Town of Center Harbor, New Hampshire
Hazard Mitigation Plan Update, 2021

Prepared by the:

Center Harbor Hazard Mitigation Update Committee

Center Harbor Public Library and Heritage Site

June 2021

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Town of Center Harbor, New Hampshire
Hazard Mitigation Plan Update

2021

With Assistance from:
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EXECUTIVE SUMMARY

The *Center Harbor Hazard Mitigation Plan Update* (the 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 Center Harbor Hazard Mitigation Planning Update Committee (the Committee) with assistance from the Lakes Region Planning Commission and contains statements of policy adopted by the Board of Selectmen in Chapter V.

The Committee agreed that most of the natural hazards identified in the 2014 Plan continue today; although some were considered less of a risk due to several mitigation efforts since that plan was adopted. Drought was no longer considered a moderate risk. The matrix below shows the natural hazards considered to be high or moderate risks.

Hazard Event	Overall Risk	Hazard Event	Overall Risk
High Wind Events	High	Inland Flooding	Moderate
Severe Winter Weather	High	Lightning	Moderate
Tropical & Post Tropical Cyclones	High	Dam Failure	Moderate
Extreme Temperatures	High	Wildfire	Moderate
		Infectious Disease	Moderate

The Committee identified numerous programs related to hazard mitigation including the Town Master Plan, Zoning Ordinance, Site Plan and Subdivision Regulations, and Emergency Operations Plans.

Five of the Actions from the 2014 Plan have are no longer pertinent and six Actions have been completed. In its effort to further reduce the vulnerability of the town to future hazards, the committee developed a list of three general and 18 hazard-specific mitigation actions. These actions were prioritized based on local criteria, reviewing both the benefits and the costs of such actions. Discussions were held regarding how implementation might occur over the next five years. Some actions will be easy to implement, others will likely be more difficult to implement. The results of these discussions are summarized in Table 11: Implementation Schedule for Mitigation Actions.

CHAPTER I: PLANNING PROCESS

A. BACKGROUND

In order to be eligible to receive disaster related Federal Emergency Management Agency (FEMA) grant funding to be used for hazard mitigation projects and actions that will ultimately reduce and mitigate future losses from natural or human hazard events, FEMA has required that all communities within the state of New Hampshire establish local hazard mitigation plans. In response to this requirement, the NH Department of Safety's Division of Homeland Security and Emergency Management (HSEM) and the nine regional planning commissions in the state entered into agreements to aid communities with plan development and update. The plan development process utilized a process adapted from FEMA's *Local Mitigation Planning Handbook, (2013)*.

B. AUTHORITY

The town of Center Harbor Hazard Mitigation Plan was prepared pursuant to Section 322, Mitigation Planning of the Robert T Stafford Disaster Relief and Emergency Assistance Act and Section 104 of the Disaster Mitigation Act (DMA) of 2000. Section 322 of DMA 2000 emphasizes the need for State, local and tribal entities to closely coordinate mitigation planning and implementation efforts.

C. FUNDING SOURCE

The New Hampshire Department of Safety's Homeland Security and Emergency Management (NH HSEM) funded the Plan with matching funds from the Lakes Region Planning Commission.

D. PURPOSE

The Center Harbor Hazard Mitigation Plan is a planning tool to be used by the town of Center Harbor, as well as other local, state, and federal government entities, in their efforts to reduce the negative effects from natural and human-related hazards. The Plan contains statements of policy as outlined in the Implementation Schedule for Mitigation Actions and in Chapter V: Plan Adoption and Monitoring. All other sections of this plan are support and documentation for informational purposes only and are not included as a statement of policy.

E. SCOPE OF PLAN

The scope of this Plan includes the identification of natural hazards affecting the town of Center Harbor, as identified by the Committee. Because there are also some human-caused and technological hazards that could impact Center Harbor, they have also been incorporated in this plan.

F. METHODOLOGY

The Lakes Region Planning Commission (LRPC) corresponded with the Center Harbor Emergency Management Director (EMD) in early 2019 to initiate the hazard mitigation update process in the town of Center Harbor. The EMD established the Center Harbor Hazard Mitigation Planning Update Committee in the summer of 2019 for the purpose of updating a long-range plan for hazard mitigation. The Committee consisted of representatives from the departments of Police, Fire, and

Highway, and Emergency Management Director, a Selectman, and member of the Conservation Commission. Public input was solicited through the update process via a survey-available at municipal office, library, and at town website. A dozen responses were received. All meetings were open to the public.

Using the *Guide to Hazard Mitigation Planning for New Hampshire Communities*, the Committee developed the content of the Plan by following the process set forth in the handbook, and by referring to FEMA's *Local Multi-Hazard Mitigation Planning Guidance.* The planner and the committee reviewed and referenced a variety of plans, studies, reports, and technical information during the development of this Plan Update; a list of these resources can be found in Appendix I. Data on property valuation was gathered from the Center Harbor MS-1 Report to the NH Department of Revenue Administration.

The Committee held regular meetings from October 2019 through February 2020. The following timeline shows the dates and corresponding Committee actions. The planning team reviewed each section of the plan and LRPC provided updated information on hazards in New Hampshire. Each section of the existing plan was revised and, in some cases, reformatted in order to develop a more comprehensive document. Meeting announcements and agendas were posted in the town offices and are included in Appendices C & D.

Committee Meetings

September 16, 2019: *Introductory Committee Meeting:*
Center Harbor Municipal Building and Fire Station
Overview of update process and objectives
Discussion of Development Trends since 2014
Identify Hazard Events since 2014
Establishing next steps in the process

October 16, 2019: *Committee meeting:*
Cary Mead Meeting Room at the Center Harbor Municipal Building
Review of Hazards and Critical Facilities
Risk Assessment

November 19, 2019: *Committee meeting:*
Cary Mead Meeting Room at the Center Harbor Municipal Building
Review of Hazards
Review Community Capabilities
Development Trends
Status of Recommended Hazard Mitigation Actions
Review of Hazard Mitigation Goals

December 12, 2019: *Committee meeting:*
Cary Mead Meeting Room at the Center Harbor Municipal Building
Review of Hazards in Center Harbor area
Risk Assessment

January 21, 2020: *Committee meeting:*
Cary Mead Meeting Room at the Center Harbor Municipal Building
Goals and Types of Mitigation Actions
Problem Statements Review

February 4, 2020: *Committee meeting:*
Cary Mead Meeting Room at the Center Harbor Municipal Building
STAPLEE and Implementation
Costs and Benefits of each Action
Prioritize Mitigation Actions

January 13, 2021: *Committee meeting:*
Zoom
Review of Draft Plan by Committee
Discuss final steps in the review, approval, and adoption process

Public Involvement

The Center Harbor EMD invited a variety of Hazard Mitigation Planning stakeholders to join the Hazard Mitigation Planning Committee. The Committee was represented by municipal officials, including a member of the Board of Selectmen. The survey submitted to the town of Center Harbor received more than a dozen responses. The survey included five questions and a comment section. The trend of the surveys tallied showed most takers are concerned with high wind events and long-term utility outages. Survey takers were also asked how important certain statements are in their opinion. The statements that showed most importance pertained mostly towards protecting private property and critical facilities. Local businesses and members of the public were encouraged to attend all meetings through press releases and postings around town. Two residents attended the Feb. 4 meeting and were involved in discussions about potential mitigation actions. One also identified an area of town that is susceptible to high winds (Appendix C).

The Committee held a public comment period in order to obtain additional feedback on the draft document. The Plan (including comment instructions) was available for public review at the Center Harbor website and in the Municipal Building from January 15 through January 25, 2021. A press release and a public notice were distributed to local media announcing the public comment period (Appendix C). The neighboring towns were also notified of the review period. This provided an opportunity for local and regional businesses, organizations, agencies, educational and health institutions in Center Harbor and surrounding towns to review and comment on the plan update.

G. ACKNOWLEDGMENTS

Special thanks to those that assisted in the development of this Plan:

Tyler Driscoll	Center Harbor EMD beginning January 2020
David Hughes	Center Harbor Fire Deputy Chief and Emergency Management Director (EMD) until December 10, 2019
Harry Viens	Center Harbor Board of Selectman and former Chair of the Center Harbor Planning Board
Mark C. Chase	Center Harbor Police Chief
Jeff Haines	Center Harbor Highway Department
Leon Manville	Center Harbor Fire Chief
Maureen Criasia	Center Harbor Citizen and Conservation Commission
Richard Hanson	Center Harbor Selectman
David Jeffers	Regional Planner, Lakes Region Planning Commission
Henry Casey	HMP Intern, Lakes Region Planning Commission

Additional information was provided by:

Mary Richardson	Center Harbor Town Clerk
Jennifer Gilbert	Floodplain Management Coordinator, NH Office of Strategic Initiatives
Samara Ebinger	CFM Principal Planner, NH Office of Strategic Initiatives
Robin Woodaman	Center Harbor Selectmen's Administrative Assistant
Kent Finemore	Assistant Chief Engineer, NH Dam Bureau, NH Department of Environmental Services
Tracy Russo	Paralegal, NH Department of Revenue Administration

CHAPTER II: COMMUNITY PROFILE

A. GEOGRAPHY

Located in northern Belknap County, the town of Center Harbor is bordered by the town of Moultonborough to the north and east, Meredith to the south, Holderness to the north and west, New Hampton and Ashland to the west. As the town name implies, proximity to water is an important feature in Center Harbor's geography with Squam Lake shaping much of the town's northern border, Lakes Waukewan and Winona forming the boundary with New Hampton, and Lake Winnipesaukee dominating the downtown scenery.

Center Harbor has 13.4 square miles of land and 3.2 square miles of water within its borders.[1] With approximately 1,100 year-round residents, its population density is 82.1 persons per square mile. Center Harbor's terrain is a mix of rolling hills, forests, some steep ledge areas in the west, and forested wetlands throughout. The highest point in town is Sunset Hill (1,121'), the low point is Lake Winnipesaukee (504') and 23% of the land is steep slopes (at least 15% slope). Several streams run through Center Harbor, as well as the Snake River.

The village of Center Harbor is located along NH Route 25 on the shores of Lake Winnipesaukee and is the focus of much of the commercial business in town. "West Center Harbor" is not an official village but many residents and some businesses are located in this portion of town; some of these residents have more interaction with the town of Meredith than with the village of Center Harbor. Center Harbor has a long history as a summer tourist destination, which continues today with many seasonal homes, both small and large scattered throughout town, many along the shoreline and on islands.

B. WEATHER CONDITIONS

Like many New England towns, Center Harbor's temperatures and precipitation vary a great deal. January temperatures range from an average high of 30 degrees Fahrenheit to an average low of 8 degrees Fahrenheit. July temperatures range from an average high of 81 degrees Fahrenheit to an average low of 58 degrees Fahrenheit. The amount of precipitation is slightly lower in the winter months when compared to summer months. Center Harbor averages about 65 inches of snow per year.[2]

C. INFRASTRUCTURE AND SERVICES

A three-member Board of Selectmen governs the town of Center Harbor. The Police Department consists of a full-time Police Chief along with three other officers. The town has a part-time Fire Chief and a Fire Department with approximately 19 on-call firefighters. Emergency Medical Services are

[1] *New Hampshire Community Profiles*, NH Employment and Security Office, http://www.nhes.nh.gov/elmi/products/cp/profiles-htm/centerharbor.htm,
[2] http://www.city-data.com/city/Center-Harbor-New-Hampshire.html,

provided by the Fire Department with 9 Emergency Medical Technicians. The Road Agent has a staff of three who maintain 15.5 miles of road. The Emergency Management Director is an officer in the Fire Department.

The Lakes Region General Hospital is located in Laconia, 16 miles southwest of Center Harbor, Plymouth's Speare Memorial Hospital is 15 miles to the west. Catholic Medical Center in Manchester is also utilized by some Center Harbor residents. Hospitals are also available in Wolfeboro, Franklin, Concord, and Lebanon.

NH Route 25 runs generally east-west from Moultonborough to Meredith through the village center. US Route 3/NH Route 25 runs south-north from Meredith to Holderness and Plymouth, cutting through the center of Center Harbor. NH Route 25B is a short cut linking the village with US Route 3/NH Route 25. Most of the town's critical facilities are located on or near these roads.

Businesses and residences in the village and along NH Route 25 have access to the Bay Sewer District system; the rest of the town has individual wells. The town is served by NH Electric Cooperative powering 916 homes[3]. The Center Harbor Fire Department maintains nineteen dry hydrants around town.[4]

D. POPULATION, LAND USE, AND DEVELOPMENT TRENDS

According to the US Census, Center Harbor's population increased by 10% between 2000 and 2010. In the fifty years since 1970, the town's population has doubled; however, most of that growth occurred prior to 1990. While this may appear to be a fast rate of change, in that same forty years the population of many other small communities in Belknap County tripled in size.

Center Harbor, NH Year-Round Population[5]

Source	*Census*					*Estimate*	*Projection*		
Year	**1970**	**1980**	**1990**	**2000**	**2010**	**2019**	**2020**	**2030**	**2040**
Population	540	808	996	996	1,096	1,091	1,091	1,123	1,159
% Changed	---	50%	23%	0%	10%	-0.5%	0%	3%	3%

Like much of Belknap County, the average age of Center Harbor's population continues to increase, with those in town tending to be slightly older than those in the rest of the county. This aging demographic can have implications in terms of the needs of the community and the resources available to the community.

[3] https://ebill.nhec.com/maps/external/OutageWebMap/
[4] Center Harbor Water Resources Plan (2009) and map updated in 2011.
[5] Source: NH Office of Strategic Initiatives Data Center, https://www.nh.gov/osi/data-center/index.htm

Center Harbor, NH Average Age of Population, 1980-2016[6]

Year	1980	1990	2000	2010	2016
Center Harbor	31.7	37.5	41.4	49.9	51.5
Belknap County	32.1	35	40.1	44.7	47.6
New Hampshire	30.1	32.8	37.1	41.1	43

The 2010 Census reported that there were 795 housing units in Center Harbor and that 36% of them were seasonal units, higher than the 2000 rate of 32% as well as the 2010 county rate of 28%. Because of this very seasonal nature of housing in Center Harbor, it is important to acknowledge that the actual number of people residing in town can fluctuate quite a bit.

The town issued 15 permits for new structures from 2010 – 2017, That is six less than the number of permits issued from the previous five-year period. (21). According to the Committee none of the recent development has been in particularly vulnerable locations.

Traffic Volume Reports from the NH Department of Transportation indicate that the Average Annual Daily Traffic counts along selected state and local roads in terms of vehicles per day (vpd). The vast majority of traffic through Center Harbor flows along NH Route 25 from Moultonborough to Meredith (11,000 – 12,000 vpd), with lesser amounts along US Route 3/NH Route 25 (3,200 – 3,800 vpd) and NH Route 25B (2,500 – 3,000 vpd). As this is a projected average over the entire year, there are certainly many summer days when the volume of traffic on any one of these roads far exceeds these figures. The table on the next page indicates that all traffic counters have reported a decrease of vehicular activity from 2014 to 2018 with the exception of 25B which instead showed an increase.

Location ID	Location	2014	2015	2016	2017	2018
62077050	US 3/ NH 25 (DANIEL WEBSTER HWY) AT HOLDERNESS TL	3,800	3,884	3,997	3,287	3,336
62295051	NH 25 (WHITTIER HWY) AT CENTER HARBOR TL (SB-NB) (61295016-61295017)	12,192	12,460	10,899	11,106	11,273
82077011	US 3/ NH 25 (DANIEL WEBSTER HWY) AT MEREDITH TL	3,800	3,884	3,997	3,525	3,578
82077051	NH 25B (DANE RD) EAST OF KEEWAYDIN RD	2,500	2,555	2,629	2,942	2,986
82077054	WINONA RD AT NEW HAMPTON TL	720	736	757	669	679
82077055	WAUKEWAN RD AT NEW HAMPTON TL	460	470	484	438	445
82077056	HIGH HAITH RD AT SQUAM LAKE CHANNEL	130	133	137	100	102

CHAPTER III: RISK ASSESSMENT

A. INVENTORY ASSETS

The list of critical infrastructures for the town of Center Harbor was updated by the Committee and the values updated with 2019 values (Table 1). The critical infrastructure list is divided into five categories, 1) Essential Services; 2) Structures and Services; 3) Emergency Shelters; 4) Populations to Protect; and 5) Other. The first category contains facilities essential in a hazard event, including the Emergency Operation Center. The second is a list of facilities that have been identified by the Committee as facilities to protect in order to minimize additional risk to hazards. The third category contains the emergency shelters within the town. The fourth category contains special populations that may require additional attention in the event of a disaster. In Center Harbor the fifth category includes structures containing hazardous materials, the local source of supplies, and the historic village area. Note: Some structures serve multiple roles and are thus listed twice; the value of the structure is only listed once.

Table 1: Center Harbor: Critical Facilities & Values

Facility/Infrastructure	Location	Owner	Assessed Value (2019)	Capacity	Generator
Essential Services					
CH Police Department, Fire Department (EOC), and Municipal Building	36 Main St.	Town	$1.03 M^		Yes
CH Hwy Garage & (Emergency Fuel, Salt Shed)	68 Dane Rd.	Town	$352,210		Yes
Structures and Services					
Fairpoint Communications (automatic ESS)	51 Plymouth St.	Private	$180,720		
Hawkins Pond Dam	Hawkins Pond Rd.	State			
Mosquito Bridge	Town Line w/ New Hampton Waukewan Rd.	State			
Anchorage Bridge	Town Line w/ New Hampton Winona Rd.	State			
Hawkins Pond Bridge	Hawkins Pond Rd.	Town			
Dog Cove Bridge	Route 25B	State			
High Haith Bridge	High Haith Rd.	Town			
Winona Bridge	Winona Bridge near Snake River	State			
NH Route 25 and 25B (Evacuation)		State			
US Route 3 (Evacuation)		State			
Coe Hill Road (Evacuation)		Town			
Center Harbor Neck Road (Evacuation)		Town			
Winona Road (Evacuation)		State			
Waukewan Road (Evacuation)		State			

Facility/Infrastructure	Location	Owner	Assessed Value (2019)	Capacity	Generator
Potential Emergency Shelters					
CH Congregational Church	52 Main St.	Private	$604,000		No
Center Harbor Inn	294 Whittier Hwy	Private	$1.7 M		No
James E. Nichols Memorial Library (Cooling Center)	35 Plymouth Street	Town	$369,800		No
Special Populations					
CH Cong. Church - Day Care	52 Main St.	Private		<25 Children	
Island Population 5 residences	Various inhabited islands	Private			
Camp Eagle Cliff (June only)	Camp Rd	Private	$86,100		
Savoie's Motel	Daniel Webster Highway (US Rte. 3)	Private	$138,490		
Center Harbor Inn	NH Route 25	Private	$1.7 M		
Sutton House B&B	NH Route 25	Private	$455,480		
Other					
Heath's Hardware (Haz. Mat.)	318 Whittier Hwy	Private	$649,020		
United Rentals (Haz. Mat.)	163 D.W. Hwy	Private	$237,810		
Inter-lakes Automotive (Haz. Mat.)	34 D.W. Hwy	Private			
Independent Volkswagen (Haz. Mat.)	34 D.W. Hwy	Private	$315,200		
Paquette Signs (Haz. Mat.)	68 D.W. Hwy	Private	$320,260		
Waukewan Golf Course (Haz. Mat.)	168 Waukewan Rd	Private	$1,353,990		
Boat Storage/A Cut Above Landscaping (Haz. Mat.)	22 Bartlett Hill Rd.	Private	$56,340		
Winnipesaukee Flagship Corp. and Shop (Haz. Mat.)	30 Lake St.	Private	$233,970		
Senter's Market (Supplies)	12E Main St.	Private	$1,185,900		
Historic Center Harbor Village (all on the National Register of Historic Places)					
Bailey Park LLC	34 Plymouth Street	Private	$364,500	Mixed use w/ 10-12 residents	
James E. Nichols Library	35 Plymouth Street	Town	$369,800		
Fountain	Main St & Plymouth St.	Town	$300,000		
Coe House	18 Main Street	Private	$604,400		
The Lake House	12H Main Street	Private	$88,300		

B. ESTIMATING POTENTIAL LOSSES

The critical facilities identified in Section A have a total value of $14,764,763 based on the 2018 assessment, the updated value from the EMD and Selectmen of the Municipal Building Addition, and the bridge valuations from the head of the Highway Department. Municipal facilities represent $3,694,617 of this figure. This does not; however, include the contents of the buildings and does not necessarily reflect the cost of full replacement. While the value of the two municipal bridges are included, it does not reflect the value of built infrastructure such as streets, curbs, sidewalks, drainage, and utility transmission lines.

These values can also be used to determine potential loss estimates in the event that a natural or manmade hazard damages a part of or an entire facility. Many of the facilities listed here are privately owned but represent service that the Committee considered either to be essential in terms of mitigating vulnerability to hazards or vulnerable to some sort of hazard event.

Table 2: Center Harbor 2018 Structure Assessment

	Residential (Mobile/ Manufactured)	Residential (Other)	Commercial	Electric Utility	Exempt	Total
Number of Structures	24	747	38	2	17	828
Value - structures	$1,502,750	$140,728,575	$11,516,910	$2,129,130	$9,621,560	$165,498,925
1%	$15,028	$1,407,286	$115,169	$21,291	$96,215	$1,654,989
2%	$30,055	$2,814,572	$230,338	$42,582	$192,431	$3,309,979
5%	$75,138	$7,036,429	$575,846	$106,457	$481,078	$8,274,946
Average Value - structures	$62,614	$188,391	$303,076	$1,064,565	$565,974	$210,262

Table 2 shows that the 2018 assessed value of all the structures in Center Harbor is $165,498,925. There are 828 structures in town, the vast majority of which are residential (93%) and have a total value of $142,231,325. There are 57 structures in town that are identified as either commercial, electrical utility, or tax-exempt (including the structures such as churches, the Municipal Building, and DPW Garage) and they have a combined value of $23,697,600. Using these figures and acknowledging that there is wide variation on the value of individual structures throughout town, the average value of residential structures in Center Harbor is $188,391 and of commercial/utilities/exempt structures is $408,204. The overall average structural value is $210,262. The table above also illustrates the potential loss if a hazard event impacted even a small percentage (1%, 2% or 5%) of the structures in Center Harbor.

C. IDENTIFYING HAZARDS

The town of Center Harbor is prone to a variety of natural and man-made hazards. The Committee reviewed all of the hazards identified in the 2014 Plan. In that plan flood, severe wind, and hazardous materials in transport were viewed as high risk hazards. Lightning, thunderstorms, severe winter weather, drought, utility interruption and transportation accident were rated as moderate hazards.

The committee supplemented this by considering all of the hazards identified in the *State of New Hampshire Multi-Hazard Mitigation Plan (2018)*, developed by the New Hampshire Department of Safety's Division of Homeland Security and Emergency Management, for additional hazards that might affect the town. The matrix below provides a state-wide summary of the frequency and severity of these hazards.

New Hampshire Hazards Profile

Hazard	State Probability	State Severity	State Relative Threat	Belknap Co. Risk
Inland Flooding	**High**	**High**	**High**	**High**
Dam Failure	**High**	**High**	Moderate	Moderate
Drought	Low	Moderate	Low	Moderate
Wildfire	Moderate	Low	Low	Low
Earthquake	Moderate	Low	Moderate	Moderate
Landslide	**High**	Low	Low	Low
High Wind Event	**High**	**High**	Moderate	Moderate
Tropical & Post-Tropical Cyclone	Low	Low	Moderate	Moderate
Lightning	**High**	Low	Low	Moderate
Severe Winter Weather	**High**	**High**	Moderate	Moderate
Snow Avalanche	Moderate	Low	Low	Low
Epidemic	Moderate	Low	**High**	**High**
Fire and Hazardous Materials	Moderate	Low	Low	Low
Terrorism	Low	**High**	Low	Low

In the latest version of the *State of New Hampshire Multi-Hazard Mitigation Plan (2018),* some hazards were grouped together, some names were refined, a couple hazards were added, and a couple were dropped from the state-wide list. Tornado, downburst, and thunderstorm have been grouped as "High Wind Event". Hurricane is now referred to as "Tropical & Post-Tropical Cyclone".

The Committee also reviewed historical information from state-wide databases and internet sources about past hazard events in and near Center Harbor since 2014. Through this review of state-wide hazards, past regional and local events, and with discussion, the committee identified the hazards listed in Table 3 as the most important hazards to the town of Center Harbor. Landslide and avalanche are listed as part of the state-wide profile; however, the committee did not consider these as significant hazards for Center Harbor. Landslide and avalanche are not likely due to topography and no records were found of these occurring in town.

Table 3: Hazards of Concern: Center Harbor, NH

Hazard Event	Overall Risk	Hazard Event	Overall Risk
High Wind Events	High	Inland Flooding	Moderate
Severe Winter Weather	High	Lightning	Moderate
Tropical & Post Tropical Cyclones	High	Dam Failure	Moderate
Extreme Temperatures	High	Wildfire	Moderate
		Infectious Disease	Moderate

As a result of steps taken by the town of Center Harbor, several of the hazards that were identified as high-risk hazards in the 2014 plan are now viewed by the committee as moderate risk hazards.

Additionally, the Center Harbor HMP Committee reviewed human-caused and technological hazards because several of these are very important to the town. Hazardous materials, long-term utility outage, and transportation incidents were considered high risk hazards.

D. PROFILING HAZARD EVENTS

Each of the hazards that the Committee identified as likely affecting Center Harbor is profiled below. This section of the plan **defines** each of the hazards which the Committee felt might impact Center Harbor. It also describes the **extent** of the hazard, the recent **history** of these events, the likely **location** of each hazard, as well as the **probability** of an occurrence in Center Harbor. These are listed in order of overall risk, as determined by the HMP Committee.

A Summary of Hazard Risk is provided on p. 48. This Plan focuses on those events that pose at least a moderate risk to the town of Center Harbor as determined by the Committee.

The **extent** is a description of "how bad the hazard could get", considering three factors – magnitude, onset, and duration.

- *Magnitude* is size of the hazard, such as depth of floodwaters or wind speed.
- *Onset* is how quickly the hazard approaches. Depending on geography as well as the nature of the rainstorm, floodwaters might rise over a period of days, or it might take just a few hours to build up a concentrated flow.
- *Duration* is a matter of how long the hazard is present. A downburst or tornado exists for minutes or hours, while a hurricane or tropical depression is usually around for days.

Within the Risk Assessment completed for this plan, extent was measure on a scale ranging from Weak through Moderate, Severe, and Extreme based on magnitude and strength.

If a hazard event has occurred in the past that is listed under **history**, with a focus on those occurring since the last plan. If some parts of the community are more likely to be impacted by a particular hazard, either based on past events or local knowledge of geography, that is described under **location**.

Probability is a description of how likely it is that an event will occur in Center Harbor within the next 25 years. The committee rated potential hazards on a four-point scale descriptive scale including

unlikely, occasional, likely, to highly likely. These were based mainly on past occurrences in the town, region, and state.

The **impact** of a hazard is the potential degree of damage that could occur in Center Harbor. To rate the impact of a hazard, committee members considered the damages and consequences that might result from an event, in three separate areas Human, Property, and Business & Services. This incorporates the likelihood of injury or death, the assessed value of each critical facility and the vulnerability of these facilities. It also anticipated disruption of services to residents and visitors. Four levels of impact were used, as defined below:

- Low: Limited structural damage, the town's ability to respond is not compromised, residents can handle the hazard event without help from outside sources
- Moderate: Some structural damage, the town's ability to respond is compromised, regional or county assistance is needed to survive and/or recover
- High: Substantial structural damage, the town's ability to respond is greatly compromised, state or federal assistance is necessary to survive and/or recover
- Catastrophic: Multiple injuries or deaths will likely result from this hazard. Damage to properties will be widespread and extensive. Essential services and other services that residents and visitors depend upon be likely be interrupted for days or weeks

A list of earlier hazard events is included in Appendix E. For additional information on these hazards, please see Appendix G.

Natural Hazards

Center Harbor 2021 Natural Hazards	Total	Risk
High Wind Events (Tornado/Downburst)	24.00	High
Severe Winter Weather	24.00	High
Tropical & Post-Tropical Cyclones	16.00	High
Extreme Temps	12.00	High
Inland Flooding	10.00	Medium
Lightning	10.00	Medium
Dam Failure	9.33	Medium
Wildfires	9.33	Medium
Infectious Diseases	6.67	Medium
Earthquake	3.33	Low
Solar Storms & Space Weather	3.33	Low
Drought	2.67	Low
Avalanche	1.00	Low
Landslides	1.00	Low

HIGH WIND EVENT (THUNDERSTORM/TORNADO/DOWNBURST)

Center Harbor is likely to experience either of two types of high wind events that usually result from other severe storms and can occur at any time of the year: tornados and straight-line winds. A **tornado** is a narrow, violently rotating column of air that extends from the base of a thunderstorm to the ground. 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.[7] **Straight-line winds** 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, including **downdraft**, which is a small-scale column of air that rapidly sinks towards the ground; and **downburst**, which is the 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.[8]

Image source: NH HSEM

Extent: Severe

Tornadoes are violent rotating storms that extend to the ground with winds that can reach 300 miles per hour. They are produced from thunderstorms and can uproot trees and buildings. According to the National Oceanic and Atmospheric Administration (NOAA) a downburst is a strong downdraft, rotational in nature, which causes damaging winds on or near the ground. Winds can exceed 130 mph.[9]

The Enhanced Fujita Scale is used to categorize tornados based on a combination of wind speed and the type of damage that is observed.

Operational Enhanced Fujita (EF) Scale

Enhanced Fujita Scale						
EF Number	**0**	**1**	**2**	**3**	**4**	**5**
3-Second Gust (mph)	**65-85**	**86-110**	**111-135**	**136-165**	**166-200**	**Over 200**
Damage Indicator		**Small barns, Farm Outbuildings**	**One-or two-family residences**	**Single-Wide Mobile Home**	**Double-Wide Mobile Homes**	**Apt, Condo, Townhouse (3 Stories or less)**

In Center Harbor, the major damage from downbursts or tornados would come from falling limbs and trees, which may take down power lines, block roads, or damage structures and vehicles. The most recent damaging tornado to touch down in New Hampshire was on July 24th, 2008 rendering around 100 homes "uninhabitable" and killing one person. This event traveled from Epsom to

[7] http://www.nssl.noaa.gov/education/svrwx101/tornadoes/
[8] http://ww.nssl.noaa.gov/education/svrwx101/wind/types
[9] *Weather Glossary*. National Oceanic and Atmospheric Administration, http://www.weather.gov/glossary/index.php?letter=d, visited August 6, 2019.

Effingham just missing Center Harbor by around 20 miles. Since 2014 there have been 13 different reported high wind events in Center Harbor and the communities near Center Harbor. One of those being a waterspout that touched down right off the shores of Center Harbor on July 24, 2014 (See Appendix G for more details). The extent of high wind events in Center Harbor are considered severe.

History of High Wind Events

Hazard	Date	Location	Magnitude	Description
High Wind	7/3/2014	BELKNAP – NEW HAMPTON	50 kts.	Thunderstorm Wind
Tornado	7/4/2014	BELKNAP - Gilford	EF0	Waterspout spotted on Lake Winnipesaukee – No damage
Tornado	7/24/2014	BELKNAP - CENTER HARBOR	EF0	Waterspout spotted on Lake Winnipesaukee – No damage
High Wind	7/28/2014	BELKNAP - LACONIA	50 kts.	Thunderstorm Wind
High Wind	10/08/2014	BELKNAP – MEREDITH	50 kts.	Thunderstorm Wind
High Wind	6/7/2016	BELKNAP – LACONIA AIRPORT	50 kts.	Thunderstorm Wind
High Wind	6/7/2016	BELKNAP – WEIRS BEACH	50 kts.	Thunderstorm Wind
High Wind	7/1/2016	BELKNAP – MEREDITH	50 kts.	Thunderstorm Wind
High Wind	7/23/2016	BELKNAP – LACONIA, SANBORNTON	50 kts.	Thunderstorm Wind
High Wind	10/30/2017	Belknap	61 kts.	50-60 mph winds/ 2 to 5 inches of rain
High Wind	8/3/2018	BELKNAP – Tilton, Belmont, Gilmanton	50-70 kts.	Thunderstorm Wind
High Wind	8/7/2018	BELKNAP – LACONIA AIRPORT, MEREDITH	50-60 kts.	Thunderstorm Wind
High Wind	6/6/2020	Sanbornton, Tilton, Laconia	50 kts.	Thunderstorm Wind, Downed trees led to home damages ($105K)

Since the last plan, there have not been documented instances of high wind events causing significant damage in Center Harbor.

