RESOLVED by the Board of Selectmen:

1. The Plan is hereby adopted as an official plan of the Town of Jaffrey;
2. The respective officials identified in the mitigation strategy of the Plan are hereby directed to pursue implementation of the recommended actions assigned to them;
3. Future revisions and Plan maintenance required by 44 CFR 201.6 and FEMA are hereby adopted as a part of this resolution for a period of five (5) years from the date of this resolution.

IN WITNESS WHEREOF, the undersigned has affixed his/her signature and the corporate seal of the Town of Jaffrey this 26 day of July, 2021




Jaffrey Board of Selectmen Chairman

Board of Selectmen

Board of Selectmen

ATTEST



Appendices

Appendix A: Hazard Descriptions

An avalanche is a slope failure consisting of a mass of rapidly moving, fluidized snow that slides down a mountainside. The flow can be composed of snow, ice, water, soil, rocks, and trees. An avalanche can be comparable to a landslide; only with snow instead of earth. Natural and human-caused snow avalanches most often result from structural weaknesses of mountainside and unstable snow and ice formations. Heavy snowfall followed by high winds often create areas of unstable snow accumulations that can be set in motion by human activities, such as hiking, ice climbing, skiing, and snowboarding.

Inland Flooding:

Inland flooding is generally defined as a high flow, overflow, or inundation by water, which causes or threatens damage. Flooding results from the overflow of rivers, their tributaries and streams primarily from high precipitation events. Flash flooding is defined as a flow with a rapid rise in water level and extreme velocities in a river or stream, beginning within six hours of the causative event (e.g., intense rainfall, dam failure, ice jam). Ongoing flooding can intensify to flash flooding in cases where intense rainfall results in a rapid surge of rising flood waters. Because of New Hampshire's steep terrain in the headwaters of watersheds, particularly outside of the coastal plain, flash floods also lead to river bank and bed erosion. Extreme precipitation events in recent years, such as Tropical Storm Irene, have led to buildings on the edges of streambanks becoming at risk to river erosion, or culvert failures. The National Flood Insurance Program (NFIP) has a more specific definition of flooding, which can also be considered and used when looking at floodplain and floodplain mapping.

A flood is defined by the NFIP as:

- A general and temporary condition of partial or complete inundation of 2 or more acres of normally dry land area or of 2 or more properties (at least 1 of which is the policyholder's property) from:
 - o Overflow of inland or tidal waters
 - o Unusual and rapid accumulation or runoff of surface waters from any source
 - o Mudflow
- Collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood as defined above.

Areas that have been identified as part of the 1% annual chance floodplain in support of the NFIP simply represent those areas for which mapping has been performed. With sufficient rainfall, snowmelt, or through the result of ice jam formation or in the event of dam failure, all areas that are floodplain adjacent to rivers and streams are prone to flood inundation. Developed areas are susceptible to poor drainage flooding during episodes of heavy rain that falls within a short duration. Such flooding is the result of the concentration of impervious surfaces where the amount of concrete, asphalt, rooftops, and other minimally or non-porous materials concentrates flow to stormwater systems that, during heavy rain, cannot always handle the input, causing flooding conditions on streets and parking lots.

Drought:

A drought is basically the absence of water in an area that occurs slowly due to below-average precipitation over an extended period, resulting in low stream flows, low surface water, and low groundwater levels. Mitigation for drought is difficult, however, preparedness can help to reduce the impacts that a drought can have. During a drought, water stored in aquifers and surface reservoirs becomes increasingly important to offset the lack of rain, especially in areas of high agricultural production. Conservation of water usage prior to, and during a drought can help reduce the potential water shortages that often occur during a drought.

Earthquakes:

The United States Geological Survey (USGS) defines an earthquake as a sudden slip on a fault. Tectonic plates are always slowly moving, but can get stuck on edges due to friction. When the stress on the plates overcomes the friction, there is an earthquake that releases an energy wave that travels through the earth's crust. The earthquake hazard is anything associated with an earthquake that may affect the normal activities of people; such as, surface faulting, ground shaking, landslides, tsunamis, structural damage, etc. There are

two primary ways in which earthquakes are measured, magnitude (the size of the earthquake) and intensity (measure of the shaking and damage, which can vary from location to location). Magnitude is measured in the Moment Magnitude scale (based off the obsolete Richter scale). The Modified Mercalli Intensity (MMI) classifies the perceived feeling of the earthquake.

Extreme Temperatures:

Extreme temperatures are a period of prolonged and/or excessive hot or cold that presents a danger to human health and life.

Extreme heat is characterized by abnormally high temperatures and/or longer than average time periods of high temperatures. These event conditions are typically infrequent. When they do occur, however, they are usually in late July and August. The severity of extreme heat can be dangerous to those residents with medical conditions and the older population. It is important to have cooling areas and a good supply of water available. Extreme heat can add to the potential for wildfires and depletion of the water supply for firefighting. Extreme heat can also damage or kill crops and animals (wild, farm, or domesticated), potentially presenting a risk to the economy.

The National Weather Service (NWS) provides the following definitions (northeast ranges):

- Heat Advisory: Two or more consecutive hours of Heat Index values of 95-99 degrees Fahrenheit for two or more days OR any duration of Heat Index values of 100-104 degrees Fahrenheit. A Heat Advisory is issued within 12 hours of the onset of extremely dangerous heat conditions.
- Excessive Heat Warning: Two or more hours with Heat Index values of 105 degrees Fahrenheit or greater. An Excessive Heat Warning is issued within 12 hours of the onset of extremely dangerous heat conditions.
- Excessive Heat Watches: Heat watches are issued when conditions are favorable for an excessive heat event in the next 24 to 72 hours. A Watch is used when the risk of a heat wave has increased but its occurrence and timing is still uncertain.
- Excessive Heat Outlooks: Issued when the potential exists for an excessive heat event in the next 3-7 days. An Outlook provides information to those who need considerable lead-time to prepare for the event.

Extreme Cold events occur during meteorological cold waves, also known as cold snaps that are caused by the southern transport of arctic airmasses into the Northeast. These events are most common in winter months and increase the likelihood of cold disorders in humans and animals that have prolonged exposure to low ambient temperatures. Cold disorders can include frostbite and hypothermia which can eventually lead to death. Extreme cold can also damage or kill crops and animals (wild, farm, or domesticated), potentially presenting a risk to the economy.

The National Weather Service provides the following definitions (northeast ranges):

- Wind Chill Watch: NWS issues a wind chill watch when dangerously cold wind chill values are possible. As with a warning, adjust your plans to avoid being outside during the coldest parts of the day. Make sure your car has at least a half a tank of gas, and update your winter survival kit.
- Wind Chill Advisory: NWS issues a wind chill advisory when seasonably cold wind chill values but not extremely cold values are expected or occurring. Be sure you and your loved ones' dress appropriately and cover exposed skin when venturing outdoors. A Wind Chill Advisory is issued for New Hampshire if wind chill values are expected to be -20°F to -29°F and winds are greater than 5 mph.
- Wind Chill Warning: NWS issues a wind chill warning when dangerously cold wind chill values are expected or occurring. A Wind Chill Advisory is issued for New Hampshire if wind chill values are expected to be -30°F and winds are greater than 5 mph.
- Freeze Watch: NWS issues a freeze watch when there is a potential for significant, widespread freezing temperatures within the next 24-36 hours. A freeze watch is issued in the autumn until the end of the growing season and in the spring at the start of the growing season.

- Frost Advisory: A frost advisory means areas of frost are expected or occurring, posing a threat to sensitive vegetation.
- Freeze Warning: When temperatures are forecasted to go below 32°F for a long period of time, NWS issues a freeze warning. This temperature threshold kills some types of commercial crops and residential plants.
- Hard Freeze Warning: NWS issues a hard freeze warning when temperatures are expected to drop below 28°F for an extended period of time, killing most types of commercial crops and residential plants.

High Wind Events:

The State of New Hampshire experiences two types of high wind events that may result from other severe storms and may occur at any time of the year:

Tornadoes: A tornado is a narrow, violently rotating column of air that extends from the base of a thunderstorm to the ground. Because wind is invisible, it is hard to see a tornado unless it forms a condensation funnel made up of water droplets, dust and debris. Tornadoes are the most violent of all atmospheric storms.

Straight-line winds: This term describes any thunderstorm wind that is not associated with rotation, and is usually used to differentiate from tornadic winds. There are several sub-types of straight-line winds:

- Downdraft - small-scale column of air that rapidly sinks towards the ground.
- Downburst - result of a downdraft, referred to as a macroburst when the area affected is greater than 2.5 miles and microburst when less than 2.5 miles.
- Gust Front - leading edge of rain-cooled air that clashes with warmer thunderstorm inflow. Characterized by wind shift, temperature drop and gusty winds in front of a thunderstorm.
- Derecho - widespread, long-lived wind storm that is associated with a band of rapidly moving showers or thunderstorms. A typical derecho consists of numerous microbursts, downbursts and downburst clusters. By definition, if the wind damage swath extends more than 240 miles and includes wind gusts of at least 58 mph or greater along most of its length, then the event may be classified as a derecho.

Infectious Disease/Pandemic:

Infectious diseases are illnesses caused by organisms - such as bacteria, viruses, fungi or parasites. Many organisms live in and on our bodies. They're normally harmless or even helpful, but under certain conditions, some organisms may cause disease. Some infectious diseases can be passed from person to person, some are transmitted by bites from insects or animals and others are acquired by ingesting contaminated food or water or being exposed to organisms in the environment. Signs and symptoms vary depending on the organism causing the infection, but often include fever and fatigue. Mild infections get better on their own without treatment, while some are life-threatening infections and may require hospitalization. Wide-spread infectious diseases may cause mass causality regionally and world-wide.

Landslide:

A landslide is the downward or outward movement of earth materials on a slope that is reacting to a combination of the force of gravity and a predisposed weakness in the material that allows the sliding process to initiate. The broad classification of landslides includes mudflows, mudslides, debris flows, rockslides, debris avalanches, debris slides, and earth flows. Landslides may be formed when a layer of soil atop a slope becomes saturated by significant precipitation and slides along a more cohesive layer of soil or rock. Although gravity becomes the primary reason for a landslide once a slope has become weak through a process such as the one just described, other causes can include:

- Erosion by rivers or the ocean that creates over-steepened slopes through erosion of the slope's base. In the case of rivers, this can occur as a result of flash flooding.
- Rock and soil slopes are weakened through saturation by snowmelt or heavy rains.
- Earthquake creates stress that makes weak slopes fail - earthquakes of 4.0 magnitude and

greater have been known to trigger landslides.

