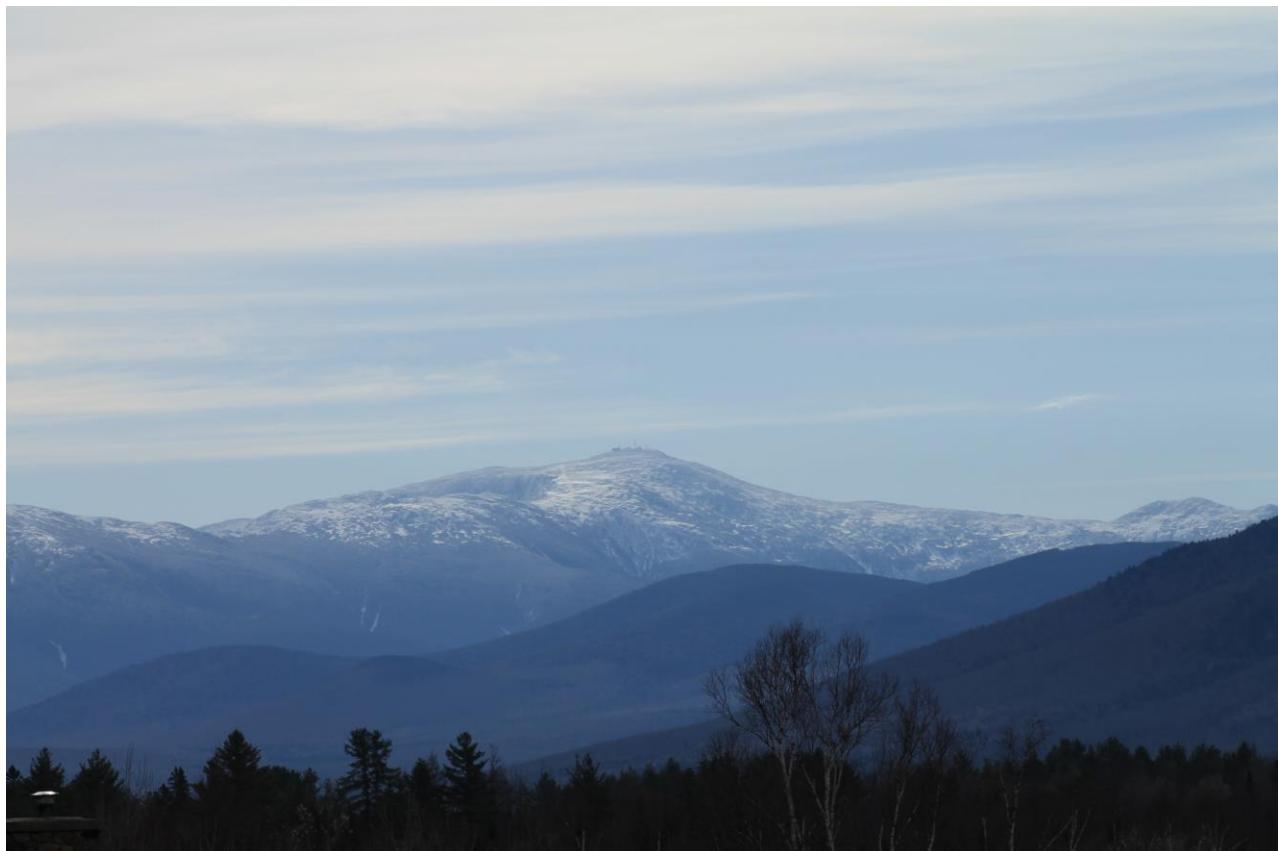


State of New Hampshire Multi-Hazard Mitigation Plan Update 2013



Mount Washington Photo Courtesy E. Peck



Prepared by the New Hampshire Department of Safety
Homeland Security and Emergency Management
33 Hazen Drive
Concord, NH 03305



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STATE OF NEW HAMPSHIRE

**RESOLUTION ADOPTING THE
STATE MULTI HAZARD MITIGATION PLAN UPDATE 2013**

WHEREAS, the State of New Hampshire receives funding from the Federal Emergency Management Agency (FEMA) to assist in the preparation of the State Multi Hazard Mitigation Plan; and

WHEREAS, several committee meetings and public notices were conducted between March 2012 and March 2013 regarding the development and review of the State Multi Hazard Mitigation Plan; and

WHEREAS, a hazard analysis, risk assessment and capability assessment has been conducted to identify potential mitigation projects to reduce the effects of a disaster in the State of New Hampshire; and

WHEREAS, the State Multi Hazard Mitigation Plan identifies potential future projects to mitigate hazard damage in the State of New Hampshire; and

NOW, THEREFORE, BE IT RESOLVED that the State of New Hampshire and the NH Department of Safety – Division Homeland Security and Emergency Management approves the State Multi Hazard Mitigation Plan.

APPROVED and SIGNED this 29 day of October 2013

A handwritten signature in blue ink, appearing to read "Margaret Wood Hassan".

Margaret Wood Hassan
Governor of New Hampshire

A handwritten signature in black ink, appearing to read "Perry E. Plummer".

Perry E. Plummer
Director of Homeland Security and Emergency Management

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Executive Summary

Background

In July of 1998, upon the Declaration of DR-1231-NH (a flood event), Federal Emergency Management Agency (FEMA) Region I Mitigation Division staff and the New Hampshire Division of Homeland Security & Emergency Management (NH HSEM) conducted an assessment of New Hampshire's existing hazard mitigation planning tool's and determined that there was not a viable plan in place that would satisfy the requirements of Section 409 within the Robert T. Stafford Disaster Relief Act. Therefore, an initial edition of this Plan was developed and presented to FEMA on April 1, 1999. The development and periodic update of this plan satisfies the planning requirements of the Disaster Mitigation Act (DMA) of 2000 which amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act). The purpose of DMA 2000 is to reduce loss of life and property, human suffering, economic disruption, and disaster assistance costs. The Plan was revised in October 2004, and has been reviewed and updated every three years to reflect the most recent information obtained through the evolution of the State of New Hampshire's hazard mitigation program. The State Multi-Hazard Mitigation Plan creates an increased coordination and integration of mitigation activities and actions throughout the State of New Hampshire. Hazard Mitigation is any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards. This Plan also shows the historical events that have had a direct effect on the State of New Hampshire, as well as bring to the forefront the State's vulnerability to hazards that are most likely to impact the State. These vulnerabilities and historical events, as well as their impacts, help lead to discussions about what mitigation activities need to take place in order to reduce the State's vulnerability to these hazards.

State of New Hampshire Multi-Hazard Mitigation Plan History

Plan	FEMA Approval Date
NH Natural Hazards Mitigation Plan (Original)	October 1999
NH Multi-Hazard Mitigation Plan Revised per DMA 2000	October 2004
NH Multi-Hazard Mitigation Plan Update	September 2007
NH Multi-Hazard Mitigation Plan Update	November 2010
NH Multi-Hazard Mitigation Plan Update	October, 2013

The State of New Hampshire continues to build a progressive and proactive Hazard Mitigation Program statewide and strives to maintain compliance with the DMA; this plan has been revised again to reflect the most up to date information on the progress of the State of New Hampshire's Hazard Mitigation Program. This updated plan was submitted to FEMA on May 21, 2013 for conditional approval, which was obtained on October 28, 2013 and adopted by the State on October 29, 2013. The final plan was submitted for FEMA's formal approval on October 31, 2013.

Hazard Risks

The State of New Hampshire is prone to a variety of hazards. This plan will focus on all hazards of concern that the State Hazard Mitigation Committee felt are prominent in this State. The Committee agrees through historical review and the review of the State's 2012 Threat and Hazard Identification and Risk Assessment (THIRA Appendix F) that the State is most vulnerable to flooding. Since 2010, when the last plan was written, we have experienced seven disaster declarations due to flooding, hurricanes and severe snow. All hazards of concern include flooding, (both coastal and riverine) dam failure, drought, wildfire, earthquakes, landslides, radon, tornadoes/downbursts, hurricanes, lightning, severe winter weather, snow avalanche, epidemic/pandemic, fire and hazardous materials, and terrorism.

The planning effort of the State is an evolving process and the Plan is considered to be a "living document". This document is available on the HSEM website: <http://www.nh.gov/safety/divisions/hsem/HazardMitigation/planning.html>

For further information please contact:

Department of Safety, Division of Homeland Security & Emergency Management

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Introduction

Authority

This Multi-Hazard Mitigation Plan for the State of New Hampshire was prepared pursuant to Section 322, Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (the Act), herein enacted by Section 104 of the Disaster Mitigation Act of 2000 (DMA) (P.L. 106-390). This Act provides new and revitalized approaches to mitigation planning. Section 322 of DMA 2000 emphasizes the need for State, local and tribal entities to closely coordinate mitigation planning and implementation efforts. It continues the requirement for a State mitigation plan as a condition of disaster assistance, and creates incentives for increased coordination and integration of mitigation activities at the State level through the establishment of criteria for two different levels of State plans e.g., "standard" and "enhanced". The State of New Hampshire has developed a standard State plan. Accordingly, this Plan will hereinafter be referred to as the "Plan".

Authority for the development of this Plan by New Hampshire Homeland Security and Emergency Management (NH HSEM) is contained in the New Hampshire Revised Statutes Annotated (RSA), Chapter 21-P Section 21-P: 37 (see Appendix B).

Purpose

The purpose of this Plan is to provide an overview of the natural and human-caused hazards that impact the State and to outline the State's Plan for the mitigation of damages that may be associated with these events. This Plan will reveal in detail how the State will address planning for future natural and human-caused hazards and to reduce the impact of those hazards.

The Plan identifies, analyzes and assesses the risk of the hazards that affect the State of New Hampshire. Therefore, the Plan has been incorporated as an annex to the State of New Hampshire Emergency Operations Plan and will continue to be an annex with each update.

Scope of the Plan

The concept of a "Multi Hazard Mitigation Plan" for the entire State is undeniably broad. The original 1999 version was divided into four sections: Executive Summary, Severe Wind Plan, Geologic Hazards and Winter Weather Hazards. However, for the purpose of meeting the requirements of the Disaster Mitigation Act of 2000, this 2013 edition will acknowledge and review each hazard individually and the findings are included in this Plan.

Assurances

The State of New Hampshire and the Department of Safety – Division of Homeland Security & Emergency Management assures that the State will comply with all applicable Federal Statutes and regulations at all times during which it receives grant funding. In compliance with 44 CFR 13.11 (c), the Division of Homeland Security & Emergency Management will amend this Plan whenever necessary to reflect changes in State or Federal laws and Statutes as required in 44 CFR 13.11 (d). The State Hazard Mitigation Officer and the State Hazard Mitigation Planner will be responsible for ensuring compliance with FEMA, reviewing the plan annually or after an event as well as updating this Plan every three years.



Undersized culverts prior to mitigation



*Mitigated culvert No. Pembroke Road,
Pembroke NH, funded by the FY 2008
LPDM*

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

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Chapter I

Planning Methodology

The planning process for this update of the Plan started in early 2012. Over the course of the past three years, the State of New Hampshire has endured seven presidentially declared disasters, numerous undeclared events, as well as slight demographical changes. All chapters of the 2010 Hazard Mitigation Plan have been reviewed and changes were made if necessary by the SHMPC and are reflected within the draft update. Information that the SHMPC felt was still pertinent remains within the plan unchanged.

An effective and open planning process helps ensure that there is an overall understanding of the risks and vulnerabilities throughout the State. As agencies work together to support policies, actions and tools that each bring to the table, overall this plan will achieve a reduction of future losses with a long term solution. Due to the change of personal within Government, knowledge and experience may also change. This Plan serves as a permanent record and explanation of how decisions were made, and who was involved with these findings.