Location: While thunderstorms can be localized, they often hit the whole town. On average, six tornadoes touch down somewhere in New England each year. There is no way of knowing where or when the next damaging tornado will strike as they are among the most unpredictable weather phenomena. Downbursts are 10 times more likely to occur than tornadoes. All areas of town are susceptible to damage from high winds; however, it was pointed out that the winds along Center Harbor Neck and High Haith Roads can be particularly strong as the wind get funneled between hills.

From Tropical Storm Irene - September 2011 (Tuftonboro)

Probability of Occurrence: Likely

Impact: High

Tornados and downbursts could strike anywhere in town with little, if any warning. While individual events may be small and rare, their impacts could be devastating. All structures, especially older ones, which are not necessarily built to the current building code standards, could be at risk.

Damage can occur to most structures in town as a result of downed trees in any high wind event, including the commonly occurring thunderstorms. These winds can bring down limbs and trees, causing damage to structures as well as pulling down power and telephone lines and blocking roads. This is particularly the case along private roadways that may only get limited cutback of vegetation. Trees and wires down across evacuation routes could slow evacuation efforts and draw limited emergency response personnel away from other safety efforts. The **potential impact** to the town due to high winds is high.

All structures in Center Harbor are susceptible to damage by high wind events, whether through thunderstorms, downburst, or tornado. Assuming 2% to 5% town-wide damage to buildings, high winds could result in $3,309,979 to $8,274,946 in damages in Center Harbor in any given year.

SEVERE WINTER WEATHER (SNOWSTORMS, ICE STORMS)

Center Harbor experiences four types of severe winter weather: heavy snow, blizzards, nor'easters, and ice storms.

Extent: Severe

A heavy snowstorm can be defined as one which deposits four or more inches of snow in a twelve-hour period.[10] Snowstorms are a common occurrence throughout the Lakes Region. Blizzards, which may dump 12" – 36" or more of snow in a one- to three-day period are less frequent, but can have a serious impact on structures, utilities, and services. The region typically receives greater than 66" of snow annually.[11]

Records indicate that Center Harbor's average snowfall on any day from November through April is less than one inch. These records also show that most days from late December through February snowfalls of 10 inches or more have been seen and that during the month of February daily snowfalls of more than 15" have occurred several times since 1948. [12]

An ice storm coats trees, power lines, streets, vehicles, and roofs with a very slick and heavy coating of ice. In the winter of 1998, a major ice storm crippled much of New Hampshire, coating everything with as much as three inches of ice. The U.S. Army Corps of Engineers, Cold Regions Research and Engineering Laboratory estimates a 40 – 90 year return period for an event with a uniform ice

[10] http://www.nh.gov/safety/divisions/hsem/NaturalHazards/index.html,
[11] *Northeast States Emergency Consortium,* http://www.nesec.org/,
[12] Weather Underground, Seasonal Weather Averages, http://www.wunderground.com/NORMS/DisplayNORMS.asp?AirportCode=KLCI&SafeCityName=KLCI&StateCode=NH&Units=none,

thickness of between 0.75 and 1.25 inches. In 2008, just ten years later, however, New Hampshire was struck again by another severe ice storm.

New Hampshire generally experiences at least one or two nor'easters each year with varying degrees of severity. A nor'easter is defined as a large anticyclone weather system that resides near the New England region. These storms have the potential to inflict more damage than many hurricanes because high winds can last from twelve hours to three days, while the duration of hurricanes ranges from six to twelve hours. A nor'easter also has the potential to sustain hurricane force winds, produce torrential rain, and create blizzard conditions in winter months.

In the winter months, the state may experience the additional coincidence of blizzard conditions with many of these events. A blizzard is characterized by sustained winds or frequent gusts to 35 miles per hour or greater and considerable amounts of falling or blowing snow that last for a duration of three hours or longer. The combination of winds and snow reduce visibility to less than a quarter mile.[13]

History of Severe Winter Weather Events

			EXTENT	IMPACT
Hazard	**Date**	**Location**	**Magnitude**	**Description**
Heavy Snow	1/2/2014	County Wide	6 to 14 inches	
Heavy Snow	2/5/2014	County Wide	6 to 12 inches	
Heavy Snow	2/13/2014	County Wide	6 to 14 inches	
Heavy Snow	2/18/2014	County Wide	6 to 14 inches	
Heavy Snow	3/19/2014	County Wide	6 to 18 inches	
Winter Storm	11/27/2014	State Wide	4 to 15 inches (10 to 15 in Belknap County)	
Heavy Snow	1/26/2015	County Wide	6 to 14 inches	
Heavy Snow	2/2/2015	County Wide	8 to 14 inches	
Heavy Snow	2/7/2015	County Wide	6 to 15 inches	
Heavy Snow	2/14/2015	County Wide	6 to 12 inches	
Heavy Snow	2/5/2016	County Wide	4 to 10 inches	
Heavy Snow	12/11/2016	County Wide	4 to 8 inches	
Heavy Snow	12/17/2016	County Wide	4 to 7 inches	
Heavy Snow	12/29/2016	County Wide	6 to 16 inches	
Heavy Snow	2/9/2017	County Wide	6 to 15 inches	
Heavy Snow	2/12/2017	County Wide	6 to 16 inches	
Heavy Snow	2/15/2017	County Wide	4 to 12 inches	
Heavy Snow	3/14/2017	County Wide	12 to 20 inches	Laconia officially observed at least three hours of blizzard conditions. (DR-4316)
Heavy Snow	3/31/2017	County Wide	6 to 12 inches	
Heavy Snow	4/1/2017	County Wide	6 to 12 inches	
Heavy Snow	12/22/2017	County Wide	3 to 10 inches	
Heavy Snow	1/4/2018	County Wide	10 to 15 inches	
Heavy Snow	2/7/2018	County Wide	6 to 10 inches	

[13] "Winter storm terms," http://www.fema.gov/hazard/winter/wi_terms.shtm,

			EXTENT	IMPACT
Hazard	Date	Location	Magnitude	Description
Heavy Snow	2/17/2018	County Wide	2 to 9 inches	
Heavy Snow	3/7/2018	County Wide	10 to 18 inches	
Heavy Snow	3/13/2018	County Wide	12 to 24 inches	
Heavy Snow	11/20/2018	County Wide	6 to 10 inches	
Heavy Snow	1/19/2019	County Wide	6 to 10 inches	
Heavy Snow	1/29/2019	County Wide	5 to 7 inches	
Heavy Snow	12/1/2019	State Wide	5 to 12 inches	
Winter Storm	12/29/2019	State Wide	6 to 10 inches	
Heavy Snow	1/16/20	County Wide	5 to 7 inches	Heavy wet snow
Winter Storm	3/23/20	State Wide	5 to 7 inches	
Winter Weather	5/9/2020	County Wide	1 to 3 inches	Wet snow

The storm on March 14, 2017 did hit Center Harbor particularly hard. The Fire Department responded to numerous trees and wires down all over town. On Center Harbor Neck Road many trees came down with one person trapped between trees and a section of the road closed for several hours while awaiting power crews to remove downed wires. There were also a few large trees blown over in the Morse Cemetery (NH Rte. 25B which were finally removed some months later by utilizing a large crane set up outside the cemetery wall with reimbursement of $11,766. On Follett Road one tree fell into a house.

Location: Severe winter weather occurs frequently in the northeast and the possibility exists for residents to have to withstand several days without power. It is felt that no one area of the town is at greater risk than another, but there are segments of the population that are more at risk. These include the elderly, people that are in need of regular medical care, and young children. These weather events can vary greatly based on slight differences in temperature, humidity, and elevation. Some events will produce a combination of winter weather types. Snow and Ice Storms can affect the entire town.

Probability of Occurrence: Highly Likely

Impact: Moderate
A couple of scales have been adopted recently by NOAA for comparing snowstorms that incorporate the number of inches of snow that accumulate, the area of the storm, and the number of people that could be impacted by the storm. The Northeast Snowfall Impact Scale (NESIS)[14] applies specifically to the northeastern United States. It groups high-impact snowstorms into five categories.

[14] https://www.ncdc.noaa.gov/snow-and-ice/rsi/nesis

CATEGORY	NESIS VALUE	DESCRIPTION
1	1—2.499	Notable
2	2.5—3.99	Significant
3	4—5.99	Major
4	6—9.99	Crippling
5	10.0+	Extreme

Major roads, Essential Services, and flat-roofed buildings are all likely to be impacted by winter storms. While the town is accustomed to seasonal heavy snowfall, any particularly severe event with significant accumulations, especially combined with severe cold can be a burden. These events often lead to ice accumulation, and power loss, significantly increasing the vulnerability of populations and facilities.

Heavy snows can cause damage to property, disrupt services, and make for unsafe travel, even for emergency responders. Due to poor road conditions, residents may be stranded for several days. Extra pressure is placed on road crews and emergency services under these conditions.

The major threats to a community due to ice storms include structural damage due to heavy loads on roofs, interruptions of services such as electricity, fuel, water, and communications, as well as hazardous road conditions. Downed limbs and wires and unplowed or untreated roads can severely limit emergency access to many residences.

Snow load in severe winter storms is of concern as well. This is particularly true for flat roofed structures. Several small storms can produce the same snow load as a single larger storm and the combined weight of the snow load can damage rooftops. Ice adds additional weight as well. It is not uncommon in New Hampshire to experience mixes of winter precipitation as temperatures fluctuate above and below the freezing mark. While not widespread, instances of collapsed roofs are not uncommon.

The 1998 ice storm was the costliest FEMA/Presidential Declared disaster in New Hampshire's history. The ice load bent trees and power lines and led to massive power outages throughout the state. The December 2008 ice storm surpassed the 1998 storm, in terms of state-wide damages. The President declared this storm as a major disaster and the state received $15 million in federal aid for recovery.[15]

Many of the roads in Center Harbor are state roads, including most of the town's evacuation routes; maintenance of them falls to NH DOT. While the town has a limited amount of roadway to maintain, ensuring that these roads are passable is often a critical task for the small DPW crew. The precipitation from some storms, especially multi-day nor'easters, can outpace the capacity of the

[15] http://www.fema.gov/news/newsrelease.fema?id=48384, visited January 25, 2011

equipment/staff of this crew. Town facilities are not particularly at risk to Severe Winter Weather. The potential for **impact** to the town is moderate.

All structures in Center Harbor are susceptible to damage by winter weather events, whether through ice storms, blizzards, or the heavy, wet snow often associated with a nor'easter. Assuming 1% to 2% town-wide damage to buildings, winter weather could result in $1,654,989 to $3,309,979 in damages in any given year.

TROPICAL & POST-TROPICAL CYCLONES

Tropical and Post-Tropical cyclones are large storms with winds rotating in a counterclockwise manner. Tropical depressions and hurricanes form over the Atlantic Ocean and often come ashore in the southeastern United States, frequently moving up the Eastern Seaboard. Occasionally such storms come ashore along the northeast coast. Sustained high winds and heavy rains for 12 – 36 hours are characteristic of tropical depressions and hurricanes. There are many stages throughout the life cycle of a tropical cyclone.

- Potential Tropical Cyclone: Describes a disturbance that is not yet a tropical cyclone, however, poses the threat of becoming one
- Tropical Disturbance: A cluster of showers and thunderstorms that flares up over the tropics. Usually 100-300 miles in diameter and generally move westward.
- Tropical Storm: Sustained wind levels are between 34 knots and 64 knots (39 to 74 MPH)
- Hurricane: Once a tropical cyclone sustains wind levels between 64 and 96 knots (74 to 111 MPH)
- Major Hurricane: A tropical cyclone with maximum sustained winds of 96 knots (111 MPH) and higher. Major hurricanes are classified as category 3 or higher.
- Post-tropical Cyclone: A former tropical cyclone, this term is used to describe a cyclone that no longer possess the sufficient tropical characteristics to be considered a tropical cyclone. These post-tropical cyclones often undergo an extratropical transition and form frontal boundaries. Post-tropical cyclones can continue carrying heavy rains and high winds and cause storm surge.

Extent: Severe

Hurricanes are severe tropical storms that have winds at least 74 miles per hour. In the Lakes Region they could produce heavy rain and strong winds that could cause flooding or damage buildings, trees, power lines, and cars.[16] Hurricanes are measured by the Saffir-Simpson Hurricane Scale: a 1-5 rating based on a hurricane's intensity using wind speed as the determining factor (see table below). The scale is used to give an estimate of the potential property damage and flooding expected from a hurricane landfall.

Saffir-Simpson Hurricane Scale

Category	Characteristics

[16] http://www.fema.gov/hazard/hurricane/hu_about.shtm, visited January 25, 2011.

Category	Characteristics
1	Winds 74-95 mph (64-82 kts or 119-153 km/hr). Storm surge generally 4-5 ft above normal. No real damage to building structures. Damage primarily to unanchored mobile homes, shrubbery, and trees. Some damage to poorly constructed signs. Also, some coastal road flooding and minor pier damage.
2	Winds 96-110 mph (83-95 kts or 154-177 km/hr). Storm surge generally 6-8 feet above normal. Some roofing material, door, and window damage of buildings. Considerable damage to shrubbery and trees with some trees blown down. Considerable damage to mobile homes, poorly constructed signs, and piers. Coastal and low-lying escape routes flood 2-4 hours before arrival of the hurricane center. Small craft in unprotected anchorages break moorings.
3	Winds 111-129 mph (96-113 kts or 178-209 km/hr). Storm surge generally 9-12 ft above normal. Some structural damage to small residences and utility buildings with a minor amount of curtainwall failures. Damage to shrubbery and trees with foliage blown off trees and large trees blown down. Mobile homes and poorly constructed signs are destroyed. Low-lying escape routes are cut by rising water 3-5 hours before arrival of the center of the hurricane. Flooding near the coast destroys smaller structures with larger structures damaged by battering from floating debris. Terrain continuously lower than 5 ft above mean sea level may be flooded inland 8 miles (13 km) or more. Evacuation of low-lying residences with several blocks of the shoreline may be required.
4	Winds 130-156 mph (114-135 kts or 210-249 km/hr). Storm surge generally 13-18 ft above normal. More extensive curtainwall failures with some complete roof structure failures on small residences. Shrubs, trees, and all signs are blown down. Complete destruction of mobile homes. Extensive damage to doors and windows. Low-lying escape routes may be cut by rising water 3-5 hours before arrival of the center of the hurricane. Major damage to lower floors of structures near the shore. Terrain lower than 10 ft above sea level may be flooded requiring massive evacuation of residential areas as far inland as 6 miles (10 km).
5	Winds greater than 156 mph (135 kts or 249 km/hr). Storm surge generally greater than 18 ft above normal. Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. All shrubs, trees, and signs blown down. Complete destruction of mobile homes. Severe and extensive window and door damage. Low-lying escape routes are cut by rising water 3-5 hours before arrival of the center of the hurricane. Major damage to lower floors of all structures located less than 15 ft above sea level and within 500 yards of the shoreline. Massive evacuation of residential areas on low ground within 5-10 miles (8-16 km) of the shoreline may be required.

Source: http://www.nhc.noaa.gov/aboutsshs.shtml

According to NOAA, while 2010 was one of the busiest hurricane seasons on record, 2013 was one of the least active hurricane seasons. New Hampshire has not experienced a severe hurricane directly since 1938.

On September 21, 1938, a Category 3 hurricane claimed 13 lives in New Hampshire and many more throughout New England. Official records at the Weather Bureau in Concord show sustained winds of 56 miles per hour, but around the state, gusts around 100 miles per hour were reported, mostly due to topographical acceleration. The Merrimack River rose nearly 11 feet above its flood stage, *The Hanover Gazette* reported that in New Hampshire, 60,000 people were homeless, and many areas were without power. Damages were estimated at $22 million.[17] Hurricane Bob, a category 2 storm, in 1991, was declared a major federal disaster in New Hampshire and is recorded as a severe storm in the state's history.

History: In the past five years no hurricanes have hit the region. By the time that a hurricane reaches central New Hampshire, it is rare that it is retains the characteristics of a hurricane. Wind speeds usually dissipate but they can still bring a great deal of rainfall to the region. That was the case with the

[17] http://www.nh.gov/safety/divisions/hsem/NaturalHazards/index.html, visited January 25, 2011.

remnants of Hurricanes Irene and Sandy, which hit the area in 2011 and 2012 as tropical depressions. The town has not experienced a tropical or post-tropical cyclone since 2014.

Location: A cyclone could affect all areas of Center Harbor. Stream crossings, floodplains, and steep slopes are most likely to be impacted. High Haith and Center Harbor Neck Roads are susceptible to high winds.

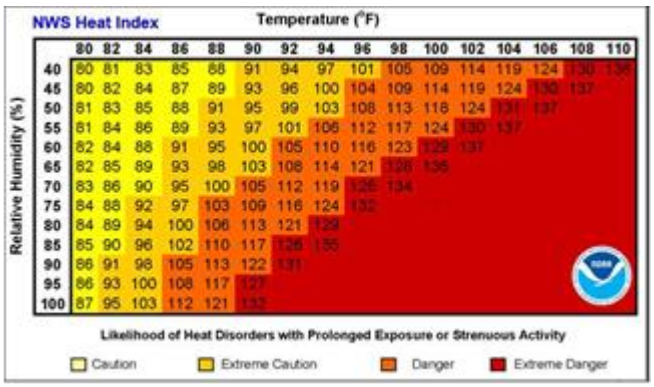
Probability of Occurrence: Occasional
Impact: High
Hurricanes in the Lakes Region could produce heavy rain and strong winds that could lead to flooding and damage to property and infrastructure. Tropical and post-tropical cyclones can cause the same damage that high wind events cause, with the added hazard of possible flooding.

All structures in Center Harbor are susceptible to damage by cyclonic events, whether through tropical depression or hurricane. Assuming 2% to 5% town-wide damage to buildings, high winds could result in $3,309,979 to $8,274,946 in damages in Center Harbor in any given year.

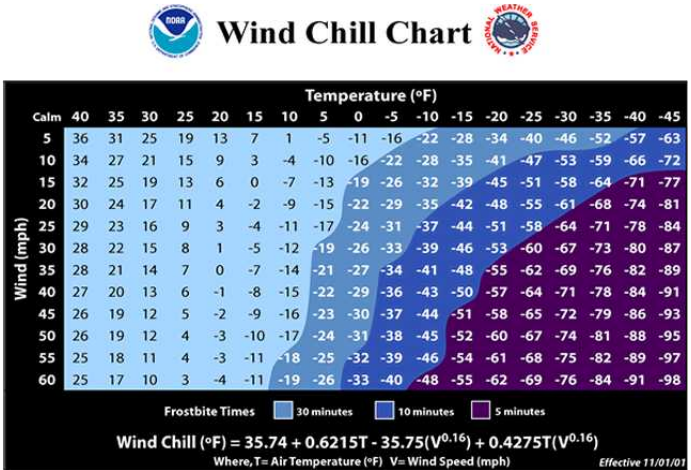
EXTREME TEMPERATURES

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

Extreme Heat events occur as a result of above normal temperatures, which often coincide with high relative humidity, that increase the likelihood of heat disorders with prolonged exposure or strenuous activity. Heat related disorders include heat cramps, heat exhaustion, and heat stroke. High heat and humidity can also adversely affect air quality, leading to respiratory problems. Extreme heat can also damage or kill crops and animals (wild, farm, or domesticated), potentially presenting a risk to the economy.



Extreme Cold events are caused by the southern transport of arctic airmasses into the Northeast. This effect is exacerbated when there are winds present that effectively lower the temperature that is perceived by the human body, known as the wind chill. The risk comes from when the body is losing heat faster than it can produce it. Wind acts to carry heat away from the body, therefore amplifying the perceived temperature by the human body and reducing the body's core temperature. Cold disorders can include frostbite and hypothermia.



Frostbite occurs when uncovered skin/extremities are exposed to extreme cold and the body tissue is either injured or killed. Hypothermia is when the body is unable to heat itself at the rate it is being cooled and the body's core temperature begins to drop below normal values. A normal core body

temperature is 98.6°F: mild hypothermia occurs when core body temperature drops between 90-95°F and severe hypothermia occurs at core body temperatures of below 90°F. If left untreated, hypothermia can result in unconsciousness and eventually death. Extreme cold can also damage or kill crops and animals (wild, farm, or domesticated), potentially presenting a risk to the economy.

Extent: Moderate

- Heat Advisory—Two or more consecutive hours of Heat Index values of 95-99 °F for two or more days *OR* any duration of Heat Index values of 100-104 °F. 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 °F 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.
- 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 is 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 is wind chill values are expected to be -30°F and winds are greater than 5 mph.[18]

History:

Event Date	Event Description	Impacts	Location	Additional Information
July 1911	Heat Wave	Record high temperatures set in Concord, New Hampshire	Statewide	Extreme heat was recorded from July 3rd through July 5th, with high temperatures ranging from 101-102°F in Concord on these days.[116] These three days account for three of the top 10 hottest days on record for Concord, New Hampshire.
March 2012	Heat Wave	Record high temperatures set in Concord, New Hampshire	Statewide	High temperature records in Concord, New Hampshire were broken for 5 consecutive days, with the hottest day being 84°F.
September 2017	Heat Wave	High temperature records set across New Hampshire	Statewide	Mount Washington set record a daily high temperatures for four consecutive days. Manchester, Concord, and other areas across the State and New England also saw daily temperature records broken.[117]
December 2017	Cold Wave	Record low temperatures set across New Hampshire	Statewide	Record low temperatures were set across the State as a result of a cold wave. Portsmouth saw a low of -1°F and Mount Washington saw a low of -33°F (with a wind chill of -51°). Wind Chill Advisories were posted in central and southern New Hampshire, and Wind Chill Warnings were posted for northern New Hampshire.
February 2018	One Day Winter Heat Wave	High temperature records set across New Hampshire	Statewide	Exceptionally strong high pressure ridge in place across the Eastern Seaboard. Record high temperatures were broken across the State.[118]

[18] Adapted from *State of NH Multi-Hazard Mitigation Plan Update 2018* https://prd.blogs.nh.gov/dos/hsem/wp-content/uploads/2015/11/State-of-New-Hampshire-Multi-Hazard-Mitigation-Plan-Update-2018_FINAL.pdf.

Center Harbor has experienced regular extreme hot and cold temperatures annually since the last plan update but nothing out of the normal range.

Location:
Extreme temperatures can occur anywhere throughout the town of Center Harbor.

Probability of Occurrence: Likely

Impact: Moderate
Heat related disorders include heat cramps, heat exhaustion, and heat stroke. Extreme heat can also damage or kill crops and animals (wild, farm, or domesticated), potentially presenting a risk to the economy. Frostbite occurs when uncovered skin and extremities are exposed to extreme cold and body tissue is either injured or killed. Hypothermia occurs when the body is unable to heat itself at the rate it is being cooled and the body's core temperature begins to drop below normal values. A normal core body temperature is 98.6°F. Mild hypothermia occurs when core body temperature drops between 90 and 95° F, and severe hypothermia occurs at core body temperatures of below 90° F. If left untreated, hypothermia can result in unconsciousness and eventually death. Extreme cold can also damage or kill crops and animals (wild, farm, or domesticated), potentially presenting a risk to the economy. Committee members expressed particular concern for vulnerable populations, including the elderly. It was noted that residents tend not to take advantage of warming and cooling shelters, preferring to "take care of things themselves".

While most of the impact from extreme temperatures is to people and animals, there can also be structural impacts, especially from freezing and expansion of water in pipes and the resulting damages. Assuming 1% to 2% town-wide damage to buildings, winter weather could result in $1,654,989 to $3,309,979 in damages in any given year.

INLAND FLOODING

Flooding is defined as a temporary overflow of water onto lands that are not normally covered by water. It results from the overflow of rivers and tributaries or inadequate drainage. Flooding is rarely associated with lakeshore properties, especially if there are appropriate setbacks and Center Harbor does not have a major river which might flood. The town does; however, have a number of streams which can flood quickly, impacting property.

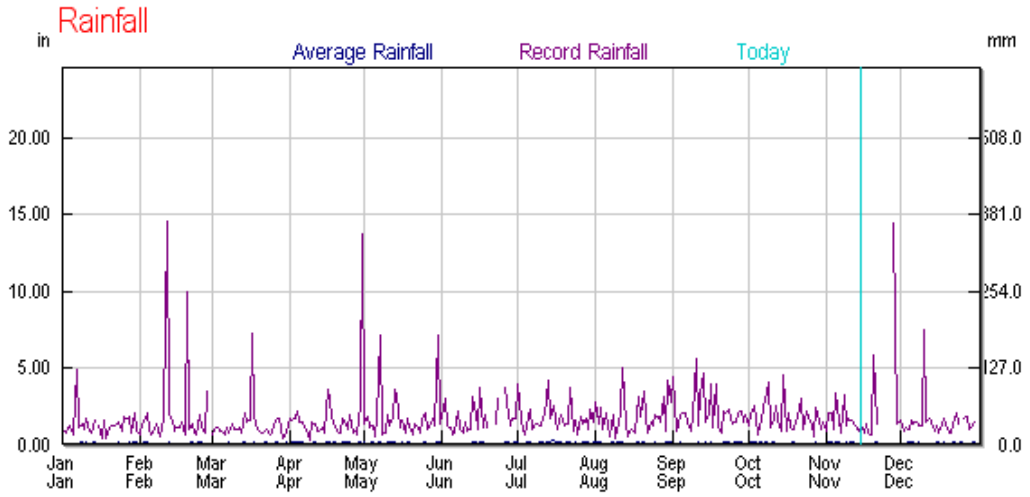
Flooding is most commonly associated with structures and properties located within the 1% annual (or 100-year) floodplain. Areas in this floodplain have been identified as having a one percent chance of flooding any given year. This means that flooding in this area is projected to have an average recurrence interval of 100-years; however, that does not mean that a flood in this area will only occur once every hundred years. Center Harbor does not yet have floodplain maps.

Extent: Moderate
The Center Harbor Natural Resource Inventory (NRI) found a total of 14 perennial streams (filled every year) with an additional 30 intermittent stream systems that feed into those perennial streams, both totaling to around 31.16 miles.

There are no US Geological Survey (USGS) stream gauges in Center Harbor or any of the waterbodies entering the town. The nearest gauge is in Tilton on the Winnipesaukee River, the outlet to Lake Winnipesaukee[19]

Thunderstorms can pop up quickly, dropping sudden bursts of rainfall upon the landscape. Often the rain soaks into the soil but if it happens very quickly, the water will run off into streams. Where drainage is inadequate, this sort of flooding can be amplified because the water has nowhere to go and backs up or overflows. Rainfall from tropical depressions or hurricanes can overwhelm the drainage systems due to the duration of the event, saturating the soil over a period of several days. The graph below of WeatherUnderground.com records stretching back to 1948 show that while the rainfall in Center Harbor averages less than half an inch per day, daily totals of five inches or more have been documented on nearly twenty separate dates and more than ten inches of rain on three separate dates.

Average and Record Daily Rainfall for Center Harbor, NH[20] Table 8:



History of Flooding Events

			EXTENT	IMPACT		
Hazard	**Date**	**Location**	**Magnitude/ Description**	**Damage**	**Notes**	**Source**
Flash Flood	6/30/2013	BELKNAP - LAKEPORT	1 to 3 inches in less than three hours			NOAA
Flash Flood	6/19/2017	BELKNAP – LACONIA & GILFORD	2 to 3 inches in three hours	$45 K		NOAA
Severe Storm & Flooding	10/29 – 11/1/2017	Belknap, Carroll, Coos, Grafton, & Sullivan Co.	Uprooted trees and heavy rains downed power lines leading to roughly 290K power outages		Presidentially Declared Disaster DR-4355	NH HSEM

There were no known instances of flooding with impact to Center Harbor since the last plan update.

[19] USGS https://waterwatch.usgs.gov/?m=real&r=nh.
[20] Weather Underground, Seasonal Weather Averages, http://www.wunderground.com/NORMS/DisplayNORMS.asp?AirportCode=KLCI&SafeCityName=KLCI&StateCode=NH&Units=none,

Location: There are two major road segments that flood in heavy rainstorms, Coe Hill Road and NH Route 25 in the village area. There are also a couple of areas that experience minor flooding due to beaver dams around Route 25B.

Probability of Occurrence: Likely
Brief thunderstorms occur frequently throughout the summer while a hurricane or tropical depression might occur once a year with several days of rain.

Impact: Moderate
FEMA has not produced a digital rendering flood map making the determination of floodplains in Center Harbor difficult. FEMA has not prepared a Flood Insurance Study in Center Harbor. According to the State Floodplain manager, FEMA mapping efforts are underway that will provide coverage for Center Harbor, but these will not be completed for several more years.

According to Center Harbor's Flood Management Ordinance 13.3, "The building inspector shall review all building permit applications for new construction or substantial improvements to determine whether proposed building sites will be reasonably safe from flooding." The town of Center Harbor has participated in the Emergency Program of the National Flood Insurance Program (NFIP) through the administration of its Flood Management Ordinance since 2007. Due to the town's participation in the NFIP, all residents are able to purchase flood insurance through the FEMA program. However, since the town is in the Emergency Program, residents can only obtain a limited amount of flood insurance.[21]

There are currently two buildings with a flood insurance policy in force (insurance value $90,000). Both are single-family homes. The data from the New Hampshire Office of Strategic Initiatives does not show which flood zones (A, B, C, or X) these insured buildings were located in. As there are no flood hazard maps for Center Harbor and therefore no flood hazard areas identified, it is difficult to state the number of structures at risk to flooding. Since 2007 there has been one loss paid out for $17,938. There have been no repetitive losses in Center Harbor since 2014. [22] Since the last Hazard Mitigation Plan, one policy had been added, valued at $45,000. There has not been an insurance pay out since this addition.

The greatest impact from flooding is associated with erosion and washouts on roads, especially those in steeply sloping areas or where drainage systems are inadequate. In 2019 the town had a culvert and Closed Drainage System Inventory conducted. Along Coe Hill Road there is poor drainage and the impact is to the road infrastructure. In the village area, the main stem drainage pipe needs enlargement as it collects stormwater from its branches; the impact is washout on major roads and sedimentation into Lake Winnipesaukee.

Assuming a total of 1%- 2% chance of damage to these bridges, flooding could result in $24,270 - $48,539 in damage to these bridges any given year. Damages to other structures might be as high as $1,654,989 - $3,309,979.

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[21] NH Floodplain Management Program Coordinator, NH Office of Strategic Initiatives, December 2019
[22] NFIP State Coordinator, NH Office of Strategic Initiatives, July 2019.

LIGHTNING

Lightning is a giant spark of electricity that occurs within the atmosphere, or between the atmosphere and the ground. As lightning passes through the air, it heats the air to a temperature of about 50,000 degrees Fahrenheit, considerably hotter than the surface of the Sun. During a lightning discharge, the sudden heating of the air causes it to expand rapidly, resulting in thunder.[23]

Extent: Moderate

All thunderstorms have the potential to create lightning, which can cause death, injury, and property damage and have great potential to cause damage to electronic equipment as well as structure and wildfires. Although the numbers have trended downward in recent decades, during the last half of the twentieth century more people were killed in the United States each year by lightning than by any other weather event. It can also wreak havoc with electrical and communications systems.

The National Weather Service does utilize a six-point scale for characterizing lightning activity called the Lightning Activity Level (LAL) based on frequency of ground strikes along with rainfall and ground conditions.[24]

Lightning Activity Level (LAL)	
LAL 1	No thunderstorms
LAL 2	Isolated thunderstorms. Light rain will occasionally reach the ground. Lightning is very infrequent, 1 to 5 cloud to ground strikes in a five-minute period.
LAL 3	Widely scattered thunderstorms. Light to moderate rain will reach the ground. Lightning is infrequent, 6 to 10 cloud to ground strikes in a 5-minute period.
LAL 4	Scattered thunderstorms. Moderate rain is commonly produced Lightning is frequent, 11 to 15 cloud to ground strikes in a 5-minute period.
LAL 5	Numerous thunderstorms. Rainfall is moderate to heavy. Lightning is frequent and intense, greater than 15 cloud to ground strikes in a 5-minute period.
LAL 6	Dry lightning (same as LAL 3 but without rain). This type of lightning has the potential for extreme fire activity and is normally highlighted in fire weather forecasts with a Red Flag Warning.