- Wildfires (loss of vegetation).
- Excess weight from accumulation of rain or snow, stockpiling of rock or ore and other material.

Lightning:

Lightning is a visible electric discharge produced by a thunderstorm. Thunder always accompanies lightning, but may or may not be heard depending on the position of the observer. As lightning passes through the air, it heats the air to a temperature of 18,000-60,000 degrees Fahrenheit. This causes the air to rapidly expand and contract creating a sound wave known as thunder. Thunder can be heard up to 10 miles away from the strike. At longer distances thunder sounds like a low rumble as the higher frequency sounds are absorbed by the environment.

Severe Winter Weather:

The State of New Hampshire experiences four types of severe weather during the winter months, which usually bring snow, high winds and/or rain depending on temperatures.

Heavy snow - Heavy snow is generally defined as:

- Snowfall accumulating to 4" or more in depth in 12 hours or less; or
- Snowfall accumulating to 6" or more in depth in 24 hours or less.

Blizzard - A blizzard is a snowstorm with the following conditions that is expected to prevail for a period of 3 hours or longer:

- Sustained wind or frequent gusts to 35mph or greater and considerable falling and/or blowing snow that frequently reduces visibility to less than ¼ mile.

Nor'easter - A Nor'easter is a large cyclonic storm that tracks north/northeastward along the East Coast of North America. It is so named due to the northeasterly prevailing wind direction that occurs during the storm. While these storms may occur at any time of the year, they are most frequent and severe during the months of September through April. Nor'easters usually develop off the east coast between Georgia and New Jersey, travel northeastward, and intensify in the New England region. Nor'easters nearly always bring precipitation in the form of heavy rain and/or snow, as well as gale force winds, rough seas, and coastal flooding.

Ice Storm - Ice storms typically occur with warm frontal boundaries, where warm air rises up and over a shallow mass of cold air near the earth's surface. When snow falls from clouds near just north of the warm frontal boundary, it will fall through the deep warm layer aloft first and melt completely into a liquid water droplet. As it passes through the shallow cold layer near the surface, the water droplet cools to the point of being supercooled (a liquid raindrop that remains a liquid at the freezing point). When these supercooled water droplets make contact with freezing surfaces on the ground, such as streets and walkways, they freeze on contact forming layers of ice. This process of freezing rain, when persistent over a long period of time, will form layers that may exceed over an inch thick in extreme cases. Any accumulation of ice can present hazards; however, significant accumulations of ice (1/4" or greater) can pull down trees and utility lines resulting in loss of power and communications. Walking and driving also becomes very dangerous to almost impossible during an ice storm.

Solar Storms and Space Weather:

The term space weather is relatively new and describes the dynamic conditions in the Earth's outer space environment, similar to how the terms "climate" and "weather" refer to the conditions in the Earth's lower atmosphere. Space weather includes any and all conditions and events on the sun, in the solar wind, in near-Earth space, and in our upper atmosphere that can affect space-borne and ground based technological systems.

The entire State of New Hampshire is at risk for solar storms and space weather. Space weather affects Earth due to the sun sending energy across the Earth in the form of light and electrically charged particles and magnetic fields. Although space weather has occurred since the beginning of time, little was understood about the causes and impacts of these instances on the planet. As society becomes increasingly reliant on electronics and technology, the hazards presented by space weather are not to be underestimated. The magnetic disturbances that solar storms can bring can disrupt communications, damage or destroy

electronic components, corrode gas and oil pipelines, and cause significant damage to spacecraft and satellites. Radio operators have long been aware of the effects of space weather and how it impacts radio communications, especially those in the High Frequency (HF) band (3-30MHz). Depending on atmospheric conditions from space weather, radio signals can be partially or completely blocked.

Hurricane and Tropical Storm:

A *hurricane* is a tropical cyclone in which winds reach speeds of 74 miles per hour or more and blow in a large spiral around a relatively calm center. The eye of the storm is usually 20-30 miles wide and may extend over 400 miles. High winds and flooding are primary causes of hurricane-inflicted loss of life and property damage. *Tropical Storms* are typically storms that have been downgraded from a hurricane as it reaches further inland. These storms often have large amounts of rain and severe wind, but wind speeds do not reach the level to be classified as a hurricane.

Wildfire:

A wildfire is any non-structural fire, other than prescribed fire, that occurs in the Wildland. Wildland here is defined as consisting of vegetation or natural fuels. Wildfires can be referred to as brushfires, wildland fires, or grass fires depending on the location and what is burning.

Technological Hazards

Aging Infrastructure:

The continued regression of the States'/towns' physical systems including, but not limited to roads and bridges, culverts, utilities, water, and sewage.

Conflagration:

A large and destructive fire that threatens human life, animal life, health, and/or property. It may also be described as a blaze or simply a (large) fire. A conflagration can begin accidentally, be naturally caused (wildfire), or intentionally created (arson). Conflagrations have the potential to cause loss of life, property devastation/destruction and potential negative economic impacts.

Dam Failure:

Dam failure is defined as the sudden, rapid, and uncontrolled release of impounded water.

Known & Emerging Contaminants:

Contaminants in drinking water include naturally occurring contaminants associated with the geology in a given region and known man-made contaminants associated with nearby land use activities. Some contaminants are considered emerging contaminants. Man-made Contaminants - Man-made chemicals that have been historically recognized to impact some groundwater and surface water sources of drinking water include volatile organic compounds, pesticides, semi-volatile compounds, radionuclides, nitrates/nitrites, metals, and radionuclides.

Emerging Contaminants - *Emerging contaminants* are chemicals that historically have not been monitored in drinking water due to the lack of laboratory capabilities to detect the compounds or a lack of knowledge about the use of certain compounds and their potential to cause human health impacts. Emerging contaminants have been detected in surface and groundwater that are sources of drinking water in the State of New Hampshire. The latest incidents in New Hampshire to garner widespread media and public attention were related to the discovery of poly and perfluoroalkyl substances, more commonly referred to as PFAS. Historically, other emerging contaminants have spiked public concern, including Methyl Tertiary Butyl Ether (MtBE), which is a manufactured chemical used to increase the octane rating of gasoline. MtBE degrades slowly and is highly soluble in water, allowing it to spread further and last longer in groundwater than many other contaminants.

Hazardous Materials:

A hazardous material is any item or agent (biological, chemical, radiological, and/or physical), which has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction

with other factors. Hazardous materials spills or releases can cause damage or loss to life and property. Short or long-term evacuation of local residents and businesses may be required, depending on the nature and extent of the incident.

Long-term Utility Outage:

A long-term utility outage is defined as a prolonged absence of any type of public utility that is caused by infrastructure failure, cyber-attack, supply depletion, distribution disruption, water source contamination, or a natural, human-caused or technological disaster. This plan considers a long-term utility outage as one lasting two weeks more, or a prolonged outage that causes extreme cascading impacts.

Radiological:

Radiological hazards can range from relatively localized incidents involving small amounts of radioactive materials to large-scale catastrophic events. Smaller sources of radiation hazards may be found in medical facilities, industrial and laboratory facilities where radioactive materials and/or radiation producing devices are used. Some radiation is produced naturally from decomposition of radioactive isotopes in soils and underlying strata.

Human-Caused Hazards

Cyber Event:

The Department of Homeland Security (DHS) defines a cyber incident as an event occurring on or conducted through a computer network that actually or imminently jeopardizes the confidentiality, integrity, or availability of computers, information or communications systems or networks, physical or virtual infrastructure controlled by computers or information systems.

Mass Casualty Incident:

Any large number of casualties (sick, injured, or dead) produced in a relatively short period of time, usually as the result of a single incident such as a military aircraft accident, hurricane, flood, earthquake, or armed attack that exceeds local logistic support capabilities.

Terrorism/Violence:

Premeditated, politically motivated violence perpetrated against noncombatant targets by subnational groups or clandestine agents.

Transport Accident:

A transport accident is any accident that occurs during transportation that has multiple injuries or deaths, or has significant impact to the roadways and surrounding area. Specifically, for this plan, it refers to an aviation, tractor trailer, or vehicle accident.

Appendix B: Risk Assessment

The Hazard Mitigation Work Group met to discuss the towns' risk assessment and assign rating scores. Consideration was given to climate change, current capabilities, town assets and critical infrastructure, and previous occurrences when determining the scale of impacts and overall risk. The following terms were used to analyze the hazards:

Impacts: The ***Impact*** is an estimate generally based on a hazard's effects on humans, property and businesses. The Work Group determined the impact rating for each of the previously identified hazards. The average impact score was calculated by computing the average of the human, property and business impact scores. The impact ratings were broken down into the following categories:

Impact Scoring

- 1 - Inconvenience, reduced service/productivity, minor damages, non-life-threatening injuries.
- 3 - Moderate to major damages, temporary closure and reduced service/productivity, numerous injuries and deaths.
- 6 - Devastation and significant injuries and deaths, permanent closure and/or relocation of services, long-term effects.

Probability of Occurrence: The *Probability of Occurrence* is a numeric value that represents the likelihood that the given hazard will occur within the next 10 years. This value was chosen based on historical information. The Work Group determined the probability of occurrence rating for each of the previously identified hazards. The probability of occurrence ratings was broken into the following categories:

Low: There is little likelihood that this event will occur within the next 10 years (1 event in 10 years).

Medium: There is moderate likelihood that this event will occur within the next 10 years (1-2 events each 5-10 years).

High: There is great likelihood that this event will occur within the next 10 years (1-2 events each year).

Probability Scoring

- 1 - 33% probability of occurring within 10 years (Low)
- 3 - 34-66% probability of occurring within 10 years (Medium)
- 6 - 67-100% probability of occurring within 10 years (High)

Severity - Severity is calculated by taking the average of the vulnerability for human, business and property impacts of each hazard type.

Risk - Risk is an adjective description (High, Medium, or Low) of the overall threat posed by a hazard over the next 10 years. It is calculated by multiplying the probability of occurrence and severity.

Low: There is little potential for a disaster during the next 10 years. The threat is such as to warrant no special effort to prepare for, respond to, recover from, or mitigate against this hazard. This hazard does not need to be specifically addressed in the town's emergency management training and exercise program except as generally dealt with during hazard awareness training.

Medium: There is moderate potential for a disaster of less than major proportions during the next 10 years. The threat is great enough to warrant modest effort to prepare for, respond to, recover from, and mitigate against this hazard. This hazard should be included in the town's emergency management training and exercise program.