Public Involvement

As with the original planning process, emails were sent to members of the previous State Hazard Mitigation Planning Committee (SHMPC) which was composed of representatives from Federal and State agencies, such as New Hampshire Department of Safety, Department of Transportation, and the United States Secret Service. A full list of the active members is on page 11 and 12, and historical reference of members who have provided information in previous plans is located in Appendix A.

All members were given a copy of the previous Plan, a copy of the Threat and Hazard Identification and Risk Assessment (THIRA) as well as a refresher on how to review and update the portions of the Plan that corresponded with their areas of expertise. Two meetings were then held with members of our Agency's partners, local government and Emergency Management Directors (EMD) to discuss the changes that had been made to the previous Plan, their contributions into the Plan, solicit ideas and comments for the Plan. Due to the security level of NH HSEM Incident Planning and Operations Center (IPOC), public meetings cannot be held there. The public was provided the opportunity to supply their input throughout the planning process. The SHMPC decided it would be worthwhile to provide surveys via Survey Monkey (a copy of information about the surveys are found in Appendix E) which allowed citizens and all interested parties such as fellow agencies an opportunity to provide their input throughout the planning process. Due to the anonymity of the responses, it cannot be determined who specifically provided the crucial information within the survey. This method was also employed for those who were unable to make it to meetings due to scheduling conflicts.

The first circulation of the State Hazard Mitigation Plan survey via Survey Monkey at <http://www.surveymonkey.com/s/2V695SJ> had an abundance of interest, so an additional

survey had to be disseminated at <http://www.surveymonkey.com/s/72D79B2> as well as the State's vulnerability survey at <http://www.surveymonkey.com/s/8NX2BLN>. These surveys were posted on the HSEM website, distributed by HSEM Field Representatives through their email contacts, and delivered throughout the State via the HSEM electronic newsletter. This provided invaluable information as to the public perception and knowledge of Hazard Mitigation as well as the degree to which the surveyor felt they (and their community) were vulnerable to natural and human-caused hazards. The results of the survey were downloaded and can be reviewed in Appendix E. The information gained from the survey was utilized throughout the plan, especially within Chapter III with county specific information. While NH does not have county based government, New Hampshire's Legislature is made up of a 400-member House, the third largest in the English speaking world, and a 24-member Senate. State representatives and senators are paid \$100 per year and generally meet from January through June. They approve a biennial State budget by July 1 of the first year of the two-year election cycle. House members do not have offices or personal staff.

There are 234 communities in New Hampshire with different forms of local government. The ten counties in New Hampshire only provide security, correctional facilities and limited social services to communities. Presidential declarations are made based on county wide thresholds that need to be met. For the purpose of this Plan information is based County and Statewide, not broken down by jurisdiction.

The public process for the Multi-Hazard Mitigation Plan Update for the State of New Hampshire was advertised through the HSEM electronic newsletter, as well as public notices on the HSEM website. The Field Services section also reached out to the members of their email distribution lists and verbally encouraged members of the community to join the SHMPC. All interested parties had an opportunity to be participants in the meetings. Each member was asked to review the plan and make any necessary updates and changes pertinent to their area of expertise. Any change that they felt were necessary was made, and there is information that was felt to still be factual and will be sustained throughout the Plan. All information from the 2013 Plan will be reviewed again for the 2016 Plan. Although the public was also solicited for their input and comments for the Plan update through the NH HSEM website, no one contacted the State Hazard Mitigation Planner with additional information to contribute to the Plan. The State Hazard Mitigation Planner also personally called and invited members of law enforcement, as well as academia from the State; their input was vital to all aspects of the Plan. At each meeting, those in attendance were given a short presentation on Hazard Mitigation planning and how they could contribute to the development of the update, and how the information they provided would ultimately be incorporated into the Plan.



North Pembroke Road, Pembroke NH April 2007 Nor'easter DR-1695

Acknowledgments

<u>Committee Member</u>	<u>Agency</u>
<u>Title</u>	
Perry Plummer Director	NH Division of Homeland Security & Emergency Management
Christopher Pope Director (Former)	NH Division of Homeland Security & Emergency Management
Steven Temperino Assistant Director	NH Division of Homeland Security & Emergency Management
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Lance Harbour State Hazard Mitigation Officer (Former)	NH Division of Homeland Security & Emergency Management
Elizabeth Peck State Hazard Mitigation Officer	NH Division of Homeland Security & Emergency Management
Gregg Champlin Natural Hazard Program Specialist	NH Division of Homeland Security & Emergency Management
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Neil Twitchell Administrator	NH Division of Public Health Services (DPHS)
Jim Gallagher Environmental Engineer	NH Department of Environmental Services (DES)
Steve Doyon Civil Engineer	NH Department of Environmental Services (DES)
Johnna McKenna Supervisor Drinking Water	NH Department of Environmental Services (DES)
Ana Ford Environmentalist	NH Department of Environmental Services (DES)
Brad Simpkins Director of Forest and Lands	NH Department of Resources & Economic Development (DRED)
Jennifer Gilbert Floodplain Coordinator/Planner	NH Office of Energy & Planning (OEP)
Shane Csiki Fluvial Geomorphologist	NH Department of Environmental Services (DES)
Edna Feighner Archaeologist	NH Department of Cultural Resources

<u>Committee Member</u>	<u>Agency</u>
<u>Title</u>	
Rick Chormann Geologist	NH Department of Environmental Services (DES)
Fay Rubin GIS Coordinator	University of New Hampshire
Michael Peck, MBA, MA Professor of Homeland Security	Great Bay Community College -Terrorism and Disaster Management
Paul Dean Chief of Police	University of New Hampshire
Paul Fulone Captain/Airport Commander	Londonderry Police Department, Manchester-Boston Regional Airport
Kieran Ramsey Resident Agent in Charge	Federal Bureau of Investigation (FBI)
Holly Fraumeni Resident Agent in Charge	United States Secret Service (USSS)

Table 1.1

NH Natural Hazards Mitigation Plan October 1999 Edition	
Date	Meeting Description
September 24, 1998	State Hazard Mitigation Team Meeting
October 16, 1998	Historical Sub-Committee Meeting
June 22, 1999	State Hazard Mitigation Team Meeting
NH Multi-Hazard Mitigation Plan October 2004 Edition	
Date	Meeting Description
January 15, 2003	State Hazard Mitigation Team was solicited for comment on the 1999 edition of the Plan via email.
April 20, 2003	State Hazard Mitigation Team Meeting
April 13, 2004	Meeting with Environmental Services
April 13, 2004	Meeting with Office of Energy and Planning
April 20, 2004	Meeting with Resources & Economic Development
April 26, 2004	Meeting with Department of Transportation
April 20, 2004	Meeting with E-911 Mapping
NH Multi-Hazard Mitigation Plan September 2007 Edition	
Date	Meeting Description
June 11, 2007	Meeting with Fire Marshals Office
June 13, 2007	Meeting with Resources and Economic Development
June 15, 2007	Meeting with Office of Energy & Planning
June 19, 2007	Meeting with Department of Health and Human Services
June 19, 2007	Meeting with Department of Transportation
June 27, 2007	Meeting with the Department of Environmental Services

NH Multi-Hazard Mitigation Plan September 2010 Edition	
Date	Meeting Description
June 30, 2010	State Hazard Mitigation Team was solicited for comment on the 2007 edition of the Plan via email
July 1, 2010	Meeting with Office of Energy and Planning
July 15, 2010	Meeting with the Department of Environmental Services
July 16, 2010	Meeting with Fire Marshall's Office
NH Multi-Hazard Mitigation Plan 2010 Edition Cont.	
Date	Meeting Description
July 20, 2010	Public Meeting: Concord
July 22, 2010	Public Meeting: Portsmouth
July 27, 2010	Public Meeting: Laconia
July 28, 2010	Meeting with the Department of Environmental Services
July 28, 2010	Meeting with multiple agencies regarding terrorism
August 3, 2010	Meeting with NH Dept. of Transportation
NH Multi-Hazard Mitigation Plan 2013 Edition	
Date	Meeting Description
March 2012	Review of 2010 State Hazard Mitigation Plan began
May 16, 2012	State Hazard Mitigation Planning Committee (SHMPC) was solicited for comment on the 2010 edition of the Plan via email
August 31, 2012	Receipt of SHMPC reviews and updated information and comments on their subject matter
September 12, 2012	Meeting with NH HSEM Directors
September 17, 2012	Receipt of SHMPC reviewed and updated information and comments on hazard risk and vulnerability
October 16, 2012	Meeting #1 with Law Enforcement Stakeholders review of terrorism, Critical infrastructure and Key resources, mitigation strategies
October 23, 2012	Meeting #1 with Stakeholders Hazard analysis, identification, vulnerability, impact and probability. Review of goals and action plans
November 26, 2012	Meeting #2 with Law Enforcement Stakeholders review of terrorism, Critical infrastructure and Key resources, mitigation strategies
December 7, 2012	Final Review of State HMP and placed on website for public comment.

Table 1.2 contains historical dates of meetings that were vital to the development and revision of this Plan (agendas and attendance sheets can be found in Appendix A).

The State Hazard Mitigation Officer, State Mitigation Planner and the Planning Committee reviewed the previous methods and resources used to identify hazards that may affect the state and added three new resource which is in italics below:

- Review of past State and Federal disaster designations.
- Review of past flooding events.
- Review of Flood Insurance Claims in the state since 1978.
- Review of the US Army Corps of Engineers – Cold Region Research Engineering Laboratory (CRREL) and their ice jam data base containing information of 520 ice jam events in the State between 1835 and 1999.
- Coordination with the NH Department of Environmental Services (DES) – Dam Bureau for the review of the threat of dam breach and failure.
- Coordination with the NH Department of Environmental Services (DES) – Geologic Survey for the review of the threat of riverine and coastal flooding as well as the Fluvial Erosion Hazard Program.
- Coordination with the Office of Energy & Planning – Coastal Program for the review of the threat of coastal erosion.
- Review of drought information from the United States Geological Survey and the NH DES.
- Review of the FEMA publication, *Multi-Hazard Identification and Risk Assessment*,
- Consultation with the State Climatologist for information on extreme heat.
- Coordination with Department of Resources and Economic Development and the State Fire Marshal Office for the review of wildfire and structural fire hazards.
- Review of the State’s Earthquake Program and the New England States Emergency Consortium for information on earthquakes.
- Coordination with the National Weather Service and the National Oceanic and Atmospheric Administration for information related to hurricanes, downbursts, winter weather and other weather related hazards.
- Review of *New Hampshire Demographic Trends in the Twenty-First Century-Kenneth M. Johnson*
- Review of *New Hampshire 2012 Threat and Hazard Identification and Risk Assessment*
- Review of *State of NH State Owned Real Property Supplemental Financial Data to the Comprehensive Annual Financial Report*

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Chapter II

Hazard Analysis

The initial production and current revised edition of this Plan included contributions from and coordination with many state and federal agencies as well as the public, private and non-profit groups. Appendix A contains a complete list of current and historic Plan Contributors that were contacted by the State Hazard Mitigation Planner in the development of the Plan. The following topic summarizes the information that the participants provided for each hazard type. Members are considered subject matter experts and any changes that were made since the 2010 plan are reflected in blue. Information was also gained by the review of the FEMA approved Local Hazard Mitigation Plans (LHMP). In addition, the State Hazard Mitigation Planning Committee (SHMPC) helped to identify and review the hazards that have or could occur in the State. As a result, the SHMPC determined that the State Hazard Mitigation Plan needed to address the risks associated with the following hazards:



Flooding	Coastal Flooding	Dam Failure
Drought	Wildfire	Earthquake
Landslide	Radon	Tornado/Downburst
Hurricane	Lightning	Severe Winter Weather
Snow Avalanche	Epidemic/Pandemic	Fire and Hazardous Materials
Terrorism		

**For this update, the SHMPC decided that Energy Hazard Mitigation and Subsidence has been removed from the Plan as a hazard due to the few historical instances, low risk and low probability of it occurring in the State.



