Meeting 5 - Climate Review

10-06-20

Town of Allenstown

New Hampshire

Hazard Mitigation Plan Update 2020

2017 Oct – Wind Storm Home Destruction

Photo courtesy of Paul St. Germaine, Fire Dept

2020 Mar - Roadway Washout, Deerfield Rd

Photo courtesy of Paul St. Germaine, Fire Dept

Adopted by the Allenstown Board of Selectmen

Month xx, 2020

NHHSEM/FEMA Approved Month xx, 2020

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General Hazard Mitigation Objectives

Main hazard event categories of **Earth, Extreme Temperatures**, **Fire**, **Flood**, **Public Health**, **Solar Storms**, **Wind, Winter, Technological,** and **Human** are intended to encompass their respective full sub-hazards range described in this Plan. The **General Objectives** are developed by addressing the primary hazard events that could impact Allenstown. They focus on minimizing or mitigating the hazard events to support the overall **Goals** while driving the direction of **Action** development later in the Plan.

Although human and technological hazards are not natural disasters, many technological hazards are secondary to (are caused by) the natural and weather hazards. Nineteen (**19**) **General Hazard Mitigation Objectives** were crafted for the **Allenstown Hazard Mitigation Plan 2020** as displayed in **Figure 5**.

Figure 5
Hazard Mitigation OBJECTIVES

EARTH HAZARDS

1. **Minimize the threat of potential landslide or rockslide areas along local roads (US 3 intersection with Granite Street) and excavation areas.**
2. **Engage in public awareness of local earthquake activity and safety precautions.**
3. **Minimize the impact of drought events to agricultural areas, private and municipal wells, and other locations through public awareness.**

EXTREME TEMPERATURE HAZARDS

4. **Minimize damages to life, property, and infrastructure due to temperature fluctuation ~~resulting from climate change~~, including excessive heat events, heat waves, extreme cold events and wind chill.**

FIRE HAZARDS

5. **Minimize the damages to life, property, and infrastructure, including Bear Brook State Park, from wildfires, brushfires, other outdoor fires, and lightning.**

2. See revision, page 25

4 HAZARD RISK ASSESSMENT

3. See revision, page 29

Natural disasters and technological, and human hazards that have occurred in Allens potential to occur in the Town were assessed in a **Hazard Identification Risk Assessment (HIRA)** to determine their **Overall Risk** to the community. The major disasters declarations covering the Central NH Region (Merrimack County and Hillsborough County) were inventoried and additional hazard events occurring in Allenstown and the surrounding area have been described. FEMA Public Assistance funding to the Town is detailed for each disaster declaration. A review of climate ~~changes~~ variations is provided for the region to provide perspective on how the weather may change over time.

The ***State of New Hampshire Multi-Hazard Mitigation Plan 2018*** recommends that municipalities examine multiple natural hazards, including several new hazards. One hazard, coastal flooding, is not discussed in Allenstown's Plan because they have no relevance to the Town. The former Human hazards of Civil Disturbance/ Public Unrest, Sabotage/ Vandalism, and Hostage Situation are absorbed into the **Terrorism/ Violence** hazard category. The opportunity was available to combine several of the former flood-related hazards into the new **Inland Flooding**. Likewise, several former wind-related hazards are compiled within **High Wind**. No natural hazards from the **2015 Plan** have been removed, only placed into other groupings for evaluation. Within the **Hazard Mitigation Plan 2020**, the **14** evaluated natural hazards and the **9** evaluated human or technological hazards have been incorporated under these basic categories, also displayed in **3 GOALS AND OBJECTIVES Table 8**:

- **Earth Hazards**
- **Extreme Temperature Hazards**
- **Fire Hazards**
- **Flood Hazards**
- **Public Health Hazards**
- **Solar Storm Hazards**
- **Wind Hazards**
- **Winter Hazards**
- **Human Hazards**
- **Technological Hazards**

Within these basic hazard categories are numerous related subcategories, all of which are detailed in the **Hazard Identification and Risk Assessment (HIRA).** This Assessment provides a measure of **Frequency (Probability of Occurrence)**, **Location Area**, **Severity of Impact to the Town**, **Hazard Magnitude**, and **Overall Risk** for each hazard in a numerical format as determined by the Hazard Mitigation Committee. Scale definitions and the process to define hazards are discussed.