High: Risks that are considered to be high were likely ranked so due to (1) a strong potential for a disaster of major proportions during the next 10 years; or (2) history suggests the occurrence of multiple disasters of moderate proportions during the next 10 years. The threat is significant enough to warrant major program effort to prepare for, respond to, recover from, and mitigate against this hazard. This hazard should be a major focus of the towns' emergency management training and exercise program.

Overall Risk: The *Overall Risk* is a representation of the combined *potential impact* and *probability of occurrence* ratings. This is calculated by multiplying the probability of occurrence rating score by the impact rating score (the average of human, property and business impacts). The goal of identifying the overall risk of each identified hazard is to assist the town in determining which hazards pose the largest potential threat. The overall risk ratings are broken down and color coded into the following categories:

White: values 1 - 6, Low Risk

Yellow: values 7 - 12, Medium Risk

Red: values 13 - 18, High Risk

Appendix C: Resources

Resources Used in the Preparation of this Plan

NH HSEM’s State of New Hampshire Natural Hazards Mitigation Plan (2018)
 FEMA’s Understanding Your Risks: Identifying Hazards and Estimating Losses
 Local Mitigation Planning Handbook
 Town of Jaffrey, NH’s Master Plan (2017)

Agencies

New Hampshire Homeland Security and Emergency Management (HSEM)	271-2231
Field Representative Hillsborough County: Liz Gilboy.....	603-223-3613
Mitigation Officer: Kayla Henderson.....	271-2231
Mitigation Planner: Meaghan Wells	223-3655
Federal Emergency Management Agency (FEMA)	877-336-2734
NH Regional Planning Commissions:	
Central NH Regional Planning Commission	226-6020
Lakes Region Planning Commission	279-8171
Nashua Regional Planning Commission	883-0366
North Country Council	444-6303
Rockingham Planning Commission	778-0885
Southern New Hampshire Planning Commission	669-4664
Southwest Region Planning Commission	357-0557
Strafford Regional Planning Commission	742-2523
Upper Valley Lake Sunapee Regional Planning Commission	448-1680
NH Executive Department:	
Governor’s Office of Energy and Community Services	271-2611
NH Department of Cultural Resources:	271-2540
Division of Historical Resources	271-3483
NH Department of Environmental Services:	271-3503
Air Resources	271-1370
Air Toxins Control Program.....	271-0901
Asbestos Program.....	271-1373
Childhood Lead Poisoning Prevention Program.....	271-5733
Environmental Health Tracking Program.....	271-4072
Environmental Toxicology Program	271-3994
Health Risk Assessment Program.....	271-6909
Indoor Air Quality Program.....	271-3911
Occupational Health and Safety Program.....	271-2024
Radon Program.....	271-4764
Geology Unit	271-3503
Pollution Preventive Program.....	271-6460
Waste Management	271-2900
Water Supply and Pollution Control	271-3414
Rivers Management and Protection Program	271-8801
NH Office of Strategic Initiatives (OSI)	271-2155
NH Municipal Association	224-7447
NH Fish and Game Department	271-3421
Region 1, Lancaster.....	788-3164
Region 2, New Hampton	744-5470
Region 3, Durham	868-1095
Region 4, Keene.....	352-9669
NH Department of Resources and Economic Development:	271-2411
Economic Development	271-2629
Travel and Tourism	271-6870
Division of Forests and Lands	271-2214
Division of Parks and Recreation	271-3556
Design, Development, and Maintenance	271-2411

NH Department of Transportation	271-3734
Northeast States Emergency Consortium, Inc. (NESEC)	(781) 224-9876
US Department of Commerce:	(202) 482-2000
NOAA: National Weather Service; Taunton, Massachusetts	(508) 824-5116
US Department of the Interior:	202-208-3100
US Fish and Wildlife Service	225-1411
US Geological Survey	225-4681
US Army Corps of Engineers	(978) 318-8087
US Department of Agriculture:	
Natural Resource Conservation Service	868-7581
Cheshire County, Jaffrey	756-2988
Sullivan County, Newport	863-4297
Hillsborough County, Milford	673-2409 Ext. #4

Mitigation Funding Resources

404 Hazard Mitigation Grant Program (HMGP).....	NH Homeland Security and Emergency Management
406 Public Assistance and Hazard Mitigation.....	NH Homeland Security and Emergency Management
Community Development Block Grant (CDBG)	NH HSEM, NH OSI, also refer to RPC
Dam Safety Program	NH Department of Environmental Services
Emergency Generators Program by NESEC [‡]	NH Homeland Security and Emergency Management
Emergency Watershed Protection (EWP) Program.....	USDA, Natural Resources Conservation Service
Flood Mitigation Assistance Program (FMAP)	NH HSEM, NH OEP
Flood Plain Management Services (FPMS)	US Army Corps of Engineers
Mitigation Assistance Planning (MAP)	NH Homeland Security and Emergency Management
Mutual Aid for Public Works	NH Municipal Association
National Flood Insurance Program (NFIP) [†]	NH OSI, NH HSEM
Power of Prevention Grant by NESEC [‡]	NH Homeland Security and Emergency Management
Project Impact	NH Homeland Security and Emergency Management
Roadway Repair & Maintenance Program(s).....	NH Department of Transportation
Section 14 Emergency Stream Bank Erosion & Shoreline Protection	US Army Corps of Engineers
Section 103 Beach Erosion.....	US Army Corps of Engineers
Section 205 Flood Damage Reduction.....	US Army Corps of Engineers
Section 208 Snagging and Clearing	US Army Corps of Engineers
Shoreline Protection Program.....	NH Department of Environmental Services
Various Forest and Lands Program(s).....	NH Department of Resources and Economic Development
Wetlands Programs	NH Department of Environmental Services

[‡]NESEC - Northeast States Emergency Consortium, Inc. is a 501(c)(3), not-for-profit natural disaster, multi-hazard mitigation and emergency management organization located in Wakefield, Massachusetts. Please, contact NH HSEM for more information or visit the Consortium's website at <http://www.nesec.org/index.cfm>.

[†] Note regarding **National Flood Insurance Program (NFIP)** and **Community Rating System (CRS)**:

The National Flood Insurance Program has developed suggested floodplain management activities for those communities who wish to more thoroughly manage or reduce the impact of flooding in their jurisdiction. Through use of a rating system (CRS rating), a community's floodplain management efforts can be evaluated for effectiveness. The rating, which indicates an above average floodplain management effort, is then factored into the premium cost for flood insurance policies sold in the community. The higher the rating achieved in that community, the greater the reduction in flood insurance premium costs for local property owners. The NH Office of Strategic Initiatives can provide additional information regarding participation in the NFIP-CRS Program.

FEMA Region 1 Mitigation Planning Webliography

Hazard Mitigation is sustained action taken to reduce or eliminate risk to people and their property from natural hazards over the longest possible term.

REGULATORY INFORMATION

Final Rule
44 CFR 201.6
<http://www.fema.gov/pdf/help/fr02-4321.pdf>

Disaster Mitigation Act of 2000 (DMA 2K)
<http://www.fema.gov/library/viewRecord.do?id=1935>

DISASTERS AND NATURAL HAZARDS INFORMATION

FEMA-How to deal with specific hazards
<http://www.ready.gov/natural-disasters>

Natural Hazards Center at the University of Colorado
<http://www.colorado.edu/hazards>

National Oceanic and Atmospheric Administration (NOAA): Information on various projects and research on climate and weather.
<http://www.websites.noaa.gov>

National Climatic Data Center active archive of weather data.
<http://lwf.ncdc.noaa.gov/oa/ncdc.html>

Northeast Snowfall Impact Scale
<http://www.erh.noaa.gov/rnk/Newsletter/Fall%202007/NESIS.htm>

Weekend Snowstorm Strikes The Northeast Corridor Classified As A Category 3 "Major" Storm
<http://www.publicaffairs.noaa.gov/releases2006/feb06/noaa06-023.html>

FLOOD RELATED HAZARDS

FEMA Coastal Flood Hazard Analysis & Mapping
<http://www.fema.gov/national-flood-insurance-program-0/fema-coastal-flood-hazard-analyses-and-mapping-1>

Floodsmart
<http://www.floodsmart.gov/floodsmart/>

National Flood Insurance Program (NFIP)
<http://www.fema.gov/nfip>

Digital quality Level 3 Flood Maps
<http://msc.fema.gov/MSD/statemap.htm>

Flood Map Modernization

<http://www.fema.gov/national-flood-insurance-program-flood-hazard-mapping/map-modernization>

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Reducing Damage from Localized Flooding: A Guide for Communities, 2005 FEMA 511

<http://www.fema.gov/library/viewRecord.do?id=1448>

FIRE RELATED HAZARDS

Firewise

<http://www.firewise.org>

NOAA Fire Event Satellite Photos

<http://www.osei.noaa.gov/Events/Fires>

U.S. Forest Service, USDA

<http://www.fs.fed.us/land/wfas/welcome.htm>

Wildfire Hazards – A National Threat

<http://pubs.usgs.gov/fs/2006/3015/2006-3015.pdf>

GEOLOGIC RELATED HAZARDS

USGS Topographic Maps

<http://topomaps.usgs.gov/>

Building Seismic Safety Council

<http://www.nibs.org/?page=bssc>

Earthquake hazard history by state

<http://earthquake.usgs.gov/earthquakes/states/>

USGS data on earthquakes

<http://earthquake.usgs.gov/monitoring/deformation/data/download/>

USGS Earthquake homepage

<http://quake.wr.usgs.gov>

National Cooperative Geologic Mapping Program (NCGMP)

<http://ncgmp.usgs.gov/>

Landslide Overview Map of the Conterminous United States

<http://landslides.usgs.gov/learning/nationalmap/>

Kafka, Alan L. 2008. Why Does the Earth Shake in New England? Boston College, Weston Observatory, Department of Geology and Geophysics

http://www2.bc.edu/~kafka/Why_Quakes/why_quakes.html

Map and Geographic Information Center, 2010, "Connecticut GIS Data", University of Connecticut

http://magic.lib.uconn.edu/connecticut_data.html

2012 Maine earthquake

http://www.huffingtonpost.com/2012/10/17/maine-earthquake-2012-new-england_n_1972555.html