History of Lightning Events

Hazard	Date	Location	Magnitude/ Description	Damage	Source
Lightning	7/4/2012	BELKNAP – WEIRS BEACH	3 Injuries	Two Men and a Woman struck by lightning	NOAA
Lightning	6/24/2013	BELKNAP – WEST ALTON	30 Injuries	Full Boy Scout troop struck by lightning	NOAA
Lightning	5/15/2020	Meredith	0 injury/fatality $20K property	House struck by lightning	NOAA

There have not been any known impacts from lightning in Center Harbor since the last plan update.

Location: Lightning can strike anywhere in town. Exactly where and when lightning will strike is unknown.

Probability of Occurrence: Likely.

[23] http://www.nh.gov/safety/divisions/hsem/HazardMitigation/documents/hmp-chapter-3.pdf accessed September 16, 2013.

[24] NWS Definitions webpage, http://graphical.weather.gov/definitions/defineLAL.html. Accessed June 3, 2014.

In the Lakes Region, fewer than two lightning strikes occur per square kilometer annually.[25] While this value is not particularly high compared with other parts of the country, the frequency of storms with lightning is a significant local concern, especially during the summer months.

Impact: Moderate
Power outages, whether associated with natural or man-made hazards like lightning, high winds, inland flooding, severe winter weather, transportation accidents, aging infrastructure, or cyber event have the potential to cause disruption to residents and the functioning of the town. There is back-up power for the EOC/Fire Department, and the Highway Garage. The elderly and disabled who rely on powered medical devices are at risk. Other locations that are vulnerable include the Center Harbor Congregational Church Day Care, the Legionnaire's of Christ school, motels/B&Bs, and Camp Eagle Cliff due to the fact that they house relatively large and vulnerable groups of people.

All structures in Center Harbor are susceptible to damage by lightning and resulting fires. The town's computer and communication systems could also be impacted by lightning. Assuming 1% town-wide damage to buildings, lightning could result in $1,654,989 in damages in any given year.

DAM FAILURE

Dams hold back (impound) water and allow the controlled release of water from the impounded areas (pond or lake). There are a variety of reasons for impounding and controlling the release of water, including power generation, flood control, and recreation. Beavers also create dams as part of their normal activities.

Extent: Moderate
Dams in New Hampshire are classified by the New Hampshire Department of Environmental Services Dams Bureau. The four dam hazard classifications (High, Significant, Low, and Non-Menace) are based on the potential losses associated with a dam failure (See Appendix G for detailed descriptions). High (H) and Significant (S) Hazard dams have the greatest potential for damage; this could include damage to state or municipal roadways. Low Hazard dams pose no threat to human life and low risk of economic loss to structures and property. There are eight active dams in Center Harbor (Table 4); one Low (L) Hazard, and seven Non-Menace (NM) Hazard dams; the Hawkins Pond dam is a Low Hazard dam.

Table 4: Active Dams in Center Harbor

HAZCL	NAME	RIVER	HEIGHT (ft.)	IMPOUND (acres)	OWNER
L	HAWKINS POND DAM	HAWKINS POND BROOK	12.00	93.000	State
NM	WILDLIFE POND	TRIB. SQUAM LAKE	9.00	5.400	Private
NM	FARM POND DAM	NATURAL SWALE	6.00	0.160	Private
NM	FARM POND	TRIB. LAKE WINNIPESAUKEE	15.00	0.700	Private
NM	BEAVER POND DAM	RUNOFF	20.00	0.130	Private
NM	UNNAMED STREAM DAM	UNNAMED STREAM	0.00	0.000	Private
NM	FARM POND	NATURAL SWALE	6.00	0.380	Private
NM	FARM POND	OTTER POND BROOK	6.00	1.600	Private

[25] *Northeast States Emergency Consortium,* http://www.nesec.org/

History: There have been no known dam failures in Center Harbor since the last plan update.

Location: Hawkins Pond dam on Hawkins Pond Road near Piper Hill Road is the only dam of significance in Center Harbor. Lake Winona is a half mile downstream of the dam. Currently there are several beaver dams in Center Harbor, including one along NH Rte. 25B, one along Waukewan Rd., and one off of Fogg Hill Road.

Probability of Occurrence: Occasional

Impact: Moderate
A failure of the low hazard state-owned Hawkins Pond dam might cause minor flooding at three or four properties before draining into Lake Winona. Failure of any of the privately-owned non-menace dams would not put property, lives, or infrastructure at risk. The committee did feel that it is important that the dams be well maintained and that the EMD be aware of their condition. Failure of the beaver dams could result in flooding and damage to NH Route 25B, Waukewan Road, Hawkins Pond Road, as well as several homes. It was noted that beaver dams are the jurisdiction of NH Fish & Game.

Assuming a 1% chance of damage to these residential structures, dam failure could result in $7,536 in damage to these structures any given year.

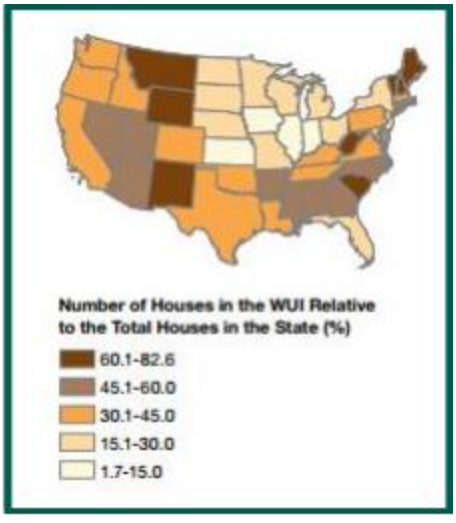
WILDFIRE

A wildfire is defined as a fire in wooded, potentially remote areas that may endanger lives. A wildfire is any non-structural fire, other than prescribed fire, that occurs in the wildland areas consisting of vegetation or natural fuels. Wildfires can be referred to as brush fires, wildland fires, or grass fires depending on the location and what is burning.[26]

Extent: Moderate
New Hampshire has about 500 wild land fires each year; most of these burn less than half an acre. Much of the Lakes Region (and Center Harbor) is forested and susceptible to fire.

The National Wildfire Coordinating Group (NWCG) has defined seven classes of wildfire based on size:

- Class A - one-fourth acre or less;
- Class B - more 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.



[26] https://www.nwcg.gov/glossary/a-z#letter_w

History:
From 2014-2018 there have been 724 wildfires state-wide amounting to 2,007 acres burned. 2016 saw 351 of those wildfires alone. Belknap County only saw one wildfire in 2018, amounting to less than one acre. In the past there have been fires in the northern and western sections of Center Harbor and on nearby Red Hill but none in the last five years.

Location: Portions of northern and western Center Harbor are heavily wooded; a fire could occur anywhere.

Probability of Occurrence: Occasional

Impact: Moderate
In the western section of town firefighters have limited access to potential wildfire areas, especially due to steep slopes but fires in this section would have limited impact on structures. Access to water resources has been improved in recent years, as recommended in the local Water Resources Management Plan. As a result, in 2019 the town's ISO (Insurance Services Office) fire rating was improved to 04-4Y.

Due to the heavily wooded nature of the town, all properties in town have the potential to be impacted by a wildland fire. Assuming 1%-2% town-wide damage to buildings, a wildfire could result in $1,654,989 to $3,309,979 in damages in any given year.

INFECTIOUS DISEASE
Infectious diseases are illnesses caused by organisms—such as bacteria, viruses, fungi or parasites. 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 life-threatening infections may require hospitalization.

While some diseases are so rare in each population that a single case warrants an epidemiologic investigation (e.g., rabies, plague, polio), there are other diseases that occur more common so that only deviations from the norm (i.e. seeing more cases than expected) warrants investigation.

Extent: Moderate
The magnitude and severity of infectious diseases is described by its speed of onset (how quickly people become sick or cases are reported) and how widespread the infection is. Some infectious diseases are inherently more dangerous and deadly than others, but the best way to describe the extent of infectious diseases relates to the disease occurrence: [27]

- Endemic – Constant presence and/or usual prevalence of a disease or infection agent in a population within a geographic area
- Hyperendemic – The persistent, high levels of disease occurrence
- Cluster – Aggregation of cases grouped in place and time that are suspected to be greater than the number expected even though the expected number may not be known

[27] https://www.cdc.gov/ophss/csels/dsepd/ss1978/lesson1/section11.html

- Epidemic – An increase, usually sudden, in the number of cases of a disease above what is normally expected
- Outbreak – The same as epidemic, but over a much smaller geographical area
- Pandemic – Epidemic that has spread over several countries or continents, usually affecting many people

The NH Department of Health and Human Services (DHHS) developed an epidemic response plan in February 2007, so that communities can be prepared and respond to outbreaks.[28] InterLakes School District, which includes Center Harbor's elementary, middle, and high school has an up to date Emergency Operations Plan with policies for addressing epidemics.

History: While there certainly have been minor outbreaks of flu in town, no major outbreaks of this or any other infectious disease was identified during this process. The 2012-13 flu season was much more severe in New Hampshire than any of the previous decade; 35 deaths occurred statewide, the most since 1997.[29] In 2016, the DHHS was notified and responded to a total of 102 outbreaks: 73 gastrointestinal illnesses (5 of which were foodborne), 23 respiratory illnesses, and 6 other types of illness. Update: The COVID-19 or Coronavirus pandemic began to impact the United States just as this plan was being finalized. The pandemic began on January 20, 2020 and continues at this writing (June 2021). A Major Disaster Declaration was made April 3, 2020.

Date	Description	Impacts	Location	Additional Info
Fall 2014	Enterovirus D-68	>40 ill children in New Hampshire	Statewide	A rare strain of enterovirus resulting in infections nationwide.
2016	Gonorrhea	465 people infected	Statewide	465 cases reported; 250% higher than previous years
2017-2018	Seasonal Influenza Outbreak	As of 2018, 63 influenza related deaths were identified in NH	Statewide	In 2018 the overall effectiveness of the flu vaccine at this time was 36%[30]
2020-21	COVID-19 Pandemic DR-4516-NH	Hospitals, schools, municipalities, & businesses have taken extra precautions, cancelled many events, and adjusted policies	Worldwide	Respiratory disease >99,000 cases in NH, with >1,350 deaths (June 2021) 73 cases locally
Annually	Foodborne outbreaks	Ill individuals associated with outbreaks	Statewide	5-10 outbreaks per year
Annually	Influenza and other raspatory virus outbreaks	Ill individuals associated with outbreaks	Statewide	25-50 outbreaks per year primarily to vulnerable populations
Annually	Norovirus and other gastrointestinal virus outbreaks	Ill individuals associated with outbreaks	Statewide	60-80 outbreaks a year primarily to vulnerable populations

[28] http://www.dhhs.nh.gov/dphs/cdcs/avian/documents/pandemic-plan.pdf,
[29] NH Department of Health and Human Services http://www.dhhs.nh.gov/media/pr/2013/01-jan/01112013flu.htm,
[30] CDC https://www.cdc.gov/mmwr/volumes/67/wr/mm6706a2.htm

Location: An epidemic is an outbreak of a disease, generally isolated to one area. The disease spreads easily person-to-person and can cause serious illness, with long-lasting side effects and deaths. An outbreak could impact anyone in town. Transmission of germs and diseases between people is accelerated in a close living and socializing environment. Schools, and congregate care centers for the elderly are good places for transmission to occur.

Probability of Occurrence: Occasional.
Epidemics do occur in Center Harbor and other Lakes Region communities from time to time.

Impact: Moderate
The concerns associated with an infectious disease include local capacity to respond to not only the residents of Center Harbor but also any visitors. The cost of infectious diseases in Center Harbor is difficult to calculate as any cost would primarily result from health care response. As we are learning from the COVID-19 pandemic, there are additional economic costs due to the slow down/shut down of many businesses in town and the region.

EARTHQUAKE

An earthquake is a series of vibrations induced in the Earth's crust by the abrupt rupture and rebound of rocks in which elastic strain has been slowly accumulating.

Extent: Weak
Earthquakes are commonly measured using *magnitude*, or the amount of seismic energy released at the epicenter of the earthquake. The Richter magnitude scale is a mathematical device used to compare the size of earthquakes, shown in Table 10.[31]

Richter Magnitude Scale

Magnitude	Earthquake Effects
2.5 or less	Usually not felt, but can be recorded by seismograph.
2.5 to 5.4	Often felt, but only causes minor damage.
5.5 to 6.0	Slight damage to buildings and other structures.

[31] http://pubs.usgs.gov/gip/earthq4/severitygip.html,.

6.1 to 6.9	May cause a lot of damage in very populated areas.
7.0 to 7.9	Major earthquake. Serious damage.
8.0 or greater	Great earthquake. Can totally destroy communities near the epicenter.

New Hampshire is considered to be in an area of moderate seismic activity with respect to other regions of the country. This means the state could experience large (6.5-7.0 magnitude) earthquakes, but they are not likely to occur as frequently as in a high hazard area like the Pacific coast. There is the potential for nearby earthquakes to register 5.5 on the Richter Scale, causing slight damage to buildings and structures. Due to the unique geology of New Hampshire, earthquake propagation waves travel up to 40 times further than they do in the western United States, possibly enlarging the area of damage.[32] The strongest earthquakes to strike New Hampshire occurred December 20 and 24, 1940 in the town of Ossipee. Both earthquakes had a magnitude of 5.5 and were felt over an area of 400,000 square miles.

History: On average, every other year the Lakes Region experiences an earthquake, though these earthquakes are mild and go mostly undetected by people. Tamworth and Gaza (a village in Sanbornton) are identified as the two major epicenters in the state.[33] A search of the USGS National Earthquake Information Center database shows that since 2008 there have been eight earthquakes (magnitude > 2.5) within a 200 km square surrounding Center Harbor; the largest, magnitude 4.0 quake centered in southern Maine (60km away) shook the region on October 16, 2012. On March 21, 2016 a 2.8 magnitude quake occurred near Contoocook, NH.

Location: An earthquake could affect all areas of Center Harbor.

Probability of Occurrence: Occasional

Impact: Moderate
According to the US Geologic Survey, the overall earthquake risk to the state is high due to the built environment; which means that many structures in the state are old or not built to withstand an earthquake. Damage from the 1940 earthquakes in Ossipee included some damage to most of the chimneys in the epicenter region of Ossipee, ranging from cosmetic cracks to total collapse. Sections of several foundations collapsed and at least one house rotated on its foundation. In the town of Conway, 15 miles from the epicenter, one house was lost by fire when sparks in a cracked chimney started the blaze. Splits found in the rafters and trusses temporarily closed Ossipee High School. No damages were associated with the October 2012 earthquake, but the potential does exist for some damages to occur.[34]

The Center Harbor Zoning Ordinance limits the height of most buildings in Center Harbor to no more than three stories high. A relatively large earthquake in all likelihood would impact the bridges, limiting the ability of emergency services to be rendered in a few areas, although in most cases there

[32] http://des.nh.gov/organization/commissioner/pip/factsheets/geo/documents/geo-3.pdf

[34] USGS http://earthquake.usgs.gov/earthquakes/eventpage/usb000d75b#pager, accessed October 17, 2012.

are alternate options, requiring redeployment of apparatus and people. Most structures in town are not built to withstand a seismic event; those that have multiple stories and house relatively large groups of people are most vulnerable (Center Harbor Inn and Congregational Church Day Care). The new addition to the Center Harbor Municipal Building was constructed to meet seismic codes. No known impacts were recognized in Center Harbor from the 2016 event in Contoocook, or any others since the last plan update.

All structures in Center Harbor are susceptible to damage by an earthquake. Assuming 1%-2% town-wide damage to buildings, an earthquake could result in $1,654,989-$3,309,979 in damages in any given year.

SOLAR STORM AND SPACE WEATHER

The term space weather is relatively new and describes conditions in the Earth's outer space environment. Space weather includes conditions and events on the sun, in the solar wind, in near-Earth space, and in Earth's upper atmosphere that can affect space-borne and ground-based technological systems.[35] Although space weather has occurred since the beginning of time, little was understood about the causes and impacts of these instances on the planet. It has only been in the last 200 or so years where multiple science fields have come together to study space weather.[36] Not all space weather is damaging or effects humans or technology. Perhaps one of the most well-known effects of space weather on the Earth's atmosphere is the Aurora Borealis (aka Northern Lights – northern hemisphere) and the Aurora Australis (southern hemisphere). Aurora displays are a result of solar wind where some of the charged particles become trapped in the Earth's atmosphere.

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)

Extent: Weak

The *2018 State of New Hampshire Multi-Hazard Mitigation Plan Update* describes three different types of events: Geomagnetic Storms, Solar Radiation Storms, and Radio Blackout. Each of these is then rated on a five-level scale (minor, moderate, strong, severe, extreme), with descriptions of increasing impacts on power, spacecraft, biological, satellite, high frequency radio, and navigation systems. A solar storm may exacerbate radio communications problems. The Radio Blackout Scale[37] offers a measure of the extent of solar storms on radio communications.

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[35] https://www.nasa.gov/mission_pages/sunearth/spaceweather/index.html#q12
[36] https://www.nasa.gov/mission_pages/sunearth/spaceweather/index.html#q12
[37] https://prd.blogs.nh.gov/dos/hsem/wp-content/uploads/2015/11/State-of-New-Hampshire-Multi-Hazard-Mitigation-Plan-Update-2018_FINAL.pdf, p. 141

History: There have not been any known occurrences in Center Harbor of solar storms or space weather, and no significant events have been reported statewide. Nearby events include Quebec, Canada, which experienced a 9-hour blackout in March 1989 when solar winds caused a fluctuation in the Earth's magnetic field and caused Hydro-Quebec's transmission to go down.[38]

Location: All of Center Harbor and the entire State of New Hampshire are at risk of solar storms and space weather. While the Earth is somewhat protected from solar storms and space weather by its upper atmosphere, the potential for a loss of communications, power, and GPS exists on a daily basis.

Probability of Occurrence: Occasional

Impact: Moderate
Solar storms and space weather impact the Earth daily, although the effects are not often felt. It is difficult to estimate the impact of this hazard on Center Harbor as knowledge of this hazard is evolving, but committee members recognized that while human and property impacts are low, compromised communications could impact communications and response during other types of hazards, including reaching out for mutual aid.

DROUGHT
Drought occurs when less than the normal amount of water is available for extended periods of time. It is often but not always, accompanies elevated temperatures. Effects may include decreased soil moisture, groundwater levels, streamflow, and lake, pond, and well levels may drop. Factors that may contribute to drought include reduced rain/snowfall, increased rates of evaporation, and increased water usage. New Hampshire generally receives adequate rainfall; it is rare that the state experiences extended periods of below normal water supplies.

Drought is the absence of water in a region that occurs slowly due to below-average precipitation over an extended period, resulting in low stream flows, low surface water, and low groundwater levels.[39] According to NOAA, the climatological community has defined four types of droughts to address their cause(s), timeframe, and effects[40]:

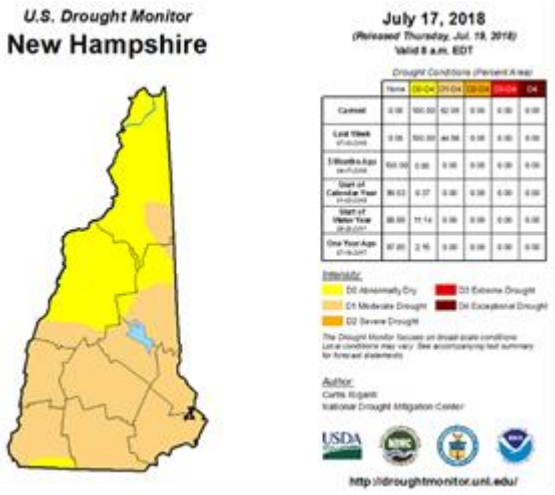
- **Meteorological Drought**: Occurs when dry weather patterns dominate an area, resulting in a lack of precipitation
- **Hydrological Drought**: Occurs when low water supply becomes evident, especially in streams, reservoirs, and groundwater levels—usually after many months of meteorological drought
- **Agricultural Drought**: Occurs when crops become affected by drought conditions
- **Socioeconomic Drought**: Effects of supply and demand of commodities affected by drought conditions

[38] Adapted from the *State of New Hampshire Multi-Hazard Mitigation Plan Update (2018),* https://prd.blogs.nh.gov/dos/hsem/wp-content/uploads/2015/11/State-of-New-Hampshire-Multi-Hazard-Mitigation-Plan-Update-2018_FINAL.pdf.
[39] https://www.des.nh.gov/organization/divisions/water/dam/drought/index.htm
[40] https://www.ncdc.noaa.gov/monitoring-references/dyk/drought-definition

Extent: Weak

A drought can last for months, or even years. Since 1990 New Hampshire has had a state Drought Emergency Plan, which identifies four levels of action indicating the severity of the drought:

- Alert
- Warning
- Severe
- Emergency



Effects may include decreased soil moisture, groundwater levels, streamflow, and lake, pond, and well levels may drop. Factors that may contribute to drought include reduced precipitation, increased rates of evaporation, and increased water usage. New Hampshire generally receives adequate rainfall; it is rare that the state experiences extended periods of below normal water supplies.

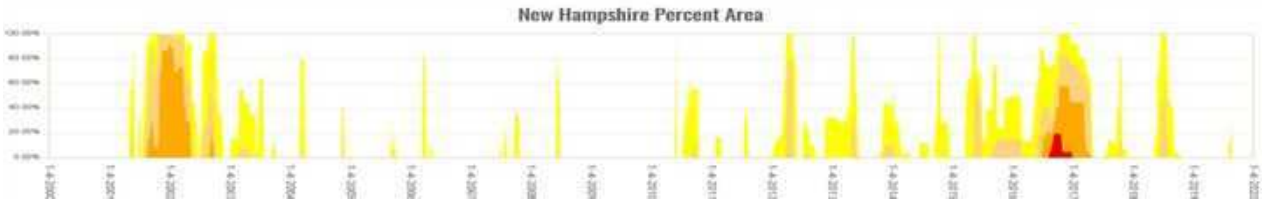
The US Drought Monitor[41] uses a five-level drought intensity scale including:

- D0 - Abnormally Dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 - Extreme Drought
- D4 - Exceptional Drought

Category	Historically observed impacts
D0	Crop growth is stunted; planting is delayed
	Fire danger is elevated; spring fire season starts early
	Lawns brown early; gardens begin to wilt
	Surface water levels decline
D1	Irrigation use increases; hay and grain yields are lower than normal
	Honey production declines
	Wildfires and ground fires increase
	Trees and landscaping are stressed; fish are stressed
	Voluntary water conservation is requested; reservoir and lake levels are below normal capacity
D2	Specialty crops are impacted in both yield and fruit size
	Producers begin feeding cattle; hay prices are high
	Warnings are issued on outdoor burns; air quality is poor
	Golf courses conserve water
	Trees are brittle and susceptible to insects
	Fish kills occur; wildlife move to farms for food
	Water quality is poor; groundwater is declining; irrigation ponds are dry; outdoor water restrictions are implemented
D3	Crop loss is widespread; Christmas tree farms are stressed; dairy farmers are struggling financially
	Well drillers and bulk water haulers see increased business
	Water recreation and hunting are modified; wildlife disease outbreak is observed
	Extremely reduced flow to ceased flow of water is observed; river temperatures are warm; wells are running dry; people are digging more and deeper wells

History: There have been five extended droughts in New Hampshire in the past century: 1929 – 1936, 1939 – 1944, 1947 – 1950, 1960 – 1969, and 2001 – 2002. While much of the country experienced drought conditions in 2012, New Hampshire received adequate precipitation.[42] Moderate drought conditions existed in New Hampshire during parts of 2015, 2016 and into April of 2017. In 2020 Belknap County experienced a moderate drought.

[42] US Drought Monitor http://droughtmonitor.unl.edu/. Accessed September 4, 2019.



Location: Being a state-wide or regional event, drought would affect most areas of the community. Those with shallow wells would likely be affected first.

Probability of Occurrence: Occasional

Impact: Low
Those with shallow wells would be most affected. Since the last plan, the well for the Fire Department has greater capacity and could be utilized as an emergency water supply. Due to the very limited reliance on agriculture in Center Harbor, limited number of shallow wells, and increased capacity to supply emergency water, the impact of a drought on Center Harbor would be minimal; there would be no direct impact to structures. It was noted that many boats had to be pulled out of the lakes early in 2020 due to lower water levels. This may have some impacts on the recreational economy.

Due to geography and topography, landslide and avalanche were not considered to be hazards likely to have any effect on Center Harbor and were thus not considered in the plan.

Human-Caused & Technological Hazards

Center Harbor 2021 Human-Caused & Technological Hazards	Total	Risk
Hazardous Materials	16.00	High
Long Term Utility Outage	14.00	High
Transport Accident	14.00	High
Mass Casualty Incident	6.00	Medium
Aging Infrastructure	5.33	Medium
Conflagration	5.33	Medium
Terrorism/Violence	5.00	Low
Cyber Event	3.33	Low
Known and Emerging Contaminants	2.00	Low
Radiological	1.00	Low

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.[43]

Extent: Moderate
Oil spills along many of the routes in Center Harbor could result in the contamination of wells or water bodies in the Lake Winnipesaukee watershed. In addition to distributing fuel to central locations in the region, tankers travel throughout the area daily to deliver home heating fuel. Many oil tankers have the capacity to carry 10,000 gallons of home heating oil.

The major areas of concern for the committee regarding the hazards posed by fixed hazardous materials centered on the Department of Public Works (DPW) Garage and Heath's Hardware Store. While the DPW Garage houses fuels and a large quantity of maintenance materials, it is located near the juncture of two state roads, in a relatively undeveloped area, and more than a quarter of a mile from any surface water. Additionally, a new salt shed now protects the material from weather and keeps it from migrating into groundwater. Heath's Hardware does handle a variety of chemicals in the form of pesticides and fertilizers. The primary concern regarding this facility is its location on the waterfront adjacent to the town beach.

History: There have not been any documented or observed hazardous materials-related events in Center Harbor for this plan.

Location: Major roadways, especially in populated areas near aquifers and wells, or at water crossings are areas of concern. Of concern, is the three large bodies of water that border Center Harbor. An accident involving a carrier of hazardous materials along Waukewan Road could pose a significant threat due to a vital drinking water source nearby.

Probability of Occurrence: Likely

Impact: High
The impact to the town from a fixed location hazardous materials event would be in the form of contamination of water and soil. The release of hazardous materials along one of the roadways in Center Harbor has the capacity to cause substantial damage in the town. Many variables could affect the degree of impact, including the nature of the material, the location of the accident and its proximity to surface and groundwater, as well as structures. An oil spill along a remote section of NH 25 is quite different from a chemical spill along the same roadway in the center of town near the town offices.

A hazardous materials accident would not likely impact structures; rather the impact would be environmental. The NH Lakes Association notes that a reduction in water quality could lead to $25 million of lost income to the 30 communities of the Lakes Region. [44]

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[43] https://www.ihmm.org
[44] *The Economic Impact of Potential Decline in New Hampshire Water Quality: The Link Between Visitor Perceptions, Usage and Spending*, New Hampshire Lakes, Streams, and Ponds Partnership (May 2007).

LONG-TERM UTILITY OUTAGE

A long-term utility outage is 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.[45]

Extent: Moderate
For the purpose of this plana long-term utility outage is classified as one that lasts a month or more or an outage that causes extreme impacts.

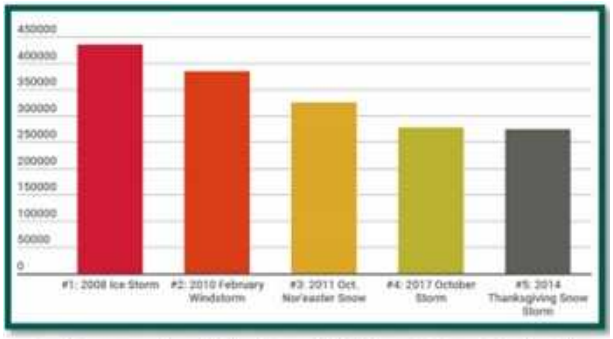
Recent History

Date	Description	Impacts	Location	Additional Info
January 2014	Fred Fuller	The Fred Fuller oil company was unable to make deliveries to numerous customers	Statewide	Residents began to run out of fuel and were not able to fill their needs.
Oct 29 – Nov 4, 2017	Severe Rain and Wind	Low pressure system merged with Tropical Storm Phillippe	Statewide	Uprooted trees and heavy rains downed power lines leading to roughly 290K power outages.

Location: The entire town of Center Harbor is at risk for this hazard in terms of trees coming down on wires.

Probability of Occurrence: Likely

Impact: Moderate
Loss of power and communications has a great impact on municipal and emergency functions.



Top 5 power outages in New Hampshire history. Data provided by NH HSEM. Figure courtesy of NHPR.

TRANSPORTATION ACCIDENT

A transport accident is any accident that occurs during transportation, including passenger vehicles, tractor trailers, airplanes and other modes of transportation.

Extent: Moderate
Several major state highways run through Center Harbor, including US 3, NH 25, and NH 25B, carrying an average annual daily volume in excess of 11,000 vehicles (2018). The actual volume can be much higher depending on the season and individual events, such as Laconia's Motorcycle Week.

History: New Hampshire has an annual average of 117 fatal transportation related fatalities.

Location: NH Routes 3, 25, and 25B were seen as the most likely areas for transportation accidents, . The only section of Center Harbor that saw an increase in vehicular traffic from the past five-years was NH Rte. 25B East of Keewaydin Road.

Probability of Occurrence: Likely

[45] State Multi-Hazard Mitigation Plan https://prd.blogs.nh.gov/dos/hsem/wp-content/uploads/2015/11/State-of-New-Hampshire-Multi-Hazard-Mitigation-Plan-Update-2018_FINAL.pdf

Impact: Moderate
The primary impact of a transportation incident would be on response capabilities of emergency services. No quantitative calculations of impact were made as part of this plan. While any vehicular accident has the potential for injury and even death, the impact of a vehicular accident on its own is relatively small. The impacts of such an event increase when multiple accidents occur, when they occur along evacuation routes, or they occur in conjunction with other hazards. A major transportation accident along NH Route 25 can tie up traffic and could result in delays in some emergency services. The steep hill along NH Route 25B at the edge of the village is an area of concern. While a couple of the town's critical facilities, the Fire and Police Stations are located near NH Route 25, there are several alternate access routes. Damage to structures would likely be minimal and the **impact** on the town would be moderate.

MASS CASUALTY INCIDENT

The state's Multi-Hazard Mitigation Plan (2018) refers to a Mass Casualty Incident as any large number of casualties 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.[46]

Extent: Severe
It was pointed out that the definition of this type of event as being one that exceeds the local logistical support capabilities means that that with the limited staff available that threshold could be reached fairly quickly in Center Harbor.

According to FEMA's Fire/Emergency Medical Services Department, since the Columbine High School shooting in 1999 up through 2013 there were a reported 250 deaths connected to an active shooter/mass casualty incident.[47] This number has shown an exponential increase in the past five-year period with 2017 seeing over 725 mass casualty event deaths alone with fifty of those occurring at a live show in Las Vegas.[48]

History: No mass casualty incidents have been recorded in Center Harbor, but in the recent years there have be a few in New Hampshire.

Date	Event	Location	Information
February 2014	Explosion	New Hampshire Ball Bearings Inc. Peterborough, NH	Firefighters from the surrounding area responded to a industrial explosion critically injuring two and seriously injuring four.
August 2017	Hospital Contamination	Exeter Hospital at Exeter, New Hampshire	Numerous staff members reported feeling dizzy and nauseous. Causing surrounding towns to get involved and closing parts of the hospital for decontamination.

[46] State Multi-Hazard Mitigation Plan https://prd.blogs.nh.gov/dos/hsem/wp-content/uploads/2015/11/State-of-New-Hampshire-Multi-Hazard-Mitigation-Plan-Update-2018_FINAL.pdf
[47] State Multi-Hazard Mitigation Plan https://prd.blogs.nh.gov/dos/hsem/wp-content/uploads/2015/11/State-of-New-Hampshire-Multi-Hazard-Mitigation-Plan-Update-2018_FINAL.pdf
[48] https://www.fbi.gov/about/partnerships/office-of-partner-engagement/active-shooter-incidents-graphics

Location: Public gathering places, schools, hospitals, and similar locations in Center Harbor and the surrounding area are vulnerable to a mass casualty incident.