DR-1643

State of New Hampshire
Presidentially Declared Disasters (DR) and Emergency Declarations(EM) 1982-2013

Date Declared	Event	FEMA DR	Program	Amount	Counties Declared
August 27, 1986	Severe storms/flooding	FEMA-771-DR	PA	\$1,005,000	Cheshire & Hillsborough
April 16, 1987	Severe storms/flooding	FEMA-789-DR	PA/IA	\$4,888,889	Carroll, Cheshire, Grafton, Hillsborough, Merrimack, Rockingham, and Sullivan
August 29, 1990	Severe Storms/Winds	FEMA-876-DR	PA	\$2,297,777	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack, and Sullivan
September 9, 1991	Hurricane	FEMA-917-DR	PA	\$2,293,449	Statewide
November 13, 1991	Coastal Storm/Flooding	FEMA-923-DR	PA/IA	\$1,500,000	Rockingham
March 16, 1993	Heavy Snow	FEMA-3101-EM	PA	\$832,396	Statewide
January 3, 1996	Storms/Floods	FEMA-1077-DR	PA	\$2,220,384	Carroll, Cheshire, Coos, Grafton, Merrimack, and Sullivan
October 29, 1996	Severe Storms/Flooding	FEMA-1144-DR	PA	\$2,341,273	Grafton, Hillsborough, Merrimack, Rockingham, Strafford, and Sullivan
January 15, 1998	Ice Storm	FEMA-1199-DR	PA/IA	\$12,446,202	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack, Strafford, and Sullivan
July 2, 1998	Severe Storms	FEMA-1231-DR	PA/IA	\$3,420,120	Belknap, Carroll, Grafton, Merrimack, Rockingham, and Sullivan
October 18, 1999	Hurricane/Tropical Storm Floyd	FEMA-1305-DR	PA	\$750,133	Belknap, Cheshire, and Grafton
March 2001	Snow Emergency	FEMA-3166-EM	PA	\$4,500,000	Cheshire, Coos, Grafton, Hillsborough, Merrimack, Rockingham, and Strafford
February 17-18, 2003	Snow Emergency	FEMA-3177-EM	PA	\$3,000,000	Cheshire, Hillsborough, Merrimack, Rockingham, and Strafford
September 12, 2003	Severe storms and flooding	FEMA-1489-DR	PA	\$1,300,000	Cheshire and Sullivan
March 11, 2003	Snow Emergency	FEMA-3177-EM	PA	\$3,000,000	Cheshire, Hillsborough, Merrimack, Rockingham, and Strafford
January 15, 2004	Snow Emergency	FEMA-3193-EM	PA	\$3,200,000	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack, and Sullivan

State of New Hampshire
Presidentially Declared Disasters (DR) and Emergency Declarations(EM) 1982-2013 Cont.

Date Declared	Event	FEMA DR	Program	Amount	Counties Declared
March 30, 2005	Snow Emergency	FEMA-3207-EM	PA	\$4,654,738	Belknap, Carroll, Cheshire, Grafton, Hillsborough, Merrimack, Rockingham, Strafford and Sullivan
March 30, 2005	Snow Emergency	FEMA-3208-EM	PA	\$1,417,129	Carroll, Cheshire, Coos, Grafton and Sullivan
April 28, 2005	Snow Emergency	FEMA-3211-EM	PA	\$2,677,536	Carroll, Cheshire, Hillsborough, Rockingham and Sullivan
October, 26, 2005	Severe Storm and Flooding	FEMA-1610-DR	PA/IA	\$14,996,626 +	Belknap, Cheshire, Hillsborough, Merrimack and Sullivan. Grafton
May 31, 2006	Severe Storm and Flooding	FEMA-1643-DR	PA/IA	\$17,691,586 +	Belknap, Carroll, Hillsborough, Merrimack, Rockingham, Strafford and Grafton
April 15 - 23, 2007	Severe Storm and Flooding	FEMA-1695-DR	PA/IA	\$27,000,000 +	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack, Rockingham, Strafford, and Sullivan.
August 11, 2008	Severe Storms, Tornado, and Flooding	FEMA-1782-DR	PA	\$1,691,240	Belknap, Carroll, Merrimack, Rockingham, and Strafford
September 5, 2008	Severe Storms and Flooding	FEMA-1787-DR	PA	\$4,967,595	Belknap, Coos, and Grafton
October 3, 2008	Severe Storms and Flooding	FEMA-1799-DR	PA	\$1,050,147	Hillsborough and Merrimack
December 11, 2008	Severe Winter Storm	FEMA-3297-EM	DFA/PA	\$900,000	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack, Rockingham, Strafford, and Sullivan
January 2, 2009	Severe Winter Storm	FEMA-1812-DR	DFA/PA	\$19,789,657	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack, Rockingham, Strafford, and Sullivan
March 29, 2010	Severe Winter Storm	FEMA-1892-DR	PA	\$9,103,138	Merrimack, Rockingham, Strafford, and Sullivan
May 12, 2010	Severe Winter Storm	FEMA-1913-DR	PA	\$3,057,473	Hillsborough and Rockingham
July 22, 2011	Severe Storms and Flooding	FEMA-4006-DR	PA	\$1,664,140	Coos and Grafton

State of New Hampshire
Presidentially Declared Disasters (DR) and Emergency Declarations(EM) 1982-2012 Cont.

Date Declared	Event	FEMA DR	Program	Amount	Counties Declared
September 3, 2011	Tropical Storm Irene	FEMA-4026-DR	PA/IA	\$11,101,752	Belknap, Carroll, Coos, Grafton, Merrimack, Stratford, and Sullivan
December 7, 2011	October Nor'Easter	FEMA-4049-DR	PA	\$4,411,457	Hillsborough and Rockingham
June 18, 2012	Severe Storms and Flooding	FEMA-4065-DR	PA	\$unknown	Cheshire
October 30, 2012	Hurricane Sandy	DR-4095 EM-3360	PA DFA	\$unknown	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack, Rockingham, Strafford, and Sullivan
February 08-10-2013	Severe Snow and Blizzard	DR-4105	PA	\$Unknown	Belknap, Carroll, Cheshire, Hillsborough, Merrimack, Strafford, Rockingham

35 Declarations Totaling \$ 175,166,810.00

Program Key: PA: Public Assistance IA: Individual Assistance DFA: Direct Federal Assistance

Table 2.1



Route 302-Tropical Storm Irene DR-4026

RATINGS OF PROBABILITY, SEVERITY, AND RISK

Probability of occurrence and severity of the event are estimated using a number system answering questions which answer High (3), Moderate (2), and Low (1). A zero (0) score meant that there is no likelihood the hazard would impact the State in the next 25 years.

The ranges established for the average to determine severity were:

- High = >3
- Moderate = 2
- Low = 1 or below

The overall risk is a numeric indication developed by multiplying the total numbers of the probability and the severity.

Probability of Occurrence

Probability is based on a limited objective appraisal of a hazard's probability using information provided by relevant sources, observations and trends. The SHMPC came together and broke down the hazards and the State's vulnerabilities to these hazards county by county. The State's probability of occurrence is an average of all ten counties.

- **High:** There is great likelihood that a hazardous event will occur within the next 25 years. Score = 3
- **Moderate:** There is moderate likelihood that a hazardous event will occur within the next 25 years. Score = 2
- **Low:** There is little likelihood that a hazardous event will occur within the next 25 years. Score = 1

Severity

Severity is an estimate generally based on a hazard's impact human, property and business. The SHMPC came together and broke down the State's impact to these hazards county by county. The severity was calculated by the average of human, property and business. The State's severity is average of all ten counties.

- **High:** The total population, property, commerce, infrastructure and services of the State is uniformly exposed to the effects of a hazard of potentially great magnitude. In a worst case scenario there could be a disaster of major to catastrophic proportions. Score = 3
- **Moderate:** The total population, property, commerce, infrastructure and services of the State are exposed to the effects of a hazard of moderate influence; or the total population, property, commerce, infrastructure and services of the State is exposed to the effects of a hazard, but not all to the same degree; or an important segment of population, property, commerce, infrastructure or service is exposed to the effects of a hazard. In a worst case scenario there could be a disaster of moderate to major, though not catastrophic, proportions. Score = 2

- **Low:** A limited area or segment of population, property, commerce, infrastructure or service is exposed to the effects of a hazard. In a worst case scenario there could be a disaster of minor to moderate proportions. Score = 1

Overall Risk

The risk number is one, which can help the State weigh the hazards against one another to determine which hazard is most detrimental to the State. This is calculated by multiplying the ***Probability of Occurrence*** score by the average of the ***Severity*** score (human, property, and business impacts).

- **High:** There is a great risk of this hazard in the State of NH. Score = 4 or greater
- **Moderate:** There is moderate risk of this hazard in the State of NH. Score = 2-3
- **Low:** There is little risk of this hazard in the State of NH Score = 1 or less

The SHMPC had an opportunity to openly discuss within a brainstorming session after reviewing the THIRA, and involving their own personal expertise and knowledge and made the decisions based on that information.

Flooding

The State Hazard Mitigation Planning Committee primary contact at Department of Environmental Services (DES) and Office of Energy and Planning (OEP) reviewed the previous information from the 2010 Plan. Flooding is the temporary overflow of water onto land that is not normally covered by water. New Hampshire has more than 16,000 miles of rivers and streams and the State's settlement pattern is confluent with these locations. Communities developed and encroached into the floodplains and along waterways which provided mills with power and transportation. As a result of this development pattern, the floodplains of the State were rapidly settled. The shift to industrialization during the mid-nineteenth century compounded the problem with residents moving to the floodplains of the cities and larger villages. Floodplains are extensions of the watercourses and have evolved to carry excessive runoff naturally. Flooding results from overflow of rivers, their tributaries, and streams throughout the state, with storm surges caused by hurricanes a concern for the seacoast communities as well as those hurricanes that track inland. Riverine flooding is the most common disaster event in the State of New Hampshire. In recent years some areas in the State have experienced multiple disastrous flood events at recurrence intervals of less than ten years.

New Hampshire usually has a climate of abundant precipitation. Weather ranges from moderate coastal to severe continental, with annual precipitation ranging from about 35 inches in the Connecticut and Merrimack River valleys, to about 90 inches on top of Mount Washington. Localized street flooding occasionally results from severe thundershowers, or over larger areas, from more general rain such as tropical cyclones and coastal "nor'easters." More general and disastrous floods are rare, but some occur in the spring from large rainfall quantities combined with warm, humid winds that rapidly release water from the snowpack.¹



Tropical Storm Irene-DR 4026 WMUR U Local

¹ Text reprinted from the Pemigewasset Flood Mitigation Project with permission of Ray Wenninger, P.E.

Debris Impacted and Undersized Infrastructure

Debris carried by floodwaters can significantly compromise the effectiveness of otherwise adequately designed bridges, dams, culverts, diverting structures, etc. Storm debris carried by floodwaters may exacerbate a given flooding hazard by becoming obstructions to normal storm water flow. Culverts and bridge crossings that are undersized in relation to the river or stream in which they are contained can lead to sedimentation and debris accumulation, potentially causing structural failures and major flooding downstream as was the case in May 2012 in Keene, NH.