WIND-RELATED HAZARDS

ATC Wind Speed Web Site

<http://www.atcouncil.org/windspeed/index.php>

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U.S. Wind Zone Maps

<http://www.fema.gov/safe-rooms/wind-zones-united-states>

Tornado Project Online

<http://www.tornadopproject.com/>

National Hurricane Center

<http://www.nhc.noaa.gov>

Community Hurricane Preparedness Tutorial

<http://meted.ucar.edu/hurricane/chp/hp.htm>

National Severe Storms Laboratory, 2009, "Tornado Basics",

http://www.nssl.noaa.gov/primer/tornado/tor_basics.html

DETERMINING RISK AND VULNERABILITY

HAZUS

<http://www.hazus.org>

FEMA Hazus Average Annualized Loss Viewer

<http://fema.maps.arcgis.com/home/webmap/viewer.html?webmap=cb8228309e9d405ca6b4db6027df36d9&extent=-139.0898,7.6266,-48.2109,62.6754>

Vulnerability Assessment Tutorial: On-line tutorial for local risk and vulnerability assessment

<http://www.csc.noaa.gov/products/nchaz/htm/mitigate.htm>

Case Study: an example of a completed risk and vulnerability assessment

<http://www.csc.noaa.gov/products/nchaz/htm/case.htm>

GEOGRAPHIC INFORMATION SYSTEMS (GIS) AND MAPPING

The National Spatial Data Infrastructure & Clearinghouse (NSDI) and Federal Geographic Data Committee (FGDC) Source for information on producing and sharing geographic data

<http://www.fgdc.gov>

The OpenGIS Consortium Industry source for developing standards and specifications for GIS data

<http://www.opengis.org>

Northeast States Emergency Consortium (NESEC): Provides information on various hazards, funding resources, and other information

<http://www.nesec.org>

US Dept of the Interior Geospatial Emergency Management System (IGEMS) provides the public with both an overview and more specific information on current natural hazard events. It is supported by the Department of the Interior Office of Emergency Management.

<http://igems.doi.gov/>

FEMA GeoPlatform: Geospatial data and analytics in support of emergency management
<http://fema.maps.arcgis.com/home/index.html>
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DATA GATHERING

National Information Sharing Consortium (NISC): brings together data owners, custodians, and users in the fields of homeland security, public safety, and emergency management and response. Members leverage efforts related to the governance, development, and sharing of situational awareness and incident management resources, tools, and best practices <http://nisconsortium.org/>

The Hydrologic Engineering Center (HEC), an organization within the Institute for Water Resources, is the designated Center of Expertise for the US Army Corps of Engineers
<http://www.hec.usace.army.mil/>

National Water & Climate Center
<http://www.wcc.nrcs.usda.gov/>

WinTR-55 Watershed Hydrology
<http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/water/?&cid=stelprdb1042901>

USACE Hydrologic Engineering Center (HEC)
<http://www.hec.usace.army.mil/software/>

Stormwater Manager's Resource Center SMRC
<http://www.stormwatercenter.net>

USGS Current Water Data for the Nation
<http://waterdata.usgs.gov/nwis/rt>

USGS Water Data for the Nation
<http://waterdata.usgs.gov/nwis/>

Topography Maps and Aerial photos
<http://www.terraserver.com/view.asp?tid=142>

National Register of Historic Places
<http://www.nps.gov/nr/about.htm>

National Wetlands Inventory
<http://www.fws.gov/wetlands/>

ICLUS Data for Northeast Region
http://www.epa.gov/ncea/global/iclus/inclus_nca_northeast.htm

PLANNING

American Planning Association
<http://www.planning.org>

Planners Web - Provides city and regional planning resources
<http://www.plannersweb.com>

FEMA RESOURCES

Federal Emergency Management Agency (FEMA)

www.fema.gov

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National Mitigation Framework

<http://www.fema.gov/national-mitigation-framework>

Federal Insurance and Mitigation Administration (FIMA)

<http://www.fema.gov/fima>

Community Rating System (CRS) <http://www.fema.gov/national-flood-insurance-program/national-flood-insurance-program-community-rating-system>

FEMA Building Science

<http://www.fema.gov/building-science>

National Flood Insurance Program (NFIP)

<http://www.fema.gov/national-flood-insurance-program>

Floodplain Management & Community Assistance Program

<http://www.fema.gov/floodplain-management>

Increased Cost of Compliance (ICC): ICC coverage allows homeowners whose structures have been repeatedly or substantially damaged to cover the cost of elevation and design requirements for rebuilding with their flood insurance claim up to a maximum of \$30,000.

<http://www.fema.gov/national-flood-insurance-program-2/increased-cost-compliance-coverage>

National Disaster Recovery Framework

<http://www.fema.gov/national-disaster-recovery-framework>

Computer Sciences Corporation: contracted by FIMA as the NFIP Statistical Agent, CSC provides information and assistance on flood insurance to lenders, insurance agents and communities

www.csc.com

Integrating the Local Natural Hazard Mitigation Plan into a Community's Comprehensive Plan: A Guidebook for Local Governments

<https://www.fema.gov/ar/media-library/assets/documents/89725>

Mitigation Best Practices Portfolio

<http://www.fema.gov/mitigation-best-practices-portfolio>

FEMA Multi-Hazard Mitigation Planning Website

<http://www.fema.gov/multi-hazard-mitigation-planning>

FEMA Resources Page <http://www.fema.gov/plan/mitplanning/resources.shtm>

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Local Mitigation Plan Review Guide <http://www.fema.gov/library/viewRecord.do?id=4859>

Local Mitigation Planning Handbook complements and liberally references the Local Mitigation Plan Review Guide above

<http://www.fema.gov/library/viewRecord.do?id=7209>

HAZUS

<http://www.fema.gov/protecting-our-communities/hazus>

Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards

<http://www.fema.gov/library/viewRecord.do?id=6938>

Integrating Hazard Mitigation Into Local Planning: Case Studies and Tools for Community Officials

<http://www.fema.gov/library/viewRecord.do?id=7130>

Mitigation Planning for Local and Tribal Communities Independent Study Course

<http://training.fema.gov/EMIWeb/IS/is318.asp>

Region 1 Mitigation Contacts

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Nan Johnson

Community Planner

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Massachusetts; Rhode Island; Vermont

Brigitte Ndikum-Nyada

Community Planner

Phone: 617-956-7614

Email: brigitte.ndikum-nyada@fema.dhs.gov

Connecticut; Maine; New Hampshire

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OTHER FEDERAL RESOURCES

U.S. Army Corps of Engineers: Provides funding for floodplain management planning and technical assistance and other water resources issues. www.nae.usace.army.mil

Natural Resources Conservation Service: Technical assistance to individual land owners, groups of landowners, communities, and soil and water conservation districts. www.nrcs.usda.gov

NOAA Coastal Services Center <http://www.csc.noaa.gov/>

Rural Economic and Community Development: Technical assistance to rural areas and smaller communities in rural areas on financing public works projects. www.rurdev.usda.gov

Farm Service Agency: Manages the Wetlands Reserve Program (useful in open space or acquisition projects by purchasing easements on wetlands properties) and farmland set aside programs www.fsa.usda.gov

National Weather Service: Prepares and issues flood, severe weather and coastal storm warnings. Staff hydrologists can work with communities on flood warning issues; can give technical assistance in preparing flood-warning plans. www.weather.gov

Economic Development Administration (EDA): Assists communities with technical assistance for economic development planning www.osec.doc.gov/eda/default.htm

National Park Service: Technical assistance with open space preservation planning; can help facilitate meetings and identify non-structural options for floodplain redevelopment. www.nps.gov

Fish and Wildlife Services: Can provide technical and financial assistance to restore wetlands and riparian habitats. www.fws.gov

Department of Housing & Urban Development www.hud.gov

Small Business Administration: SBA can provide additional low-interest funds (up to 20% above what an eligible applicant would qualify for) to install mitigation measures. They can also loan the cost of bringing a damaged property up to state or local code requirements. www.sba.gov/disaster

Environmental Protection Agency www.epa.gov

Sustainability/Adaptation/Climate Change

Why the Emergency Management Community Should be Concerned about Climate Change: A discussion of the impact of climate change on selected natural hazards

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<http://www.cna.org/sites/default/files/research/WEB%2007%2029%2010.1%20Climate%20Change%20and%20the%20Emergency%20Management%20Community.pdf>

Resilient Sustainable Communities: Integrating Hazard Mitigation& Sustainability into Land Use

<http://www.earth.columbia.edu/sitefiles/file/education/documents/2013/Resilient-Sustainable-Communities-Report.pdf>

U.S. EPA

<http://www.epa.gov/climatechange/>

NOAA National Ocean Service (NOS)

<http://oceanservice.noaa.gov/>

The Northeast Climate Research Center (NRCC) folks were heavily involved in climate data in the NCA, below. They have a wealth of historic climate data and weather information, trends, etc. <http://www.nrcc.cornell.edu/>

NOAA RISA for the Northeast (Regional Integrated Sciences and Assessments) <http://ccrun.org/home>

Community and Regional Resilience: Perspectives from hazards, disasters, and emergency management http://www.resilientus.org/library/FINAL_CUTTER_9-25-08_1223482309.pdf

National Fish, Wildlife and Plants Climate Adaptation Strategy www.wildlifeadaptationstrategy.gov

ICLEI Local Governments for Sustainability <http://www.icleiusa.org/>

Kresge Foundation Survey

<http://www.kresge.org/news/survey-finds-communities-northeast-are-trying-plan-for-changes-climate-need-help-0>

New England's Sustainable Knowledge Corridor <http://www.sustainableknowledgecorridor.org/site/>

The Strategic Foresight Initiative (SFI)

http://www.fema.gov/pdf/about/programs/oppa/findings_051111.pdf

Northeast Climate Choices http://www.climatechoices.org/ne/resources_ne/nereport.html

Northeast Climate Impacts Assessment <http://www.northeastclimateimpacts.org/>

Draft National Climate Assessment Northeast Chapter released early 2013 <http://ncadac.globalchange.gov/>

Northeast Chapter of the National Climate Assessment of 2009:
<http://www.globalchange.gov/images/cir/pdf/northeast.pdf>

ClimateNE
www.climatenortheast.com

Scenarios for Climate Assessment and Adaptation <http://scenarios.globalchange.gov/>

Northeast Climate Science Center <http://necsc.umass.edu/>

FEMA Climate Change Adaptation and Emergency Management
<https://www.llis.dhs.gov/content/climate-change-adaptation-and-emergency-management-0>

Climate Central <http://www.climatecentral.org>

Other Resources

New England States Emergency Consortium (NESEC): NESEC conducts public awareness and education programs on natural disaster and emergency management activities throughout New England. Resources are available on earthquake preparedness, mitigation, and hurricane safety.
www.nesec.org

Association of State Floodplain Managers (ASFPM): ASFPM has developed a series of technical and topical research papers, and a series of proceedings from their annual conferences.
www.floods.org

National Voluntary Organizations Active in Disaster (VOAD) is a non-profit, nonpartisan membership organization that serves as the forum where organizations share knowledge and resources throughout the disaster cycle - preparation, response, recovery and mitigation. <http://www.nvoad.org/>

Additional Websites

Sponsor	Internet Address	Summary of Contents
Natural Hazards Research Center, U. of Colorado	http://www.colorado.edu/hazards/	Searchable database of references and links to many disaster-related websites.
National Emergency Management Association	http://nemaweb.org	Association of state emergency management directors; list of mitigation projects.
NASA – Goddard Space Flight Center “Disaster Finder:	http://disasterfinder.gsfc.nasa.gov/Disaster_Management/ /	Searchable database of sites that encompass a wide range of natural disasters.
NASA Natural Disaster Reference Database	http://ltpwww.gsfc.nasa.gov/ndrd/main/html	Searchable database of worldwide natural disasters.