Many of these examined hazards discussed may pose little threat to the Town. The Hazard Mitigation Committee wanted to acknowledge their possibility as opposed to simply focusing on a handful of top hazards which will certainly occur in the community. Using this broad vision allows Allenstown to contemplate the impact of a variety of hazards and to develop mitigation actions and design emergency planning programs as appropriate. Only the most predominant hazards, or even multiple hazards, will

Magnitude of Landslide

There is no known standardized measurement of landslide magnitude available.

4. See revision, page 94

EXTREME TEMPERATURE HAZARDS

Extreme temperature hazards include diverse hazards such as severe cold or windchill, excessive heat, and heatwaves. Excessive heat or extreme cold can create other hazards such as public health issues, utility outages. The severity of these hazards is influenced by New Hampshire's changing climate and severe weather systems. This category is meant to encompass all the hazards which can be influenced by the ~~extreme weather temperatures and climate changes~~ abnormal temperature variations that New England, New Hampshire, the Central NH Region, and Allenstown are experiencing.

There are several types of **EXTREME TEMPERATURE** hazards examined in the **Hazard Identification and Risk Assessment**:

Main Hazard Category	Specific Hazards Included
EXTREME TEMPERATURES	EXTREME TEMPERATURES Excessive Heat, Heat Wave, Cold or Wind Chill

The environmental temperature spectrum is addressed under extreme temperatures, from very cold to very hot.

The overall ratings of **Extreme Temperatures** in Allenstown from the **HIRA** are:

Natural, Technological, Human Hazard Categories	Probability of Occurrence in 10 Years (1-4)	Human Injury Impact (1-4)	Essential Services or Infrastructure Impact (1-4)	Property Damage or Economic Impact (1-4)	OVERALL RISK (1-16)
EXTREME TEMPERATURES **Excessive Heat, Heat Wave, or Cold or Wind Chill**	**4** **HIGH**	1 LOW	1 LOW	1 LOW	**4.0** **LOW**

Excessive Heat or Heatwave

A heat wave is a period of abnormally and uncomfortably hot and unusually humid weather that typically lasts two or more days. The National Weather Services' Heat Index is used to measure humidity against temperature to develop a "real feel" temperature. Heat disorders on the body are quick and can be deadly. These now normal hot temperatures in the summer are commonly known as **excessive heat**.

The National Weather Service categorizes a **Hot Day** when temperatures reach **90°** or warmer. An official **Heat Wave** is defined as three or more consecutive days with the temperature reaching or exceeding **90°**.

Influenza

A magnitude scales for **Pandemic Severity Index (PSI) for Influenza** and resulting Community Mitigation Strategies is available from the US Center for Disease Control (US CDC). The State of New Hampshire Influenza Pandemic Public Health Preparedness and Response Plan 2007 included the **PSI for Influenza** classification system and the Community Strategies. As a growing college community, Allenstown may be particularly vulnerable to influenza.

Arboviral

New Hampshire developed guidelines for phased response to the arboviruses (mosquito-borne) Eastern Equine Encephalitis (EEE) and West Nile Virus (WNV) and Jamestown Canyon Virus (JCV). Annually, the NH DHHS publishes the State of New Hampshire Arboviral Illness Surveillance, Prevention, and Response Plan 2018 and its associated Arboviral Risk Map 2018. Risk Categories **1** through **5** determine human illness probability and the recommended response to outbreaks.

The new State of New Hampshire Zika Virus Response Plan 2018 describes Response Phases **0** to **3** and is written like an Emergency Operations Plan Annex for emergency responders to follow.

The NH DHHS and the Capital Area Public Health Network should be notified of all public health emergencies, no matter the type of threat.

Tick-borne

Tick-borne diseases are increasing in New Hampshire, and now include Lyme Disease, Anaplasmosis, Babesiosis, Powassan Virus, and more. These are all carried by the black legged tick in New Hampshire. The State has currently stopped producing annual maps and updates of tick-borne disease locations, but they have other resources available. Check back here at the NH Department of Health and Human Services for future updates: https://www.dhhs.nh.gov/dphs/cdcs/lyme/index.htm.

Air and Water Quality

The NH DES Drinking Water and Groundwater Bureau administers the federal Safe Drinking Water Act and NH statutes to protect public water systems, drinking water sources and groundwater supplies to help maintain safe **water quality** for drinking. NHDES currently is encouraging municipalities to refine the potable water definition in NH municipal building codes.

5. Noted but no revisions, page 114

Water quality hazards such as radon, arsenic, uranium Per- and polyfluoroalkyl substances (PFAS) industrial chemicals, cyanobacteria, coliform bacteria, lead and copper in public water systems, are constantly being tested for and when found, monitored. Once these enter the groundwater (aquifers) system, they are extremely difficult to mitigate. The Climate Change Resilience Plan 2015 describes the NHDES efforts understand how damage to infrastructure from natural hazards such as **Inland Flooding** and spring **snow melt** runoff can occur to create more resilient water systems.