Probability of Occurrence: Unlikely

Impact: Moderate
By definition a mass casualty incident will have an catastrophic impact on humans. The impact on property and business service would be low.

AGING INFRASTRUCTURE

In Center Harbor, infrastructure includes roadways, stormwater drainage, power and communication lines, and hook-ups to the regional sewer line in the Village area.

Extent: Moderate

History: In recent years the stormwater drainage system through the Village area gets overwhelmed during summer rainstorms resulting in flooding near roads. Several properties along Kelsea Road used to flood, but recent upgrades eliminated that.

Location: The Village area around NH Route 25 and Coe Hill Road. The Road Agent has also identified the Hawkins Pond Bridge as needing repair/upgrade/replacement.

Probability: Occasional

Impact: Low
Road width and load rating on Hawkins Pond Bridge are concerns. If the bridge were to be closed it would mean longer travel/evacuation routes and interrupted services. The Town Road Agent and Engineer identified the need for $500,000 to $750,000 for repair/upgrade/replacement of the Hawkins Pond Bridge.

CONFLAGRATION

Conflagration is an extensive, destructive fire in a populated area that endangers lives and affects multiple buildings. Historically, many New Hampshire towns were settled in areas along waterways in order to power the mills. Often the town centers were at a low point in the topography, resulting in dense residential development on the steeper surrounding hillsides. Hillsides provide a natural updraft that makes firefighting more difficult. Structural fires spread more readily in hillside developments because burning buildings pre-heat the structures that are situated above them.

Extent: Moderate
A major portion of Center Harbor's business activity is in the Village area with structures (most wooden) either attached to one another or in close proximity.

History: Center Harbor has not experienced an urban fire in recent history. Within the Lakes Region the city of Laconia was the site of one of the most devastating structural fires to occur in the state of New Hampshire. The 1903 Great Lakeport Fire

Alton Bay Christian Conference Center, 2009

consumed more than 100 homes; two churches, two factories, a large mill, a power plant, and a fire station. Wolfeboro's history includes a significant fire in the winter of 1956. This event is recognized as the last block fire in town and is considered a small conflagration. On April 12, 2009 the Alton Bay Christian Conference Center complex caught fire, resulting in an 11-alarm fire and destroying more than 40 structures.

Location: Buildings in the village area are relatively close together and most are older structures. The area most susceptible to conflagration is the Village commercial area including Senter's Market and approximately ten other businesses. Several of these structures are part of the Historic District.

Probability of Occurrence: Occasional

Impact: Low
Factors that enhance the likelihood of a spreading urban fire include little separation between structures, structures built along steep hillsides, older structures, limited access, and limited water resources. While the village area in Center Harbor is the most densely populated area in town and many of the structures are older, almost all buildings do have some separation, most structures are not built into the steep hillside, there is good access to most buildings in the village, and access to water is good (improved during the past five years). As noted under "Wildfire", the town's ISO fire rating was improved to 04-4Y and the Fire Station is just a block away. The value of the structures in the Village area is estimated to be more than three million dollars.

Terrorism/Violence
Events around the country demonstrate that one or more people intent on inflicting harm and terror on others can occur almost anywhere, not just in urban areas. Committee members also discussed an increase in general violence which included recent police officer-involved shootings. The consideration for this hazard was not only specific to an armed terror attack but also intentional contamination of water resources. These resources include surface water as well as ground water and the infrastructure used to deliver potable water. It is also possible that cyber events could also fit within this potential hazard.

Extent: Severe
Such events may be limited to just one or two victims or the perpetrator(s) may be seeking to inflict damage on many people.

History: Center Harbor has not experienced an armed attack in the past; nor have there been instances of intentional contamination of water supplies.

Location: An armed attack could occur anywhere in town. The most likely locations are either areas where people congregate (Heath Supermarket, Town Offices, Post Office, Churches) or where the most vulnerable people are (schools in Meredith). Surface water might be contaminated from the bridges crossing over brooks and streams that lead into either Squam Lake, Lake Waukewan, or Lake Winnipesaukee. While the groundwater might be contaminated through contamination of soils overtop of the aquifer, the most immediate threats would come through the compromising of infrastructure.

Probability of Occurrence: Unlikely

Impact: Low
One or more people intent on doing harm could do so just about anywhere. Whether large or small, such an event would impact the people in the community. The impact of an armed attack comes through instilling fear and terror, structural damages would be low. The most vulnerable places are those areas where many people congregate such as the village area or the Congregational Church Day Care. Those most impacted by contamination of the town's water resources would be those in the Special Needs Population – the elderly, children, and the mentally challenged.

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, or information resident thereon.[49]

Extent: Moderate
The National Cybersecurity and Communications Integration center (NCCIC) classifies a cyber incident using a scoring system of zero to 100 using the following factors: Functional Impact

- Observed Activity
- Location of Observed Activity
- Actor Characterization
- Information Impact
- Recoverability
- Cross-Sector Dependency
- Potential Impact

History Center Harbor has not recorded a cyber event, but approximately 75 cyber incidents affecting New Hampshire's public sector were reported in 2017-2018.

Location Any location connected to the internet in the town of Center Harbor is at risk to a cyber event. Center Harbor is reliant on technology for regular municipal functions as well as emergency response. The locations that could pose the largest impact are the public offices of Center Harbor along with critical communications infrastructure.

Probability: Unlikely

Impact: Moderate
The primary impact of a cyber event would be on emergency, municipal, and business services.

KNOWN AND EMERGING CONTAMINANTS

[49] State Multi-Hazard Mitigation Plan https://prd.blogs.nh.gov/dos/hsem/wp-content/uploads/2015/11/State-of-New-Hampshire-Multi-Hazard-Mitigation-Plan-Update-2018_FINAL.pdf p. 177

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. 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 are particularly concerning to the public because the potential health impacts of these are sometimes uncertain.[50]

Extent: Weak
Typically measured in parts per million (ppm), parts per billion (ppb), or even parts per trillion (ppt).

History: There have been no known instances of contamination.

Location: Known and emerging contaminants are associated with and migrate through ground water resources. Of particular concern would be any facility handling potentially toxic substances.

Probability: Occasional
During the past five years the Conservation Commission and Planning Board have identified and assessed the town's water resources. Several of these resources have received additional protections.

Impact: Low
The immediate impact on the community was seen as minimal. If not addressed, the long term impacts would appear as health impacts to people in the community whose water was impacted and perhaps eventually in property values.

[50] ibid. p. 165.

E. VULNERABILITY ASSESSMENT

The Committee did review and revise the list of Critical Facilities in Center Harbor. In addition to reviewing functional capacity and value, the group reviewed the vulnerability to each potential hazard (Table 5). For each Critical Facility the committee was asked to rate the likelihood that for each potential hazard, if this event occurred, what is the likelihood that this particular facility would be adversely impacted?

The Committee gave a rating of high-medium-low (3, 2, 1). Those scores were added up for a vulnerability score, both for each potential hazard and for each facility. The top 20% in each category were considered High Vulnerability and the next 20% were considered Medium Vulnerability. The results are shown in the matrix on the next page. This assessment combined with the review of development in town since the last plan update (Chapter II) indicate that Center Harbor's vulnerability to hazards since the last plan update has not changed substantially.

Table 5: Critical Facilities Vulnerability

Critical Facilities Hazard - Vulnerability	Key: Low = 1, High = 3									High - Top 20% score				Medium - Top 40% score											
Center Harbor	**Natural Hazards**														**Human-Caused & Technological Hazards**										
Facility/Infrastructure	Inland Flood	Wildfire	Drought	Extreme Temps	Earth-quake	Land-slide	Infectious Disease	Aval-anche	Light-ning	Trop. & Post-Trop. Cyclones	High Wind Events	Dam Failure	Severe Winter Weather	Solar Storms Space Weather	Aging Infrastruct ure	Long-Term Utility Outage	Conflag-ration	Transp. Incident	Haz Mat	Contamin ents	Cyber Event	Terror Violence	Mass Casualty Incident	Radio-logical	**TOTAL**
Essential Services/ Structures/Shelters																									
Municipal Building (FD, PD, EOC)	3	3	1	3	2	2	1	1	3	3	3	1	3	1	1	3	3	3	3	1	1	3	1	3	**52**
Hwy Garage & Salt Shed (Emerg Fuel)	3	3	2	3	3	2	1	1	3	3	3	1	3	1	1	3	2	2	3	1	1	3	1	3	**52**
Fairpoint Communic. (automatic ESS)	3	2	1	2	2	2	1	1	3	3	3	1	3	2	1	3	3	3	3	1	1	3	1	3	**51**
Evacuation Routes																									
NH Route 25 (Evacuation)	3	3	1	1	3	2	1	2	3	3	3	1	3	1	1	3	3	3	2	1	1	3	1	2	**50**
NH Route 25B (Evacuation)	3	3	1	1	3	3	1	2	3	3	3	1	3	1	1	3	3	3	2	1	1	3	1	2	**51**
US Route 3 (Evacuation)	3	3	1	1	3	3	1	2	3	3	3	1	3	1	1	3	2	3	2	1	1	3	1	2	**50**
Waukewan Road (Evacuation)	3	3	1	1	3	3	1	2	3	3	3	1	3	1	1	3	2	3	2	1	1	2	1	2	**49**
Winona Road (Evacuation)	3	3	1	1	3	3	1	2	3	3	3	1	3	1	1	3	2	3	2	1	1	2	1	2	**49**
Coe Hill Road (Evacuation)	3	3	1	1	3	3	1	2	3	3	3	1	3	1	1	2	2	3	2	1	1	2	1	2	**48**
Center Harbor Neck Road (Evacuation)	3	3	1	1	3	3	1	2	3	3	3	1	3	1	1	3	2	3	2	1	1	2	1	2	**49**
Dam and Bridges																									
Hawkins Pond Dam	3	2	1	1	3	2	1	1	3	3	3	2	3	1	1	2	2	3	2	1	1	2	1	2	**46**
Mosquito Bridge	3	2	1	1	3	2	1	1	3	3	3	1	3	1	1	2	2	3	2	1	1	2	1	2	**45**
Anchorage Bridge	3	2	1	1	3	2	1	1	3	3	3	1	3	1	1	2	2	3	2	1	1	2	1	2	**45**
Hawkins Pond Bridge	3	2	1	1	3	3	1	1	3	3	3	1	3	1	1	2	2	3	2	1	1	2	1	2	**46**
Dog Cove Bridge	3	2	1	1	3	3	1	1	3	3	3	1	3	1	1	2	2	3	2	1	1	2	1	2	**46**
High Haith Bridge	3	3	1	1	3	3	1	1	3	3	3	1	3	1	1	2	2	3	2	1	1	2	1	2	**47**
Winona Bridge	3	2	1	1	3	3	1	1	3	3	3	1	3	1	1	2	2	3	2	1	1	2	1	2	**46**
Shelters & Cooling Center																									
CH Congregational Church (Shelter)	3	3	2	3	1	2	2	1	2	3	3	1	2	1	1	3	2	3	2	1	1	3	1	2	**48**
Library (Cooling Center)	3	2	2	2	2	2	2	1	3	3	3	1	2	1	1	3	2	3	2	1	1	2	1	2	**47**
Special Populations & Other																									
CH Cong.Church - Day Care	3	3	2	3	2	2	2	1	3	3	3	1	3	1	1	3	3	2	2	1	1	3	1	2	**51**
Senter's Market (Supplies)	3	2	2	2	2	2	2	1	2	3	3	1	3	1	1	3	3	2	2	1	1	3	1	2	**48**
Historic Center Harbor Village	3	2	2	2	2	2	2	2	2	3	3	1	3	1	1	3	3	2	2	1	1	3	1	2	**49**
Island Population 5 residences	3	3	2	2	2	2	2	1	3	3	3	1	2	1	1	3	1	2	2	1	1	2	1	2	**46**
Seasonal/Transient Lodging																									
Camp Eagle Cliff (June only)	3	3	2	3	2	2	2	1	3	3	3	1	1	1	1	3	1	2	2	1	1	3	1	2	**47**
Center Harbor Inn	3	3	2	2	2	2	2	1	3	3	3	1	2	1	1	3	3	2	2	1	1	2	1	2	**48**
Savoie Motel	3	2	2	3	1	2	2	1	2	3	3	1	2	1	1	3	2	3	2	1	1	2	1	2	**46**
Sutton House B&B	3	2	2	2	1	2	2	2	2	3	3	1	2	1	1	3	3	3	2	1	1	2	1	2	**47**
Hearthstone B&B	3	2	3	2	1	2	2	2	2	3	3	1	2	1	1	3	2	2	2	1	1	2	1	2	**46**
Hazardous Materials																									
Winni. Flagship Corp. (Mt. Wash.)	3	2	3	2	1	2	1	1	3	3	3	1	2	1	1	3	2	2	2	1	1	2	1	2	**45**
Heath's Hardware	2	2	2	2	2	2	1	1	2	3	3	1	3	1	1	3	2	3	3	1	1	2	1	2	**46**
United Rentals	2	2	2	2	2	2	1	1	2	3	3	1	2	1	1	3	2	2	2	1	1	2	1	2	**43**
Inter-lakes Automotive	2	2	2	2	1	2	1	1	2	3	3	1	2	1	1	3	2	2	2	1	1	2	1	2	**42**
Independent Volkswagon	2	2	2	2	1	2	1	1	2	3	3	1	2	1	1	3	2	2	2	1	1	2	1	2	**42**
Paquette Signs	2	2	2	2	1	2	1	1	2	3	3	1	2	1	1	3	2	2	2	1	1	2	1	2	**42**
Waukewan Golf Course	2	2	2	2	1	2	1	1	2	3	3	1	2	1	1	3	2	2	2	1	1	2	1	2	**42**
Boat Storage/A Cut Above Landscaping	2	2	2	2	1	2	1	1	2	3	3	1	2	1	1	3	2	2	2	1	1	2	1	2	**42**
SUM TOTAL	**101**	**87**	**58**	**64**	**77**	**82**	**47**	**46**	**95**	**108**	**108**	**37**	**92**	**37**	**36**	**100**	**79**	**93**	**76**	**36**	**36**	**83**	**36**	**75**	

F. SUMMARY OF RISK

A matrix was created to determine an overall hazard risk assessment rating (Table 6). Each criterion (Probability of occurrence, Extent, and Impact – an average of three types) was given a rating to show which hazards are the greatest threat to the community, based on historic events and local knowledge, danger/destruction, the town's ability to respond, along with economic and environmental issues.

These ratings were transformed into numerical values 4, 3, 2, and 1, with 4 as high and 1 as low. The overall risk rating associated with each hazard was determined by multiplying the three factors. This resulted in risk ratings ranging from 1 to 24 for Natural Hazards and 1 to 16 for Human-Caused & Technological Hazards. The top 1/3 of the scores were considered high risk, the bottom third low risk, and the middle third medium risk. This Plan focuses on those events that pose at least a moderate risk to the town of Center Harbor as determined by the Committee.

Probability of Future Events

- **Unlikely**: <10% probability of occurrence in the next year or a recurrence interval of more than every ten years
- **Occasional**: 10 - 25% probability of occurrence in the next year or a recurrence interval of three to ten years
- **Likely**: 25 - 80% probability of occurrence in the next year or a recurrence interval of two to three years
- **Highly Likely**: 80-100% probability of occurrence in the next year or a recurrence interval of nearly every year

Extent - How bad could it get?

- **Weak:** limited magnitude, slow onset, short duration, little damage.
- **Moderate:** moderate magnitude, moderate onset speed, moderate duration, some damage/loss of service for days.
- **Severe:** Severe magnitude, fast speed of onset, long duration, devastating damage and loss of service for weeks
- **Extreme:** Extreme magnitude, immediate onset, extended duration, catastrophic damage, uninhabitable conditions.

Impact - Human, Property, Business

Low: There is little likelihood that injury or death will result from this hazard. The damage to land and property will likely be limited. Essential services and other services that residents and visitors depend upon will not be interrupted.

Moderate: There is some likelihood that injury or death will result from this hazard. There will likely be some damage to land and property. There will likely be some interuption of essential services and other services that residents and visitors depend upon for hours of days.

High: It is quite likely that injury or death will result from this hazard. There will be damage to multiple properties. Essential services and other services that residents and visitors depend upon be likely be interupted for days.

Catastrophic: Multiple injuries or deaths will likely result from this hazard. Damage to properties will be widespread and extensive. Essential services and other services that residents and visitors depend upon be likely be interupted for days or weeks.

Table 6: Summary of Risk Assessment

Center Harbor 2020 Hazards	Probability	Extent	Human Impact	Property Impact	Business Impact	Average Impact	Risk
Definition	Likelihood this will occur w/in 25 yrs	(Magnitude / Strength)	Probability of Death or Injury	Physical Loss or damage	Interruption of Service	Average of Human, Property, Business	Probability x Exent x Avg. Impact
Scale	1: Unlikely 2: Occasional 3: Likely 4: Highly Likely	1: Weak, 2: Moderate, 3: Severe, 4: Extreme	1: Low 2: Moderate 3: High 4: Catastrophic	1: Low 2: Moderate 3: High 4: Catastrophic	1: Low 2: Moderate 3: High 4: Catastrophic	1: Low 2: Moderate 3: High 4:Catastrophic	Low Medium High
High Wind Events (Torn./Downb.)	3	3	2	3	3	2.67	24.00
Severe Winter Weather	4	3	2	2	2	2.00	24.00
Tropical & Post-Tropical Cyclones	2	3	2	3	3	2.67	16.00
Extreme Temps	3	2	2	2	2	2.00	12.00
Inland Flooding	3	2	1	2	2	1.67	10.00
Lightning	3	2	2	2	1	1.67	10.00
Dam Failure	2	2	2	3	2	2.33	9.33
Wildfires	2	2	2	3	2	2.33	9.33
Infectious Diseases	2	2	2	1	2	1.67	6.67
Earthquake	2	1	1	2	2	1.67	3.33
Solar Storms & Space Weather	2	1	1	1	3	1.67	3.33
Drought	2	1	1	1	2	1.33	2.67
Avalanche	1	1	1	1	1	1.00	1.00
Landslides	1	1	1	1	1	1.00	1.00
Human-Caused & Technological Hazards	**Probability**	**Extent**	**Human Impact**	**Property Impact**	**Business Impact**	**Average Impact**	**Risk**
Hazardous Materials	3	2	2	3	3	2.67	16.00
Long Term Utility Outage	3	2	2	2	3	2.33	14.00
Transport Accident	3	2	3	2	2	2.33	14.00
Mass Casualty Incident	1	3	4	1	1	2.00	6.00
Aging Infrastructure	2	2	1	1	2	1.33	5.33
Conflagration	2	2	1	2	1	1.33	5.33
Terrorism/Violence	1	3	3	1	1	1.67	5.00
Cyber Event	1	2	1	1	3	1.67	3.33
Known and Emerging Contaminants	2	1	1	1	1	1.00	2.00
Radiological	1	1	1	1	1	1.00	1.00
High Risk - Top 1/3 score			Medium Risk - Top 2/3 score				

It should be noted that the ranking of individual hazards for the purposes of planning discussion should not in any way diminish the potential severity of the impacts of a given hazard event. Further, hazards ranked as low risk may have the impact of increasing the risk of other hazards when they occur. For example, in the event of a drought, the risk of woodland fire may be greater. In combination, hazard events may have the impact of overwhelming existing emergency response systems.

Due to geography, coastal flooding, landslide, and avalanche were not considered as locally pertinent. This summary list of hazards includes most of the elements from the 2014 HMP but with the addition of Hazardous Materials in Transport and Transportation Incidents. Drought was included in the 2007 Plan but while drought has occurred in New Hampshire, it is relatively infrequent and the committee viewed the impact on Center Harbor as minimal, therefore the overall risk to the community is quite low.

Summary

It is cost prohibitive to make the built environment resistant to the most devastating natural hazards that could occur, though reasonable measures can be taken to minimize loss of life and property damage. Center Harbor may be affected by an unavoidable extraordinary circumstance such as a violent earthquake, but historically, events of this magnitude have been infrequent. Those natural events that are common to the northeast also have common elements of concern for public safety. These include the potential for long-term power outages, the potential need for short-term sheltering facilities, and the availability of equipment and trained personnel. Key to loss prevention in these relatively common event scenarios is pre-event planning that critically assesses communications within the community, mutual aid resources regionally, public awareness and education, and emergency response training.

CHAPTER IV: MITIGATION STRATEGIES

A. CURRENT PLANS, POLICIES, AND REGULATIONS

Many local programs have the effect of mitigating disasters; some of these have been in effect for years, others have been implemented as a result of the 2014 Hazard Mitigation Plan. A review of existing mitigation strategies was conducted and included review of pertinent documents including the zoning ordinance, subdivision regulations, site plan regulations, and discussion with Committee members. The review of existing capabilities utilized these categorizations:

Poor ..... *The policy, plan or mutual aid system does* ***not work as well as it should*** *and* ***often*** *falls short of meeting its goals.*
Fair .....*The policy, plan or mutual aid system does* ***not work as well as it should*** *and* ***sometimes*** *falls short of meeting its goals.*
Good .....*The policy, plan or mutual aid system* ***works well*** *and* ***is achieving its goals****.*
Excellent .....*The policy, plan or mutual aid system* ***works very well*** *and* ***often exceeds its goals.***

In 2009 the town worked with the staff at the North Country Resource Conservation & Development Area Council under the NH Rural Fire Protection Initiative to develop a Water Resources Plan for improved emergency response for rural firefighting.

Table 7: Existing Protections and Policies

Existing Protection	Description	Area Covered	Responsible Party	Effectiveness	Improvements/Changes	Effectiveness/ Improvements (2019)
Zoning Ordinance	Flood Management Ordinance (section 13 of the Center Harbor Zoning Ordinance) – adopted in 2016. Determination of whether a proposed site for new construction (building, water, or sewer) or substantial improvements is located in a "flood prone area" and enforcement of this ordinance are and will continue to be carried out by the Code Enforcement Officer.	Town	Planning Board	Fair	Relies upon maps of existing features - slopes, wetland, soils and CEO knowledge & training. There are very few flood-prone areas in town and limited development at this point in time. FEMA should develop floodplain maps.	Fair

Existing Protection	Description	Area Covered	Responsible Party	Effectiveness	Improvements/Changes	Effectiveness/ Improvements (2019)
	Participate in NFIP Emergency Program since 2007 through enforcement of the Flood Management Ordinance (see above).	Town	Planning Board	Fair	See above	Fair
	Shoreland Protection through the state's Shoreland Water Quality Protection Act requires basic shoreland buffers and state wetlands and Alteration of Terrain permits. (NH DES review) Water Resources Protection Ordinance (local enforcement)	Town	Planning Board	Good	No changes are necessary.	As of 2016, there exists a local zoning ordinance for water resources protection that has worked well in conjunction with the State's Shoreland and Wetlands regulations.
	Require access for FD & emergency responders on all property with the State RSA. Fire Chief review of all new Planning Board applications with notifications.	Town	Planning Board	Good	No changes are necessary.	Good
	Planning Board may require additional water source for subdivision of three or more lots. (This was a recommendation in the Water Resources Plan (2009).)	Town	Planning Board	Good	No changes are necessary.	Good
	Telecom Towers – require access for public safety	Town	Planning Board	Good	No changes are necessary.	Good
	Zoning Ordinance was updated in 2019.	Town	Planning Board	Good	No changes are necessary.	Good
	Water Resources Conservation Overlay District exists within the Zoning Ordinances. The Town and State have designated 12 Prime Wetland Complexes. In addition to protecting natural resources, this reduces the likelihood that development will occur in areas that are wet or prone to flooding.	Town	Planning Board	Good	No changes are necessary.	Good
	Steep Slopes Ordinance limits construction on Steep Slopes, reducing the likelihood of erosion. This is part of the Zoning Ordinance.	Town	Planning Board	Good	No changes are necessary.	Good

Existing Protection	Description	Area Covered	Responsible Party	Effectiveness	Improvements/Changes	Effectiveness/ Improvements (2019)
Radio Communications	Have interdepartmental radio interoperability	Region – partial coverage due to mountains	Police Chief	Fair	Work with Belknap County Sheriff to improve coverage through more/better repeaters.	Interoperability is effective but the dispatches have some issues.
	Meet the 2013 FCC Rules and Regulations	Town	Police Chief	Good	No changes are necessary.	Done
Sewer/ Water Service	Bay Sewer District serves the downtown area, reducing the likelihood of a spill near Lake Winnipesaukee.	Village Area	Selectmen	Good	No changes are necessary.	Done
	All others on septic systems	Town	Planning Board	Good	No changes are necessary.	Done
Fire Dept.	Participate in Lakes Region Mutual Aid.	Town/ Region	Fire Chief	Good	No changes are necessary.	Done
	The F.D. reviews site plans and performs final inspections for oil burners.	Town/ Region	Fire Chief	Good	No changes are necessary.	Done
	Part-time chief and 20 on-call firefighters, conduct regular training	Town/ Region	Fire Chief	Good	No changes are necessary.	Done; There is a challenge with getting staffing
	Member of the Central NH Haz Mat Team.	Town/ Region	Fire Chief	Good	No changes are necessary.	Have access but not represented.
	Inspection/Maintenance Plan for equipment	Town/ Region	Fire Chief	Good	No changes are necessary.	Done
	FD conducts inspection & upkeep	Town	Fire Chief	Good	No changes are necessary.	Done

Existing Protection	Description	Area Covered	Responsible Party	Effectiveness	Improvements/Changes	Effectiveness/ Improvements (2019)
Water Resources Plan for Fire Protection (2009)	Plan recommends nine new hydrant locations	Town	Fire Chief	Good	By installing some recommended hydrants, the town's ISO rating for fire was reduced. More can be done.	May be too complicated
Police Department	Full-time PD Chief	Town	Police Chief	Good	No changes are necessary.	Done
	3 full-time officers, 1 support staff	Town	Police Chief	Good	No changes are necessary.	Done
	Participates in state and regional mutual aid.	Town	Police Chief	Good	No changes are necessary.	Done
Highway Department	Full-time Road Agent	Town	Road Agent	Good	No changes are necessary.	Done
	Two full-time staff	Town	Road Agent	Good	No changes are necessary.	Done
	Culverts are cleaned regularly to reduce flooding on roads.	Town	Road Agent	Good	No changes are necessary.	Done
	Have Debris Management Training	Town	Road Agent	Good	No changes are necessary.	Done
Emergency Operations Plans	Updated in 2015.	Town	Emergency Management Director	Good	It is due for a full update in 2015.	Due for 5-year update
Building Codes and Inspector	Consistent with State Building Code: IRC for residential and IBC for commercial.	Town	Selectmen	Good	No changes are necessary.	Good
	Do have Building Inspector	Town	Selectmen	Good	No changes are necessary.	Done

Existing Protection	Description	Area Covered	Responsible Party	Effectiveness	Improvements/Changes	Effectiveness/ Improvements (2019)
Regional Health Emergency Plan	In partnership with nearby communities and Lakes Region Partnership for Public Health (LRPPH) have developed plans for preventing and responding to regional health emergencies.	Town & region	EMD, CEO	Good	No changes are necessary.	Done
School Emergency Operations Plan	The local school district (InterLakes) has plans for preventing and responding to regional health emergencies.	Town & region	EMD, CEO	Good	No changes are necessary.	Good
Back-up power	Covers Emergency Operations Center	Municipal Building	Emergency Management Director	Excel-lent	The generator at the Highway Department should be upgraded.	Done
Fire Dept.	Planning for a new fire engine	Town	Fire Chief	Good		Good

B. STATUS OF 2014 ACTIONS

Many of the mitigation strategies from the 2014 Hazard Mitigation Plan have either been completed or are no longer applicable due to changes in local circumstances. The status of the mitigation actions recommended in the 2007 plan is indicated in Table 8 as either, Completed, Deleted, or Deferred. Some of the deleted Actions are now listed above as "Current Plans, Policies, and Regulations". Three Mitigation Actions from 2007 have had portions of the task completed but more still needs to be done, so those unfinished portions have been deferred. Deferred Actions (or deferred portions of Actions) were carried forward to be considered as new Mitigation Actions (Table 9-11).

Table 8: Status of Mitigation Actions from the 2014 Hazard Mitigation Plan

ID	Hazard	Problem	Recommended Action	Status (Completed, Deleted, Deferred)	Comment
2	All Hazards	The purchasing of needed but expensive emergency equipment can significantly impact the town's budget and result in delays in approval.	The Planning Board should consider re-activating the town's Capital Improvement Program to guide the town in planning for the costs associated with maintaining and upgrading equipment on a regular schedule.	Deleted	• Center Harbor maintains a list of capital programs for maintaining and upgrading equipment. Instead of a CIP they use Expendable Trust Funds & Capital Reserve funds. It's essentially a CIP but not formally drafted as a plan. • The Highway Department Equipment is not on a set schedule.
7A	Inland Flooding	There is not consistent communication regarding dams and infrastructure.	Develop a checklist for EMD to go through when discussing dams, roads, and structures with dam owners.	Deleted	Start a vulnerability and prioritization lists for dams, infrastructure, and properties most likely to be affected.
7B	Inland Flooding	Failure of some dams could result in damage to roads and structures. Lake Winona and Lake Waukewan could also be impacted by a breached dam.	EMD should maintain contact with landowners regarding the condition of dams and the nearby roads and structures.	Deleted	Start a vulnerability and prioritization lists for dams, infrastructure, and properties most likely to be affected.

ID	Hazard	Problem	Recommended Action	Status (Completed, Deleted, Deferred)	Comment
11A	Transportation HazMat	The hill on NH Rte. 25B has a 14% grade and leads directly into the Village. Some trucks have difficulty with this hill but they are using this route more often. (Same as #11B)	Create an emergency truck turnout along NH Route 25B.	Deleted	This was not realistic. See #11
18	All Hazards	Getting information to both residents and the many visitors to Center Harbor regarding hazards and prevention in a timely manner can be difficult. (Same as #17)	Purchase and install a "Reader Board" in West Center Harbor to effectively get information out to residents and visitors on this side of town.	Deleted	Does not seem to be practical. Efforts should be put into the website.
4	All Hazards	It is difficult to share all pertinent data between town departments due to computer and compatibility issues.	Upgrade computers in all departments and make equipment information available to all departments.	Completed	In process
12	Wildfire	Some structures in town do not have a complete water supply readily available.	Construct more dry hydrants/cisterns.	Completed	All hydrants recommended in Water Resources Plan constructed.
1	All Hazards	The supply of emergency traffic signage is quite limited.	More signage should be available to detour traffic when accidents do happen (limited staff for traffic control).	Completed	Signage has been updated within the past few years.
3	All Hazards	The Highway Department is the secondary EOC yet it does not have a dependable back-up power source.	The generator at the Highway Department should be replaced with a more dependable model.	Completed	This was completed within the last five years.

ID	Hazard	Problem	Recommended Action	Status (Completed, Deleted, Deferred)	Comment
17A	All Hazards	Getting information to both residents and the many visitors to Center Harbor regarding hazards and prevention in a timely manner can be difficult.	Upgrade the "Reader Board" to effectively get information out to residents and visitors.	Completed	Have upgraded Reader Board in front of the municipal building.
22	All Hazards	There is no shelter in town.	Identify, designate, and equip an appropriate shelter in town.	Completed	The Town Offices are designated as the primary shelter for Center Harbor while the EOC is designated as the Police Department.
15	High Winds (Tornado, Downburst)	High winds can damage property anywhere in town (especially downed trees and wires). Many are not aware of the steps they can take to protect their property.	Improve communication & outreach to property owners regarding steps they can take to reduce the vulnerability of their properties and improve emergency preparedness.	Deferred	Committee Members expressed an interest in working with the NH Electric Coop in developing a plan. Road Agent notifies landowners about dead or dangerous trees. Landowners are responsible for trees on their property and removal of debris shall be done within a year's time. High Haith and CH Neck Road is noted by the committee as a high hazard area.
14	Lightning	Lightning can damage property anywhere in town. Many are not aware of the steps they can take to protect their property.	Improve communication & outreach to property owners regarding steps they can take to reduce the vulnerability of their properties, such as FireWise materials on the website.	Deferred	

ID	Hazard	Problem	Recommended Action	Status (Completed, Deleted, Deferred)	Comment
16	Severe Winter Weather	Snow and ice can damage property anywhere in town. Some are not aware of the steps they can take to protect their property and be prepared for loss of power.	Improve communication & outreach to property owners regarding steps they can take to reduce the vulnerability of their properties and improve emergency preparedness.	Deferred	Information and resources on topics like "Code Red" (see blah) are located under the "Resource Links" tab on Center Harbors Homepage. There is also opportunities for receiving "e-alerts" on their webpage.
13	Wildfire, All Hazards	Some areas in town are not readily accessible to firefighters	Access roads for fire should be designated, mapped, and maintained.	Deferred	Start a vulnerability and prioritization lists for Fire Access Roads. The committee determined mapping could be consolidated or provided with no additional costs.
9	HazMat Transport	A fuel spill near one of the lakes can spread quickly, contaminating the lake. Having containment equipment nearby for quick deployment can reduce the impact of a spill.	The FD should have a boom and materials to contain a fuel spill into the lake. Associated training should also be provided.	Deferred	The committee determined access to the Regional Hazmat Team should also occur and the assurance that proper hazard deployment training should happen.
17B	All Hazards	Getting information to both residents and the many visitors to Center Harbor regarding hazards and prevention in a timely manner can be difficult.	Explore options for new ways of reaching out to residents and visitors regarding hazards.	Deferred	Adding additional information and resources on the Center Harbor town website about hazard information and easing signing up for "e-alerts" were discussed by the committee.