U.S. State & Local Gateway	http://www.statelocal.gov/	General information through the federal-state partnership.
National Weather Service	http://nws.noaa.gov/	Central page for National Weather Warnings, updated every 60 seconds.
USGS Real Time Hydrologic Data	http://waterdata.usgs.gov/nwis/rt	Provisional hydrological data
Dartmouth Flood Observatory	http://www.dartmouth.edu/~floods	Observations of flooding situations.
FEMA, National Flood Insurance Program, Community Status Book	http://www.fema.gov/about/programs/nfip/index.shtm	Searchable site for access of Community Status Books
Florida State University Atlantic Hurricane Site	http://www.met.fsu.edu/explores/tropical.html	Tracking and NWS warnings for Atlantic Hurricanes and other links
National Lightning Safety Institute	http://lightningsafety.com/	Information and listing of appropriate publications regarding lightning safety.
NASA Optical Transient Detector	http://thunder.msfc.nasa.gov/research.html	Space-based sensor of lightning strikes
LLNL Geologic & Atmospheric Hazards	http://www.llnl.gov/hmc/	General hazard information developed for the Dept. of Energy.
The Tornado Project Online	http://www.tornadoproject.com/	Information on tornadoes, including details of recent impacts.
National Severe Storms Laboratory	http://www.nssl.noaa.gov/	Information about and tracking of severe storms.
Earth Satellite Corporation	http://www.earthsat.com/	Flood risk maps searchable by state.
USDA Forest Service Web	http://www.fs.fed.us/land	Information on forest fires and land management.

Appendix D: Hazard Mitigation Resource Profiles

The following are resources that can be used in Hazard Mitigation projects:

U.S. Army Corps of Engineers

Contacts:

John Kennelly, Chief, Special Studies Section (for Flood Plain Management Services activities), Phone: (978) 318-8505, Fax: (978) 318-8080, E-mail: John.R.Kennelly@usace.army.mil

Mike Keegan, Chief, Project Planning Section (for Section 14, 103, and 205 authorities), Phone: (978) 318-8087, Fax: (978) 318-8080, E-mail: Michael.F.Keegan@usace.army.mil

Address: US Army Corps of Engineers
New England District
696 Virginia Road
Concord, Massachusetts 01742-2751

Description and Mission:

The Corps of Engineers is a multi-disciplinary engineering and environmental organization that has been identifying and meeting the water resources needs of the nation. These needs have been in the areas of flood damage reduction, flood plain information and management, navigation, shore protection, environmental restoration, water supply, streambank protection, recreation, and fish and wildlife resources conservation, as well as technical assistance in other water resources areas.

The New England District (NAE) of the Corps of Engineers is responsible for managing the Corps' civil responsibilities in a 66,000 square-mile region encompassing the six New England states east of the Lake Champlain drainage basin. The District and its leadership are headquartered in Concord, Massachusetts. The missions of the New England District are many and varied. They include:

- flood damage reduction
- navigation improvements and maintenance
- natural resource management
- streambank and shoreline protection
- disaster assistance
- environmental remediation and engineering
- engineering and construction management support to other agencies

Flood Mitigation Involvement:

As a result of the catastrophic floods in 1936, 1938 and 1955, the Corps was called upon to undertake a comprehensive flood damage reduction program. Since then the Corps has built many flood control structures throughout New England. These include 35 dams and reservoirs, five hurricane protection barriers (two are operated by the Corps) and approximately 60 local flood protection projects. The New England District has also completed two nonstructural projects involving the relocation of flood prone property and the acquisition of natural flood storage areas. The Corps also provides technical assistance to states and municipalities in locally constructed flood damage mitigation projects and to promote wise and informed use of floodplain and natural retention areas in order to minimize potential future flood damages.

Mitigation Goals and Objectives:

The New England District has two primary mitigation objectives with respect to flood damage reduction. The first objective is the operation and maintenance of the 35 flood control reservoirs and two hurricane barriers that provide protection to the Connecticut, Merrimack, Thames, Naugatuck, and Blackstone River Basins. The second objective is to continue to work with the states and communities in New England to address flooding problems affecting the region.

Projects Desired:

The Corps of Engineers has several programs available under its Civil Works authorities to address flooding problems. These programs provide assistance either through the construction of structural and nonstructural projects to mitigate the flooding problem or by providing technical information to assist mitigation performed at the state or local level. Flood damage reduction projects constructed by the Corps of Engineers must demonstrate, based on current Federal guidelines, that the flood damages prevented by the project's construction exceed its total cost. The Corps must also demonstrate that the 10-year frequency flood discharge at the point of concern is equal to or greater than 800 cubic-feet per second (cfs). Technical assistance provided by the Corps does not need to meet the above criteria.

COE Resources with Respect to Hazard Mitigation:

The New England Division assists in meeting national, regional and local needs through a variety of means. Congressionally authorized water resources investigations have resulted in the planning, design and implementation of many flood control and flood damage reduction projects. Work conducted under a Congressional authorization can be extensive and there is currently no monetary limit of funding. Typically, there is a 1-2 year minimum delay in the identification of a proposed investigation and the funding of that work. The first phase of study, the Reconnaissance investigation, is 100 percent Federally funded and must be completed within twelve months. The second phase, the Feasibility investigations, must be cost-shared with a local sponsor where the sponsor provides 50 percent of the cost of the feasibility study. Congress in a Water Resources Development Act must specifically authorize construction of any project resulting from a General Investigation study. The cost of implementation for flood damage reduction projects is generally 65 percent Federal and 35 percent non-Federal.

Through the Continuing Authorities Programs of the Corps many structural and non-structural local protection project reducing or eliminating damages from flooding have been constructed. Investigations initiated under the Corps Continuing Authorities do not require specific congressional authorization are initiated simply with a request from the State or community to the New England District. The following is a list of Continuing Authorities applicable to flood mitigation:

Section 14 - Emergency Stream Bank & Shoreline Protection: This work consists of evaluating alternatives to provide emergency protection to public facilities, such as highways and bridges that are threatened due to erosion. The current Federal limit on Section 14 projects is \$500,000. The local sponsor is required to provide 25 percent of the cost of developing plans and specifications and of construction.

Section 103 - Beach Erosion: Investigations conducted under this authority are to determine methods of protecting public facilities that have been threatened by beach erosion. Currently there is a Federal limit of \$2,000,000 and the local sponsor is required to contribute 35 percent of plans, specifications and construction. The local sponsor is also required to cost-share equally the cost of the feasibility investigation that exceeds \$100,000. The first \$100,000 is at full Federal expense.

Section 205 - Flood Damage Reduction: Investigations are conducted under this program to assist local communities to identify flooding problems and to formulate and construct alternatives for flood damage reduction. The local sponsor is required to cost-share equally in the cost of the feasibility investigation that

exceeds \$100,000 and the Federal limit is \$5,000,000. The local sponsor is required to contribute 25 percent of the cost of plans, specifications and construction.

Section 208 - Snagging and Clearing: This emergency program is designed to reduce flood damage potential by identifying and removing obstructions that contribute to flooding by causing higher flood stages in the floodways. The

Federal limit under this program is \$500,000 and the local sponsor is required to contribute 25 percent of the cost of plans, specifications and construction.

The New England Division also has two Planning Assistance Programs, which provide opportunities for the States to obtain assistance in addressing water resource issues. These programs are the Section 22, Planning Assistance to the States (PAS) program and the Section 206, Flood Plain Management Services (FPMS) program.

Planning Assistance to States Program (PAS): The Planning Assistance to States Program is designed to assist the States in developing comprehensive plans to meet State planning goals. The program is extremely flexible in the type and the methodology of investigations. Studies conducted under the PAS program require a 50/50 cost share with a local sponsor. The existing funding limits are \$300,000 per state and a national budget not to exceed \$5,000,000.

Flood Plain Management Services (FPMS): The FPMS Program is designed for the Corps to assist States and local communities in improving management of flood plains by performing technical assistance and conducting special investigations. Cost recovery has been implemented in this program effective in FY 1991. Under cost recovery, assistance provided to Federal agencies and private interests must be fully reimbursed by those customers. States and local communities are still provided technical assistance at 100 percent Federal cost. One of the major efforts being conducted under the FPMS program at this time is the preparation of Hurricane Evacuation Studies. These studies are jointly funded with the Federal Emergency Management Agency.

Ice Engineering Research Division
U.S. Army Cold Regions Research and Engineering Laboratory

Contact:
Dr. J-C Tatinclaux, Chief, Ice Engineering Research Division
Phone: (603) 646-4187 Fax: (603) 646-4477
E-mail: Jean-Claude.Tatinclaux@cr102.usace.army.mil
Website: <http://www.crrel.usace.army.mil/ierd/>

Address: US Army Cold Regions Research and Engineering Laboratory
Ice Engineering Research Division
72 Lyme Road
Hanover, NH 03755-1290

Description and Mission:

The US Army Cold Regions Research and Engineering Laboratory (CRREL) is a Corps of Engineers' research laboratory that is dedicated to multi-disciplinary engineering and research that addresses the problems and opportunities unique to the world's cold regions. CRREL exists largely to solve the technical problems that develop in cold regions, especially those related to construction, transport, and military operations. Most of these problems are caused by falling and blowing snow, snow on the ground, ice in the air and in the ground, river ice, ice on seas and lakes, and ice effects on manmade materials. CRREL serves the Corps of Engineers and its clients in three main areas:

- Traditional military engineering, which deals with problems that arise during conflict;

- Military construction and operations technology, i.e., the building and maintenance of military bases, airfields, roads, ports, and other facilities; and
- Civil works, which involves the Corps in such things as flood protection, navigation on inland waterways and coastal engineering.