DR-4065 May 2012 WMUR U Local

Per the Inter-Agency Hazard Mitigation Team Meeting from FEMA DR-1077-NH, a project was designed to educate the public as to the dimensions of this problem. The Pemigewasset River Corridor Stewardship Program includes the cooperation of the NHDES Wetlands Bureau to develop *Best Management Practices* to facilitate river corridor stewardship (i.e., stream bank maintenance and the development of stream maintenance plans.)



Keene DR-4065 May 2012 WMUR U local

Undersized infrastructure is of increasing concern to communities and emergency officials across the state. Culvert assessments have become a priority for multiple communities and state agencies given concerns associated with culverts becoming compromised from being undersized or blocked. NHDES is presently undertaking assessments of this infrastructure and is analyzing the data using a tool that allows for prioritizing the most at-risk culverts based on their compatibility with river processes.

Riverine Erosion and Scouring

River erosion is a recurrent problem in New Hampshire, especially with those rivers within watersheds that are more developed, which tend to experience a greater number of intense flood events. More local scale erosion, or scouring, is also occurring throughout the State, particularly in the vicinity of abutments and other structures within rivers. This has been a major problem in the “flashy” streams of northern New Hampshire. Most recently, severe bank erosion occurred on rivers in the White Mountains as a result of Tropical Storm Irene, threatening homes and infrastructure, demonstrating that extreme rain events of that magnitude can lead to widespread river erosion through an entire region of the State.



*Loon Mountain Tropical Storm Irene August 2011 DR-4026
NH HSEM Staff photo*

The State of New Hampshire has established a Fluvial Erosion Hazards (FEH) program to assess the State’s rivers and streams to evaluate the susceptibility of individual river reaches to erosion and to identify homes and infrastructure at greatest risk from eroding or weak stream banks. This information will be incorporated into community hazard mitigation plans as well as information obtained will also be incorporated into the 2016 update of the State Multi-Hazard Mitigation Plan.

Rapid Snowmelt

The State’s climate, mountainous terrain increases the susceptibility to flooding which



Peterborough, NH, WMUR ULocal Photo

may be accelerated by the seasonal rapid melting of the snowpack, coupled with moderate temperatures and heavy rains. The upland areas may be exposed to associated erosion and deposition issues in or near streambeds. The lower-lying areas of the State may experience either flash-flooding or inundation events accelerated by the rapid melting of the snowpack.

Ice Jam Flooding

Ice forming in riverbeds and against structures often presents significant hazardous conditions for many communities in the State. Melt water and/or storm waters may then encounter these ice formations which may tend to apply lateral and/or vertical force upon structures. Moving ice may scour abutments and riverbanks. Ice may also create

temporary dams. These dams may create flood hazard conditions where none previously existed.



The State's exposure to this hazard type has prompted several interventions in NH by the U.S. Army Corps of Engineers, Cold Regions Research and Engineering Laboratory (CRREL). The Corps has constructed dams and ice diversion structures to arrest the flow of large, potentially damaging ice formations in order to reduce flooding potential and the possible impact by ice on bridges and other structures. Mitigation measures include excavation, mechanical breaking, ice blasting, over-spraying an area with ash or leaf mulch to accelerate melting, planned releases of relatively warmer water from impoundments and the installation of electronic devices to signal ice movement which might aid in evacuations and other response measures.



Above:WMUR U Local photo

Number of Ice Events in New Hampshire Year 2011-2012

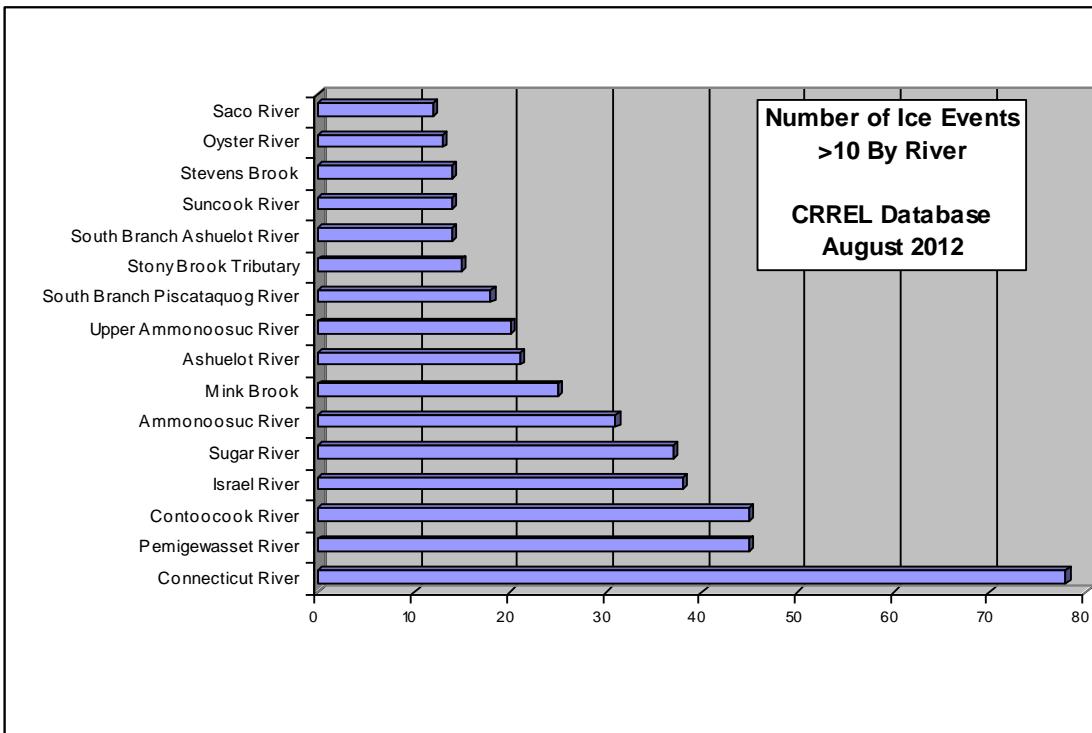


Table 2.2

New Hampshire's Flood History

Date	Area Affected (River Basins/Region)	Recurrence Interval (Year)	Remarks
December 1740	Merrimack	Unknown	First recorded flood in New Hampshire.
October 23, 1785	Cocheco, Baker, Pemigewasset, Contoocook and Merrimack	Unknown	Greatest discharge at Merrimack and at Lowell, Mass. Through 1902.
March 24-30, 1826	Pemigewasset, Merrimack, Contoocook, Blackwater and Ashuelot	Unknown	Through 1902 and at Lowell, Mass. Through 1902.
April 21-24, 1852	Pemigewasset, Winnipesaukee, Contoocook, Blackwater, and Ashuelot	Unknown	Merrimack River at Concord; highest stream stage for 70 years. Merrimack River at Nashua; 2 feet lower than 1785.
April 19-22, 1862	Contoocook, Merrimack, Piscataquog, and Connecticut	Unknown	Highest stream stages to date on the Connecticut River; due solely to snowmelt.
October 3-5, 1869	Androscoggin, Pemigewasset, Baker, Contoocook, Merrimack, Piscataquog, Souhegan, Ammonoosuc, Mascoma, and Connecticut	Unknown	Tropical storm lasting 36 hours. Rainfall, 6-12 inches.
November 3-4, 1927	Pemigewasset, Baker, Merrimack, Ammonoosuc and Connecticut	25 to > 50	Upper Pemigewasset River and Baker River; exceeded the 1936 Flood. Down stream at Plymouth; less severe than 1936 flood.
March 11-21, 1936	Statewide	25 to > 50	Double flood; first due to rains and snowmelt; second, due to large rainfall.
September 21, 1938	Statewide	Unknown	Hurricane. Stream stages similar to those of March 1936 and exceeded 1936 stages in Upper Contoocook River.
June 1942	Merrimack River Basin	Unknown	This was the fourth flood in the lower Merrimack River basin at Manchester, NH.
June 15-16, 1943	Upper Connecticut, Diamond and Androscoggin	25 to >50	Intense rain exceeding 4 inches; highest stream stages of record in parts of the effected area.

New Hampshire's Flood History (Continued)

June 1944	Merrimack River	Unknown	This was one of the five highest known floods at Manchester on the Merrimack
November 1950	Contoocook River and Nubanusit Brook	Unknown	Localized storm resulted in flooding of this area.
March 27, 1953	Lower Androscoggin, Saco, Ossipee, Upper Ammonoosuc Israel, and Ammonoosuc	25 to > 50	Peak of record for the Saco and Ossipee Rivers.
August 1955	Connecticut River Basin	Unknown	Heavy rains caused extensive damage throughout the basin area
October 25, 1959	White Mountain Area; Saco, Upper Pemigewasset and Ammonoosuc Rivers	25 to > 50	Largest of record on Ammonoosuc at Bethlehem Junctions; third largest of record on the Pemigewasset and Saco Rivers
December 1959	Piscataquog - Portsmouth	Unknown	A Nor'easter brought tides exceeding maximum tidal flood levels in Portsmouth. Damage was heavy along the coast.
April 1960	Merrimack and Piscataquog	Unknown	Flooding resulted from rapid melting of deep snow covering and the moderate to heavy rainfall. This was the third highest flood of record on the rivers.
April 1969	Merrimack River Basin	Unknown	A record depth of snow cover in the Merrimack River Basin and elsewhere resulted in excessive snowmelt and runoff when combined with sporadic rainfall.
February 1972	Coastal Area	Unknown	The Coastal Area was declared a National Disaster Area as a result of the devastating effects of a severe coastal storm. Damage was extensive.

New Hampshire's Flood History (Continued)

June 1972	Pemigewasset River	Unknown	Five days of heavy rain caused some of the worst flooding since 1927 along streams in the upper part of the State. Damage was extensive along the Pemigewasset River and smaller streams in northern areas.
June 30, 1973	Ammonoosuc River	25 to > 50	Northwestern White Mountains
April 1976	Connecticut River	Unknown	Rain and snowmelt brought the river to 1972 levels, flooding roads and croplands.
March 14, 1977	South-central and Coastal New Hampshire	25 to 50	Peak of record for Soucook River
February 1978 ("The Blizzard of '78")	Coastal New Hampshire	Unknown	A Nor'easter brought strong winds and precipitation to the entire state. Hardest hit area was the coastline, with wave action and floodwaters destroying homes. Roads all along the coast were breached by waves flooding over to meet the rising tidal waters in the marshes.
July 1986 – August 10, 1986	Statewide	Unknown	Severe summer storms with heavy rains, tornadoes, flash flood and severe winds. FEMA DR-771-NH
March 31 to April 2, 1987	Androscoggin, Saco, Ossipee, Piscataquog, Pemigewasset, Merrimack and Contoocook River	25 to > 50	Caused by snowmelt and intense rain. Precursor to a significant, following event.
April 6-7, 1987	Lamprey River and Beaver Brook	25 to > 50	Large rainfall quantities following the March 31- April 2 storm. FEMA DR-789-NH
August 7-11, 1990	Statewide	Unknown	A series of storm events from August 7-11, 1990 with moderate to heavy rains during this period produced widespread flooding. FEMA DR-876-NH

New Hampshire's Flood History (continued)

August 19, 1991	Statewide	Unknown	Hurricane Bob struck New Hampshire causing extensive damage in Rockingham and Stafford counties, but the effects were felt statewide. FEMA DR-917-NH
October 1995	Northern and Western Regions	Unknown	Counties Declared: Carroll, Cheshire, Coos, Grafton,
			Merrimack and Sullivan. FEMA DR-1077-NH
October – November 1996	Northern and Western Regions	Unknown	Counties Declared: Grafton, Hillsborough, Merrimack, Rockingham, Strafford and Sullivan. FEMA DR-1144-NH
June – July 1998	Central and Southern Regions	Unknown	Series of rainfall events. Counties Declared: Belknap, Grafton, Carroll, Merrimack, Rockingham and Sullivan. (1 fatality) (Several weeks earlier, significant flooding, due to rain and rapid snowpack melting, occurred in Coos county, undeclared in this event. Heavy damage to secondary roads occurred) FEMA DR-1231-NH
September 18 - 19, 1999	Central and Southwest Regions	Unknown	FEMA DR-1305-NH: Heavy rains associated with Tropical Storm/Hurricane Floyd. Counties Declared: Belknap, Cheshire and Grafton.
July 21 – August 18, 2003	Southwestern Region	50 yr	FEMA-1489-DR: Severe storms and flooding occurred in Cheshire and Sullivan counties. Public Assistance provided for repair of disaster damaged facilities.