ID	Hazard	Problem	Recommended Action	Status (Completed, Deleted, Deferred)	Comment
20	Inland Flooding	As no NFIP maps have been produced for Center Harbor by FEMA, the Code Enforcement Officer (CEO) "determines whether proposed building sites will be reasonably safe from flooding"	The CEO will participate in NFIP training that addresses flood hazard identification when offered by the state or FEMA.	Deferred	The committee added mitigation action #30 for increased action against this issue.
5A	Inland Flooding	In heavy rains in the Village Center and Coe Hill Road flood because the existing drainage is undersized. This results in flooding, washouts, and sedimentation.	Exploring additional funding options to upgrade undersized drainage in the Village Center.	Deferred	The committee noted that the clarification to the ownership of infrastructure (state or local) should occur along with exploring additional funding.
5B	Inland Flooding	In heavy rains in the Village Center and Coe Hill Road flood because the existing drainage is undersized. This results in flooding, washouts, and sedimentation. (Same as 5A)	Upgrade undersized drainage along Coe Hill Rd.	Deferred	The same as #5A
19	Earthquake	Center Harbor is located near a fault. Many local buildings are not built to withstand an earthquake.	Center Harbor is located near a fault. Many local buildings are not built to withstand an earthquake.	Deferred	Outreach could include information about earthquake insurance

ID	Hazard	Problem	Recommended Action	Status (Completed, Deleted, Deferred)	Comment
11	Transportation HazMat	The hill on NH Rte. 25B has a 8% grade and leads directly into the Village. Some trucks have difficulty with this hill but they are using this route more often.	Work with NHDOT to explore more signage options or GPS warning systems put in place for the steep grade on Rte. 25B.	Deferred	The committee noted that NHDOT added some new signage to this road segment.
21	All Hazards	There are still some areas of town where emergency radio communications are poor.	Work with the Belknap County Sheriff and HSEM to explore funding options and improve coverage through more/better repeaters.	Deferred	The Committee noted Gilmanton Hill has new repeater equipment. Some additional funding may be available to assist on more repeater equipment.

In addition to this list, the development of the Water Resources Plan for firefighting protection led to the installation of a new draft site in the village area, resulting in a reduction in the insurance fire rating protection class for the village. These reduced fire insurance premiums on both municipal and private properties in the village.

NH RSA 674:2(e) does allow for the inclusion of a natural hazards chapter in a local master plan. While preparing the 2012 Center Harbor Master Plan, the planning board decided not to incorporate the 2009 HMP as a chapter but rather to have it stand on its own.

The town has used operating budgets and Capital Reserve accounts to help pay for most of its hazard mitigation expenses.

The Center Harbor Local Emergency Operations Plan (LEOP) was updated in 2010 and references the Center Harbor Hazard Mitigation Plan. Several of the actions listed above were implemented through incorporation into the LEOP. Updates for the LEOP from the 2010 version are currently in the process.

C. MITIGATION GOALS AND TYPES OF ACTIONS

The overall goals of Center Harbor's Hazard Mitigation Plan Update have not changed substantially since the adoption of the 2007 Plan except for the addition of Goal 1.b (below).

1. Community and Resource Protection (CRP)
    a. Maintain and continuously improve Center Harbor's emergency response system to be able to assist those in need.
    b. Reduce the impact that potential hazards may have on Center Harbor's residents and visitors, services, and natural resources.
2. Coordination and Communication (CC)
    a. Ensure that regular communication occurs between various departments and with local, regional, and state officials.
    b. Have up to date plans in place to address various emergency situations and ensure that those involved are aware of their responsibilities.
3. Outreach and Education (OE)
    a. Build an awareness of public responsibility for hazard mitigation as well as steps that the town is taking.
4. Damage Prevention and Reduction (DPR)
    a. Minimize the damage and public expense which might be caused to public and private buildings and infrastructure due to natural and manmade hazards.

There is a strong emphasis in the town on Outreach and Education in part because so many of the areas of concern are private property. It is also important to know that LRPC and the town of Center Harbor are constantly evaluating and acquiring appropriate new technologies to achieve these goals.

By reviewing the various potential hazards and the potential impacts that these might have on the community, several specific Problem Statements were identified. These are the basis for several hazard-specific goals:

- Improve communication with citizens and visitors.
- Help homeowners protect their property against a variety of hazards that could impact any of the homes in Center Harbor.
- Protect and maintain the town's and state's infrastructure and reduce the risk of damage from damage due to erosion, washout, and sedimentation as a result of excess stormwater.
- Protect the residents, property, and the local environment from the release of hazardous materials.

There are several types of actions that communities may take to reduce the likelihood that a hazard might impact the community. These include:

1. **Actions that will keep things from getting worse - Prevention**
    a. Zoning – floodplain and steep slope overlays
    b. Open space preservation
    c. Subdivision and Site Plan Review
        i. Impervious surface limits
        ii. Stormwater management
    d. Capital Improvements Plan – limiting the extension of public infrastructure into hazard areas
    e. Building and Fire codes

2. **Actions that address individual buildings - Property Protection**
    a. Flood-proofing existing buildings
    b. Retrofitting existing buildings to reduce damage
    c. Relocating structures from hazard-prone areas
    d. Public procurement and management of land vulnerable to hazard damage

3. **Actions that will inform the public - Public education and awareness**
    a. Make hazard information and maps available to residents and visitors.
        i. Paper or electronic
        ii. Targeted at residents and businesses in hazard-prone areas
        iii. Set up displays in public areas, or homeowners associations.
        iv. Give educational programs in schools.
        v. Make information available through newspapers, radio, TV.
    b. Ask businesses to provide hazard information to employees.
    c. Adopt a real estate disclosure requirement so that potential owners are informed of risks prior to purchase.

4. **Actions that will protect natural resources**
    a. Erosion and sediment control programs
    b. Natural Resource Protection/Wetlands Protection Programs
    c. Expand public open space
    d. Environmental restoration programs

5. **Actions that will protect emergency services before, during, and immediately after an event (long-term continuity)**
    a. Protect warning system capability

b. Protection or hardening of critical facilities such as fire stations or hospitals
c. Protection of infrastructure, such as roads that are needed in emergency response

6. **Actions that will control the hazard – Structural projects**
   a. Diversion of stormwater away from developed areas
   b. Reservoirs to store drinking water

D. POTENTIAL ACTIONS

Through a review of the risk assessment and local vulnerabilities, a number of Problem Statements were identified and refined by the Committee. Multiple brainstorming sessions yielded an updated list of mitigation strategies to address these current problems. Table 9 lists the problems and actions sorted out by ID number. The table indicates the hazard that each action addresses, whether the action addresses existing or future (new) structures/infrastructure, which overall goal it primarily addresses, as well as the type of mitigation action each represents. The ID numbers were used simply for tracking purposes; they do not indicate any sort of prioritization. Several the problem statements generated multiple actions.

Overall Goal Key:	CRP – Community and Resources Protection	OE – Outreach & Education
	C&C – Coordination & Communication	DPR – Damage Prevention

The Committee identified the various pros and cons associated with each action. The estimated financial cost represents what the town estimates it will cost in terms of dollars or staff/volunteer hours to implement each action.

Blue highlight indicates new actions; actions not highlighted were deferred from the 2014 Plan. Some completed and deferred actions from the 2014 Plan were amended and included as new actions in this 2021 Plan; therefore, they are highlighted in blue. Gray highlights indicate Problems for which multiple actions were identified. Yellow highlight (in the Goal column) indicates Preparedness actions rather than purely Mitigation actions. Mitigation is action taken to reduce or eliminate long-term risk to hazards while preparedness is action taken to improve emergency response or operational preparedness.[51] The table of recommended actions also indicates the type of structure (existing or new) that each action addresses.

[51] *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards*, January 2013. FEMA.

Table 9: Suggested Mitigation Actions by Hazard Type – Problem, Structure, Goal, Type, and Structure

ID	Problem	Recommended Action	Hazard	Goal	Type	Struct.
1	A mass casualty event could happen in Center Harbor and the town is well prepared. With limited resources, the town is reliant on others for support. Training, communications, and some first response equipment is important to maintaining this high level of preparedness.	Ensure that proper equipment and training is available in case of a mass casualty event	Mass Casualty Event	CC & CRP	4 - Natural Resources	n/a
2	A wide-spread illness could strain the town's limited resources, limiting their ability to assist others in preparation for or during an hazard event	Disseminate information to public about illness and reach out to regional and state resources.	Infectious Diseases	OE	3 - Public Education & Awareness	n/a
3	There are some maintenance issues associated with Hawkins Pond Dam that need to be clarified so that road and dam maintenance can be done.	Develop an agreement between the state, town, and any other parties regarding maintenance of Hawkins Pond Dam and associated property	Dam Failure	CC & CRP	2 - Property Protection	Existing
4	Some areas in town are not readily accessible to firefighters	Access roads for fire should be designated, mapped, and maintained.	Wildfire, All Hazards	CRP	5 - Long-term Continuity	New
5	Snow and ice can damage property anywhere in town. Some are not aware of the steps they can take to protect their property and be prepared for loss of power.	Improve communication & outreach to property owners regarding steps they can take to reduce the vulnerability of their properties to heavy snow and ice and improve emergency preparedness.	Severe Winter Weather	OE	3 -- Public Education & Awareness	Existing
6	Lightning can damage property anywhere in town. Many are not aware of the steps they can take to protect their property.	Improve communication & outreach to property owners regarding steps they can take to reduce the vulnerability of their properties to lightning strikes and fire, such as FireWise materials on website.	Lightning	OE	3 -- Public Education & Awareness	Existing

ID	Problem	Recommended Action	Hazard	Goal	Type	Struct.
7	Excessive build up of water can potentially lead to failure of any dam (state, private, or even beaver dams), putting property, structures, and people at risk. A full inventory & assessment of all dams and documentation of stakeholders plus communication protocol has not been established. Same #21.	Establish a communication process for high rain events.	Inland Flooding	CC & CRP	3 -- Public Education & Awareness	Existing
8	Heavy rains in the Village Center and Coe Hill Road cause flooding because the existing drainage is undersized. This results in flooding, washouts, and sedimentation. Same #9.	Explore additional funding options to upgrade undersized drainage in the Village Center.	Inland Flooding	DPR	6 - Structural Projects	Existing
9	Heavy rains in the Village Center and Coe Hill Road cause flooding because the existing drainage is undersized. This results in flooding, washouts, and sedimentation. (Same as #8.)	Upgrade undersized drainage along Coe Hill Rd.	Inland Flooding	DPR	6 - Structural Projects	Existing
10	High winds can damage property anywhere in town (especially downed trees and wires). Many are not aware of the steps they can take to protect their property.	Improve communication & outreach to property owners regarding steps they can take to reduce the vulnerability of their properties to damage from high winds, especially from downed trees and wires and improve emergency preparedness.	High Winds, Cyclone	OE	3 - Public Education & Awareness	Existing
11	A fuel spill near one of the lakes can spread quickly, contaminating the lake. Having containment equipment nearby for quick deployment can reduce the impact of a spill.	The FD should acquire or have access to a boom and materials to contain a fuel spill into the lake. Associated training should also be provided.	HazMat Transport	CRP	4 - Natural Resources	Existing

ID	Problem	Recommended Action	Hazard	Goal	Type	Struct.
12	The EOP is more than five years old. It does not include information about warming and cooling shelters.	Update EOP to include a warming and cooling shelter plan and a populations at risk plan.	Extreme Temps	CRP	5 - Long-term Continuity	n/a
13	Center Harbor is located near a fault. Many local buildings are not built to withstand an earthquake.	Center Harbor should provide education and outreach about earthquake resiliency.	Earth-quake	EO	3 - Public Education & Awareness	Existing
14	The likely primary shelters do not have back-up power	Work with the likely primary shelter (Congregational Church) and HSEM to secure matching funds and grant funds for an appropriate generator.	All Hazards	CRP	5 - Long-term Continuity	n/a
15	Getting information to both residents and the many visitors to Center Harbor regarding hazards and prevention in a timely manner can be difficult.	Explore options for new ways of reaching out to residents and visitors regarding hazards.	All Hazards	OE	3 - Public Education & Awareness	Existing
16	The town should have an inventory of the location and condition of its roads, drainage structures, buildings, and facilities. This can be utilized in a variety of situations including prioritization of maintenance.	Explore opportunities to inventory, assess, and prioritize the town's infrastructure along with potential funding mechanisms.	Aging Infrastructure	DPR	5 - Long-term Continuity	Existing
17	The hill on NH Rte. 25B has a steep grade and leads directly into the Village. Some trucks have difficulty with this hill but they are using this route more often.	Work with NHDOT to explore more options for warning systems, especially for trucks regarding the steep grade on NH Route 25B, perhaps incorporating this into establish GPS navigation systems.	Transportation HazMat	DPR	3 - Public Education & Awareness	Existing

ID	Problem	Recommended Action	Hazard	Goal	Type	Struct.
18	No NFIP Flood Maps have been developed for the town of Center Harbor. The town still continues to be in the NFIP program under emergency status, limiting the amount of Flood Insurance available.	As the FEMA Watershed Flood Mapping efforts (Winnipesaukee and Pemigewasset watersheds) progress over the next several years, maintain local involvement, especially during map review and drafting of a flood ordinance.	Inland Flooding	DPR	1 - Prevention	New
19	As no NFIP maps have been produced for Center Harbor by FEMA, the Code Enforcement Officer (CEO) "determines whether proposed building sites will be reasonably safe from flooding"	The CEO will participate in NFIP training that addresses flood hazard identification when offered by the state or FEMA.	Inland Flooding	DPR	1 - Prevention	New
20	There are still some areas of town where emergency radio communications are poor.	Work w/ Belknap County Sheriff & HSEM to explore funding options & improve coverage through more/better repeaters.	All Hazards	CC & CRP	5 - Long-term Continuity	n/a
21	Excessive build up of water can potentially lead to failure of any dam (state, private, or even beaver dams), putting property, structures, & people at risk. A full inventory & assessment of all dams & documentation of stakeholders plus communication protocol hasn't been set up. Same as #7.	Identify, assess, monitor, and document the dams of Center Harbor for communication among their stakeholders.	Inland Flooding	DPR	3 - Public Education & Awareness	Existing
22	Hawkins Pond Bridge has some structural and capacity issues that could compromise its ability to serve as an evacuation route and limit the availability of services during and after a hazard event.	Repair/upgrade/replace Hawkins Pond Bridge.	Aging Infra-structure	CRP	5 - Long-term Continuity	Existing
23	Communication systems and services can be interrupted by solar storms and space weather, though there is little that might be done locally.	Maintain situational awareness on NOAAs solar and space weather page to stayed informed on potential impacts from anticipated solar and space weather.	Solar Storm & Space Weather	C&C	5 - Long-term Continuity	Existing

The cost of implementing each action was estimated as accurately as possible either in terms of dollars or staff hours. Cost was also a factor in the evaluation process. After considering the Pros and Cons of each project, the Committee prioritized the various projects which had been identified utilizing the STAPLEE method, with potential scores ranging from -7 to 7 (See Appendix H for full details). Table 10 shows the Actions ordered by their overall score, which range from a low of -1 to a high of 5. Actions #22 and #23 were added after committee prioritization had been completed.

Table 10: Prioritized Recommended Actions

ID	Recommended Action	Estimated Cost	Potential Funding	STAPLEE	2021 Comment
1	Ensure that proper equipment and training is available in case of a mass casualty event	Medium 100 hours Staff Time	Operating Budget, HSEM grants	**5**	Current training and communication is good but this must be maintained.
2	Disseminate information to public about illness & reach out to regional & state resources.	Low 40 hours Staff Time	Grants, PPH, Operating Budget	**5**	Regional Resource (Partnership for Public Health)
3	Develop an agreement between the state, town, and any other parties regarding maintenance of Hawkins Pond Dam and associated property	Medium 80 hours Staff Time	Operating Budget	**5**	Road Agent established some communication with NH DES during the update process.
4	Access roads for fire should be designated, mapped, and maintained.	Medium $2,000/ 80 hours Staff Time	Operating Budget	**4**	Start a vulnerability and prioritization list for fire access roads. Mapping might be consolidated or provided with minimal costs. Possibility for assistance from LRPC and outdoors or snowmobile clubs.

ID	Recommended Action	Estimated Cost	Potential Funding	STAPLEE	2021 Comment
5	Improve communication & outreach to property owners regarding steps they can take to reduce the vulnerability of their properties to heavy snow and ice and improve emergency preparedness.	Low $500/ 20 hours Staff Time	Operating Budget	**4**	Information and resources on topics like "Code Red" can be found under the "Resource Links" tab on Center Harbor's Homepage. There is also opportunity for receiving "e-alerts" on the webpage.
6	Improve communication & outreach to property owners regarding steps they can take to reduce the vulnerability of their properties to lightning strikes and fire, such as FireWise materials on the website.	Low $500/ 20 hours Staff Time	Operating Budget	**4**	
7	Establish a communication process for high rain events.	Low 20 hours staff time	Operating Budget	**4**	This is mainly for the people that live downstream from dams.
8	Explore additional funding options to upgrade undersized drainage in the Village Center.	High$1,000,000	Highway Dept. Budget, Warrant Article Grants – EPA 319, NH DES Watershed ProtectionHMPG	**4**	Culverts are not sized properly to handle peak flow. This was identified from Winnipesaukee Watershed Management Plan and structures have been inventoried and assessed. Work on the hydrant system could be done at the same time. Committee noted that clarification to the ownership of infrastructure (state or local) should occur along with exploring additional funding.

ID	Recommended Action	Estimated Cost	Potential Funding	STAPLEE	2021 Comment
9	Upgrade undersized drainage along Coe Hill Rd.	High $500,000	Highway Dept. Budget, Warrant Article Grants – EPA 319, NH DES Watershed Protection HMPG	**4**	The same as #8 but also focuses on private property protection.
10	Improve communication & outreach to property owners regarding steps they can take to reduce the vulnerability of their properties to damage from high winds, especially from downed trees and wires and improve emergency preparedness.	Low $500/ 20 hours Staff Time	Operating Budget	**4**	Work with the NH Electric Coop in developing a plan. Road Agent notifies landowners about dead or dangerous trees. Landowners are responsible for trees on their property and removal of debris shall be done within a year's time. High Haith Road and CH Neck Rd are noted by the committee as a high hazard area.
11	The FD should acquire or have access to a boom and materials to contain a fuel spill into the lake. Associated training should also be provided.	Low $500/ 20 hours Staff Time	FD budget, grants	**4**	Access to the Regional HazMat Team should be maintained & confirm that proper hazard deployment training will happen. Proper materials & equipment should be on hand.
12	Update EOP to include a warming and cooling shelter plan and a populations at risk plan.	Medium $2,000/ 40 hrs. Staff Time	HSEM Grant	**4**	Town is scheduled to update the EOP within the next year

ID	Recommended Action	Estimated Cost	Potential Funding	STAPLEE	2021 Comment
13	Center Harbor should provide education and outreach about earthquake resiliency.	Low $500/ 10 hrs. staff time	Operating Budget	**4**	Outreach could include information about earthquake insurance.
14	Work with the likely primary shelter (Congregational Church) and HSEM to secure matching funds and grant funds for an appropriate generator.	Medium $2,000/ 80 hours Staff time	Private funds, warrant article, HMPG grant	**4**	Steps have already been taken to address this.
15	Explore options for new ways of reaching out to residents and visitors regarding hazards.	Low $1,000/ 40 hours Staff Time	Operating Budget, grant	**4**	Adding additional information and resources on the Center Harbor town website about hazard information and simplifying signing up for "e-alerts" were discussed by the committee.
16	Explore opportunities to inventory, assess, and prioritize the town's infrastructure along with potential funding mechanisms.	Low $500/ 40 hours Staff Time	Operating Budget	**4**	Actual inventories and assessments may require more resources.
17	Work with NHDOT to explore more options for warning systems, especially for trucks regarding the steep grade on NH Route 25B, perhaps incorporating this into establish GPS navigation systems.	Medium 80 hours Staff Time	NH DOT	**3**	This state road segment is a high priority for the town but not the state. The committee noted that NHDOT added some new signage to this road segment. Center Harbor has voiced that trucking is a large concern.

ID	Recommended Action	Estimated Cost	Potential Funding	STAPLEE	2021 Comment
18	As the FEMA Watershed Flood Mapping efforts (Winnipesaukee and Pemigewasset watersheds) progress over the next several years, maintain local involvement, especially during map review & drafting of a flood ordinance.	Low 20 hours Staff Time	Operating Budget	**2**	
19	The CEO will participate in NFIP training that addresses flood hazard identification when offered by the state or FEMA.	Low 40 hours Staff Time annually	Operating Budget	**1**	Enables town to stay current on flooding issues. Reduces likelihood that structures will be constructed in flood-prone areas. Committee added mitigation action #18 for increased action against this issue.
20	Work with the Belknap County Sheriff and HSEM to explore funding options and improve coverage through more/better repeaters.	High $250,000	HSEM Grant	**0**	Gives emergency responders better ability to communicate throughout town. This may require a new tower. Gilmanton Hill has new repeater equipment. Some additional funding may be available to assist on more repeater equipment.
21	Identify, assess, monitor, and document Center Harbor dams for communication among their stakeholders.	Medium $5,000	EMD	**-1**	
22	Repair/upgrade/replace Hawkins Pond Bridge.	High $500,00 - $750,000	CRF in Town Budget	**-1**	While this is a significant expense, the town has budgeted for this.
23	Maintain situational awareness on NOAAs solar and space weather page to stayed informed on potential impacts from anticipated solar and space weather.	Low 20 hours Staff Time annually	Operating Budget	**-1**	

E. IMPLEMENTATION OF MITIGATION ACTIONS

There are many factors that influence how a town chooses to spend its energy and resources in implementing recommended actions. Factors include:

- Urgency
- How quickly an action could be implemented
- Likelihood that the action will reduce future emergencies
- Regulations required to implement the action
- Administrative burdens
- Time (both paid and volunteer)
- Funding availability
- Political acceptability of the action.

In the context of these factors, the Committee discussed the mitigation actions and utilized the STAPLEE method (Section D above and Appendix H) as a guide to reach consensus regarding their relative level of priority, recognizing that some actions are of greater priority to different town departments. This implementation schedule contains a matrix (Table 11) indicating the estimated financial cost of implementation, potential funding sources, the parties responsible for bringing about these actions, and implementation time frame. Though a number of recommended mitigation actions received high scores, the time frame for which the actions are executed depend upon staff time and budgetary limitations. These are listed in order of their Time Frame. To keep the plan current, the implementation schedule should be updated and re-evaluated on a regular basis as outlined in the monitoring section of this plan.

Table 11: Implementation Schedule for Mitigation Actions

ID	Problem	Recommended Action	Hazard	Responsible Party	Time Frame
1	A mass casualty event could happen in Center Harbor and the town is well prepared. With limited resources, the town is reliant on others for support. Training, communications, and some first response equipment is important to maintaining this high level of preparedness.	Ensure that proper equipment and training is available in case of a mass casualty event	Mass Casualty Event	PD	Ongoing/ Long Term 4+ years

ID	Problem	Recommended Action	Hazard	Responsible Party	Time Frame
2	A wide-spread illness could strain the town's limited resources, limiting their ability to assist others in preparation for or during an hazard event	Disseminate information to public about illness and reach out to regional and state resources.	Infectious Diseases	EMD	Long Term 4+ years
3	There are some maintenance issues associated with Hawkins Pond Dam that need to be clarified so that road and dam maintenance can be done.	Develop an agreement between the state, town, and any other parties regarding maintenance of Hawkins Pond Dam and associated property	Dam Failure	Highway Dept./BoS	Long Term 4+ years
4	Some areas in town are not readily accessible to firefighters	Access roads for fire should be designated, mapped, and maintained.	Wildfire, All Hazards	FD	Mid-Term 2 to 4 years
5	Snow and ice can damage property anywhere in town. Some are not aware of the steps they can take to protect their property and be prepared for loss of power.	Improve communication & outreach to property owners regarding steps they can take to reduce the vulnerability of their properties to heavy snow and ice and improve emergency preparedness.	Severe Winter Weather	Admin/BoS/ EMD	Short Term 1 to 2 years
6	Lightning can damage property anywhere in town. Many are not aware of the steps they can take to protect their property.	Improve communication & outreach to property owners regarding steps they can take to reduce the vulnerability of their properties to lightning strikes and fire, such as FireWise materials on the website.	Lightning	Admin/BoS/ EMD	Short Term 1 to 2 years
7	Excessive build up of water can potentially lead to failure of any dam (state, private, or even beaver dams). This can put property, structures, and people at risk. A full inventory and assessment of all dams and documentation of stakeholders plus communication protocol has not been established. Same as #21.	Establish a communication process for high rain events.	Inland Flooding	EMD/BoS	Long Term 4+ years

ID	Problem	Recommended Action	Hazard	Responsible Party	Time Frame
8	Heavy rains in the Village Center and Coe Hill Road cause flooding because the existing drainage is undersized. This results in flooding, washouts, and sedimentation. Same #9.	Explore additional funding options to upgrade undersized drainage in the Village Center.	Inland Flooding	Highway Dept.	Long Term 4+ years
9	Heavy rains in the Village Center and Coe Hill Road cause flooding because the existing drainage is undersized. This results in flooding, washouts, and sedimentation. (Same as #8.)	Upgrade undersized drainage along Coe Hill Rd.	Inland Flooding	Highway Dept.	Long Term 4+ years
10	High winds can damage property anywhere in town (especially downed trees and wires). Many are not aware of the steps they can take to protect their property.	Improve communication & outreach to property owners regarding steps they can take to reduce the vulnerability of their properties to damage from high winds, especially from downed trees and wires and improve emergency preparedness.	High Winds, Cyclones	Admin/BoS/ EMD	Short Term 1 to 2 years
11	A fuel spill near one of the lakes can spread quickly, contaminating the lake. Having containment equipment nearby for quick deployment can reduce the impact of a spill.	The FD should acquire or have access to a boom and materials to contain a fuel spill into the lake. Associated training should also be provided.	HazMat Transport	FD	Short Term 1 to 2 years
12	The EOP is more than five years old. It does not include information about warming and cooling shelters.	Update EOP to include a warming and cooling shelter plan and a populations at risk plan.	Extreme Temps	EMD	Mid-Term 2 to 4 years
13	Center Harbor is located near a fault. Many local buildings are not built to withstand an earthquake.	Center Harbor should provide education and outreach about earthquake resiliency.	Earthquake	Admin/BoS/ EMD	Mid-Term 2 to 4 years

ID	Problem	Recommended Action	Hazard	Responsible Party	Time Frame
14	The likely primary shelter does not have back-up power	Work with the likely primary shelter (Congregational Church) and HSEM to secure matching funds and grant funds for an appropriate generator.	All Hazards	EMD/BoS	Short Term 1 to 2 years
15	Getting information to both residents and the many visitors to Center Harbor regarding hazards and prevention in a timely manner can be difficult.	Explore options for new ways of reaching out to residents and visitors regarding hazards.	All Hazards	Admin/BoS/ EMD	Short Term 1 to 2 years
16	The town should have an inventory of the location and condition of its roads, drainage structures, buildings, and facilities. This can be utilized in a variety of situations including prioritization of maintenance.	Explore opportunities to inventory, assess, and prioritize the town's infrastructure along with potential funding mechanisms.	Aging Infrastructure	Highway Dept.	Long Term 4+ years
17	The hill on NH Rte. 25B has a steep grade and leads directly into the Village. Some trucks have difficulty with this hill, but they are using this route more often.	Work with NHDOT to explore more options for warning systems, especially for trucks regarding the steep grade on NH Route 25B, perhaps incorporating this into establish GPS navigation systems.	Transportation HazMat	PD	Short Term 1 to 2 years
18	No NFIP Flood Maps have been developed for the town of Center Harbor. The town continues to be in the NFIP program under emergency status, limiting the amount of Flood Insurance available.	As the FEMA Watershed Flood Mapping efforts (Winnipesaukee and Pemigewasset watersheds) progress over the next several years, maintain local involvement, especially during map review and drafting of a flood ordinance.	Inland Flooding	PB	Long Term 4+ years

ID	Problem	Recommended Action	Hazard	Responsible Party	Time Frame
19	As no NFIP maps have been produced for Center Harbor by FEMA, the Code Enforcement Officer (CEO) "determines whether proposed building sites will be reasonably safe from flooding"	The CEO will participate in NFIP training that addresses flood hazard identification when offered by the state or FEMA.	Inland Flooding	CEO	Long Term 4+ years
20	There are still some areas of town where emergency radio communications are poor.	Work with the Belknap County Sheriff and HSEM to explore funding options and improve coverage through more/better repeaters.	All Hazards	PD	Long Term 4+ years
21	Excessive build-up of water can potentially lead to failure of any dam (state, private, or even beaver dams). This can put property, structures, and people at risk. A full inventory and assessment of all dams and documentation of stakeholders plus communication protocol has not been established. Same as #7.	Identify, assess, monitor, and document the dams of Center Harbor for communication among their stakeholders.	Inland Flooding	EMD	Mid-Term 2 to 4 years
22	Hawkins Pond Bridge has some structural and capacity issues that could compromise its ability to serve as an evacuation route and limit the availability of services during and after a hazard event.	Repair/upgrade/replace Hawkins Pond Bridge.	Aging Infra-structure	RA	Long Term 4+ years
23	Communication systems and services can be interrupted by solar storms and space weather, though there is little that might be done locally.	Maintain situational awareness on NOAAs solar and space weather page to stayed informed on potential impacts from anticipated solar and space weather.	Solar Storm & Space Weather	EMD/PD	Ongoing

CHAPTER V: PLAN ADOPTION AND MONITORING

A. IMPLEMENTATION

The Center Harbor Hazard Mitigation Plan Update Committee, established by the EMD and Board of Selectmen, will meet annually to review the Plan and provide a mechanism for ensuring that an attempt is made to incorporate the actions identified in the plan into ongoing town planning activities. Essential elements of implementation require that all responsible parties for the various recommendations understand what is expected of them, and that they are willing to fulfill their role in implementation. It is therefore important to have the responsible parties clearly identified when the town adopts the final plan. Where appropriate it would be helpful to have any hazard mitigation activities identified in job descriptions.

Many of the actions in this plan rely on the town's operating budget, which may also include the use of Capital Reserve Funds along with grant funds available through FEMA, the US Environmental Protection Agency (EPA), and other sources such as those listed in Appendix B. The Emergency Management Director will coordinate with department heads, the Budget Committee, and Selectmen to ensure that funds and staff time for these projects are available. The EMD will also coordinate with the NH HSEM Field Representative to ensure that the town applies for appropriate grant funds.

As indicated in Section IV.A., there are some local planning mechanisms that the town can utilize to incorporate information or actions from the hazard mitigation plan including the Center Harbor Master Plan, Zoning Ordinance, and local Regulations.

While some of these planning mechanisms fall under the purview of the town's planning board, the process of incorporation varies between the documents and departments. Adoption of and amendments to the master plan, zoning ordinance, and regulations are addressed in NH RSA 675:1-7.

When appropriate, an effort will be made to incorporate this plan into the Emergency Operations Plan. Within a year after the town officially adopts the 2021 update to the Hazard Mitigation Plan, an attempt will be made to have hazard mitigation strategies integrated into these existing mechanisms and into all other ongoing town planning activities.