CRREL also deals with cold regions problems for the other defense services, for civilian agencies of the federal government, and to some extent for state agencies, municipalities and private industry.

CRREL's Ice Engineering Research Division (IERD) was created to research, analyze and solve ice problems in and around water bodies, including ice jam flooding and ice accumulation in lock chambers, to ice buildup at water intakes and the destructive forces that moving ice exerts on riverine or coastal structures. In cooperation with the New England District (NAE) of the Corps of Engineers (located in Concord, MA), IERD personnel provide technical assistance before, during and after ice jam flood emergencies. IERD research has resulted in the design and construction of a number of low-cost ice control structures as well as nonstructural mitigation measures. IERD also provides instruction on dealing with river ice problems to local emergency management agencies.

Flood Mitigation Involvement:

IERD is frequently called upon by the various Corps Districts to provide technical assistance to states and municipalities in the form of emergency mitigation. IERD is also involved with Corps and local agencies in developing locally constructed flood damage mitigation projects and promoting wise and informed use of floodplain areas in order to minimize potential future flood damages.

Mitigation Goals and Objectives:

The IERD has two primary mitigation objectives with respect to flood damage reduction. The first objective is to work with the Corps and other federal, state and local agencies to design and implement ice control methods to reduce ice-related flood potential. The second is to work with the states and communities nationwide as well as in New England to address ice-related emergency flooding problems affecting the region.

Projects Desired:

CRREL and IERD are a national resource ready to apply our unique facilities and capabilities to solve problems and conduct innovative, state-of-the-art research and technical support. There are a number of mechanisms that enable IERD and the rest of CRREL to partner with various Federal, non-DoD and private sector entities. The Federal Technology Transfer Act of 1986 (15 USC 3710a) allows CRREL to collaborate with any non-Federal partner on research and technical support consistent with the mission of the laboratory. The Intergovernmental Cooperation Act (31 USC 6505) lets CRREL work with state and local governments on a broad range of reimbursable projects. Under the "Authority to Sell" (10 USC 2539b), CRREL can provide test and evaluation services to the states and the private sector. This includes the testing and evaluation of materials, equipment, models, computer software, and other items. The laboratory can also provide support to other Federal agencies via the Economy in Government Act (31 USC 1535) through MOUs/MOAs that establish a framework for the partnership and provide a concise description of the planned work. CRREL's 35 active Cooperative Research and Development Agreements (CRADAs) with industry and academia and 17 Intergovernmental Cooperation Agreements with states and local governments in 1998 demonstrate a robust program in this area and the relevance of CRREL's research to many segments of American society beyond DoD.

The Corps of Engineers has several programs available under its Civil Works authorities to address flooding problems. These programs provide assistance either through the construction of structural and nonstructural projects to mitigate the flooding problem or by providing technical information to assist mitigation performed at the state or local level. Flood damage reduction projects constructed by the Corps of Engineers must demonstrate, based on current Federal guidelines, that the flood damages prevented by the

project's construction exceed its total cost. The Corps must also demonstrate that the 10-year frequency flood discharge at the point of concern is equal to or greater than 800 cubic-feet per second (cfs). Technical assistance provided by the Corps does not need to meet the above criteria. Through the Corps, IERD has been involved in Section 205 Flood Damage Reduction program, Section 22 Planning Assistance to States Program (PAS)) projects, the Section 206 Flood Plain Management Services (FPMS) program funded jointly with FEMA, and numerous instances of technical assistance.

CRREL IERD Resources with Respect to Hazard Mitigation:

Corps: CRREL works jointly with the Corps' New England Division to address regional and local ice-related hazard mitigation needs through a variety of means. Congressionally authorized water resources investigations have resulted in the planning, design and implementation of many flood control and flood damage reduction projects. Work conducted under a Congressional authorization can be extensive and there is currently no monetary limit of funding. Typically there is a 1-2 year minimum delay in the identification of a proposed investigation and the funding of that work. The first phase of study, the Reconnaissance investigation, is 100 percent Federally funded and must be completed within twelve months. The second phase, the Feasibility investigations, must be cost-shared with a local sponsor where the sponsor provides 50 percent of the cost of the feasibility study. Congress in a Water Resources Development Act must specifically authorize construction of any project resulting from a General Investigation study. The cost of implementation for flood damage reduction projects is generally 65 percent Federal and 35 percent non-Federal.

Through the Continuing Authorities Programs of the Corps many structural and non-structural local protection project reducing or eliminating damages from flooding have been constructed. Investigations initiated under the Corps Continuing Authorities do not require specific congressional authorization are initiated simply with a request from the State or community to the New England District. The following is a list of Continuing Authorities applicable to flood mitigation:

Section 205 - Flood Damage Reduction: Investigations are conducted under this program to assist local communities to identify flooding problems and to formulate and construct alternatives for flood damage reduction. The local sponsor is required to cost-share equally in the cost of the feasibility investigation that exceeds \$100,000 and the Federal limit is \$5,000,000. The local sponsor is required to contribute 25 percent of the cost of plans, specifications and construction.

Section 22 - Planning Assistance to States Program (PAS): The Planning Assistance to States Program is designed to assist the States in developing comprehensive plans to meet State planning goals. The program is extremely flexible in the type and the methodology of investigations. Studies conducted under the PAS program require a 50/50 cost share with a local sponsor. The existing funding limits are \$300,000 per state and a national budget not to exceed \$5,000,000.

Section 206 - Flood Plain Management Services (FPMS): The FPMS Program is designed for the Corps to assist States and local communities improve management of flood plains by performing technical assistance and conducting special investigations. Cost recovery has been implemented in this program effective in FY 1991. Under cost recovery, assistance provided to Federal agencies and private interests must be fully reimbursed by those customers. States and local communities are still provided technical assistance at 100 percent Federal cost. One of the major efforts being conducted under the FPMS program at this time is the preparation of Hurricane Evacuation Studies. These studies are jointly funded with the Federal Emergency Management Agency.

Personnel:

IERD was created to research, analyze and solve ice problems in and around water bodies. The technical experience of the staff and their in-depth research and field capabilities combine with CRREL's unique Ice Engineering Facility to form one of the premier ice engineering organizations in the world. IERD has a staff of 15 engineers and technicians experienced in technical analyses, methods and engineering solutions to ice problems -- that is, any situation where the effects of ice cause flooding, increase operational and

maintenance requirements of water control projects, impede navigation, or adversely impact the environment in cold regions.

Equipment and Facilities:

The Ice Engineering Facility was built to increase the research capabilities of the U.S. Army Cold Regions Research and Engineering Laboratory. It is a two-story building approximately 160 by 210 feet containing three primary cold spaces: the test Basin, Flume, and Research Area. They have recently designed and built a new Wind Tunnel Facility. In addition, there is a machine room in the basement, an instrumentation corridor separating the flume and test basin spaces, a shop/storage area, and one sample-storage cold room.

The Test Basin was designed primarily for large-scale work on ice forces on structures, such as drill platforms and bridge piers, and for tests using model icebreakers. The Basin is 30 feet wide, 8 feet deep and 120 feet long. The room is designed to operate at any temperatures between +65° and -10°F with very even temperature distribution, which results in uniform ice thickness. Other studies conducted in the Test Basin concern the formation of ice pressure ridges, ice problems in and around navigation locks and vertical uplift forces.

The Flume is situated in a room where the temperature can be regulated between +65° and -20° F. The Flume is 2 by 4 feet in cross section and 120 feet long. It can tilt from +2° to -1° slope, have a flow capacity of nearly 14 cubic feet per second and have a refrigerated bottom. Some other studies conducted in the Flume are the formation of ice covers and frazil ice, the hydraulics of ice-covered rivers, the formation of ice jams, and the effect of ice covers on sediment transport and scour.

Possibly the most versatile portion of the Ice Engineering Facility is the Research Area. This room is 80 by 160 feet clear span and has a temperature range of +65° to -10°F. Piping capable of providing a flow of 1, 2, 4 or 8 cubic feet per second is located on one side of the room, and a large drain trough is on the other. The floor is designed for loads up to 400 pounds per square foot. Models of reaches can be constructed in this area to test ways to alleviate ice jams through channel modification. Tests of the bearing capacity of large ice sheets and cold-testing of vehicles and structures are a few of the other potential uses of this space. Tests conducted in this room will help to alleviate much of the flooding caused by ice jams.

USDA, Natural Resources Conservation Service

Contacts:

Gerald J. Lang, Technology Leader; Phone: (603) 868-7581, Fax: (603) 868-5301
E-mail: gerald.lang@nh.usda.gov

Edward Hansalik, Civil Engineer; Phone: (603) 868-7581, Fax: (603) 868-5301
E-mail: ehansalik@nh.usda.gov

Address: Federal Building
2 Madbury Road
Durham, NH 03824

Description and Mission:

The Natural Resources Conservation Service (NRCS) is a Federal agency within the US Department of Agriculture. The mission of the NRCS is to help people conserve, improve and sustain our natural resources and environment. NRCS, formerly the Soil Conservation Service, is the lead federal agency for conservation on private land. NRCS provides conservation technical assistance through local conservation districts and Resource Conservation and Development (RC&D) Councils to individuals, communities, watershed groups, tribal governments, federal, state, and local agencies, and others. NRCS has an interdisciplinary staff of professional engineers, planners, biologists, foresters, agronomists, and soil scientists working together to provide the necessary technical assistance to solve resource or environmental

problems. NRCS products typically include conservation plans, study reports, engineering designs, and resource maps.

Authorities and Funding:

NRCS state and field offices derive funding from two possible sources, direct Federal appropriations and reimbursable agreements with agencies and units of government. NRCS manages several programs; Environmental Quality Incentive Program (EQIP), Wildlife Habitat Incentives Program (WHIP), Wetland Reserve Program (WRP), Forestry Incentives Program (FIP), and Farmland Protection Program (FPP) which provide cost-share assistance to landowners and users (primarily agricultural or forestry land) to install conservation practices to restore and protect natural resources. NRCS can also provide technical assistance ranging from preliminary reviews to complete detail designs to landowners/users solving resource problems even if financial assistance is not being provided for the installation of conservation practices. This assistance is dependent on staff availability and priorities.