New Hampshire's Flood History (continued)

October 7 – 15, 2005	Southwestern Region	50 – 100 yr	FEMA-1610-DR: Severe storms and flooding. Counties Declared: Belknap, Cheshire, Hillsborough, Merrimack and Sullivan.
May 12, 2006 ("Mother's Day Flood")	Central and Southern Regions	100 yr – 500 yr	FEMA-1643-DR: Severe storms and flooding. Counties Declared: Belknap, Carroll, Grafton, Hillsborough, Merrimack, Rockingham, and Strafford.
April 15 - 23, 2007	Statewide	100 yr – 500 yr	FEMA-1695-DR: Severe storms and flooding associated with a Nor'easter. Counties Declared: Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack, Rockingham, Strafford, and Sullivan.
July 24, 2008	Central and Southern Regions	50 yr – 100 yr	FEMA-1782-DR: Severe storms, tornado and flooding. Counties Declared: Belknap, Carroll, Merrimack, Rockingham, and Strafford
July 24 August 14, 2008	Central Northern Regions	50 yr – 100 yr	FEMA-1787-DR: Severe storms and flooding. Counties Declared: Belknap, Carroll, Coos and Grafton
September 6 and 7, 2008	Southern New Hampshire	50 yr – 100 yr	FEMA-1799-DR: Severe storms and flooding. County Declared: Hillsborough County
March 14 – 31, 2010	Southeastern Region	50 yr – 100 yr	FEMA-1913-DR: Severe storms and flooding. Counties Declared: Hillsborough and Rockingham County
May 26 – 30, 2011	Northern and Western Region	50 yr	FEMA-4006-DR: Severe storms and flooding. Counties Declared: Coos and Grafton Counties

New Hampshire's Flood History (continued)			
August 26 – September 6, 2011	Central and Northern Regions	100 yr	FEMA-4026-DR: Tropical Storm Irene. Counties Declared: Belknap, Carroll, Coos, Grafton, Merrimack, Strafford, and Sullivan Counties
May 29 –31, 2012	Southwestern Region	100 yr-500 yr	FEMA-4065-DR Severe storms and flooding. County Declared: Cheshire County

Table 2.3

Coastal Flooding

The flooding of low-lying areas on the New Hampshire coast is a natural phenomenon and has occurred for centuries. Coastal flooding in the region primarily occurs due to major rain storms and nor'easters with the added combination of full-moon tides, causing storm surge and wave effects. In some areas, human activities, particularly disruption of natural protective coastal features (e.g. dunes or wetlands) or the lowering of land as a consequence of drainage, may also have aggravated the coastal flooding hazard.

State of NH Coastal Flooding	
Events* Coastal NH Only Rockingham and Strafford Counties	
Probability	2
Severity	2
Overall Risk	4



WMUR U Local Photo

There is currently an adaptation plan in process and will be reviewed for the next update. A previous study by John Cannon from NOAA identified 96 major coastal inundation/storm surge events between 1914 and 2007, and 37 events between 1980 and 2007 (<http://www.erh.noaa.gov/ssd/erps/ta/ta2007-03.pdf>). This study shows several facts about the way storm surges occur on our coast:

- 1) 83% of storms happen in the colder months of October through March.
- 2) Tidal flooding, although relatively infrequent, tends to cluster with two or more events in a single year.
- 3) While most flooding occurs with high tides (above 12 ft.) many happen at lower tides due to wind, wave and tidal water “piling”.
- 4) Storm surge can be very difficult to predict due to the complexities of the shape of our coast and variability in meteorological data.



Fosters Daily Democrat-Hampton Beach tides higher than normal due to an unusual astronomical event

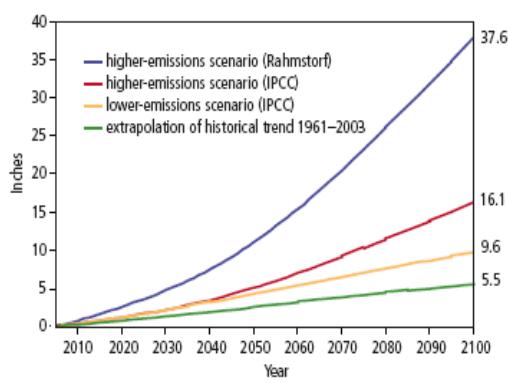
SLOSH modeling by NOAA predicts that a direct “hit” by a category 3 hurricane would result in a 14 ft. storm surge across coastal New Hampshire. While such a storm surge would have dramatic impacts on roads and homes near the shoreline, the effects of such a storm to the States to our south would be much greater.

The potential impact of predicted, human-caused climate change might also aggravate existing coastal flooding hazard in the future, particularly through an acceleration in the rate of rise of mean sea level and possible changes in the nature, frequency and magnitude of coastal storms.

Sea level has been rising at an average rate of 2 – 2.7 mm per year for the last millennium, which equates to about 8-10 inches per century. The following graph below shows sea level rates over the past 14,000 years (Source: Larry Ward, UNH).

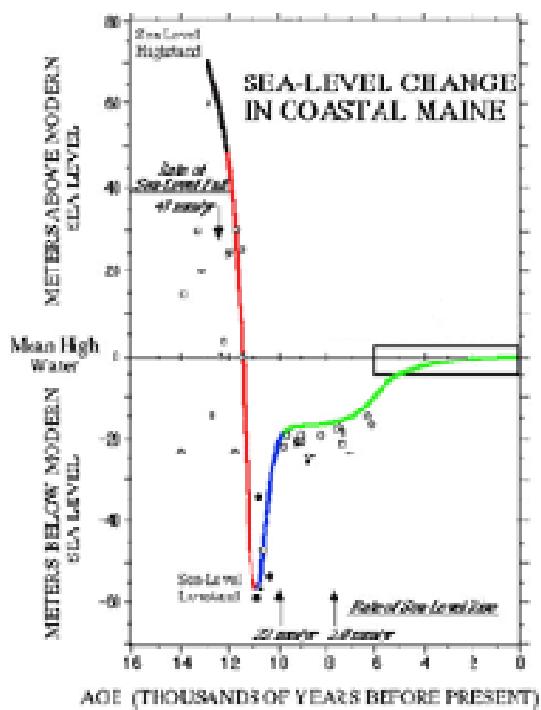
The graph illustrates that the last several thousand years have been a period of relatively slow sea level rise.

Between the years of 1921-1999, sea level (as measured in Boston) has been rising at 2.65mm per year http://www.northeastclimateimpacts.org/pdf/miti/kirshen_et_al.pdf. The United Nations Intergovernmental Panel on Climate Change (IPCC) projects that global sea levels will rise between 7 and 14 inches under the lower-emissions scenario and between 10 and 23 inches under the higher emissions scenario.



This graph depicts the average or mid-range of a number of different sea-level rise (SLR) simulations: a continuation of recent observed SLR rates (green line); the mid-range of the most recent IPCC projections under the lower-emissions scenario (yellow line); the mid-range of the recent IPCC projections under the higher-emissions scenario (red line); and the midrange of a more recent set of projections under the higher-emissions scenario (blue line).

Source: Frumhoff, P.C., J.J. McCarthy, J.M. Melillo, S.C. Moser, and D.J. Wuebbles. 2007. *Confronting Climate Change in the U.S. Northeast: Science, Impacts, and Solutions. Synthesis report of the Northeast Climate Impacts Assessment (NECIA)*. Cambridge, MA: Union of Concerned Scientists (UCS).



Based on research by Ward and Adams and Kirchen, et al., the result of this magnitude of sea level rise is the return recurrence interval of today's 100-year storm surge and will drop between 2 and 15 years. This means that, on-average, a large flooding storm will happen every few years to a decade. It should be noted that the Blizzard of 1978 storm is considered to be a 10-20 year storm surge.

History of the State of NH notable coastal storms		
Date	Location	Impact
December 1959	Portsmouth	A Nor'easter brought tides exceeding maximum tidal flood levels in Portsmouth. Damage was heaviest along the coast
February 1972	NH Coast	The Coastal Area was declared a National Disaster Area as a result of the devastating effects of a severe coastal storm. Damage was extensive along the coast.
February 1978	Statewide	"The Blizzard of '78" A Nor'easter brought strong winds and precipitation to the entire State. The Hardest hit area was the coastline, with wave action and floodwaters destroying homes. Roads all along the coast were breached by waves flooding over to meet the rising tidal waters in the marshes.
October 1991	NH Coast	"The Perfect Storm" – Tidal surge of approximately 3.5 feet
October 1996	NH Coast	The coastal areas were declared "disaster areas" after receiving 14 inches of rain. High tides coincided with a 500-year precipitation event to cause significant damage.
May 2006	Rye	A Nor'easter created flooding through the State. The Town of Rye was especially hard hit by coastal flooding.
April 2007	NH Coast	A major Nor'easter fueled waves that reached over 30' off the shore. The storm surge associated with this event was several feet above the astronomical high tide. The beaches, especially North Beach, suffered the worst erosion in decades.
February & March 2010	NH Coast	The seacoast area received three, 50-year precipitation events in a 35-day period. Numerous roads were flooded and culverts were blown-out. Disaster declarations were made for two of the storms.



Hampton Beach, February Windstorm DR-1892

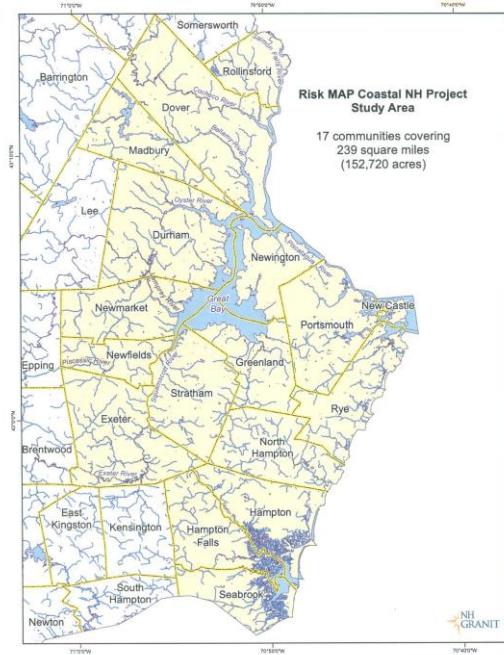
Coastal Floodplain Mapping

In September 2011, the NH Piscataqua/Salmon Falls Basin Coastal Project was kicked off for community officials and interested parties at a meeting at the University of New Hampshire. The Coastal Project is being conducted by the University of New Hampshire, in partnership with the NH Office of Energy and Planning (OEP), the U.S. Geological Survey New Hampshire/Vermont Water Resources Center, and AECOM.

A primary goal of the effort is to produce new FEMA Digital Flood Insurance Rate Maps (DFIRM) for 17 coastal communities located in Rockingham and Strafford counties (as shown in the map below).