B. PLAN MAINTENANCE & PUBLIC INVOLVEMENT

The Center Harbor Hazard Mitigation Planning Committee and the Selectboard, in order to track progress and update the mitigation strategies identified in Chapter IV - D & E, will review the Center Harbor Hazard Mitigation Plan every year or after a hazard event. The Town of Center Harbor Emergency Management Director is responsible for initiating this review and needs to consult with members of the Center Harbor Committee identified in this Plan. Changes will be made to the Plan to accommodate projects that have failed, are no longer consistent with the timeframe identified, are no longer consistent with the community's priorities, or lack funding resources. Priorities that were not ranked high, but identified as potential mitigation strategies, will be reviewed during the monitoring and update of this Plan to determine feasibility of future

implementation. In keeping with the process of adopting the Plan, a public hearing will be held to receive public comment on the Plan.

Maintenance and updating will be held during the annual review period and the final product adopted by the Selectboard. The Committee will meet annually as part of this plan maintenance. The Emergency Management Director is also responsible for updating and resubmitting the plan to FEMA to be re-approved every five years. The EMD will convene a plan update committee in the early 2025 to begin updating this plan before it expires.

On behalf of the Hazard Mitigation Committee, the Emergency Management Director, under direction of the Selectboard, will be responsible for ensuring that town's departments and the public have adequate opportunity to participate in the planning process during the Plan's annual review and during any Hazard Mitigation Committee meetings. Administrative staff may be utilized to assist with the public involvement process.

For each committee meeting, and the annual update process, techniques that will be utilized for public involvement include:

- Provide notification to the Select Board for budgeting purposes:
- Provide invitations to municipal department heads;
- Post notices of meetings at the Municipal Building, Library, and on the town website;
- Submit press releases for publication in the *Meredith News*, *Laconia Daily Sun*, and other appropriate newspapers or media outlets.

Entities to invite to future Hazard Mitigation plan updates include the Emergency Management Directors of the neighboring communities of Moultonborough, Ashland, New Hampton, Holderness, and Meredith.

C. **LOCAL ADOPTION**

Certificate of Adoption – Town of Center Harbor

A resolution adopting the Center Harbor Hazard Mitigation Plan Update 2021

APPENDIX A: TECHNICAL RESOURCES

NH Homeland Security and Emergency Management 271-2231
http://www.nh.gov/safety/divisions/HSEM/
Hazard Mitigation Section 271-2231
http://www.nh.gov/safety/divisions/hsem/HazardMitigation/index.html

Federal Emergency Management Agency ..... (617) 223-4175
http://www.fema.gov/
FEMA, National Flood Insurance Program, Community Status Book
http://www.fema.gov/national-flood-insurance-program/national-flood-insurance-program-community-status-book

NH Regional Planning Commissions:
Central NH Regional Planning Commission 796-2129
http://www.cnhrpc.org/
Lakes Region Regional Planning Commission 279-8171
http://www.lakesrpc.org/
Nashua Regional Planning Commission 883-0366
http://www.nashuarpc.org/
North Country Council 444-6303
http://www.nccouncil.org/
Rockingham Regional Planning Commission 778-0885
http://www.rpc-nh.org/
Southern New Hampshire Regional Planning Commission 669-4664
http://www.snhpc.org/
Southwest Regional Planning Commission 357-0557
http://www.swrpc.org/
Strafford Regional Planning Commission 742-2523
http://www.strafford.org/
Upper Valley Lake Sunapee Regional Planning Commission 448-1680
http://www.uvlsrpc.org/

NH Governor's Office of Strategic Initiative 271-2155
http://www.nh.gov/osi/index.htm
New Hampshire Floodplain Management Program
http://www.nh.gov/oep/planning/programs/fmp/index.htm
News and Events page, including training opportunities
http://www.nh.gov/oep/planning/programs/fmp/news-events.htm

NH Department of Transportation 271-3734
http://www.nh.gov/dot/index.htm

NH Department of Cultural Affairs 271-2540
http://www.nh.gov/nhculture/
Division of Historical Resources 271-3483
http://www.nh.gov/nhdhr/

NH Department of Environmental Services 271-3503
http://www.des.state.nh.us/
Dam Bureau 271-3406
http://www.des.state.nh.us/organization/divisions/water/dam/index.htm

NH Municipal Association 224-7447
http://www.nhmunicipal.org/LGCWebsite/index.asp

NH Fish and Game Department 271-3421
http://www.wildlife.state.nh.us/

NH Department of Resources and Economic Development 271-2591
http://www.dred.state.nh.us/
Division of Forests and Lands 271-2214
http://www.nhdfl.org/
Natural Heritage Inventory 271-2215
http://www.nhdfl.org/about-forests-and-lands/bureaus/natural-heritage-bureau/
Division of Parks and Recreation 271-3255
http://www.nhstateparks.org/

NH Department of Health and Human Services 271-9389
http://www.dhhs.state.nh.us/

Northeast States Emergency Consortium, Inc. (NESEC) ..... (781) 224-9876
http://www.nesec.org/

US Department of Commerce ..... (202) 482-2000
http://www.commerce.gov/
National Oceanic and Atmospheric Administration ..... (202) 482-6090
http://www.noaa.gov/
National Weather Service, Eastern Region Headquarters
http://www.erh.noaa.gov/
National Weather Service, Tauton, Massachusetts ..... (508) 824-5116
http://www.erh.noaa.gov/er/box/
National Weather Service, Gray, Maine ..... (207) 688-3216
http://www.erh.noaa.gov/er/gyx/

US Department of the Interior
http://www.doi.gov/
US Fish and Wildlife Service 225-1411
http://www.fws.gov/
US Geological Survey 225-4681
http://www.usgs.gov/
US Geological Survey Real Time Hydrologic Data
http://waterdata.usgs.gov/nwis/rt
US Army Corps of Engineers ..... (978) 318-8087
http://www.usace.army.mil/

US Department of Agriculture
http://www.usda.gov/wps/portal/usdahome
US Forest Service ..... (202) 205-8333
http://www.fs.fed.us/

New Hampshire Electrical Cooperative ..... (800) 698-2007
http://www.nhec.com/

Cold Region Research Laboratory 646-4187
http://www.crrel.usace.army.mil/

National Emergency Management Association .....(859) 244-8000
http://nemaweb.org
National Aeronautics and Space Administration
http://www.nasa.gov/
NASA Optical Transient Detector – Lightning and Atmospheric Research
http://thunder.msfc.nasa.gov/

National Lightning Safety Institute
http://lightningsafety.com/

The Tornado Project Online
http://www.tornadoproject.com/

National Severe Storms Laboratory
http://www.nssl.noaa.gov/

Plymouth State University Weather Center
http://vortex.plymouth.edu/

APPENDIX B: MITIGATION FUNDING RESOURCES

There are numerous potential sources of funding to assist with the implementation of mitigation efforts. Two lists of state and federal resources are provided below. Some of these may not apply or be appropriate for Center Harbor. The NH Homeland Security and Emergency Management Field Representative for Belknap County can provide some assistance.

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 Watershed Protection (EWP) Program..... USDA, Natural Resources Conservation Service

Flood Mitigation Assistance Program (FMAP) ..... NH Homeland Security and Emergency Management

Highway Safety Improvement Program……. NH Department of Transportation

Pre-Disaster Mitigation Assistance Planning (MAP) ..... NH Homeland Security and Emergency Management

Mutual Aid for Public Works..... NH Municipal Association, UNH Technology Transfer

National Flood Insurance Program (NFIP) ..... NH Office of Strategic Initiatives

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

Shoreline Protection Program ..... NH Department of Environmental Services

Various Forest and Lands Program(s)..... NH Department of Resources & Economic Development

Wetlands Programs..... NH Department of Environmental Services

State Aid Bridge Program for Communities ..... NH Department of Transportation

Contribution of Damage Losses (RSA 235:34) ..... NH Department of Transportation

Federal Mitigation Funding Sources

Federal Emergency Management Agency

Program	Details	Notes
Flood Mitigation Assistance Program (FMA)	Provides funding to implement measures to reduce or eliminate the long-term risk of flood damage http://www.fema.gov/government/grant/fma/index.shtm	States and localities
Hazard Mitigation Grant Program (HMGP)	Provides grants to implement long-term hazard mitigation measures after a major disaster declaration http://www.fema.gov/government/grant/hmgp/index.shtm	Open
National Flood Insurance Program (NFIP)	Enables property owners to purchase insurance as a protection against flood losses in exchange for state and community floodplain management regulations that reduce future flood damages http://www.fema.gov/business/nfip/	States, localities, and individuals
Pre-Disaster Mitigation Program (PDM)	Provides funds for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event http://www.fema.gov/government/grant/pdm/index.shtm	States, localities and tribal governments

Environmental Protection Agency

The EPA makes available funds for water management and wetlands protection programs that help mitigate against future costs associated with hazard damage.

Mitigation Funding Sources Program	Details	Notes
Clean Water Act Section 319 Grants	Grants for water source management programs including technical assistance, financial assistance, education, training, technology transfer, demonstration projects, and regulation. http://www.epa.gov/OWOW/NPS/cwact.html	Funds are provided only to designated state and tribal agencies
Clean Water State Revolving Funds	State grants to capitalize loan funds. States make loans to communities, individuals, and others for high-priority water-quality activities. http://www.epa.gov/owow/wetlands/initiative/srf.html	States and Puerto Rico
Wetland Program Development Grants	Funds for projects that promote research, investigations, experiments, training, demonstrations, surveys, and studies relating to the causes, effects, extent, prevention, reduction, and elimination of water pollution. http://www.epa.gov/owow/wetlands/initiative/#financial	See website

National Oceanic and Atmosphere Administration (NOAA)

NOAA is the major source for mitigation funding related to coastal zone management and other coastal protection projects.

Mitigation Funding Sources Program	Details	Notes
Coastal Services Center Cooperative Agreements	Funds for coastal wetlands management and protection, natural hazards management, public access improvement, reduction of marine debris, special area management planning, and ocean resource planning. http://www.csc.noaa.gov/funding/	May only be used to implement and enhance the states' approved Coastal Zone Management programs
Coastal Services Center Grant Opportunities	Formula and program enhancement grants for implementing and enhancing Coastal Zone Management programs that have been approved by the Secretary of Commerce. http://www.csc.noaa.gov/funding/	Formula grants require non-federal match
Coastal Zone Management Program	The Office of Ocean and Coastal Resource Management (OCRM) provides federal funding and technical assistance to better manage our coastal resources. http://coastalmanagement.noaa.gov/funding/welcome.html	Funding is reserved for the nation's 34 state and territory Coastal Zone Management Programs
Marine and Coastal Habitat Restoration	Funding for habitat restoration, including wetland restoration and dam removal. http://www.nmfs.noaa.gov/habitat/recovery/	Funding available for state, local and tribal governments and for- and non-profit organizations.

Floodplain, Wetland and Watershed Protection Programs

USACE and the U.S. Fish and Wildlife Service offer funding and technical support for programs designed to protect floodplains, wetlands, and watersheds.

Funding and Technical Assistance for Wetlands and Floodplains Program	Details	Notes
USACE Planning Assistance to States (PAS)	Fund plans for the development and conservation of water resources, dam safety, flood damage reduction and floodplain management. http://www.lre.usace.army.mil/planning/assist.html	50 percent non-federal match
USACE Flood Plain Management Services (FPMS)	Technical support for effective floodplain management. http://www.lrl.usace.army.mil/p3md-o/article.asp?id=9&MyCategory=126	See website
USACE Environmental Laboratory	Guidance for implementing environmental programs such as ecosystem restoration and reuse of dredged materials. http://el.erdc.usace.army.mil/index.cfm	See website
U.S. Fish & Wildlife Service Coastal Wetlands Conservation Grant Program	Matching grants to states for acquisition, restoration, management or enhancement of coastal wetlands. http://ecos.fws.gov/coastal_grants/viewContent.do?viewPage=home	States only. 50 percent federal share
U.S. Fish & Wildlife Service Partners for Fish and Wildlife Program	Program that provides financial and technical assistance to private landowners interested in restoring degraded wildlife habitat. http://ecos.fws.gov/partners/viewContent.do?viewPage=home	Funding for volunteer-based programs

Housing and Urban Development

The Community Development Block Grants (CDBG) administered by HUD can be used to fund hazard mitigation projects.

Mitigation Funding Sources Program	Details	Notes
Community Development Block Grants (CDBG)	Grants to develop viable communities, principally for low and moderate income persons. CDBG funds available through Disaster Recovery Initiative. http://www.hud.gov/offices/cpd/communitydevelopment/programs/	Disaster funds contingent upon Presidential disaster declaration
Disaster Recovery Assistance	Disaster relief and recovery assistance in the form of special mortgage financing for rehabilitation of impacted homes. http://www.hud.gov/offices/cpd/communitydevelopment/programs/dri/assistance.cfm	Individuals
Neighborhood Stabilization Program	Funding for the purchase and rehabilitation of foreclosed and vacant property in order to renew neighborhoods devastated by the economic crisis. http://www.hud.gov/offices/cpd/communitydevelopment/programs/neighborhoodspg/	State and local governments and non-profits

Bureau of Land Management

The Bureau of Land Management (BLM) has two technical assistance programs focused on fire mitigation strategies at the community level.

Mitigation Funding Sources Program	Details	Notes
Community Assistance and Protection Program	Focuses on mitigation/prevention, education, and outreach. National Fire Prevention and Education teams are sent to areas across the country at-risk for wildland fire to work with local residents. http://www.blm.gov/nifc/st/en/prog/fire/community_assistance.html	See website
Firewise Communities Program	Effort to involve homeowners, community leaders, planners, developers, and others in the effort to protect people, property, and natural resources from the risk of wildland fire before a fire starts. http://www.firewise.org/	See website

U.S. Department of Agriculture

There are multiple mitigation funding and technical assistance opportunities available from the USDA and its various sub-agencies: the Farm Service Agency, Forest Service, and Natural Resources Conservation Service.

Mitigation Funding Sources Agency Program	Details	Notes
USDA Smith-Lever Special Needs Funding	Grants to State Extension Services at 1862 Land-Grant Institutions to support education-based approaches to addressing emergency preparedness and disasters. http://www.csrees.usda.gov/funding/rfas/smith_lever.html	Population under 20,000
USDA Community Facilities Guaranteed Loan Program	This program provides an incentive for commercial lending that will develop essential community facilities, such as fire stations, police stations, and other public buildings. http://www.rurdev.usda.gov/rhs/cf/cp.htm	Population under 20,000
USDA Community Facilities Direct Loans	Loans for essential community facilities. http://www.rurdev.usda.gov/rhs/cf/cp.htm	Population of less than 20,000
USDA Community Facilities Direct Grants	Grants to develop essential community facilities. http://www.rurdev.usda.gov/rhs/cf/cp.htm	Population of less than 20,000
USDA Farm Service Agency Disaster Assistance Programs	Emergency funding and technical assistance for farmers and ranchers to rehabilitate farmland and livestock damaged by natural disasters. http://www.fsa.usda.gov/	Farmers and ranchers
USDA Forest Service National Fire Plan	Funding for organizing, training, and equipping fire districts through Volunteer, State and Rural Fire Assistance programs. Technical assistance for fire related mitigation. http://www.forestsandrangelands.gov/	See website
USDA Forest Service Economic Action Program	Funds for preparation of Fire Safe plans to reduce fire hazards and utilize byproducts of fuels management activities in a value-added fashion. http://www.fs.fed.us/spf/coop/programs/eap/	80% of total cost of project may be covered
USDA Natural Resources Conservation Service Emergency Watershed Protection Support Services	Funds for implementing emergency measures in watersheds in order to relieve imminent hazards to life and property created by a natural disaster. http://www.nrcs.usda.gov/programs/ewp/	See website
USDA Natural Resources Conservation Service Watershed Protection and Flood Prevention	Funds for soil conservation; flood prevention; conservation, development, utilization and disposal of water; and conservation and proper utilization of land. http://www.nrcs.usda.gov/programs/watershed/index.html	See website

Health and Economic Agencies

Alternative mitigation programs can be found through health and economic agencies that provide loans and grants aimed primarily at disaster relief.

Federal Loans and Grants for Disaster Relief Agency Program	Details	Notes
Department of Health & Human Services Disaster Assistance for State Units on Aging (SUAs)	Provide disaster relief funds to those SUAs and tribal organizations who are currently receiving a grant under Title VI of the Older Americans Act. http://www.aoa.gov/doingbus/fundopp/fundopp.asp	Areas designated in a Disaster Declaration issued by the President
Economic Development Administration (EDA) Economic Development Administration Investment Programs	Grants that support public works, economic adjustment assistance, and planning. Certain funds allocated for locations recently hit by major disasters. http://www.eda.gov/AboutEDA/Programs.xml	The maximum investment rate shall not exceed 50 percent of the project cost
U.S. Small Business Administration Small Business Administration Loan Program	Low-interest, fixed rate loans to small businesses for the purpose of implementing mitigation measures. Also available for disaster damaged property. http://www.sba.gov/services/financialassistance/index.html	Must meet SBA approved credit rating

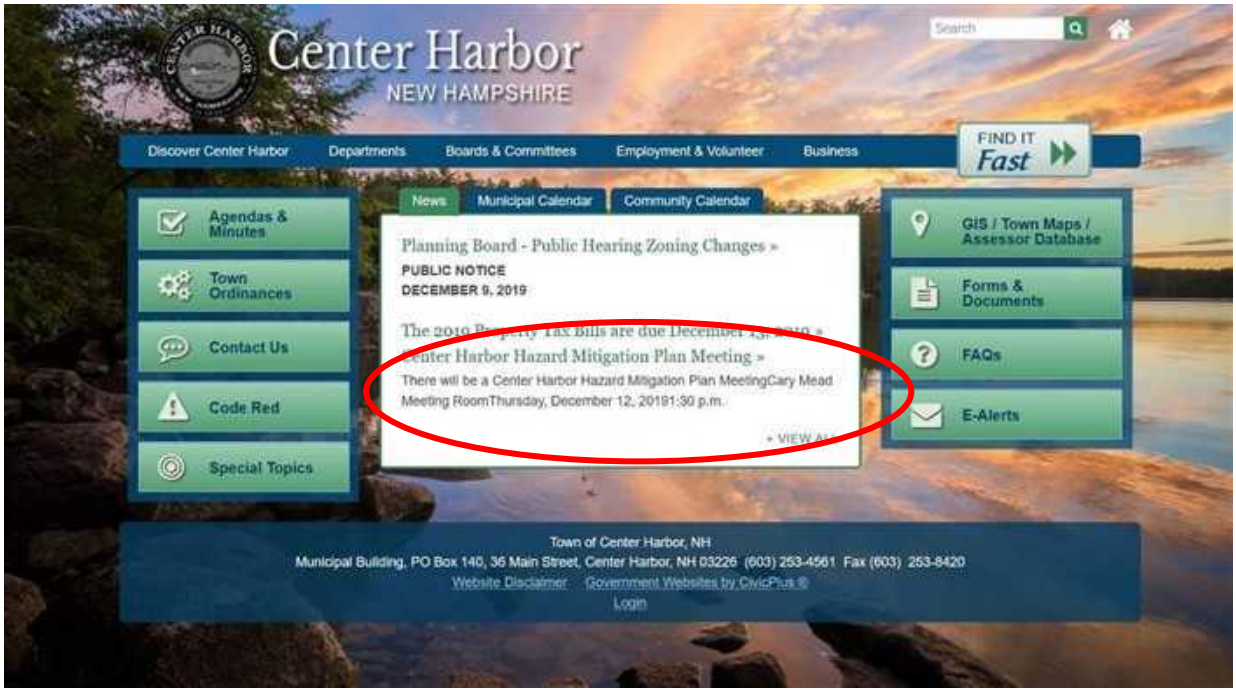
Research Grants

The United States Geological Survey (USGS) and the National Science Foundation (NSF) provide grant money for hazard mitigation-related research efforts.

Hazard Mitigation Research Grants Agency Program	Details	Notes
National Science Foundation (NSF) Decision, Risk, and Management Sciences Program (DRMS)	Grants for small-scale, exploratory, high-risk research having a severe urgency with regard to natural or anthropogenic disasters and similar unanticipated events. http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5423&org=SES	See website
U.S. Geological Survey (USGS) National Earthquake Hazards Reduction Program	The purpose of NEHRP is to provide products for earthquake loss reduction to the public and private sectors by carrying out research on earthquake occurrence and effects. http://www.usgs.gov/contracts/nehrp/	Community with a population under 20,000

APPENDIX C: PUBLICITY AND INFORMATION

Committee meetings were announced on through press releases in local newspapers and posting of meeting announcements and the agenda in town. Press releases similar to the ones on the following pages were sent to the *Laconia Daily Sun* and weekly *Meredith News* newspapers prior to the Committee meetings.



LAKES REGION PLANNING COMMISSION

103 Main Street, Suite #3
Meredith, NH 03253
tel (603) 279-8171
fax (603) 279-0200
www.lakesrpc.org

November 15, 2019

For Immediate Release

Contact: David Jeffers, 279-5341, djeffers@lakesrpc.org

Town of Center Harbor Hazard Mitigation Plan Meeting

The Center Harbor Hazard Mitigation Plan Committee is in the process of updating its 2014 Hazard Mitigation Plan. The committee is represented by a variety of local interests including the Fire, Police, and Highway departments, along with the Select board. The group is reviewing the various hazards that put Center Harbor at risk as well as the development of recommendations to protect the safety and well being of town residents.

The committee will meet on November 19, 2019 at the Center Harbor Town Office (36 Main Street) starting at 1:30 PM. Residents of Center Harbor and representatives from neighboring communities are encouraged to attend and provide input.

Hazard Mitigation Planning is as important to reducing disaster losses as are appropriate regulations and land use ordinances. The most significant areas of concern for Center Harbor are being reviewed and evaluated through this process; in the 2014 Plan these included flooding, severe wind, and the transportation of hazardous materials.

With the update to the Hazard Mitigation Plan, town leaders will be able to evaluate the status of current plans, policies, and actions then develop and prioritize actions to reduce the impacts of these and other hazards. Community leaders want the town to be a disaster resistant community and believe that updating the Hazard Mitigation Plan will bring Center Harbor one step closer to that goal.

For more information please contact David Hughes, Emergency Management Director at (603) 707-9339 or David Jeffers, Regional Planner, Lakes Region Planning Commission at 279-5341.

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November 27, 2019

For Immediate Release

Contact: David Jeffers, 279-5341, djeffers@lakesrpc.org

Town of Center Harbor Hazard Mitigation Plan Meeting

The Center Harbor Hazard Mitigation Plan Committee is in the process of updating its 2014 Hazard Mitigation Plan. The committee is represented by a variety of local interests including the Fire, Police, and Highway departments, along with the Selectboard and Conservation Commission. The group is reviewing the various hazards that put Center Harbor at risk as well as the development of recommendations to protect the safety and well being of town residents.

The committee will meet on December 10, 2019 at the Center Harbor Town Office (36 Main Street) starting at 1:30 PM. Residents of Center Harbor and representatives from neighboring communities are encouraged to attend and provide input. The deadline for submission of the survey about local hazards, planning priorities, and outreach has been extended; it is available at https://www.centerharbornh.org/home/news/hazard-mitigation-plan-survey in both electronic and paper format.

Hazard Mitigation Planning is as important to reducing disaster losses as are appropriate regulations and land use ordinances. The most significant areas of concern for Center Harbor are being reviewed and evaluated through this process; in the 2014 Plan these included flooding, severe wind, and the transportation of hazardous materials.

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LAKES REGION PLANNING COMMISSION

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December 5, 2019

For Immediate Release

Contact: David Jeffers, 279-5341, djeffers@lakesrpc.org

Town of Center Harbor Hazard Mitigation Plan Meeting

The Center Harbor Hazard Mitigation Plan Committee is in the process of updating its 2014 Hazard Mitigation Plan. The committee is represented by a variety of local interests including the Fire, Police, and Highway departments, along with the Selectboard and Conservation Commission. The group is reviewing the various hazards that put Center Harbor at risk as well as the development of recommendations to protect the safety and well being of town residents.

The committee will meet on December 12, 2019 at the Center Harbor Town Office (36 Main Street) starting at 1:30 PM. Residents of Center Harbor and representatives from neighboring communities are encouraged to attend and provide input. The deadline for submission of the survey about local hazards, planning priorities, and outreach has been extended; it is available at https://www.centerharbornh.org/home/news/hazard-mitigation-plan-survey in both electronic and paper format.

Hazard Mitigation Planning is as important to reducing disaster losses as are appropriate regulations and land use ordinances. The most significant areas of concern for Center Harbor are being reviewed and evaluated through this process; in the 2014 Plan these included flooding, severe wind, and the transportation of hazardous materials.

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For more information please contact David Hughes, Emergency Management Director at (603) 707-9339 or David Jeffers, Regional Planner, Lakes Region Planning Commission at 279-5341.

Local Hazard Mitigation Planning

Hazard Mitigation:

"Hazard Mitigation means any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards"

Questions to address:

- Where are potential hazards?
- What are the risks?
- What are we already doing?
- Where are the gaps?
- What actions can be taken?
- What actions are feasible?
- What are our priorities?
- How will these actions be implemented?
- How will the plan be monitored?

What is a Hazard Mitigation Plan?

In cooperation with the NH Bureau of Emergency Management (BEM), the Lakes Region Planning Commission (LRPC) is working with several of its member communities each year to develop local Hazard Mitigation Plans.

The Hazard Mitigation Plans are designed to address each particular community's vulnerability to natural and man-made hazards. The local plan serves as a means to reduce future losses from hazard events before they occur. This local initiative is guided by a community-based Hazard Mitigation Planning Committee, with the LRPC providing technical support. The structure for plan development is provided through the *Guide to Hazard Mitigation Planning for New Hampshire Communities* which ensures that the community has considered the content of the State of New Hampshire Hazard Mitigation (409) Plan.

MITIGATION PROCESS

- IDENTIFY HAZARDS
- PROFILE HAZARD EVENTS
- INVENTORY ASSETS
- ESTIMATE LOSSES
- PRIORITIZE ACTION STEPS
- ADOPT THE PLAN
- IMPLEMENTATION

Why create a plan?

Development of a local Hazard Mitigation Plan is a chance for the community to assess the hazards that have the potential to threaten residents and their property. It also gives the community an opportunity to identify at-risk populations as well as resources within the community that might be at risk. The committee can then explore a variety of steps that might be put into place to help the community reduce damage and loss.

Having a Hazard Mitigation Plan in place, enables many communities to allocate their resources more effectively. It can also be a useful tool for leveraging additional sources of funding in the event of a disaster.

Federal Emergency Management Agency (FEMA) Requirement:

In order for communities to be eligible for the full spectrum of mitigation program funding, local hazard mitigation plans must be approved by FEMA. The staff of LRPC attend semi-annual hazard mitigation meetings and training programs that are designed to expedite the approval process.

Frequently asked questions

- **What will a Hazard Mitigation Plan cost?**

Since this project is funded by the NH Bureau of Emergency Management, the only cost to the community is the dedication of committee members' time and energy.

- **How is a Hazard Mitigation Plan different from an Emergency Action Plan?**

Although there is some overlap, these are different plans, each serving a different function in helping a community to minimize the potential for damage and loss in a community.

Emergency Action Plans (EAP) identifies potential hazard events and the resources available to address them; it also addresses how a community responds to an emergency.

A Hazard Mitigation Plan (HMP) also identifies potential hazard events and community resources. However, an HMP looks at the situation in terms of prevention instead of response. Gaps in coverage, programs, and structural needs are analyzed and specific mitigation steps are recommended and potential funding sources are identified.

- **Is this a community plan, a state plan, or a federal plan?**

The state of New Hampshire does require that each community develop an HMP. Once a plan is approved by FEMA and adopted by the community, should there be a need for Federal Mitigation money, more funding would be available. However, local public involvement is required. The local Emergency Management Director or a committee of citizens should help in plan development; there should also be several public presentations where citizens can make recommendations, provide input, and participate in development of the plan. In the end, the Board of Selectmen need to approve the plan.

Alton dam breach, 1996

The Essentials

At a minimum, each local Hazard Mitigation Plan should contain the following sections:

- An evaluation of the potential hazards within the community
- A description and analysis of local, state, and federal hazard mitigation policies, programs, and capabilities to mitigate the identified hazards in the area
- Goals, objectives, strategies and actions to reduce long-term vulnerability to hazards
- An evaluation of the costs and benefits of the recommended mitigation projects.

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L · R · P · C

State and Local Mitigation Planning

Building stronger and safer

Hazard mitigation planning is the process state, local and tribal governments use to identify risks and vulnerabilities associated with natural disasters and to develop long-term strategies for protecting people and property in future hazard events. The process results in a mitigation plan that offers a strategy for breaking the cycle of disaster damage, reconstruction and repeated damage and a framework for developing feasible and cost-effective mitigation projects. Under the Disaster Mitigation Act of 2000 (Public Law 106-390), State, local and Tribal governments are required to develop a hazard mitigation plan as a condition for receiving certain types of non-emergency disaster assistance.

Reducing risks through mitigation planning

A hazard mitigation plan is a long-term strategy for reducing disaster losses. The planning process promoted by the Disaster Mitigation Act of 2000 is as important as the resulting plan because it encourages jurisdictions to integrate mitigation with day-to-day decision-making regarding land-use planning, floodplain management, site design and other functions.

Mitigation planning elements

- Public involvement – In addition to government agencies involved in incident management, floodplain management and economic development, the planning process usually involves a range of stakeholders, including representatives of neighborhood groups, civic organizations, academia, environmental groups, the business community and individual citizens. Involving stakeholders is essential to determining the most vulnerable populations and facilities in the community and to assuring community wide support for the plan.
- Risk assessment – A risk assessment is the process of identifying natural hazards and risks associated with them, including threats to public health and safety, property damage and economic loss. The assessment answers the fundamental question, "What would happen if a natural disaster occurred?" and provides a factual basis for the mitigation activities proposed in the strategy. The assessment includes a description of the type, location and extent of natural hazards; the jurisdiction's vulnerability to the hazards; and the type and numbers of buildings, infrastructure and critical facilities located in identified hazard areas.
- Mitigation strategy – Based on the risk assessment, State, local and Tribal governments develop mitigation goals and objectives and a strategy for mitigating disaster losses. The strategy sets forth an approach for implementing activities that are cost-effective, technically feasible and environmentally sound.

Hazard mitigation plan required to receive HMGP Project Grants

Local jurisdictions are required by federal law to have a FEMA-approved hazard mitigation plan in order to receive Pre-Disaster Mitigation (PDM) or Hazard Mitigation Grant Program (HMGP) project grant funding. However, in extraordinary circumstances, HMGP funds can be awarded to communities that agree to develop a hazard mitigation plan within 12 months of receiving the project grant. Every State has a FEMA-approved hazard mitigation plan, though many local jurisdictions still do not.

FEMA "FEMA's mission is to support our citizens and first responders to ensure that as a nation we work together to build, sustain, and improve our capability to prepare for, protect against, respond to, recover from, and mitigate all hazards."

Fact Sheet

State and Local Mitigation Planning

FEMA

Mitigation Examples

History shows that the physical, financial and emotional losses caused by disasters can be reduced significantly through mitigation planning. Mitigation focuses attention and resources on solving a particular problem (such as reducing repetitive flood losses) and thereby produces successive benefits over time. Through implementation of local floodplain ordinances, for example, it is estimated that $1.1 billion in flood damages are prevented annually.

Mitigation includes a broad range of activities designed to protect homes, schools, public buildings and critical facilities. Examples include the following types of projects:

- Adopting and enforcing more stringent building codes, flood-proofing requirements, seismic design standards, or wind-bracing requirements for new construction or the retrofit of existing buildings.
- Exceeding the National Flood Insurance Program (NFIP) floodplain management regulations by elevating structures above the base flood elevation (BFE) in high-risk areas.
- Adopting stricter development regulations and zoning ordinances that steer development away from areas subject to flooding, storm surge, or coastal erosion.
- Retrofitting public buildings, schools and critical facilities, such as police and fire stations, to withstand hurricane-strength winds or ground shaking from earthquakes.
- Using public funds to acquire damaged homes or businesses in flood-prone areas, demolish or relocate the structures and use the property for open space, wetlands, or recreational uses.
- Building community shelters and "safe rooms" to help protect people in public buildings and schools in hurricane- and tornado-prone areas.