NRCS also manages the Emergency Watershed Protection (EWP) program, which can provide financial and technical assistance to units of government and groups to repair damages sustained from a natural disaster (flood, fire, hurricane, tornado) creating an imminent hazard to life and property. The restoration efforts must be environmentally and economically cost effective and typically includes clearing debris from clogged stream channels, stabilizing eroded stream banks and restoring vegetation for stabilization purposes. NRCS can also provide technical assistance to watershed associations or groups to develop comprehensive plans for improving or protecting the watershed environment (water quality, flood reduction, wildlife habitat).

Mitigation Involvement:

The NRCS can provide technical assistance to conduct inventories, to complete watershed or site-specific plans, or to develop detail engineering and construction designs for conservation applications that will help reduce future damages from natural disasters. Some examples of past mitigation efforts include: floodplain management studies for towns, site assessments of stream flow impairments, stabilization designs to protect structures which could sustain severe damages from another storm event, and small watershed plans addressing flooding problems. Some of these products can be provided through other conservation assistance efforts. However, the major jobs would require a reimbursable agreement with the state or towns to complete the work.

Mitigation Goals and Objectives:

With respect to hazard mitigation, the goal of the NRCS in New Hampshire is to meet the needs of the State and local governments by providing timely technical assistance to support recovery and restoration efforts. NRCS can contribute this technical assistance by interacting directly with NH HSEM at the state level and having field staff working directly with Town Emergency Management officials at the local level. Short-term goals are to establish contacts with local officials and the conservation districts at the field office level to facilitate quicker response times. Intermediate and long-term objectives are to improve the cooperative efforts of working with NH HSEM and establish additional contacts for providing timely technical assistance at the local level.

Projects/Planning Desired:

NRCS would like to work with local watershed associations to develop comprehensive plans addressing resource and environmental needs and opportunities in the priority watersheds as identified in the Unified Watershed Assessment. These plans can provide the basis for targeting and requesting special funding to meet the needs of the local watershed association. Technical assistance for planning and designing along with public information dissemination are the typical activities the agency can provide in this effort.

NRCS Resources with respect to Hazard Mitigation

Personnel:

NRCS in New Hampshire has a workforce of 45 staff members along with 5 multi-state staff members. Approximately 22 staff members consisting of engineers, biologists, foresters, conservation planners, and technicians are available to provide some assistance in mitigation efforts. Support staff of a GIS specialist, computer specialist and public information specialist could assist in providing information for public outreach. This staff is available to provide limited assistance under present program funding authorities. However, larger projects would require reimbursement for planning and design assistance.

Equipment, Physical Facilities and Other Capabilities:

All of the field offices and State office have computers and access to the internet. All of the field offices have survey equipment and all engineers have the use of CADD software. All field offices have access to small meeting rooms and access to the Federal Telecommunications System. Government vehicles are located at all field offices for use by government employees and could be made available in emergencies.

Northeast States Emergency Consortium (NESEC)

Contacts:

Edward S. Fratto, Executive Director: Phone: (781) 224-9876, Fax: (781) 224-4350
E-Mail: www.nesec.org

Kristin M. O'Brien, Assistant Executive Director: Phone: (781) 224-9876 ; e-mail: www.nesec.org

Address: Northeast States Emergency Consortium
419 Main Street, Suite 5
Wakefield, MA 01880

Organization Description:

The Northeast States Emergency Consortium, Inc. (NESEC) is a 501(c)(3) not-for-profit natural disaster mitigation and emergency management organization, located in Wakefield, Massachusetts. NESEC is the only multi-hazard consortium of its kind in the country and is supported and funded by the Federal Emergency Management Agency (FEMA). The eight Northeast States of Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island and Vermont form the consortium. NESEC has a full-time Executive Director, and Assistant. It is governed by a Board of Directors. The Board is comprised of the Directors of the State Emergency Management Agencies from each of the six New England States and the States of New York and New Jersey.

Organization Mission:

NESEC works in partnership with government and private organizations to reduce losses of life and property from natural disasters in the Northeast United States. The Northeast States are vulnerable to most of the natural hazards, including hurricanes, earthquakes, coastal and inland flooding, tornadoes and micro-bursts, forest fires, drought, lightning, blizzards, and other forms of severe weather. Our developed urban areas and the desire to build and live on waterfront property have increased our degree of risk from natural hazards.

Mitigation Programs:

Grants: NESEC raises funds from government and private sources to support local mitigation projects. These funds are awarded on a competitive basis in the form of grants in the range of \$500-5,000. The name of this program is called the **Power of Prevention**. All grant programs are administered in cooperation with the New Hampshire Homeland Security and Emergency Management (NH HSEM). Communities interested in participating should contact NH HSEM.

HAZUS: NESEC assists FEMA PROJECT IMPACT Communities in the use of HAZUS as a planning platform for incorporating multi-hazard disaster prevention initiatives. NESEC can produce a HAZUS report using default data for each of the initial PROJECT IMPACT Communities. Priority is given to PROJECT IMPACT communities; however, assistance may be provided to other communities as resources allow. This report provides an excellent starting point for communities wishing to utilize HAZUS to identify potential hazards. The NESEC HAZUS Report is multi-hazard and usually contains information on earthquakes, tornadoes, flood and wind.

There is no fee or charge for producing the default HAZUS Report and meeting with the community to discuss the results. All HAZUS support is arranged in cooperation with the New Hampshire Homeland Security and Emergency Management (NH HSEM). Communities interested in participating should contact NH HSEM.

Emergency Generators: NESEC assists communities to establish a partnership with their electric utilities and service companies. The partnership would conduct an energy efficiency audit of the community, recommend cost saving measures, and implement a cost saving plan. Monthly savings could be used to fund emergency generator(s) for local critical facilities. The utility or energy service company could then lease, install, and maintain generator(s) in a community.

The community would pay a monthly charge for the lease agreement. This charge would not exceed the savings derived through energy efficiency measures, so there would be no capital outlay or additional cost to the community. In fact, some communities may be able to reduce their monthly electric bills in an amount that exceeds the cost of the generator(s) lease agreement.

Monthly savings and utility participation will vary from state to state and community-to-community depending on present electric power usage and efficiency measures and deregulation. There is no fee or charge for assisting communities in establishing partnerships with electric utilities. NESEC assistance will be provided as resources allow. All emergency generator support is arranged in cooperation with the New Hampshire Homeland Security and Emergency Management (NH HSEM). Communities interested in participating should contact NH HSEM.

Federal Mitigation Grant Programs

Pre-Disaster Mitigation Grant Program

The Pre-Disaster Mitigation (PDM) program provides funds to states, territories, tribal governments, communities, and universities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. Funding these plans and projects reduces overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations. PDM grants are to be awarded on a competitive basis and without reference to state allocations, quotas, or other formula-based allocation of funds. <http://www.fema.gov/government/grant/pdm/index.shtm>

Hazard Mitigation Grant Program

The Hazard Mitigation Grant Program (HMGP) provides grants to States and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. The HMGP is authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act. <http://www.fema.gov/government/grant/hmfp/index.shtm>

Flood Mitigation Assistance Program

The Flood Mitigation Assistance (FMA) program was created as part of the National Flood Insurance Reform Act of 1994 (42 U.S.C. 4101) with the goal of reducing or eliminating claims under the [National Flood Insurance Program](#).

FEMA provides FMA funds to assist states and communities in implementing measures that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes and other structures insurable under the National Flood Insurance Program.

<http://www.fema.gov/government/grant/fma/index.shtm>

Appendix E: Documentation of the Planning Process

Jaffrey Hazard Mitigation Plan Update

Work Group

Meeting #1

AGENDA

July 14, 2020

9:00 a.m.

Zoom meeting: <https://bit.ly/June14JHMPWG20>

Or Phone: (646) 558-8656

Meeting ID: 873 7162 6740

Password: 450355

1. Introduction

- a. Discuss the addition of recently added hazards to the State Hazard Mitigation Plan

2. Status of Previous Hazard Mitigation Actions

- a. Review the Action Plan from the existing Hazard Mitigation Plan to determine what has been completed, deleted, or deferred to the updated plan

3. Risk Assessment

- a. Determine the *Impact*, *Probability* and *Overall Risk* of each potential hazard

4. Identify Past and Potential Hazards

- a. Review each hazard type and other information on the chart provided in the existing plan
- b. Add any new hazards that have occurred since the previous plan was adopted
- c. Add any “potential hazard” concerns

5. Next Meeting

Jaffrey Hazard Mitigation
Meeting 1
July 14, 2020

Sign-In Sheet

Name	Title/Affiliation	Email
David Chamberlain	Fire Chief / EMD	firechief@townofjaffrey.com
Todd Croteau	Superintendent of Highways & Facilities	tcroteau@townofjaffrey.com
Tony Cavaliere	Superintendent of Utilities	tcavaliere@townofjaffrey.com
Louis Chatel	SAU 47 JRCSD Safety Coordinator	l.chatel@sau47.org
Jon Frederick	Town Manager	jfrederick@townofjaffrey.com
Jo Anne Carr	Director of Planning and Economic Development	jacarr@townofjaffrey.com
Renee Sangermano	Recreation Director	rsangermano@townofjaffrey.com
Todd Muilenberg	Police Chief	tmuilenberg@townofjaffrey.com
Liz Gilboy	NH HSEM	Elizabeth.gilboy@dos.nh.gov
Lisa Murphy	SWRPC	lmurphy@swrpc.org

Jaffrey Hazard Mitigation Plan Update

Work Group

Meeting #2

AGENDA

August 12, 2020

9:00 a.m.