Hazard Risk Assessment Hazards	Overall Risk	Potential Future Hazards – Locations and Impacts	Magnitude/ Extent Measurement Scales
Internet, Communications or Live Wire Danger ***NO Event(s) Within Last 5 Years***		area first, the most populated area, before the remote locations in Allenstown (NH 28, Deerfield Road) have utilities restored. Underground water, gas, or sewer lines could break from **Earthquake** or **Severe Winter Weather**. A strategic break could isolate all those connections at the far end of the line. • Many Allenstown residences outside Suncook Village own generators for their homes and are prepared for several days of no utilities to their homes during future storms. • The telecommunications tower may be disrupted during future storm events. Essential communications may be paused until redundant capabilities are reestablished in the region.	
TRANSPORTATION CRASH **Vehicle, Airplane, Helicopter, Rail, Interstate, Pedestrian or Bicycle** ***Events(s) Within Last 5 Years***	not scored	• With NH 28 and US 3 running through Allenstown and forming an intersection, the Town's Fire and Rescue and Police Departments are often the first to respond to the vehicle crashes experienced on the State roadways. These routes are used heavily by commuters as they travel through Allenstown to their destinations. Crashes ~~are expected to~~may increase over time, especially when conditions become icy from winter snow melt ~~(climate change)~~ for the fast highways and greater numbers of vehicles use the roads. • The Town maintained roads, Class VI unmaintained roads and private roads can have elevation changes that will continue to make travel difficult in the future in snowy, icy, flooded, or debris blockage conditions. Any time of year, dangerous intersections become more difficult to navigate with heavy winds, rain, treefall or flooding hazards. Travel through State Park roads could become difficult or impossible. • **Vehicle, pedestrian, and bicycle crashes** are anticipated to continue to occur Downtown in the future as the economic center of the community and access to the **Merrimack and Suncook Rivers** are improved. • The Town may also have alternative future **crash** potential, such as airplanes, helicopters, and drones. Nearby airports enable plane traffic. With the increased usage of private drones, the future potential for their crashing in populated areas or causing vehicular crashes is anticipated to rise.	N/A
MASS CASUALTY INCIDENT **As a result of any hazard event** ***NO Events(s) Within Last 5 Years***	not scored	• Large groups of people are located at the Town Hall, Community Center, Allenstown Elementary School, Armand Dupont School, and Bear Brook State Park which could be where a future mass casualty event could occur as a result of any other type of hazard event. • Allenstown is a vibrant community with active groups and social calendars. Events such as political candidate visits, Allenstown School District sporting events, Bear Brook State Park museums and events, Town Meeting, Old Home Day, Veteran's Parades, Church events, Suncook Village events, Volunteer Park activities, and other community gatherings could set the location for future mass casualty incidents.	N/A

6. See revision, page 149

Local Climate ~~Changes~~ Variations and Extreme Weather

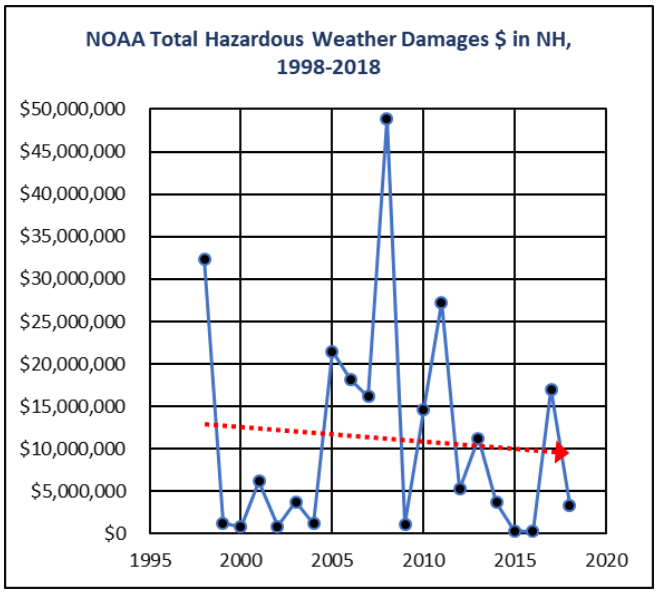
7. See revision, page 156

In the State and the Central NH Region, like any other areas, exist our own "micro-climate" areas that can be analyzed for future susceptibility to disasters and hazard events. New Hampshire has obtained high costs of damage over time due to hazardous weather and declared disasters. A review of the state and area history can provide a perspective on what Allenstown can expect to see in terms of extreme weather in the future.