The project will involve conducting engineering studies along the 18 miles of New Hampshire coastline and along 16 stream miles. There will also be 136 stream miles of Zone A (those areas without base flood elevations) restudied, which will be based on generalized modeling. In 2011, 2-meter topographic data collected through Light Detection and Ranging (LiDAR), was collected to more accurately delineate the floodplain areas. The remainder of the study area's floodplains will be re-delineated based on the better topographic data.

The project's anticipated timeframe includes



the release of the preliminary maps and studies in 2013, community coordination meetings in 2013, and the release of the final maps and studies in 2014.

An open house for this project was held on August 1, 2013 at UNH to view the Project's Work Maps. Each community has been offered an opportunity to speak to project staff members, ask questions, and provide feedback. Currently a public meeting is being planned.

New Hampshire OEP will also be reviewing community's floodplain ordinances in the Fall of 2013 to ensure compliance as part of the mapping update process.

The project is part of FEMA's Risk Mapping, Assessment, and Planning (Risk MAP) initiative that involves more than just updating the floodplain maps. The vision for Risk MAP is to deliver quality data that increases public awareness and leads to action that reduces risk to life and property.

On July 6, 2012, Congress passed the Bigger-Waters Flood Insurance Reform Act of 2012 (BW-12). This is designed to make the National Flood Insurance Program (NFIP) more sustainable and financially sound. This act also renewed the NFIP for five more years. This will mitigate the negative effects felt by policy holders over the past few years when congress had several extensions and lapses. This Act will eliminate most of the low/non-risk policies which are found to no longer be sustainable. BW-12 will now have flood rates for most structures that are in a Special Flood Hazard Area (SFHA) reflect the structures true flood risk. Grandfathered rates will be phased out and move to a full-risk rate. (Source: NH OEP Flood Lines Newsletter)

Summary

Coastal flooding is a combination of riverine flooding from precipitation and from storm surge. As such, it is extremely difficult to predict the occurrence of coastal flooding. Much more work is needed to develop better prediction tools for coastal flooding and to better characterize coastal flow patterns.

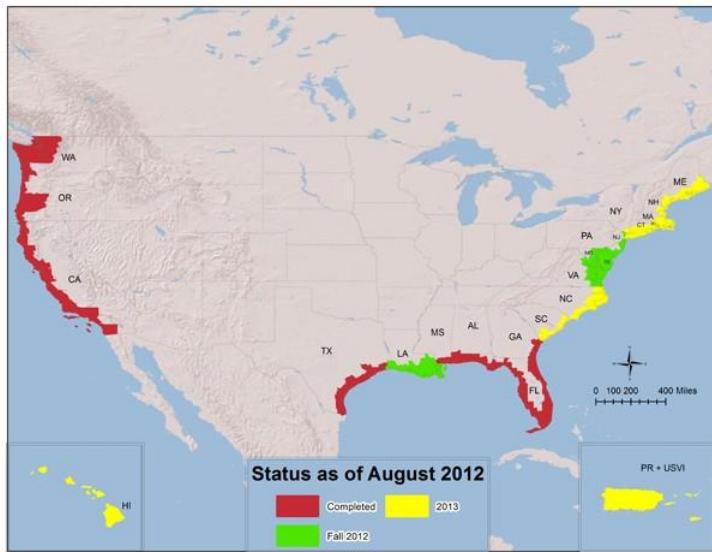
In 2011, LiDAR data was collected for 49 communities along the Southeastern portion of the state including the coastal communities in an effort to better map and characterize coastal and river flooding risk. The 2-meter LiDAR data will be used as part of coastal mapping project. The goal of the coastal mapping project is produce new floodplain maps and products that will increase public awareness and reduce risk of life and property in the State's 17 coastal communities.

It is important to note that the complex combination of riverine flooding and ocean storm surge is further complicated by development patterns on the land. The loss of natural flood attenuation systems like floodplains, dune, marshes and eelgrass beds exacerbate the effects of coastal flooding. In addition, increased development and its accompanying impervious surfaces tend to increase storm water flow and worsen the effects of precipitation events.

Finally, the impacts of climate change are magnified at the coast. Clearly, sea level rise is a concern, as are changing storm patterns. In addition, climate change may increase vulnerability to invasive flora and fauna; and it is not clear that some of our natural

protections, like salt marshes, will be able to keep up with sea level rise. The National Oceanic and Atmospheric Administration (NOAA) are currently working on a Sea Level Rise and Coastal Flooding Impacts viewer. This tool will help visualize the potential impacts from sea level rise. This Sea Level Rise Viewer brings this capability to coastal communities. A slider bar will be used to show how various levels of sea level rise will impact coastal communities. New England is

slated to be completed in 2013, according to the NOAA website, <http://www.csc.noaa.gov/digitalcoast/tools/slrvieviewer>. The 2016 update of this plan will provide more information about this tool and New England.



State of NH Drought

Drought

The State Hazard Mitigation Planning Committee's primary contact at the Department of Environmental Services (DES) reviewed the previous information from the 2010 plan. A drought is a natural hazard that evolves over months or even years and can last as long as several years to as short as a few months. Fortunately droughts are rare in New Hampshire. The severity of the drought is gauged by the degree of moisture deficiency, its duration and the size of the area affected. The effect of droughts, or decreased precipitation, is indicated through measurements of soil moisture, groundwater levels, lake levels, stream flow and increased fire danger. Not all of these indicators will be minimal during a particular drought. For example, frequent minor rainstorms can replenish the soil moisture without raising ground water levels or increasing stream flow for a sustained period of time.

Low stream flow correlates with low ground water level because it is ground water that discharges to streams and rivers that maintain stream flow during extended dry periods. Low stream flow and low ground water levels commonly cause diminished water supply.

New Hampshire breaks the State into five Drought Management Areas: one in the north; one across the central region; and three along the southern portion of the State (see Figure 1). Federal agencies have coordinated to develop the National Drought Monitor which classifies the duration and severity of the drought using precipitation, stream flow, and soil moisture data coupled with information provided on a weekly basis from local officials. The New Hampshire Drought Management Team, whose efforts are coordinated by the NH DES, utilizes these maps to help determine which areas are the hardest hit. NH DES also maintains a "Situation Summary" where precipitation, stream flow, groundwater level, lake level and fire danger data from all over the state can be accessed to assess if areas in New Hampshire are being impacted by drought.

There are five magnitudes of drought outlined in the New Hampshire State Drought Management Plan. The highest magnitude is Exceptional, followed by Extreme, Severe, Moderate and Abnormally Dry. Each level has varying responses. The statistical recurrence interval of each magnitude is summarized in Table 1. Table 2 lists the years in which the magnitude of drought in New Hampshire was at least "Extreme" for some period of time.

Probability	1
Severity	1
Overall Risk	1

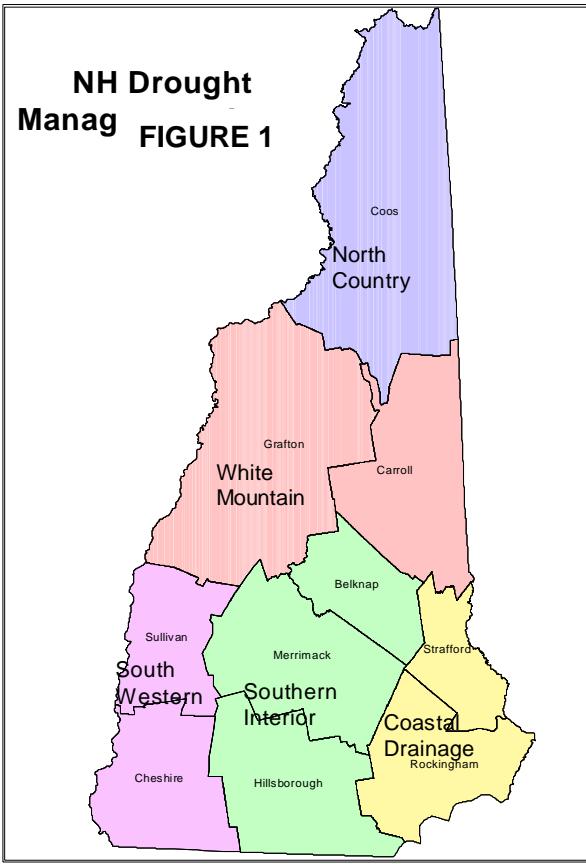


TABLE 1: RECURRENCE INTERVALS (YEARS)

	North Country (Diamond)	White Mtns (Pemi)	Sout Western (Ashuelot)	Southern Interior (Souhegan)	Seacoast (Lamprey)
Moderate	1	1	1	1	1
Severe	2	2	2	2	2
Extreme	9	10	7	9	5
Exceptional	N/A	N/A	>25	>25	>25

TABLE 2: YEARS IN WHICH AT LEAST ONE MONTH WAS EXTREME
Climate Period 1950-2010

North Country (Diamond)	White Mtns (Pemi)	South Western (Ashuelot)	Southern Interior (Souhegan)	Seacoast (Lamprey)
1953	1953			
	1957	1957	1957	1957
1961		1963	1963	
	1964			1964
		1965	1965	1965
			1966	
1968		1970	1970	
				1971
1978	1978	1978		1974
		1980		1978
1984	1984			
		1993		1993
				1995
				1997
				1999
2001		2001	2001	
	2002			2002
			2010	2010

Dam Failure



State of NH Dam Failure Events	
Probability	1
Severity	2
Overall Risk	2

The State Hazard Mitigation Planning Committee's (SHMPC) primary contacts at the Department of Environmental Services (DES) and Office of Energy and Planning (OEP) reviewed the previous information from the 2010 plan.

Spaulding Dam DR-1643 NH HSEM Photo

The Department of Environmental Services (DES), through its Dam Bureau, is responsible for the regulation of the State's dams to ensure that they are constructed, maintained and operated in a manner to promote public safety. This is accomplished through the review, approval and permitting of plans and specifications for the construction and reconstruction of dams, as well as the regular inspection of all dams that pose a hazard to downstream lives or property.

There are a total of 2,623 dams in the State of New Hampshire that are subject to NH's Dam Safety Rules, and an additional 24 dams that are not subject to NH's Dam Safety Rules. To be subject to the rules they must be over 6' in height. Out of the 2,623 dams New Hampshire owns 278. To view the current administrative rules for the NH Dams follow this link <http://des.nh.gov/organization/commissioner/legal/rules/documents/env-wr100-700.pdf> or contact James Gallagher Chief Engineer at NH Department of Environmental Services, james.gallagher@des.nh.gov. Currently the NH Dam Safety rules are in process of minor revisions with an anticipated re-adoption date of August 2013. The 2016 update of the State Multi-Hazard Mitigation Plan will contain the updated revised rules.

Dam failures resulting in notable downstream damages are not common in New Hampshire, although they have occurred. Damages to dams themselves are more frequent. Dams can sustain damage during an unusually heavy rain event or a rain event that occurs in conjunction with runoff produced during the spring thaw, which can stress a dam beyond its design capabilities. An example would be if a storm event produced more runoff than a dam's outlet works (spillways and gates, etc.) could pass. In such cases, the dam will likely be overtopped, that is, have water flow over or through areas that are not designed to pass water.



Spaulding Dam, Throop Station Dam DR-4026

This condition generally leads to erosion damage to earthen sections and difficulty to owners and respondents in getting access for operation, and can cause complete failure of the dam.

Dams can also fail due to poor design and/or construction, as well as due to poor or inadequate maintenance. These types of failures are less common, which may be the result of the generally high degree of dam owner stewardship and the State's permitting regulations and periodic inspection program. Some notable failures have occurred, however, and information related to them is provided below.