Zoom meeting: <https://bit.ly/Aug12JHMPWG20>

Or Phone: (646) 558-8656

Meeting ID: 820 2659 0873

Password: 899 530

- 1. Identify Past and Potential Hazards**
 - a. Review each hazard type and other information on the chart provided in the existing plan
 - b. Add any new hazards that have occurred since the previous plan was adopted
 - c. Add any “potential hazard” concerns
- 2. Existing Mitigation Strategies**
 - a. Review the list of mitigation strategies identified in the current plan.
 - b. Determine gaps and edit as needed.
- 3. Identify Critical Facilities**
 - a. Review existing critical facilities identified and determine edits needed.
- 4. Next Meeting: September 9th at 9:00 a.m.**

Jaffrey Hazard Mitigation
Meeting 2
August 12, 2020

Sign-In Sheet

Name	Title/Affiliation	Email
David Chamberlain	Fire Chief / EMD	firechief@townofjaffrey.com
Jon Frederick	Town Manager	jfrederick@townofjaffrey.com
Todd Muilenberg	Police Chief	tmuilenberg@townofjaffrey.com
Todd Croteau	Superintendent of Highways & Facilities	tcroteau@townofjaffrey.com
Tony Cavaliere	Superintendent of Utilities	tcavaliere@townofjaffrey.com
Jo Anne Carr	Director of Planning and Economic Development	jacarr@townofjaffrey.com
Louis Chatel	SAU 47 JRCSD Safety Coordinator	l.chatel@sau47.org
Rob Deschenes	Building Inspector / Code Enforcement	rdeschenes@townofjaffrey.com
Liz Gilboy	NH HSEM	Elizabeth.gilboy@dos.nh.gov
Lisa Murphy	SWRPC	lmurphy@swrpc.org

Jaffrey Hazard Mitigation Plan Update

Work Group

Meeting #3

AGENDA

September 9, 2020

9:00 a.m.

To join this Zoom Meeting click:

<https://bit.ly/Sept9JHMWG20>

Meeting ID: 823 5536 1820

Password: 415 571

Or by phone: (646) 558-8656

- 1. Existing Mitigation Strategies**
 - a. Review the list of mitigation strategies identified in the current plan.
 - b. Determine gaps and edit as needed.
- 2. Identify Critical Facilities**
 - a. Review existing critical facilities identified and determine edits needed.
- 3. Next Meeting: October 14th at 9:00 a.m.**

Jaffrey Hazard Mitigation
Meeting # 3
September 9, 2020

Sign-In Sheet

Name	Title/Affiliation	Email
David Chamberlain	Fire Chief / EMD	firechief@townofjaffrey.com
Jon Frederick	Town Manager	jfrederick@townofjaffrey.com
Louis Chatel	SAU 47 JRCSD Safety Coordinator	l.chatel@sau47.org
Todd Muilenberg	Police Chief	tmuilenberg@townofjaffrey.com
Todd Croteau	Superintendent of Highways & Facilities	tcroteau@townofjaffrey.com
Tony Cavaliere	Superintendent of Utilities	tcavaliere@townofjaffrey.com
Jo Anne Carr	Director of Planning and Economic Development	jacarr@townofjaffrey.com
Rob Deschenes	Building Inspector / Code Enforcement	rdeschenes@townofjaffrey.com
Liz Gilboy	NH HSEM	Elizabeth.gilboy@dos.nh.gov
Lisa Murphy	SWRPC	lmurphy@swrpc.org

Jaffrey Hazard Mitigation Plan Update

Work Group

Meeting #4

AGENDA

October 14, 2020

9:00 a.m.

To join this Zoom Meeting click:

<https://bit.ly/Sept9THMWG20>

Meeting ID: 811 6415 6119

Password: 868 288

Or by phone: (646) 558-8656

1. Existing Mitigation Strategies

- a. Review the list of mitigation strategies identified in the current plan.
- b. Determine gaps and edit as needed.

2. Past and Potential Hazard Areas

- a. Map exercise to add areas of past hazards and potential hazards.

3. Next Meeting

- a. Potential dates for next meeting - November 4, 5, 10, 12 at 9:00 a.m.

Jaffrey Hazard Mitigation
Meeting # 4
October 14, 2020

Sign-In Sheet

Name	Title/Affiliation	Email
David Chamberlain	Fire Chief / EMD	firechief@townofjaffrey.com
Jon Frederick	Town Manager	jfrederick@townofjaffrey.com
Todd Muilenberg	Police Chief	tmuilenberg@townofjaffrey.com
Todd Croteau	Superintendent of Highways & Facilities	tcroteau@townofjaffrey.com
Tony Cavaliere	Superintendent of Utilities	tcavaliere@townofjaffrey.com
Jo Anne Carr	Director of Planning and Economic Development	jacarr@townofjaffrey.com
Renee Sangermano	Recreation Director	rsangermano@townofjaffrey.com
Rob Deschenes	Building Inspector / Code Enforcement	rdeschenes@townofjaffrey.com
Liz Gilboy	NH HSEM	Elizabeth.gilboy@dos.nh.gov
Lisa Murphy	SWRPC	lmurphy@swrpc.org

Jaffrey Hazard Mitigation Plan Update

Work Group

Meeting #5

AGENDA

November 4, 2020
9:00 a.m.

To join this Zoom Meeting click:

<http://bit.ly/Nov04JHM20>

Meeting ID: 875 7140 4977

Or by phone: (646) 558-8656

1. Potential Mitigation Strategies

- a. Review chart of potential mitigation strategies and determine which ones should be added to the plan.

2. Determine Hazard Mitigation Goals

- a. Review the proposed Hazard Mitigation Goals and determine if changes are needed.

3. Next Meeting

- a. Potential dates for next meeting - December 2 at 9:00 a.m.

Jaffrey Hazard Mitigation
Meeting # 5

November 4, 2020

Sign-In Sheet

Name	Title/Affiliation	Email
David Chamberlain	Fire Chief / EMD	firechief@townofjaffrey.com
Jon Frederick	Town Manager	jfrederick@townofjaffrey.com
Todd Muilenberg	Police Chief	tmuilenberg@townofjaffrey.com
Todd Croteau	Superintendent of Highways & Facilities	tcroteau@townofjaffrey.com
Louis Chatel	SAU 47 JRCSD Safety Coordinator	l.chatel@sau47.org
Tony Cavaliere	Superintendent of Utilities	tcavaliere@townofjaffrey.com
Renee Sangermano	Recreation Director	rsangermano@townofjaffrey.com
Rob Deschenes	Building Inspector / Code Enforcement	rdeschenes@townofjaffrey.com
Liz Gilboy	NH HSEM	Elizabeth.gilboy@dos.nh.gov
Lisa Murphy	SWRPC	lmurphy@swrpc.org

Jaffrey Hazard Mitigation Plan Update

Work Group

Meeting #6

AGENDA

December 9, 2020

9:00 a.m.

Join Zoom Meeting

<https://bit.ly/Dec9JHMWG20>

Meeting ID: 839 7676 5641

Passcode: 642858

or

Join by Telephone: (646) 558-8656

- 1. Determine Hazard Mitigation Goals**
 - a. Review the proposed Hazard Mitigation Goals and determine if changes are needed.
- 2. Identify and Prioritize Mitigation Actions for Each Hazard**
 - a. Identify specific locations to be added to the Action Plan.
 - b. Use the STAPLEE Chart to identify and rank actions for each hazard.
- 3. Prepare an Action Plan**
 - a. Determine the *Who*, *When* and *Funding Source* for each action identified in the STAPLEE Chart.
- 4. Next Meeting**
 - a. Potential date for next meeting - January 13, 2021 at 9:00 a.m.

Jaffrey Hazard Mitigation
Meeting # 6

December 9, 2020

Sign-In Sheet

Name	Title/Affiliation	Email
David Chamberlain	Fire Chief / EMD	firechief@townofjaffrey.com
Jon Frederick	Town Manager	jfrederick@townofjaffrey.com
Todd Muilenberg	Police Chief	tmuilenberg@townofjaffrey.com
Todd Croteau	Superintendent of Highways & Facilities	tcroteau@townofjaffrey.com
Tony Cavaliere	Superintendent of Utilities	tcavaliere@townofjaffrey.com
Jo Anne Carr	Director of Planning and Economic Development	jacarr@townofjaffrey.com
Rob Deschenes	Building Inspector / Code Enforcement	rdeschenes@townofjaffrey.com
Liz Gilboy	NH HSEM	Elizabeth.gilboy@dos.nh.gov
Lisa Murphy	SWRPC	lmurphy@swrpc.org

Jaffrey Hazard Mitigation Plan Update

Work Group

Meeting #7

AGENDA

January 27, 2021

9:00 a.m.

Join Zoom Meeting

<http://bit.ly/Jan27JHMWG21>

Meeting ID: 879 2334 1891

Passcode: 771678

or

Join by Telephone: (646) 558-8656

1. Prepare an Action Plan

- a. Determine the *Who*, *When* and *Funding Source* for each action identified in the STAPLEE Chart.

2. Review the Draft Plan

- a. Review the draft and make edits where needed.

3. Discuss Next Steps

- a. Discuss the review and approval process by NH HSEM, adoption of the plan and FEMA final approval.

Jaffrey Hazard Mitigation
Meeting # 7

January 27, 2021

Sign-In Sheet

Name	Title/Affiliation	Email
David Chamberlain	Fire Chief / EMD	firechief@townofjaffrey.com
Jon Frederick	Town Manager	jfrederick@townofjaffrey.com
Todd Croteau	Superintendent of Highways & Facilities	tcroteau@townofjaffrey.com
Tony Cavaliere	Superintendent of Utilities	tcavaliere@townofjaffrey.com
Jo Anne Carr	Director of Planning and Economic Development	jacarr@townofjaffrey.com
Renee Sangermano	Recreation Director	rsangermano@townofjaffrey.com
Rob Deschenes	Building Inspector / Code Enforcement	rdeschenes@townofjaffrey.com
Louis Chatel	SAU 47 JRCSD Safety Coordinator	l.chatel@sau47.org
Liz Gilboy	NH HSEM	Elizabeth.gilboy@dos.nh.gov
Lisa Murphy	SWRPC	lmurphy@swrpc.org

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Public Hearing for Adoption of Hazard Mitigation Plan

townofjaffrey.com/home/news/public-hearing-adoption-hazard-mitigation-plan-0

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Public Hearing for Adoption of the Hazard Mitigation Plan

Monday, July 26th 6pm- Jaffrey Town Office

POSTED ON: JULY 15, 2021 - 3:38PM

The Jaffrey Board of Selectmen will be holding a public hearing to adopt the Hazard Mitigation Plan at their meeting on Monday, July 26th at 6pm at the Jaffrey Town Office (10 Goodnow Street). The plan is attached for public review.

Attachment

Size

Hazard Mitigation Plan Update 20211.38 MB

Code RED

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Town of Jaffrey, 10 Goodnow Street, Jaffrey, New Hampshire 03452 | (603) 532-7445
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Appendix F: Project Status Sheets

The following form can be used to keep track of projects identified in the hazard mitigation plan that are in progress or that have been completed.

Hazard Mitigation Plan- Project

Project Title	Page # in Plan	Date of Project Completion	Comments