Planning tool available for government agencies

FEMA has developed a number of planning tools to help government agencies develop mitigation plans. These include how-to guides, CD ROMs and online information about organizing a planning team, involving stakeholders, conducting risk assessments, evaluating potential mitigation measures, conducting benefit-cost analyses and other planning issues.

For more information

Please visit: http://www.fema.gov/plan/mitplanning/index.

For state name disaster recovery, visit www.fema.gov or your state Web-site.

FEMA

"FEMA's mission is to support our citizens and first responders to ensure that as a nation we work together to build, sustain, and improve our capability to prepare for, protect against, respond to, recover from, and mitigate all hazards."

APPENDIX D: AGENDAS, SURVEY, AND PARTICIPATION

This section contains copies of the Committee meeting agendas and a summary of participation. All Committee meetings were held in the Center Harbor Municipal Building. Agendas were developed by the LRPC planner and meetings were chaired by the Emergency Management Director.

Members of the public were free to participate in the full discussion during each meeting, two residents did attend and participate in the January meeting. They provided input on several proposed actions, including pointing out that the High Haith Road area is particularly susceptible to high winds and the associated downed trees.

Additionally, a five-question survey was made available for the public to complete. Hard copies were available at the Municipal Building and an electronic version was posted to the town website. More than a dozen surveys were completed and the results shared at committee meetings.

Center Harbor Hazard Mitigation Plan Update (Introductory)

September 16, 2019 10:00 AM
Center Harbor Municipal Offices
36 Main Street, Center Harbor, NH

AGENDA

1. Introductions
2. Mitigation planning vs. emergency response planning
3. Changes to Plan Development
    a. State HMP (2018)
    b. LRPC Agreement – Roles & Responsibilities
4. Committee Members
5. Community Outreach & Opportunities for Public Input
6. Process – Information - Changes
    a. Natural hazards
    b. Critical Facilities
    c. Development Trends
    d. Community Capabilities
        i. Planning & Regulatory
        ii. Administrative and Technical
        iii. Financial
        iv. Education & Outreach
        v. National Flood Insurance Program (NFIP)
7. Schedule for Meetings

Center Harbor Hazard Mitigation Plan Update Committee

October 16, 2019 10:00 AM
Center Harbor Town Office
36 Main Street, Center Harbor, NH

AGENDA

1. Introductions
2. What is Hazard Mitigation Planning?
    a. Mitigation planning vs. emergency response planning
    b. Purpose of Committee
    c. Community Outreach
    d. New Hampshire's Hazard Mitigation Plan (2018)
3. Identify all hazards in the Center Harbor area
    a. since 2014
    b. potential
4. Changes to Critical Facilities
5. Development Trends
6. Community Capabilities
    a. Planning & Regulatory
    b. Administrative and Technical
    c. Financial
    d. Education & Outreach
    e. National Flood Insurance Program (NFIP)
7. Schedule for future meetings
8. Public Input

Goals for next meeting:
    a. Risk Assessment, including data collection
    b. Town Goals

Center Harbor Hazard Mitigation Plan Update Committee

November 19, 2019 1:30 PM
Center Harbor Town Office
36 Main Street, Center Harbor, NH

AGENDA

1. Introductions

2. Review of hazards in the Center Harbor area
   a. since 2014
   b. potential

3. Development Trends

4. Review Community Capabilities
   a. Planning & Regulatory
   b. Administrative and Technical
   c. Financial
   d. Education & Outreach
   e. National Flood Insurance Program (NFIP)

5. Status of Recommended Hazard Mitigation Actions

6. Review of Hazard Mitigation Goals

7. Schedule for future meetings

8. Public Input

Goals for next meeting:
   a. Risk Assessment, including data collection
   b. Town Goals

Center Harbor Hazard Mitigation Plan Update Committee

December 12, 2019 1:30 PM
Center Harbor Town Office
36 Main Street, Center Harbor, NH

AGENDA

A. Introductions

B. Review of hazards in the Center Harbor area
   a. survey input

C. Risk Assessment:

   a. Vulnerabilities: critical facilities
   b. Risk: probability-extent-impact
   c. Problem Statements

D. Schedule for future meetings

E. Public Input

Goals for next meeting:
   a. Hazard Mitigation Goals
   b. Mitigation Actions
   c. Status of Recommended Hazard Mitigation Actions
   d. Costs & Benefits of Mitigation Actions

The focus of this pr[illegible] mitigation, which is action ta[illegible] reduce or eliminate long-term risk to hazards.

Center Harbor Hazard Mitigation Plan Update Committee

January 15, 20201:30 PM
Center Harbor Town Office
36 Main Street, Center Harbor, NH

AGENDA

A. Introductions

B. Hazard Mitigation Goals

C. Problem Statements - review

D. Mitigation Actions
   a. Costs & Benefits
   b. Comments

E. Rating Mitigation Actions
   a. STAPLEE
   b. Implementation
   c. Timeframe

F. Schedule for future meetings

G. Public Input

Goals for next meeting:

Results of the Community Survey – The results and input were shared with HMP Committee at the December, January, and February meetings. Symbol Key: 3.0 or greater is Red, 2.0 – 2.99 is Yellow, Less than 2.0 is Green.

1. How concerned are you about the following disasters affecting Center Harbor?

Natural Hazards	Very Concerned	Somewhat Concerned	Neutral	Not Very Concerned	Not Concerned	Number of responses	Total	Average
Value	**4**	**3**	**2**	**1**	**0**			
Avalanches	0	0	2	0	11	13	4	0.31
Drought	1	3	5	4	1	14	27	1.93
Earthquake	0	2	3	3	5	13	15	1.15
Extreme Temperature	0	6	3	1	3	13	25	1.92
Flooding	2	6	3	1	1	13	33	2.54
High Wind Events	7	5	1	0	0	13	45	3.46
Infectious Disease	2	4	4	3	0	13	31	2.38
Landslide	0	1	5	1	6	13	14	1.08
Lightning	3	6	3	0	1	13	36	2.77
Severe Winter Storm	6	7	0	0	0	13	45	3.46
Solar Storms and Space Weather	0	3	5	3	2	13	22	1.69
Tropical and Post-Tropical Cyclones	0	3	4	0	6	13	17	1.31
Wildfires	1	10	1	0	0	12	36	3.00
Technological Events								
Aging Infastructure	4	6	2	1	0	13	39	3.00
Conflagration - Urban Fire	0	5	0	2	4	11	17	1.55
Dam Failure	1	2	3	4	3	13	20	1.54
Hazardous Materials	3	4	1	3	1	12	29	2.42
Known and Emerging Contaminates	3	5	1	4	0	13	33	2.54
Long Term Utility Outage	5	7	0	1	0	13	42	3.23
Radiological	0	5	5	2	1	13	27	2.08
Human-Related Events								
Cyber Event	3	7	0	2	1	13	35	2.69
Mass Casualty Incident	2	4	5	1	0	12	31	2.58
Terrorism/Violence	2	1	6	1	3	13	24	1.85
Transport Accident	4	4	2	2	1	13	34	2.62

2. What is the most effective way for you to receive information about how to make mebers of your household and you home safer from disasters? (Check up to three)

Newspaper	3		Other	0
Radio	2		schools	1
Television	3		mailings	3
Internet	11		fire department	1
town website	3		public workshops	1
electronic newsletter	3		town hall/building permit	1
social media	3		other	1

3. Natural hazards can have a significant impact on a community but planning for these events can help lessen the

Statements	Very Important	Somewhat Important	Neutral	Not Very Important	Not Important	Number of responses	Total	Average
	4	3	2	1	0			
Protecting private property	10	3				11	49	4.45
Protecting critical facilities (such as transportation networks, fire stations, medical facilities)	12	3				11	57	5.18
Limiting development in hazard areas	9	3	1			11	47	4.27
Enhancing the functions of natural features (such as streams and wetlands)	8	5				11	47	4.27
Protecting historical and cultural landmarks	6	7				11	45	4.09
Protecting and reducing damage to utilities	10	3				11	49	4.45
Strengthening emergency services (police, fire, ambulance)	7	4	2			11	44	4.00
Disclosing natural hazards during real estate transactions	8	3	2			11	45	4.09
Promoting cooperation among public agencies, citizens, non-profit organizations, and businesses	8	2	2	1		11	43	3.91

4. We would appreciate any information that you are willing to share regarding you and your household. (Check all that apply.)

	Tally
Resident of Center Harbor	9
Resident of a nearby community	2
Visitor	
Work in Center Harbor	1
Center Harbor business owner	
Homeowner	7
Renter	

5. Please feel free to provide any other information related to hazard mitigation in Center Harbor in the space below.

	Entry
1	Dead branches overhanging public roads should be removed. Winter plowing often creates snow banks that block the vision of oncoming vehicles at intersections. This probably isn't appreciated from the high vantage point of the plow truck operator. Same for summer foliage.

Meeting participation

Committee Member	Position	4/24/19	9/16/19	10/16/19	11/19/19	12/12/19	1/20/20	2/4/20	1/13/21
David Hughes	Center Harbor EMD	X	X	X	X	X			
Tyler Driscoll	Center Harbor EMD						X	X	X
Harry Viens	Center Harbor Selectman	X			X				X
Mark Chase	Center Harbor Police Chief			X		X	X	X	X
Leon Manville	Center Harbor Fire Chief			X	X	X		X	X
Jeff Haines	Center Harbor Highway Dept. (Head)				X	X	X	X	X
Maureen Criasia	Center Harbor Citizen, Conservation Commissioner				X	X	X	X	X
Others									
Richard Drenkhahn	Center Harbor Selectman	X							
Richard Hanson	Center Harbor Selectman	X				X			
Robin Woodaman	Center Harbor Admin. Assistant	X							
John Beland	Partnership for Public Health							X	
Tony Haley	Citizen						X		
Tom Ploszaj	Resident						X		
David Jeffers	Regional Planner	X	X	X	X	X	X	X	X
Henry Casey	LRPC Intern		X						
Alexx Monastiero	NH HSEM SHMO					X			
Kayla Henderson	NH HSEM Planner				X	X	X		X
Julia Chase	NH HSEM Field Rep		X	X			X		

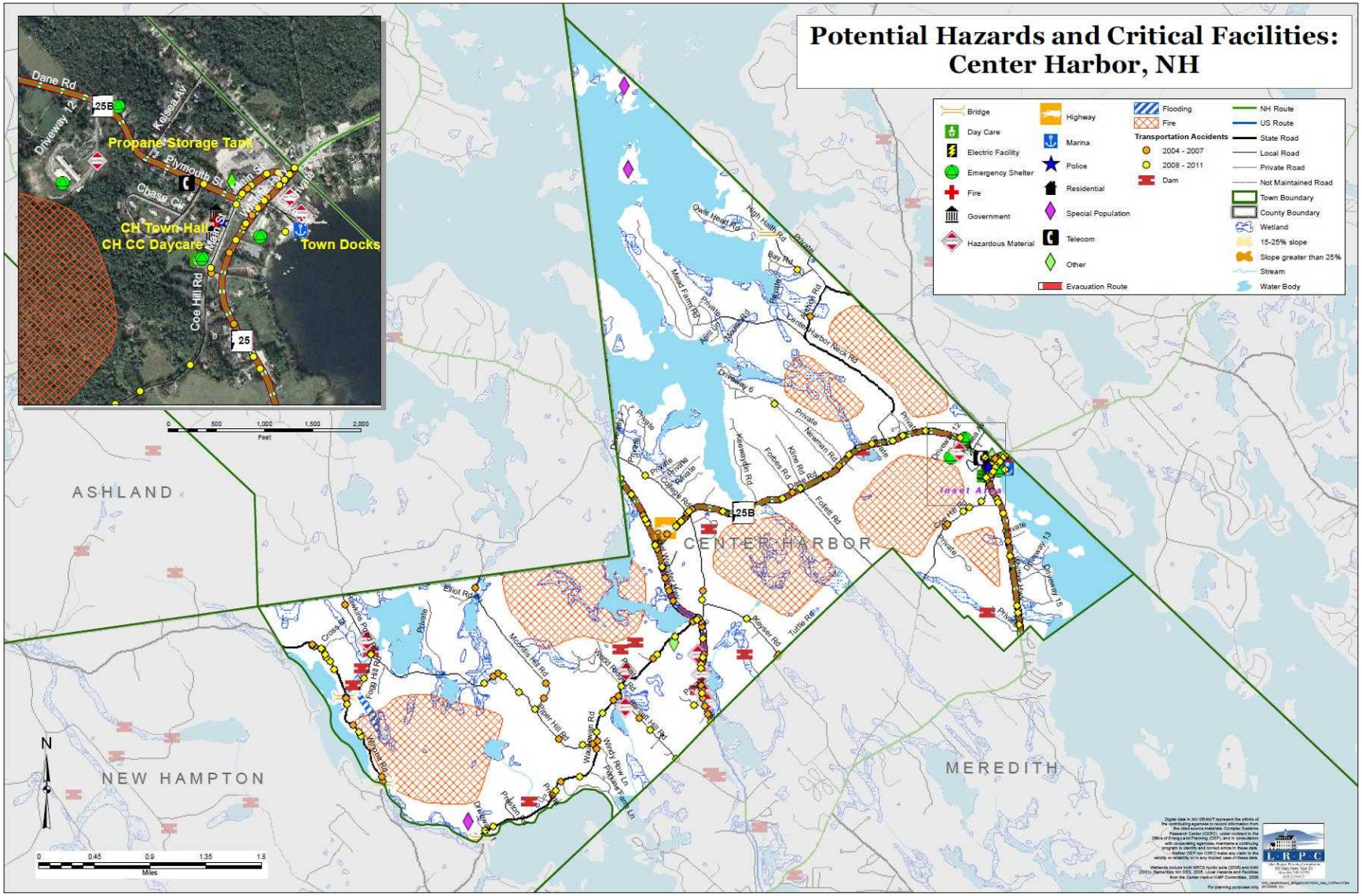
APPENDIX E: HAZARD EVENTS PRIOR TO 2012

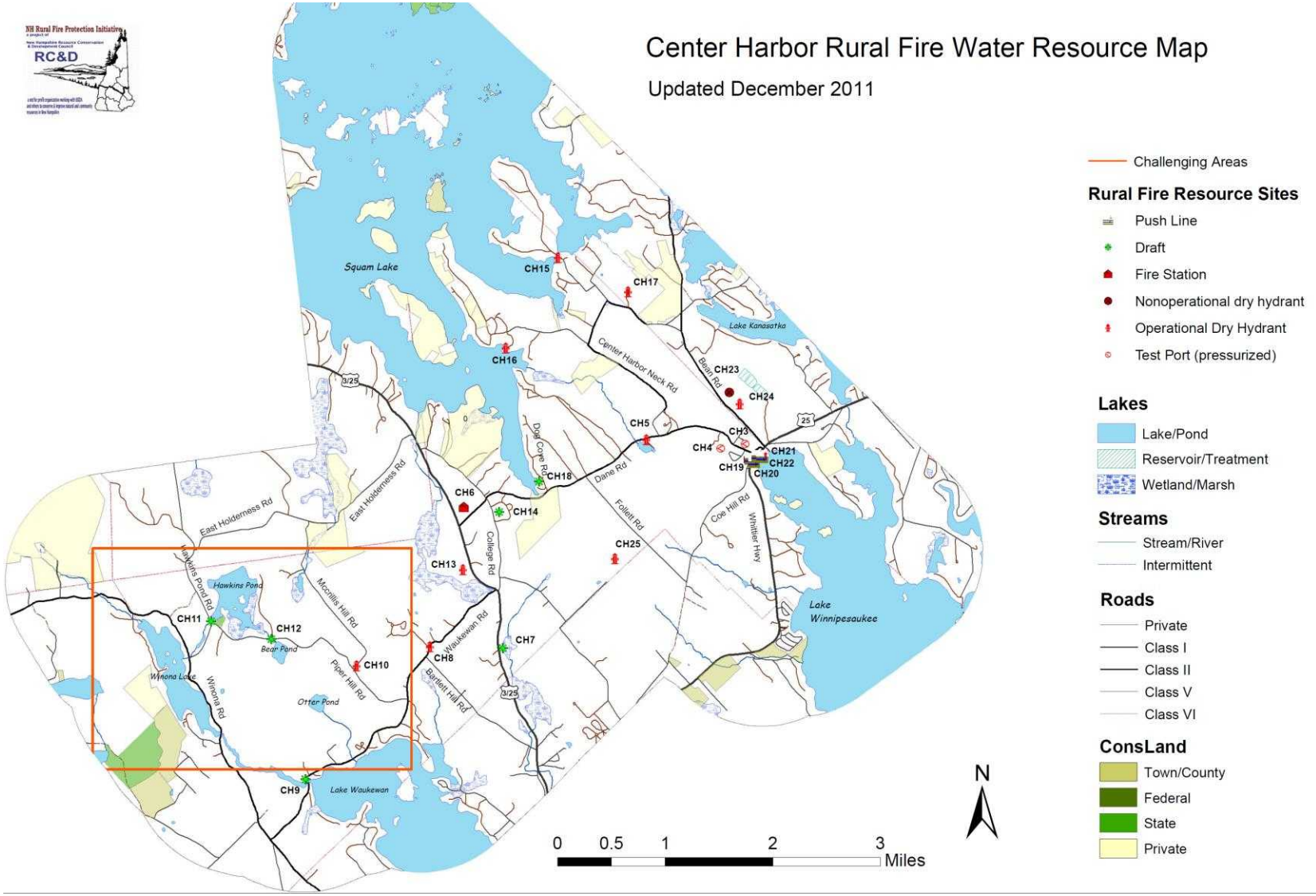
			EXTENT	PROBABILITY	IMPACT			
Hazard	**Date**	**Location**	**Magnitude/ Description**	**Period of Recurrence**		**Damages**	**Notes**	**Source**
Drought	1929-36	Statewide	Regional	10 to >25 yr				Heavy Snow
Drought	1939-44	Statewide	Moderate	10 to >25 yr				Heavy Snow
Drought	1947-50	Statewide	Moderate	10 to >25 yr				Heavy Snow
Drought	1960-69	Statewide	Longest recorded continuous spell of less than normal precipitation.	>25 yr				Heavy Snow
Drought	8/1/1999	Statewide	Fire danger in the moderate to severe category; about 515 acres had burned.		Wells ran dry and crops wilted.		Nine of NH's ten counties were declared disaster	Heavy Snow
Earthquake	12/20/1940	Ossipee	5.2 Richter, 19 km away from Center Harbor					Heavy Snow
Earthquake	12/24/1940	Ossipee	5.5 Richter, 19 km away from Center Harbor					Heavy Snow
Earthquake	1/19/1982	Center Harbor	4.7 Richter, 25 km away					Heavy Snow
Earthquake	10/25/1986	Center Harbor	3.9 Richter, 36 km away		Three chimneys fractured			Heavy Snow
Extreme Temperature	1/1/1999	STATEWIDE						Heavy Snow
Wind chill temperatures near 35 degrees below zero.								Heavy Snow
Extreme Temperature	1/13/1999	Statewide	Wind chill temperatures ranged from about 35 to 40 degrees below zero.					Winter Storm
Fire	4/6/1923	Waterville Valley	3500 acres burned				Wildfire	Heavy Snow
Fire	4/30/1947	Freedom	1225 acres burned				Wildfire	Heavy Snow
Heavy Snow	12/21/2008	BELKNAP	15 inches				NOAA	Heavy Snow
Heavy Snow	1/18/2009	BELKNAP	12 inches				NOAA	Heavy Snow
Winter Storm	1/28/2009	BELKNAP					NOAA	Winter Storm
Heavy Snow	2/18/2009	BELKNAP	9 inches				NOAA	Heavy Snow
Heavy Snow	2/22/2009	BELKNAP	9 inches				NOAA	Heavy Snow

			EXTENT	PROBABILITY	IMPACT			
Hazard	**Date**	**Location**	**Magnitude/ Description**	**Period of Recurrence**		**Damages**	**Notes**	**Source**
Heavy Snow	3/1/2009	BELKNAP	7 inches				NOAA	Heavy Snow
Winter Storm	12/9/2009	BELKNAP					NOAA	Winter Storm
Heavy Snow	1/17/2010	BELKNAP	8 inches				NOAA	Heavy Snow
Nor'easter	2/3/10 – 3/3/10	Statewide	Snow and ice	330,000 without power	$2 M	Presidential Disaster	FEMA[52]	Nor'easter
Heavy Snow	12/26/2010	BELKNAP	12 inches				NOAA	Heavy Snow
High Wind	7/15/2007	BELKNAP			High Wind	7/15/2007	BELKNAP	
50 kts.			Thunderstorm Wind	NOAA	50 kts.			Thunderstorm Wind
High Wind	8/16/2007	BELKNAP			High Wind	8/16/2007	BELKNAP	
50 kts.			Thunderstorm Wind	NOAA	50 kts.			Thunderstorm Wind
High Wind	9/27/2007	BELKNAP			High Wind	9/27/2007	BELKNAP	
50 kts.			Thunderstorm Wind	NOAA	50 kts.			Thunderstorm Wind
High Wind	6/22/2008	BELKNAP			High Wind	6/22/2008	BELKNAP	
50 kts.			Thunderstorm Wind	NOAA	50 kts.			Thunderstorm Wind
High Wind	7/18/2008	BELKNAP			High Wind	7/18/2008	BELKNAP	
50 kts.			Thunderstorm Wind	NOAA	50 kts.			Thunderstorm Wind
High Wind	7/19/2008	BELKNAP - Alton, Belmont			High Wind	7/19/2008	BELKNAP - Alton, Belmont	
50 kts.			Thunderstorm Wind	NOAA	50 kts.			Thunderstorm Wind
Tornado	7/24/2008	BELKNAP			Tornado	7/24/2008	BELKNAP	
EF2		$561 K		NOAA	EF2		$561 K	
High Wind	8/7/2008	BELKNAP			High Wind	8/7/2008	BELKNAP	
50 kts.			Thunderstorm Wind	NOAA	50 kts.			Thunderstorm Wind
High Wind	8/10/2008	BELKNAP			High Wind	8/10/2008	BELKNAP	
50 kts.			Thunderstorm Wind	NOAA	50 kts.			Thunderstorm Wind
Hail	6/5/2007	BELKNAP - Center Harbor, Alton	Hail	6/5/2007	BELKNAP - Center Harbor, Alton	Hail	6/5/2007	BELKNAP - Center Harbor, Alton
1.00 in.	NOAA		1.00 in.	NOAA		1.00 in.	NOAA	
Hail	7/9/2007	BELKNAP - Sanb., Laconia, Gilford	Hail	7/9/2007	BELKNAP - Sanb., Laconia, Gilford	Hail	7/9/2007	BELKNAP - Sanb., Laconia, Gilford
1.25 in.	NOAA		1.25 in.	NOAA		1.25 in.	NOAA	
Hail	7/15/2007	BELKNAP	Hail	7/15/2007	BELKNAP	Hail	7/15/2007	BELKNAP
0.88 in.	NOAA		0.88 in.	NOAA		0.88 in.	NOAA	
Hail	6/22/2008	BELKNAP - Meredith	Hail	6/22/2008	BELKNAP - Meredith	Hail	6/22/2008	BELKNAP - Meredith
1.25 in.	NOAA		1.25 in.	NOAA		1.25 in.	NOAA	

			EXTENT	PROBABILITY	IMPACT			
Hazard	**Date**	**Location**	**Magnitude/ Description**	**Period of Recurrence**		**Damages**	**Notes**	**Source**
Hail	7/2/2008	BELKNAP	Hail	7/2/2008	BELKNAP	Hail	7/2/2008	BELKNAP
0.75 in.	NOAA		0.75 in.	NOAA		0.75 in.	NOAA	
Hail	7/18/2008	BELKNAP	Hail	7/18/2008	BELKNAP	Hail	7/18/2008	BELKNAP
0.75 in.	NOAA		0.75 in.	NOAA		0.75 in.	NOAA	
Hail	7/19/2008	BELKNAP	Hail	7/19/2008	BELKNAP	Hail	7/19/2008	BELKNAP
0.88 in.	NOAA		0.88 in.	NOAA		0.88 in.	NOAA	
Hail	8/10/2008	BELKNAP - Laconia, Meredith, Gilford	Hail	8/10/2008	BELKNAP - Laconia, Meredith, Gilford	Hail	8/10/2008	BELKNAP - Laconia, Meredith, Gilford
Flood	6/27/2009	BELKNAP			$50 K	Flash Flood	NOAA	Flood
Flood	7/26/2011	BELKNAP				Flash Flood	NOAA	Flood
Flood	8/28/2011	BELKNAP	3 - 6 inches of rain		1 death, 1 injury, $25 K	Tropical Storm Irene	NOAA	Flood
Flood	4/16/2007	BELKNAP			$700K			
Flood	8/7/2008	BELKNAP Ashland, W. Center Harbor, New Hampton, Meredith, Laconia	6 inches of rain in 3 hours	Damage to homes, cars, road washouts	1 death, 2 injuries, $3.0 M	Flash Flood		
Flood	8/10/2008	BELKNAP - Laconia, Gilford, Meredith	3 inches of rain	Stream flooding				
Lightning	9/27/2007	BELKNAP			$200 K	Downed trees in Center Harbor	NOAA	
Lightning	8/7/2008	BELKNAP		Structural fire in Laconia	$60 K		NOAA	NOAA

APPENDIX F: CRITICAL FACILITIES & POTENTIAL HAZARDS MAP




NH Rural Fire Protection Initiative
RC&D
Center Harbor Rural Fire Water Resource Map
Updated December 2011
Squam Lake
Lake Kanasatka
Lake Winnipesaukee
Lake Waukewan
Hawkins Pond
Bear Pond
Wynona Lake
Otter Pond
CH3
CH4
CH5
CH6
CH7
CH8
CH9
CH10
CH11
CH12
CH13
CH14
CH15
CH16
CH17
CH18
CH19
CH20
CH21
CH22
CH23
CH24
CH25
Center Harbor Neck Rd
Bean Rd
Dane Rd
Dow Cove Rd
Follett Rd
Coe Hill Rd
Whittier Hwy
College Rd
Waukewan Rd
Bartlett Hill Rd
Piper Hill Rd
Mcmillis Hill Rd
Hawkins Pond Rd
Wynona Rd
East Holderness Rd
3/25
25
N
0 0.5 1 2 3
Miles
Challenging Areas
Rural Fire Resource Sites
Push Line
Draft
Fire Station
Nonoperational dry hydrant
Operational Dry Hydrant
Test Port (pressurized)
Lakes
Lake/Pond
Reservoir/Treatment
Wetland/Marsh
Streams
Stream/River
Intermittent
Roads
Private
Class I
Class II
Class V
Class VI
ConsLand
Town/County
Federal
State
Private

APPENDIX G: HAZARDS – SUPPLEMENTARY HAZARD INFORMATION

This section provides statewide or regional information regarding hazards. Some information is about hazards mentioned in the NH Hazard Mitigation Plan. Other information either provides context or extra detail which supplements the locally important information addressed in Chapter III.

I. FLOOD, WILDFIRE, DROUGHT

Flooding

Historically, the state's two largest floods occurred in 1936 and 1938. The 1936 flood was associated with snow melt and heavy precipitation. The 1938 flooding was caused by the Great New England Hurricane of 1938. Those floods prompted the construction of a series of flood control dams throughout New England, built in the 1950s and '60s. They continue to be operated by the US Army Corps of Engineers.[53]

A series of floods in New Hampshire began in October 2005 with a flood that primarily affected the southwest corner of the state and devastated the town of Alstead. The flood killed seven people. It was followed by floods in May 2006 and April 2007 and a series of floods during the late summer and early fall of 2008. The most recent flooding in the region was associated with Tropical Storm Irene in September 2011.

Flooding in the Lakes Region is most commonly associated with structures and properties located within a floodplain. There are numerous rivers and streams within the region and significant changes in elevation, leading to some fast-moving water. The region also has a great deal of shoreline, making it exposed to rising water levels as well. Although historically, there have not been many instances of shoreline flooding, the potential always exists for a major flood event to occur. Center Harbor's Natural Resource Inventory (NRI) found a total of 1,090 acres of wetlands/hydric soils within the boundary of Center Harbor.

Recent rain events have proven this is becoming an increasing concern as additional development is contributing to flood hazards. As areas are covered with impervious surfaces, less water is allowed to infiltrate, evaporate, or be transpired by vegetative growth and more of it runs off directly into surface drainages and water bodies. This increases the likelihood of flash floods and substantial overland flow. Of greatest concern are the waterfront properties on the lakes, ponds, and associated tributaries.

Culvert improvements and roadwork have been conducted throughout the region as a result of localized flooding events. Of particular concern in the region are areas of steep slopes and soils with limited capacity to accept rapid volumes of rainwater. Roads and culverts in close proximity to these conditions are most at risk of localized flooding.

[53] http://www.nh.gov/safety/divisions/hsem/NaturalHazards/index.html date visited: January 18, 2011

Flooding due to Dam Failure

Dam failure results in rapid loss of water that is normally held back by a dam. These types of floods can be extremely dangerous and pose a threat to both life and property. Dam classifications in New Hampshire are based on the degree of potential damages that a failure or disoperation of the dam is expected to cause. The classifications are designated as non-menace, low hazard, significant hazard, and high hazard and are summarized in greater detail in Table G-1.

The designations for these dams relate to damage that would occur if a dam were to break, not the structural integrity of the dam itself. In the Lakes Region, the Town of Alton was impacted by an earthen dam failure on March 12, 1996. Although listed in the NH Hazard Mitigation Plan as a significant hazard, it did result in the loss of one life.

Table G-1: New Hampshire Dam Classifications[54]

Classification	Description
Non-Menace	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	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: • No possible loss of life. • Low economic loss to structures or property. • Structural damage to a town or city road or private road accessing property other than the dam owner's that could render the road impassable or otherwise interrupts public safety services. • The release of liquid industrial, agricultural, or commercial wastes, septage, or contaminated sediment if the storage capacity is less than two-acre-feet and is located more than 250 feet from a water body or water course. • Reversible environmental losses to environmentally-sensitive sites.
Significant Hazard	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: • No probable loss of lives. • Major economic loss to structures or property. • Structural damage to a Class I or Class II road that could render the road impassable or otherwise interrupt public safety services. • Major environmental or public health losses, including one or more of the following: • Damage to a public water system, as defined by RSA 485:1-a, XV, which will take longer than 48 hours to repair. • The release of liquid industrial, agricultural, or commercial wastes, septage, sewage, or contaminated sediments if the storage capacity is 2 acre-feet or more. • Damage to an environmentally-sensitive site that does not meet the definition of reversible environmental losses.
High Hazard	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 causing the structural failure of a foundation of a habitable residential structure or commercial or industrial structure, which is occupied under normal conditions. • Water levels rising above the first floor elevation of a habitable residential structure or a

[54] NH DES Fact Sheet WD-DB-15 "Classification of Dams in New Hampshire", http://des.nh.gov/organization/commissioner/pip/factsheets/db/documents/db-15.pdf. Accessed October 1, 2012.

	commercial or industrial structure, which is occupied under normal conditions when the rise due to dam failure is greater than one foot. • Structural damage to an interstate highway, which could render the roadway impassable or otherwise interrupt public safety services. • The release of a quantity and concentration of material, which qualify as "hazardous waste" as defined by RSA 147-A:2 VII. • Any other circumstance that would more likely than not cause one or more deaths.

Ice Jam

Ice forming in riverbeds and against structures often presents significant hazardous conditions for communities. Meltwater or stormwater may encounter these ice formations and apply lateral and/or vertical force upon structures. Moving ice may scour abutments and riverbanks. Ice may also create temporary dams. These dams can create flood hazard conditions where none previously existed. According to the Corps of Engineers Cold Regions Research and Engineering Laboratory (CRREL), 43% of New Hampshire ice jams have occurred in March and April during the ice breakup on the rivers, while 47% of ice jams occurred in January and February during either ice freeze up or ice break up periods.[55]

Wildfire

Several areas in the region are relatively remote in terms of access and fire fighting abilities. Of greatest concern are those areas characterized by steep slopes and vast woodlands, with limited vehicular access. These areas include the Ossipee, Squam, Belknap, and Sandwich Mountain Ranges. The islands in the region also pose a unique fire safety concern given that access is limited and most of the islands are predominately wooded with residential development. Most of the residential development on the islands is situated on the shores, and inland fire fighting capabilities are often limited.

The National Wildfire Coordinating Group (NWCG) has defined seven classes of wildfire based on size:

- Class A - one-fourth acre or less;
- Class B - more 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.