Table 28

Summary of Hazardous Weather Fatalities, Injuries, and Damage Costs in NH, 1998-2018

Year	Fatalities	Injuries	Total Damages $ in Million
2018	2	9	**$3.4**
2017	0	0	**$17.0**
2016	1	1	**$0.27**
2015	2	34	**$0.37**
2015	0	2	**$3.7**
2013	0	30	**$11.3**
2012	1	4	**$5.28**
2011	1	2	**$27.3**
2010	1	6	**$14.63**
2009	1	0	**$1.13**
2008	2	5	**$48.9**
2007	0	3	**$16.15**
2006	1	9	**$18.2**
2005	4	9	**$21.5**
2004	0	11	**$1.2**
2003	2	29	**$3.8**
2002	0	7	**$0.9**
2001	0	2	**$6.2**
2000	2	6	**$8.0**
1999	3	17	**$1.3**
1998	1	23	**$32.4**



Source: National Oceanic and Atmospheric Administration, last accessed 07/19.
Adjusted for inflation [Consumer Price Index CPI)]
http://www.nws.noaa.gov/om/hazstats.shtml

Injuries to people and the costs of damages in New Hampshire have slightly decreased from hazardous weather over the last **20** years according to the trendline displayed in the associated chart for **Table 28**. Between **1998-2008**, this slight decline in injuries and damages can be generally applied to the major disasters declared in the State. The highest damage costs correlate to the **1998** (**$32m**) and **2008** (**$49m**) ice storms. The number of injuries and fatalities have a less distinct association, with the highest casualties shown in **2015** (**36**), **2013** (**30**) and **2003** (**31**). However, the single greatest number of fatalities during this time period occurred in **2005** (**4**), likely during the time of the **Oct 2005 Columbus Day Floods** that struck the southwestern section of the State very hard.

8. (SA) Study is relevant. No revisions, page 163

IMPACTS OF CLIMATE CHANGES IN SOUTHERN NEW HAMPSHIRE

This climate data may certainly be relevant to the entire Central NH Region which includes the Town of Allenstown. The Central NH region climate summation is that the **temperature is getting warmer**, the **precipitation is increasing**, and the **snowfall is decreasing** according to the National Oceanic and Atmospheric Administration's data collection at the Concord airport. There are no indications to see these trend lines reverse in the future.

9. (SA) Noted but no revisions, page 163

The Southern NH Climate Change Assessment, formally entitled ***Climate Change in Southern New Hampshire: Past, Present, and Future, 2015*** by Climate Change Solutions of New England under the University of New Hampshire, reviewed current climate conditions and projected future conditions of Southern New Hampshire under potential low and high emission scenarios. The Central NH Region and the Town of Allenstown are within southern New Hampshire. The past and future Southern NH climate overview is illustrated in **Figure 27**.

As a result of anticipated extreme weather continuing and climate changes in Central NH and Allenstown, consideration should be given for potential impacts to the community. Several new issues are considered, including public health, natural environment disruption, declining forest health, fewer recreational opportunities, risks to the built environment, transportation system maintenance, aging stormwater infrastructure, decreasing water resources and changing food and agriculture, all of which may result from climate change. For more information on these topics, refer to the ***Central NH Regional Plan 2015***.

10. See revision, page 163

Figure 27

Southern NH Climate Assessment Projections

Past Data and Future Climate Overview

SOUTHERN NH CLIMATE ASSESSMENT Projections

TEMPERATURE

What have we seen since 1970?

- → Average maximum temperatures have warmed by 2.0°F (spring, fall and summer) and 2.9°F (winter)
- → Average minimum temperatures have warmed by 3.2°F (spring, fall and summer) and 6.1°F (winter)

What can we expect in the future?

- → Summers will be hotter: 16-47 days above 90°F
- → Winters will be warmer: 20-45 fewer days below 32°F

RAINFALL

What have we seen since 1970?

- → Annual precipitation has increased by 8-22%
- → Frequency and magnitude of extreme events

What can we expect in the future?

- → Precipitation annual average will increase: 15-20%
- → More frequent and severe flooding

SNOW

What have we seen since 1970?

- → Fewer days with snow cover
- → Lake ice-out dates occurring earlier

What can we expect in the future?

- → Significant decrease of 20-50% in number of snow covered days

Source: UNH Climate Solutions of New England, 2015