Another flooding potential relating to dams has to do with improper operations of the dams' discharge or outlet works. This can occur both during dry (normal) conditions as well as during flood events. It is extremely important for dam owners to understand the impacts related to both routine and emergency operations. DES works with both owners and local response officials to insure that information and data are available and properly communicated so that all parties are making informed decisions based on potential impacts.

New Hampshire Significant Dam Failure Events			
Name	Year	Hazard Classification	Cause of Failure
Abenaki Lake Dam Dixville NH	1960	Significant	Non-overtopping embankment. Slough/slide failure
Nash Bog Pond, Odell NH	May 20, 1969	Significant	Non-overtopping failure of the rock-filled timber crib spillway
Cold Brook Pond Dam, Lempster NH	October 21, 1996	Significant	Progressive, and complete erosion of the vegetated emergency spillway
Meadow Pond Dam Alton, NH	March 12, 1996	Significant	Non-overtopping embankment piping (internal erosion) failure
Ox Bow Campground Dam Hillsborough, NH	April 6, 2004	Non-Hazardous	Overtopping embankment failure
Campton Dam, Campton NH	August 28, 2011	Non-Hazardous	Overtopping embankment failure

Table 2.4

Earthquake

The State Hazard Mitigation Planning Committee (SHMPC) Natural Hazards specialist reviewed the previous information from the 2010 plan. An earthquake is defined as 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. New Hampshire is considered to lie in an area of moderate seismic hazard with respect to other areas within the United States. New Hampshire has had and will continue to experience large damaging earthquakes; however, the intervals between such events are greater in New Hampshire than in high hazard areas.

State of NH Earthquake Events	
Probability	1
Severity	3
Overall Risk	3

Earthquakes in the New Hampshire cannot be associated with specific, known faults. Though there are no identified active faults in New Hampshire, no doubt that there are active faults located beneath the surface. With that said, there is a "zone" that extends from north of the Lakes Region south along the Merrimack River into Massachusetts where most New Hampshire earthquakes have occurred. New Hampshire is in the low attenuation of seismic waves in the eastern United States. Attenuation is a term in physics that means the slow loss of intensity of flow through any kind of medium. Seismic waves can cover an area 4 to 40 times greater in the east than they do in the west because of the cold hard rock geology of New Hampshire. The importance of this to emergency planning and response is that damages can be expected to be spread over a much greater area, and an earthquake's location does not have to be close to a particular point to cause damage.

Potential Future Hazards

During a damaging earthquake (Magnitude 5 or greater), it can be expected that there is wide spread damage due to the historically built environment. There are a large number of un-reinforced masonry structures still in use and much of our infrastructure, including bridges and many of our gas and waterlines, are very vulnerable to seismic forces, not only the older and historic structures should be a concern, many of our newer structures are not built to any seismic building codes and therefore are vulnerable. Damages from an earthquake generally fall into two categories: Structural and Nonstructural.

- **Structural Damage** is any damage to the load-bearing components of a building or other structure.
- **Nonstructural Damage** is any portion not connected to the superstructure. This includes anything added after the frame is complete; such as lighting fixtures, bookcases, utilities, etc

Impact

Magnitude and location from a damaging earthquake are the key factors for the possible impact as well as a cascade of disasters that may occur:

- 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 Casualties
- 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
- Hazardous Material incidences
- Loss of critical capabilities from structural and nonstructural damages
- Lack of mutual aid support
- Damage to gas lines and chimneys result in fires that are difficult to extinguish due to damage to the roads and bridges, 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

Historical Earthquake Events

One of the earliest written accounts of earthquake activity in North American (from 1638), describes an event which most probably had its epicenter in, or near the Ossipee Range of Central New Hampshire. Table demonstrates the historical earthquakes that have directly been tied to New Hampshire, or were felt in New Hampshire.

<i>Epicenter Location</i>	<i>Date</i>	<i>Magnitude</i>
Ossipee, NH	December 20, 1940	5.5
Ossipee, NH	December 24, 1940	5.5
Dover, NH-Foxcroft, ME	December 28, 1947	4.5
Kingston, RI	June 10, 1951	4.6
Portland, ME	April 26, 1957	4.7
Middlebury, VT	April 10, 1962	4.2
Quebec Border, NH	June 15, 1973	4.8
West of Laconia, NH	January 19, 1982	4.5
Ontario-Quebec Border	June 23, 2010	5.0
Boscawen, NH	September 26, 2010	3.1
Virginia	August 23, 2011	5.8
Concord, NH	September 18, 2012	1.2
Southern Maine	October 16, 2012	4.0

Wildfire

The State Hazard Mitigation Planning Committee's (SHMPC) primary contact at the Department of Resource and Economic Development (DRED) reviewed the previous information from the 2010 plan. New Hampshire is a heavily forested state and is therefore vulnerable to this hazard, particularly during periods of drought and/or large-scale natural disturbances causing unusual fuel buildup. The proximity of many populated areas to the State's forested lands exposes these areas and their populations to the potential impact of wildfire. The Granite State is the second most forested state in the United States (trailing Maine). Forests occupy 84 percent, or 4.8 million acres. The southern portion of the State has seen rapid commercial and residential development which has extended into previously forested areas. Although this development has slowed, this sprawl has created its own concerns regarding the increased risk of damage in the wildland-urban interface. In a study conducted by the United States Forest Service in 2006, New Hampshire was ranked as having the highest percentage of homes in the wildland-urban interface of any state in the nation.

New Hampshire experiences in the range of 350-400 wildfires during an average year. Approximately 95% of these fires are caused by humans, whereas the remaining 5% are caused by lightning. Due to this fact, the vast number of fires occurs in the State's most populated areas, such as the Hillsborough and Rockingham County areas, as well as into the Capital Region of Merrimack County. However, these fires typically are suppressed quickly, resulting in an average fire size of less than one acre. The primary cause of wildfires in the Granite State continues to be escaped debris burns, with miscellaneous causes (power lines, fireworks, etc.) and campfires rounding out the top three.

Average acres burned per year in New Hampshire are between 200-250 acres. However, this number can vary widely depending on the weather conditions. Typically, the months of April and May experience the highest number of fire starts, with another typically shorter spike of fires in October and November. The reason the majority of fires occur in spring and fall are due to the fact that the predominant forest type is hardwood trees.



Note the proximity of growth of the phragmites with respect to the structures

Therefore, fires typically burn in hardwoods in early spring before green-up, and again in late fall after leaf-drop. New Hampshire can experience an active summer fire season,

but normally this occurs only with an extended period of hot, dry weather resulting in drought-like conditions. While most of the State is covered in northern hardwood forests containing maple, birch and beech, there are numerous smaller “pockets” of high-hazard fuel types scattered throughout the State. These hazardous fuel types include the pitch-pine/scrub oak, spruce-fir, phragmites (see photo on previous page), and oak-pine forests.

Historical Events

The increased incidence of large wildland fire activity in the late 1940s and early 1950s is thought to be associated, in part, with debris from the Hurricane of 1938. Significant woody “fuel” was deposited in the forests during that event. Large fires burned in rural, suburban, and urban areas, including one fire of over 1,500 acres in Salem and Atkinson, and numerous large fires in Farmington and Rochester which spread in to southern Maine. Large fire activity continued through the early 1950’s, again in the mid-1960’s – including a crown fire that spread from Brentwood through Exeter and in to Kensington. Fire activity in the 1970’s and ‘80’s when many towns created permanently staffed fire departments to replace volunteers showed a general decrease in total acreage burned; however, the total number of fire starts actually increased

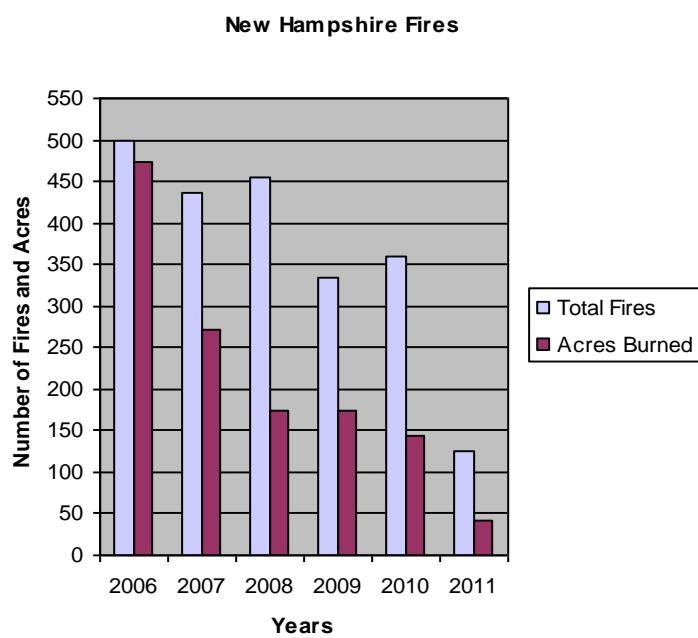


Table 2.6

New Hampshire Wildfire Historical Events		
Year	Location	Acres/Area
1885	Wild River Area East	3,000 acres
1888	Zealand Valley	12,000 acres
1903	Northern NH	84,255 acres
1907	Lincoln	5,000 acres
1908	Shelburne	5,060 acres
1912	Swift River (Conway)	1,000 acres
1914	Rock Branch (Conway)	10,052 acres
1915	Most of NH	29,480 acres
1923	Waterville Valley	3,500 acres
New Hampshire Wildfire Historical Events Cont.		
Year	Location	Acres/Area
1941	Marlow, NH	25,000 Acres
1940's (Exact year unknown)	Ossipee Plains	Several thousand Acres
1947	Marlow/Stoddard	27,000 acres
1952	Grantham Fire	1,500 acres
1952	Shaw Mountain	1,500 acres
1962	Concord Plains	900 acres
1963	Kensington-Exeter	760 acres
1984	Table Mountain (Bartlett)	100 acres
1987	Concord Heights	>100 acres
1988	Red Hill	262 acres
2004	White Mtn National Forest	100 + Acres

Summary

Concerns of NHDRED Division of Forest and Lands include future natural disturbances that may create a significant amount of woody debris in the forests, such as hurricanes, wind events, ice storms, and insect or disease outbreaks. A second, weather-related concern is any period of prolonged drought, which makes fire starts more likely and makes suppressing fires much more difficult. A third concern is the continual sprawl of development into historically rural, forested areas. Although this development has slowed in recent years, these homes and other valuable resources that are scattered throughout the forest often have limited access and may be some distance from the closest fire department, thereby increasing the danger of damage or destruction from a wildland fire.

Local fire departments find an increased need for State personnel, equipment and technical support from the Division of Forests and Lands as fire numbers and incident complexity increase. For example, even though the southern tier of the State experiences the highest number of fires, fires in the northern regions where the population is minimal

are complicated by poor access and rugged terrain, which greatly hinders efficient and safe response by firefighters. While there are over 8,000 firefighters in New Hampshire, they belong to predominantly volunteer organizations with roughly 1,000 firefighters belonging to permanent departments in larger towns or cities. These volunteer or permanent fire departments generally specialize in structural fire response and emergency medical services. Though early detection of fires has helped to decrease the total acreage burned, it is common for towns to rely on state support for any incident that involves more than just a few acres in size.