As these once remote areas begin to see more development (the urban wildfire interface), care should be taken to ensure that adequate fire protection and buffers are established. Techniques include increased buffers between wooded areas and residential buildings, requirements for cisterns or fire ponds, a restriction on the types of allowable building materials such as shake roofs, and special considerations for landscaping. While historically massive wildfires have been western phenomena, each year hundreds of woodland acres burn in New Hampshire. The greatest risk exists in the spring when the snow has melted and before the tree canopy has developed, and in the late

[55] "Ice Jams in New Hampshire," CRREL, http://www.crrel.usace.army.mil/ierd/tectran/IERD26.pdf visited February 8, 2011

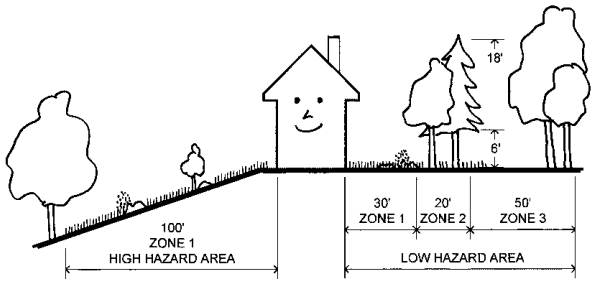
summer – early fall. Appropriate planning can significantly reduce a community's vulnerability for woodland fires. There are four-zone suggestions from the Firewise community program that could be potentially helpful for Center Harbor's homeowners.[56]

ZONE 4 is a natural zone of native or naturalized vegetation. In this area, use selective thinning to reduce the volume of fuel. Removing highly flammable plant species offers further protection while maintaining a natural appearance.

ZONE 3 is a low fuel volume zone. Here selected plantings of mostly low-growing and fire-resistant plants provide a decreased fuel volume area. A few well-spaced, fire resistant trees in this zone can further retard a fire's progress.

ZONE 2 establishes a vegetation area consisting of plants that are fire resistant and low growing. An irrigation system will help keep this protection zone green and healthy.

ZONE 1 is the protection area immediately surrounding the house. Here vegetation should be especially fire resistant, well irrigated and carefully spaced to minimize the threat from intense flames and sparks.



FIREZONES

II. GEOLOGICAL HAZARDS

Earthquake

Notable New Hampshire earthquakes are listed in Table G-2 with the extent of the hazard expressed in the Modified Mercalli Intensity scale and the Richter Magnitude.[57]

Table G-2: NH Earthquakes of magnitude or intensity 4 or greater (1638-2007)

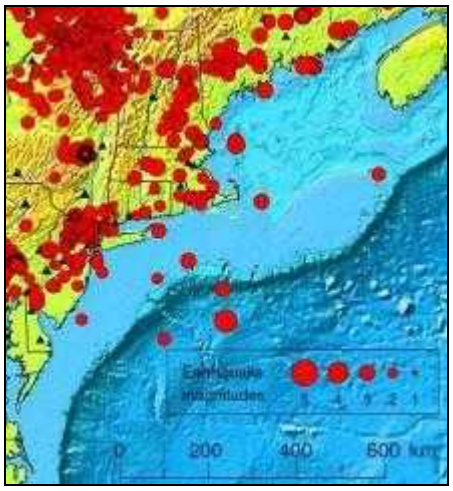
Location	Date	MMIntensity	Magnitude
Ossipee	December 24, 1940	7	5.5
Ossipee	December 20, 1940	7	5.5
Ossipee	October 9, 1925	6	4
Laconia	November 10, 1936	5	-
New Ipswich	March 18, 1926	5	-
Lebanon	March 5, 1905	5	-
Rockingham County	August 30, 1905	5	-
Concord	December 19, 1882	5	-
Exeter	November 28, 1852	5	-
Portsmouth	November 10, 1810	5	4

[56] http://www.firewise.org accessed September 21, 2012.
[57] http://earthquake.usgs.gov/learn/topics/mag_vs_int.php, visited June 8, 2012.

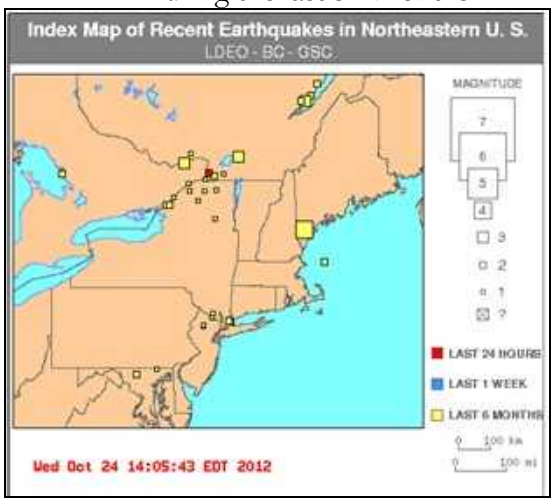
Location	Date	MMIntensity	Magnitude
Off Hampton	July 23, 1823	4	4.1
15km SE of Berlin	April 6, 1989	-	4.1
5km NE of Berlin	October 20, 1988	-	4
W. of Laconia	January 19, 1982	-	4.7
Central NH	June 11, 1638	-	6.5

Earthquakes in the Northeast[58]

1990 – 2010



During the last six months



Damage from an earthquake generally falls into two types; Structural and Nonstructural.

- **Structural Damage** is considered any damage to the load bearing components of a building or other structure.
- **Nonstructural Damage** is considered any portion not connected to the superstructure. This includes anything added after the frame is complete.

According to the NH Division of Homeland Security and Emergency Management, some of the issues likely to be encountered after a damaging earthquake could be:

- Total or partial collapse of buildings, especially un-reinforced masonry structures and those not built to seismic codes.
- Damage to roads and bridges from ground settlement and structural damage.
- Mass Causalities.
- Loss of electric power.
- Loss of telecommunication systems.
- Fires from gas line ruptures and chimney failures.
- Total or partial loss of potable and fire fighting water systems from pipe ruptures.

[58] Lamont-Doherty Cooperative Seismic Network http://www.ldeo.columbia.edu/LCSN/index.php, accessed October 24, 2012

- Hazardous Material incidences.
- Loss of critical capabilities from structural and nonstructural damages.
- Lack of mutual aid support.

The NH HSEM also notes that a "cascade of disasters" typically occurs after a damaging earthquake. For example:

- Damage to gas lines and chimneys result in fires that are difficult to extinguish due to damage to the road, water systems, fire and police stations.
- Structural and Nonstructural damage cause many injuries, but because of damage to health care facilities and emergency response facilities, there is a slow or nonexistent response.
- Responders are slowed in their response because of Hazardous Material incidents.
- Flooding due to dam failures.

Landslide

A landslide is the downward or outward movement of slope-forming materials reacting to the force of gravity, including 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. Seismic activity may play a role in the mass movement of landforms also. Although New Hampshire is mountainous, it consists largely of relatively old geologic formations that have been worn by the forces of nature for eons. Consequently, much of the landscape is relatively stable and the exposure to this hazard type is generally limited to areas in the north and north central portion of the state. Formations of sedimentary deposits and along the Connecticut and Merrimack Rivers also create potential landslide conditions.

Although the overall vulnerability for landslides in the state is low, there is considerable terrain susceptible to landslide action. This was exemplified in May of 2003 when the Old Man of the Mountain collapsed. The continuous action of freezing and thawing of moisture in rock fissures causes it to split and separate. This action occurs frequently on the steeply sloped areas of the state, increasing the risk of landslides. In addition to being susceptible to this freeze/thaw process, the Ossipee Mountain Range, Squam Range, and other mountains throughout the Lakes Region are also close to seismic faults and at risk to increased pressure to development. Consideration must be given to the vulnerability of man-made structures in these areas due to seismic- and/or soils saturation-induced landslide activity. Landslide activities are also often attributed to other hazard events. For example, during a recent flood event, a death occurred when a mass of saturated soil collapsed. This death was attributed to the declared flood event.[59] Also, during the 2007 Nor'easter a landslide occurred in Milton, resulting in the temporary closure of NH Route 101.

III. Severe Wind

The Lakes Region is at risk of several types of natural events associated with high winds, including nor'easters, downbursts, hurricanes and tornadoes. The northeast is located in a zone that should be built to withstand 160 mile an hour wind gusts. A large portion of the northeast, including the Lakes Region, is in a designated hurricane susceptible region.

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[59] http://www.nh.gov/safety/divisions/hsem/NaturalHazards/index.html visited February 8, 2011.

Tornado/Downburst

Although tornadoes are locally produced, damage paths can be in excess of one mile wide and 50 miles long.[60] The Fujita Scale is used to measure the intensity of a tornado (or downburst) by examining the damage caused in the aftermath, shown in Table G-3.[61] An F2 tornado ripped through a 50-mile section of central NH in July of 2008 from Epsom to Ossipee leading to requests for federal disaster declarations in several counties.[62]

Table G-3: The Fujita Scale

F-Scale #	Intensity Phrase	Wind Speed	Type of Damage
F0	Gale tornado	40-72 mph	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages sign boards.
F1	Moderate tornado	73-112 mph	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
F2	Significant tornado	113-157 mph	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
F3	Severe tornado	158-206 mph	Roof and some walls torn off well constructed houses; trains overturned; most trees in forest uprooted.
F4	Devastating tornado	207-260 mph	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
F5	Incredible tornado	261-318 mph	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel reinforced concrete structures badly damaged.
F6	Inconceivable tornado	319-379 mph	These winds are very unlikely. The small area of damage they might produce would probably not be recognizable along with the mess produced by F4 and F5 wind that would surround the F6 winds. Missiles, such as cars and refrigerators would do serious secondary damage that could not be directly identified as F6 damage. If this level is ever achieved, evidence for it might only be found in some manner of ground swirl pattern, for it may never be identifiable through engineering studies.

Source: http://www.tornadoproject.com/fscale/fscale.htm

The major damage from downbursts come from falling trees, which may take down power lines, block roads, or damage structures and vehicles. New Hampshire experienced three such events in the 1990s. One event occurred in Moultonborough on July 26, 1994 and was classified as a macroburst. It affected an area one-half mile wide by 4-6 miles in length.

The tornado/downburst risk for an individual community in New Hampshire is relatively low compared to many other parts of the country. Though the danger that these storms present may be high, the frequency of these storms is relatively low to moderate.

[60] FEMA Hazards: Tornadoes http://www.fema.gov/business/guide/section3e.shtm, visited February 8, 2011.
[61] http://www.tornadoproject.com/fscale/fscale.htm visited March 8, 2011.
[62] http://www.fema.gov/news/newsrelease.fema?id=45525 visited March 8, 2011.

Hurricane

Hurricanes are severe tropical storms that have winds at least 74 miles per hour. In the Lakes Region they could produce heavy rain and strong winds that could cause flooding or damage buildings, trees, power lines, and cars.[63] Hurricanes are measured by the Saffir-Simpson Hurricane Scale: a 1-5 rating based on a hurricane's intensity using wind speed as the determining factor (Table G-4). The scale is used to give an estimate of the potential property damage and flooding expected from a hurricane landfall.

Table G-4: Saffir-Simpson Hurricane Scale

Category	Characteristics
1	Winds 74-95 mph (64-82 kts or 119-153 km/hr). Storm surge generally 4-5 ft above normal. No real damage to building structures. Damage primarily to unanchored mobile homes, shrubbery, and trees. Some damage to poorly constructed signs. Also, some coastal road flooding and minor pier damage.
2	Winds 96-110 mph (83-95 kts or 154-177 km/hr). Storm surge generally 6-8 feet above normal. Some roofing material, door, and window damage of buildings. Considerable damage to shrubbery and trees with some trees blown down. Considerable damage to mobile homes, poorly constructed signs, and piers. Coastal and low-lying escape routes flood 2-4 hours before arrival of the hurricane center. Small craft in unprotected anchorages break moorings.
3	Winds 111-129 mph (96-113 kts or 178-209 km/hr). Storm surge generally 9-12 ft above normal. Some structural damage to small residences and utility buildings with a minor amount of curtainwall failures. Damage to shrubbery and trees with foliage blown off trees and large trees blown down. Mobile homes and poorly constructed signs are destroyed. Low-lying escape routes are cut by rising water 3-5 hours before arrival of the center of the hurricane. Flooding near the coast destroys smaller structures with larger structures damaged by battering from floating debris. Terrain continuously lower than 5 ft above mean sea level may be flooded inland 8 miles (13 km) or more. Evacuation of low-lying residences with several blocks of the shoreline may be required.
4	Winds 130-156 mph (114-135 kts or 210-249 km/hr). Storm surge generally 13-18 ft above normal. More extensive curtainwall failures with some complete roof structure failures on small residences. Shrubs, trees, and all signs are blown down. Complete destruction of mobile homes. Extensive damage to doors and windows. Low-lying escape routes may be cut by rising water 3-5 hours before arrival of the center of the hurricane. Major damage to lower floors of structures near the shore. Terrain lower than 10 ft above sea level may be flooded requiring massive evacuation of residential areas as far inland as 6 miles (10 km).
5	Winds greater than 156 mph (135 kts or 249 km/hr). Storm surge generally greater than 18 ft above normal. Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. All shrubs, trees, and signs blown down. Complete destruction of mobile homes. Severe and extensive window and door damage. Low-lying escape routes are cut by rising water 3-5 hours before arrival of the center of the hurricane. Major damage to lower floors of all structures located less than 15 ft above sea level and within 500 yards of the shoreline. Massive evacuation of residential areas on low ground within 5-10 miles (8-16 km) of the shoreline may be required.

Source: http://www.nhc.noaa.gov/aboutsshs.shtml

[63] http://www.fema.gov/hazard/hurricane/hu_about.shtm, visited January 25, 2011.

According to NOAA, 2010 was one of the busiest hurricane seasons on record.[64] However, the position of the jet stream kept the northeastern Atlantic region dry as a barrier to the storms. New Hampshire has not experienced a severe hurricane since 1938. On September 21, 1938, a Category 3 hurricane claimed 13 lives in New Hampshire and many more throughout New England. Official records at the Weather Bureau in Concord show sustained winds of 56 miles per hour, but around the state, gusts around 100 miles per hour were reported, mostly due to topographical acceleration. The Merrimack River rose nearly 11 feet above its flood stage, *The Hanover Gazette* reported that in New Hampshire, 60,000 people were homeless and many areas were without power. Damages were estimated at $22 million.[65] Hurricane Bob, a category 2 storm, in 1991, was declared a major federal disaster in New Hampshire and is recorded as a severe storm in the state's history.[66] Declared Disaster FEMA – 4316 on March 14-15, 2017 caused incredible damage to the town of Center Harbor. Route 25b was reported close for a week after the wind storm. An area of fallen trees were reported as well a mile-wide in northern Center Harbor. Businesses were closed and some citizens lost their power for one to multiple weeks depending on the person after this storm as well. Most of the damaged was focused along Neck Road and FEMA reimbursed the Town $10,744.95 for recovery efforts.[67]

Lightning

Thunderstorms have several threats associated with them including heavy rain, high wind, and hail. In a heavy rain storm, large amounts of rain may fall in a short period of time, severely impacting roads and low-lying developments. The discharge of lightning causes an intense sudden heating of air. The air rapidly expands when heated then contracts as it cools, causing a shock wave that we hear as thunder. This shock wave is sometimes powerful enough to damage windows and structures. Lightning damages cost the insurance industry more than $5 billion annually in the United States.[68] The National Weather Service does utilize a six-point scale for characterizing lightning activity called the Lightning Activity Level (LAL) based on frequency of ground strikes and to some degree ground conditions.[69]

LAL 1	No thunderstorms
LAL 2	Isolated thunderstorms. Light rain will occasionally reach the ground. Lightning is very infrequent, 1 to 5 cloud to ground strikes in a five minute period.
LAL 3	Widely scattered thunderstorms. Light to moderate rain will reach the ground. Lightning is infrequent, 6 to 10 cloud to ground strikes in a 5 minute period.
LAL 4	Scattered thunderstorms. Moderate rain is commonly produced Lightning is frequent, 11 to 15 cloud to ground strikes in a 5 minute period.
LAL 5	Numerous thunderstorms. Rainfall is moderate to heavy. Lightning is frequent and intense, greater than 15 cloud to ground strikes in a 5 minute period.
LAL 6	Dry lightning (same as LAL 3 but without rain). This type of lightning has the potential for extreme fire activity and is normally highlighted in fire weather forecasts with a Red Flag Warning.

[64] http://www.noaanews.noaa.gov/stories2010/20101129_hurricaneseason.html visited January 25, 2011.
[65] http://www.nh.gov/safety/divisions/hsem/NaturalHazards/index.html, visited January 25, 2011.
[66] http://www.fema.gov/news/event.fema?id=2118 visited January 25, 2011
[67] Center Harbor Department Head Meeting on October 16th, 2019
[68] *National Lightning Safety Institute webpage,* http://www.lightningsafety.com/nlsi_lls/nlsi_annual_usa_losses.htm visited February 8, 2011.
[69] NWS Definitions webpage, http://graphical.weather.gov/definitions/defineLAL.html.

Hail

High winds can bring down limbs and trees, knocking out electricity and blocking roads. Hail can cause damage to crops and structural damage to vehicles. Hail is measured by the TORRO intensity scale, shown in Table G-5. Although hailstorms are not particularly common in the Lakes Region, which averages fewer than two hailstorms per year, several have occurred in New Hampshire in the last few years.

Table G-5: TORRO Hailstorm Intensity Scale

Code	Diameter	Description	Typical Damage
H0	5-9 mm*	Pea	No damage
H1	10-15 mm	Mothball	Slight damage to plants, crops
H2	16-20 mm	Marble, grape	Significant damage to fruit, crops, vegetation
H3	21-30 mm	Walnut	Severe damage to fruit/crops, damage to glass/plastic structures, paint & wood scored
H4	31-40 mm	Pigeon's egg	Widespread glass damage, vehicle bodywork damage
H5	41-50 mm	Golf ball	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	51-60 mm	Hen's egg	Aircraft bodywork dented, brick walls pitted
H7	61-75 mm	Tennis ball	Severe roof damage, risk of serious injuries
H8	76-90 mm	Large orange	Severe damage to aircraft bodywork
H9	91-100 mm	Grapefruit	Extensive structural damage. Risk of severe or fatal injuries to exposed persons
H10	>100 mm	Melon	Extensive structural damage. Risk of severe or fatal injuries to exposed persons

***mm** = millimeters (Approximate range since other factors (e.g. number, density of hailstones, hail fall speed, surface wind speed) affect severity
Source: http://www.torro.org.uk/torro/severeweather/hailscale.php

IV. WINTER WEATHER

The Sperry-Piltz Ice Accumulation (SPIA) Index is now being used to forecast and classify ice storms based on a combination of the average thickness of ice coating (referencing expected temperature and precipitation levels) and wind speed; ratings range from 0 to 5.[70] The SPIA Index was first used in the United States in 2009 and is now beginning to be utilized by the National Weather Service.

The Sperry-Piltz Ice Accumulation Index, or "SPIA Index" – Copyright, February, 2009

ICE DAMAGE INDEX	* AVERAGE NWS ICE AMOUNT (in inches) *Revised October, 2011	WIND (mph)	DAMAGE AND IMPACT DESCRIPTIONS
0	< 0.25	< 15	Minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages.
1	0.10 – 0.25	15 - 25	Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges may become slick and hazardous.
	0.25 – 0.50	< 15	
2	0.10 – 0.25	25 - 35	Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation.
	0.25 – 0.50	15 - 25	
	0.50 – 0.75	< 15	
3	0.10 – 0.25	>= 35	Numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 5 – 9 days.
	0.25 – 0.50	25 - 35	
	0.50 – 0.75	15 - 25	
	0.75 – 1.00	< 15	
4	0.25 – 0.50	>= 35	Prolonged & widespread utility interruptions with extensive damage to main distribution feeder lines & some high voltage transmission lines/structures. Outages lasting 5 – 10 days.
	0.50 – 0.75	25 - 35	
	0.75 – 1.00	15 - 25	
	1.00 – 1.50	< 15	
5	0.50 – 0.75	>= 35	Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed.
	0.75 – 1.00	>= 25	
	1.00 – 1.50	>= 15	
	> 1.50	Any	

(Categories of damage are based upon combinations of precipitation totals, temperatures and wind speeds/directions.)

[70] SPIA Northeast webpage, http://www.spia-index.com/neIce.php.

APPENDIX H: STAPLEE RESULTS

As the Committee began the process of prioritizing these actions, the group considered the standard tool for project prioritization, the STAPLEE Method with a score of 1 being positive, 0 neutral, and -1 was for projects perceived to have a negative impact or obstacles for that particular category. New ID numbers were assigned to incorporate both deferred and new actions.

The seven category scores for each project were added up. Under this system, the maximum possible score is 7, the minimum is -7. The actual scores ranged from -1 to 5. Committee members discussed each project and scored it as a group.

ID	NEW ID	Hazard	Recommended Action	Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
23	3	Dam Failure	Develop an agreement between the state, town, and any other parties regarding maintenance of Hawkins Pond Dam and associated property	0	1	1	1	1	0	1	**5**
28	2	Infectious Diseases	Disseminate information to public about illness, and reach reaching out to regional resources.	1	1	1	1	1	0	0	**5**
26	1	Mass Casualty Event	Ensure that proper equipment and training is available in case of a mass casualty event	1	1	0	1	1	1	0	**5**
27	16	Aging Infrastructure	Explore opportunities for inventory assessment, and prioritize the town's infrastructure along with potential funding mechanisms.	0	1	1	1	0	0	1	**4**
17B	15	All Hazards	Explore options for new ways of reaching out to residents and visitors regarding hazards.	1	1	1	0	0	0	1	**4**

ID	NEW ID	Hazard	Recommended Action	Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
new	14	All Hazards	Work with the likely primary shelter (Congregational Church) and HSEM to secure matching funds and grant funds for an appropriate generator	1	1	1	0	0	1	0	**4**
19	13	Earthquake	Center Harbor should provide education and outreach about earthquake resiliency.	1	1	1	0	0	0	1	**4**
25	12	Extreme Temps	Update EOP to include a warming and cooling shelter plan and a populations at risk plan.	1	1	0	1	0	1	0	**4**
9	11	HazMat Transport	The FD should acquire or have access to a boom and materials to contain a fuel spill into the lake. Associated training should also be provided.	1	1	0	1	0	0	1	**4**
15	10	High Winds	Improve communication & outreach to property owners regarding steps they can take to reduce the vulnerability of their properties and improve emergency preparedness.	1	1	1	0	0	0	1	**4**
7B	7	Inland Flooding	Establish a communication process for high rain events.	1	1	1	0	0	0	1	**4**
5A	8	Inland Flooding	Exploring additional funding options to upgrade undersized drainage in the Village Center.	0	1	1	0	1	0	1	**4**
5B	9	Inland Flooding	Upgrade undersized drainage along Coe Hill Rd.	0	1	1	0	1	0	1	**4**
14	6	Lightning	Improve communication & outreach to property owners regarding steps they can take to reduce the vulnerability of their properties, such as FireWise materials on the website.	1	1	1	0	0	0	1	**4**

ID	NEW ID	Hazard	Recommended Action	Social	Technical	Administrative	Political	Legal	Economic	Environmental	TOTAL
16	5	Severe Winter Weather	Improve communication & outreach to property owners regarding steps they can take to reduce the vulnerability of their properties and improve emergency preparedness.	1	1	1	0	0	0	1	**4**
13	4	Wildfire, Conflagration, Lighting	Access roads for fire should be designated, mapped, and maintained.	1	1	0	1	0	0	1	**4**
11	17	Transportation HazMat	Work with NHDOT to explore more options or gps warning systems put in place for the steep grade on Rte. 25B.	1	1	1	0	0	0	0	**3**
30	18	Inland Flooding	As the FEMA Watershed Flood Mapping progress (Winnipesaukee and Pemigewasset watersheds) over the next several years, maintain local involvement, especially during map review and drafting of a flood ordinance.	1	0	0	0	0	0	1	**2**
20	19	Inland Flooding	The CEO will participate in NFIP training that addresses flood hazard identification when offered by the state or FEMA.	1	0	0	0	0	0	0	**1**
21	20	All Hazards	Work with the Belknap County Sheriff and HSEM to explore funding options and improve coverage through more/better repeaters.	0	0	0	0	0	0	0	**0**
7A	21	Inland Flooding	Identify, assess, monitor, and document the dams of Center Harbor for communication among their stakeholders.	1	-1	-1	0	0	-1	1	**-1**
new	22	Aging Infrastructure	Repair/upgrade/replace Hawkins Pond Bridge	0	1	0	0	-1	-1	0	**-1**
new	23	Solar/Space Weather	Maintain situational awareness on NOAA's solar and space weather page to stay informed on potential impacts from anticipated solar and space weather.	0	0	0	-1	0	0	0	**-1**

APPENDIX I: EXISTING PLANS, STUDIES, REPORTS, AND TECHNICAL INFORMATION

Center Harbor Hazard Mitigation Plan, 2014
Center Harbor Master Plan, 2012
Center Harbor Zoning Ordinance
Center Harbor Subdivision Regulations
Center Harbor Site Plan Regulations
"Development Activity in the Lakes Region, 2016 Annual Report", Lakes Region Planning Commission.
FEMA Community Information System
Town of Center Harbor Assessor Database, 2018
"2018 Multi-Hazard Mitigation Plan", NH Homeland Security and Emergency Management
National Climactic Data Center, National Oceanic and Atmospheric Administration http://www.ncdc.noaa.gov/stormevents/
NH Division of Forests and Lands http://www.nhdfl.org/fire-control-and-law-enforcement/fire-statistics.aspx

APPENDIX J: MONITOR, EVALUATE, & UPDATE

Table A: Periodic Hazard Mitigation Plan Review Record

Meeting Schedule (dates)	Tasks Accomplished	How well (or not-so-well) is implementation progressing?	Lead Parties	Public Involvement (citizens, neighboring communities)

Table B: Project Implementation Checklist

ID	Recommended Action	Hazard	Responsible Party	Time Frame	2022	2023	2024	2025
1	Ensure that proper equipment and training is available in case of a mass casualty event	Mass Casualty Event	PD	Ongoing/ Long Term 4+ years				
2	Disseminate information to public about illness and reach out to regional and state resources.	Infectious Diseases	EMD	Long Term 4+ years				
3	Develop an agreement between the state, town, and any other parties regarding maintenance of Hawkins Pond Dam and associated property	Dam Failure	Highway Dept./BoS	Long Term 4+ years				
4	Access roads for fire should be designated, mapped, and maintained.	Wildfire, All Hazards	FD	Mid-Term 2 to 4 years				
5	Improve communication & outreach to property owners regarding steps they can take to reduce the vulnerability of their properties to heavy snow and ice and improve emergency preparedness.	Severe Winter Weather	Admin/BoS/ EMD	Short Term 1 to 2 years				
6	Improve communication & outreach to property owners regarding steps they can take to reduce the vulnerability of their properties to lightning strikes and fire, such as FireWise materials on the website.	Lightning	Admin/BoS/ EMD	Short Term 1 to 2 years				
7	Establish a communication process for high rain events.	Inland Flooding	EMD/BoS	Long Term 4+ years				

ID	Recommended Action	Hazard	Responsible Party	Time Frame	2022	2023	2024	2025
8	Explore additional funding options to upgrade undersized drainage in the Village Center.	Inland Flooding	Highway Dept.	Long Term 4+ years				
9	Upgrade undersized drainage along Coe Hill Rd.	Inland Flooding	Highway Dept.	Long Term 4+ years				
10	Improve communication & outreach to property owners regarding steps they can take to reduce the vulnerability of their properties to damage from high winds, especially from downed trees and wires and improve emergency preparedness.	High Winds Cyclone	Admin/BoS/ EMD	Short Term 1 to 2 years				
11	The FD should acquire or have access to a boom and materials to contain a fuel spill into the lake. Associated training should also be provided.	HazMat Transport	FD	Short Term 1 to 2 years				
12	Update EOP to include a warming and cooling shelter plan and a populations at risk plan.	Extreme Temps	EMD	Mid-Term 2 to 4 years				
13	Center Harbor should provide education and outreach about earthquake resiliency.	Earthquake	Admin/BoS/ EMD	Mid-Term 2 to 4 years				
14	Work with the likely primary shelter (Congregational Church) and HSEM to secure matching funds and grant funds for an appropriate generator.	All Hazards	EMD/BoS	Short Term 1 to 2 years				
15	Explore options for new ways of reaching out to residents and visitors regarding hazards.	All Hazards	Admin/BoS/ EMD	Short Term 1 to 2 years				

ID	Recommended Action	Hazard	Responsible Party	Time Frame	2022	2023	2024	2025
16	Explore opportunities to inventory, assess, and prioritize the town's infrastructure along with potential funding mechanisms.	Aging Infrastructure	Highway Dept.	Long Term 4+ years				
17	Work with NHDOT to explore more options for warning systems, especially for trucks regarding the steep grade on NH Route 25B, perhaps incorporating this into establish GPS navigation systems.	Transportation HazMat	PD	Short Term I to 2 years				
18	As the FEMA Watershed Flood Mapping efforts (Winnipesaukee and Pemigewasset watersheds) progress over the next several years, maintain local involvement, especially during map review and drafting of a flood ordinance.	Inland Flooding	PB	Long Term 4+ years				
19	The CEO will participate in NFIP training that addresses flood hazard identification when offered by the state or FEMA.	Inland Flooding	CEO	Long Term 4+ years				
20	Work with the Belknap County Sheriff and HSEM to explore funding options and improve coverage through more/better repeaters.	All Hazards	PD	Long Term 4+ years				
21	Identify, assess, monitor, and document the dams of Center Harbor for communication among their stakeholders.	Inland Flooding	EMD	Mid-Term 2 to 4 years				
22	Repair/upgrade/replace Hawkins Pond Bridge.	Aging Infra-structure	RA	Long Term 4+ years				
23	Maintain situational awareness on NOAAs solar and space weather page to stayed informed on potential impacts from anticipated solar and space weather.	Solar Storm & Space Weather	EMD & PD	Ongoing				

APPENDIX K: FEMA MITIGATION PLANNING WEBLIOGRAPHY

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/MSC/statemap.htm
Flood Map Modernization	http://www.fema.gov/national-flood-insurance-program-flood-hazard-mapping/map-modernization
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 Quake 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,	http://magic.lib.uconn.edu/connecticut_data.html

"Connecticut GIS Data", University of Connecticut	
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
U.S. Wind Zone Maps	http://www.fema.gov/safe-rooms/wind-zones-united-states
Tornado Project Online	http://www.tornadoproject.com/
National Hurricane Center	http://www.nhc.noaa.gov
Community Hurricane Preparedness Tutorial	http://meted.ucar.edu/hurrican/chp/hp.htm
National Severe Storms Laboratory, 2009, "Tornado Basics",	http://www.nssl.noaa.gov/primer/tornado/tor_basics.html

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

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

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	http://nisconsortium.org/

incident management resources, tools, and best practices	
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

SUSTAINABILTY/ADAPTATION/CLIMATE CHANGE

Planning for a Sustainable Future: the Link Between Hazard Mitigation and Livability	http://www.fema.gov/media-library-data/20130726-1454-20490-3505/fema364.pdf
Why the Emergency Management Community Should be Concerned about Climate Change: A discussion of the impact of climate change on selected natural hazards	http://www.cna.org/sites/default/files/research/WEB%2007%2029%2010.1%20Climate%20Change%20and%20the%20Emergency%20Management%20Community.pdf
NOAA RISA for the Northeast (Regional Integrated Sciences and Assessments)	http://ccrun.org/home
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/
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
NEclimateUS.org	http://www.neclimateus.org
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
EPA State and Local Climate and Energy Program	http://www.epa.gov/statelocalclimate/index.html

PLANNING

American Planning Association	http://www.planning.org
PlannersWeb - Provides city and regional planning resources	http://www.plannersweb.com

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

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

FEMA RESOURCES

Federal Emergency Management Agency (FEMA)	www.fema.gov
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 provides up to $30,000 for elevation and design requirements to repeatedly or substantially damaged property.	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	www.csc.com

as the NFIP Statistical Agent, CSC provides information and assistance on flood insurance to lenders, insurance agents and communities	
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
Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning	http://www.fema.gov/media-library/assets/documents/4317

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
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
IS-318 Mitigation Planning for Local and Tribal Communities Independent Study Course	http://training.fema.gov/EMIWeb/IS/is318.asp

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