Landslide

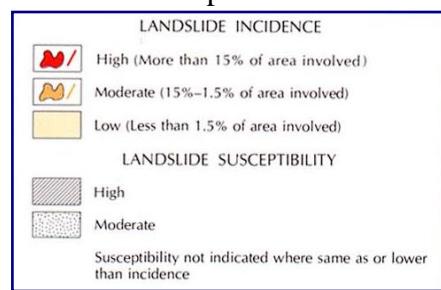
The State Hazard Mitigation Planning Committee (SHMPC) Natural Hazards Specialist reviewed the previous information from the 2010 plan. A Landslide is the downward or outward movement of slope forming materials reacting under the force of gravity. These include mudflows, mudslides, debris flows, rockslides, 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. Seismicity may play a role in the mass movement of landforms, such as was reported in Newcastle, NH and Berlin, MA during the Cape Ann event of 1755.

State of NH Landslide Events	
Probability	1
Severity	1
Overall Risk	1

New Hampshire, although mountainous, largely consists of relatively “old” geologic formations that have been worn by the forces of nature for eons prior to the arrival of the Europeans. Consequently, much of the landscape is relatively stable and the exposure to this hazard type is generally limited to recreational and sparsely populated 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. (*See map to the right*).

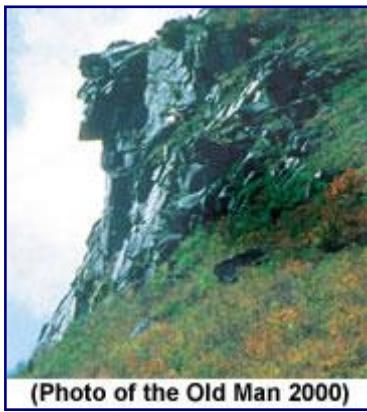
Historical Events

Although the vulnerability to landslide activity is generally modest statewide, the reader should be aware that the State has considerable terrain that is susceptible to landslide action. Along the roadside in the area known as Crawford Notch in the White Mountain National Forest, there is a historical marker documenting a farm family who perished in a landslide event. In most recent events, the historic “Old Man of the Mountain” fell prey to a natural landslide event. There have not been other significant landslides that have greatly impacted the State of New Hampshire since the 2010 update of this plan.



The Old Man of the Mountain, the enduring symbol of the State of New Hampshire, is no more. Some time between the evening of Friday, May 2, 2003 and the morning of Saturday, May 3, 2003, the stone profile that drew hundreds of thousands of visitors to Franconia Notch State Park each year collapsed. On Saturday, May 3 at approximately 7:30 a.m., two Franconia Notch State Park employees noticed that the Old Man of the Mountain had collapsed. The continuous action upon the seemingly solid rock of the freezing and thawing of the moisture which invades the rock's fissures causes the rock to split and separate as the formed ice expands. As this action occurs repetitively on the steeply sloped areas of the State, eventually the land will succumb to the force of gravity.

An accumulation of this relatively loose debris may eventually become unstable in mass and form a landslide.



(Photo of the Old Man 2000)



(View After the Rock Slide
May 3, 2003)

Consideration must be given to the vulnerability of structures in these areas to seismicity and/or soils saturation induced landslide activity. This is especially the case, given the proximity of these landslide vulnerable areas to the areas of relatively high seismicity originating from north in the St. Lawrence River Basin, as well as those events originating in the Ossipee Mountain Range, coupled with the relatively high incidence of flooding in these areas, with associated saturated soil conditions.

Losses related to this hazard type are often attributed to other related events. During a flood event (FEMA DR-1231-NH), a death occurred when a mass of saturated soil collapsed taking a man's life. The death was attributed to the declared flood event. Upon review of this hazard there have been no new incidences of a landslide occurring within the State of New Hampshire over the past three years to report.

Radon

The State Hazard Mitigation Planning Committee (SHMPC) reviewed the previous information from the 2010 Plan. In 2011, NH State Legislature cut the NH Radon Program; this is the last updated information available. Radon is a radioactive gas which is naturally occurring as a result of the typical decay of uranium commonly found in soil and rock (especially granite). Radon has carcinogenic properties and is a common problem in many states; New Hampshire has some isolated areas that are among the highest levels of radon in the United States according to the US Environmental Protection Agency (EPA).

State of NH Radon Events	
Probability	2
Severity	1
Overall Risk	2

Whether or not a particular type of granite emanates radon is dependent on the geochemistry of that particular granite, some types are a problem and some are not. In other parts of the country, radon is associated with certain black shales, sandstones, and even limestones. The EPA has estimated that radon in indoor air is responsible for about 13,600 lung cancer deaths in this country each year (EPA document, EPA 811-R-94-001, 1994). Data is very limited for radon. For the 2016 update of this plan there will be a discussion of whether radon should stay within the plan.

Historical Events

Radon is not a singular event; rather it is a natural hazard that the effects of which can take years and decades to see the effects. Most data collected by the NH Office of Community and Public Health's Bureau of Radiological Health in 2003 indicates that one-third of the houses in New Hampshire have indoor radon levels that exceed the US Environmental Protection Agency's "action level" of four picocuries per liter for at least some portion of the year. Measured values exceeding 100 pCi/l have been recorded in at least eight of New Hampshire's ten counties. The highest indoor radon reading in New Hampshire of which Bureau staff is aware is greater than 900 pCi/l, although higher values probably exist. The table below reflects only data collected as part of state-run surveys and in no way should be considered to represent the full range of values found in the respective counties. The table below reflects the most updated radon levels per county.

State of New Hampshire 2011** Average Radon Levels (per county)			
County	County Average	National Average	Difference
Belknap	2.6 pCi/L	1.3 pCi/L	1.3 pCi/L
Carroll	8.8 pCi/L	1.3 pCi/L	7.2 pCi/L
Cheshire	3.3 pCi/L	1.3 pCi/L	2.0 pCi/L
Coös	8.8 pCi/L	1.3 pCi/L	7.2 pCi/L
Grafton	4.5 pCi/L	1.3 pCi/L	3.2 pCi/L
Hillsborough	5.3 pCi/L	1.3 pCi/L	4.0 pCi/L
Merrimack	5.1 pCi/L	1.3 pCi/L	3.8 pCi/L
Rockingham	5.6 pCi/L	1.3 pCi/L	4.3 pCi/L
Strafford	6.2 pCi/L	1.3 pCi/L	4.9 pCi/L
Sullivan	2.2 pCi/L	1.3 pCi/L	.9 pCi/L

Table 2.8 **Picocuries Per Liter pCi/L**): A unit of measure for levels of radon gas; becquerels per cubic meter is the metric equivalent-

**In 2011 NH State Legislature cut the NH Radon Program; this is the last updated information available.

Tornado/Downburst

The State Hazard Mitigation Planning Committee (SHMPC) Natural Hazards Specialist reviewed the previous information from the 2010 plan. A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud. These events are spawned by thunderstorms and occasionally by hurricanes. They may also occur singularly or in multiples. Tornados develop when cool air overrides a layer of warm air, causing the warm air to rise rapidly. Most vortices remain suspended in the atmosphere. Should they touch down, they become a force of destruction.



Tilton NH, 07/04/2012 Microburst WMUR U Local Photo

State of NH Tornado/Downburst Events	
Probability	1
Severity	2
Overall Risk	2

A downburst is a severe, localized wind blasting down from a thunderstorm. These “straight line” winds are distinguishable from tornadic activity by the pattern of destruction and debris. Depending on the size and location of these events, the destruction to property can be devastating. Downbursts fall into two categories: ***Microburst*** which covers an area less than 2.5 miles in diameter; and ***Macroburst*** which covers an area at least 2.5 miles in diameter

Historical Events

Though the frequency of tornado events in New Hampshire is not as great as those states located in ‘Tornado Alley’ the State has experienced large tornados throughout its history. An early example is the tornado that stuck the State in September 1821. This tornado was reported to have tracked from the Connecticut River, near Cornish, and terminated near Boscawen. When the skies cleared, 6 people were dead, hundreds injured and thousands homeless.



In 1998, an F2 tornado in Antrim, blew down a 45-foot by 12-foot section of the Great Brook Middle School. Witnesses reported seeing a funnel cloud, and the weather service, after an inspection, confirmed that it was a tornado. According to the June 2, 1998 edition of the Eagle Tribune, John Jensenius from the National Weather Service in Gray, Maine estimated that the twister cut a path half a mile long, up to 100 yards wide, and was on the ground for several minutes.

1998 Antrim Tornado-Great Brook Middle School Classroom-NH HSEM photo

In July 2008, an F2 tornado and high winds created a path of destruction through five New Hampshire counties that destroyed homes, displaced families, downed trees and forest lands and closed major state roadways. The impact to residents was extensive, with over 100 homes rendered uninhabitable. Phone and electric service was cut off to over 12,500 customers. One fatality is attributed to a building collapse, and local hospitals reported numerous physical injuries associated with this severe storm.

*Photo: Northwood,
2008 Tornado
NH HSEM Photo*



Alexander Cohn Concord Monitor photo-09/06/2012 Bow Microburst

State of New Hampshire Micro/Microburst Historic Events			
Location(Town or Counties)	Date	Type	Damages
Town of Stratham	08/18/1991	Microburst	11 Injured, 5 fatalities and \$2,498,974 in damages
Town of Moultonborough	07/26/1994	Microburst	Downed trees, utility poles and wires, 1800 homes without power, and 50 – 60 houses damaged
Merrimack, Grafton, Hillsborough	07/06/1999	Macroburst	2 fatalities, 2 roofs blown off structures, downed trees, widespread power outages, and damaged utility poles and wires
Town of Bow	09/06/2011	Microburst	City Auto in Bow had 15 campers damaged and estimated \$200,000 in damage
Lake Winnisquam, Tilton	07/04/2012	Microburst	Several large trees came down, many landing on homes or parked vehicles. No one was hurt, but there was a lot of damage. Thirty homes were damaged and 12 people spent the night sheltered at a local hotel.
City of Franklin, Webster Lake	10/30/2012	Microburst	Several large trees came down, landing on two summer homes, completely demolishing one. No injuries were reported.

Table 2.9



July 24, 2008 Northfield NH HSEM Staff photo

State of New Hampshire Tornado History 1951-2013

Date	Fujita	Fatalities	Injuries	Affected Counties
8/21/1951	2	0	0	Rockingham
6/9/1953	3	0	5	Rockingham
6/9/1953	1	0	0	Strafford
7/31/1954	1	0	0	Rockingham
10/24/1955	0	0	0	Sullivan
6/27/1956	?	0	0	Hillsborough
7/9/1956	?	0	0	Coos
6/19/1957	2	0	1	Rockingham
8/27/1959	?	0	0	Cheshire
6/24/1960	1	0	0	Belknap
7/2/1961	2	0	0	Hillsborough
7/2/1961	2	0	1	Rockingham
7/21/1961	1	0	0	Hillsborough
8/26/1961	1	0	0	Cheshire

State of New Hampshire Tornado History 1951-2013 Cont

Date	Fujita	Fatalities	Injuries	Affected Counties
7/9/1962	2	0	0	Sullivan
7/9/1962	2	0	0	Sullivan
5/9/1963	1	0	0	Hillsborough
5/14/1963	2	0	0	Strafford
5/20/1963	?	0	0	Cheshire, Hillsborough
5/20/1963	1	0	0	Hillsborough
6/9/1963	2	0	0	Hillsborough, Rockingham
7/14/1963	1	0	0	Grafton
7/18/1963	2	0	0	Carroll
7/18/1963	1	0	0	Sullivan
8/13/1963	2	0	0	Cheshire
6/27/1964	0	0	0	Grafton
6/23/1965	0	0	0	Carroll
7/14/1965	0	0	0	Cheshire
8/28/1965	1	0	0	Hillsborough
7/13/1966	?	0	0	Coos
7/19/1966	1	0	0	Hillsborough
8/11/1966	2	0	0	Grafton
7/12/1967	1	0	5	Merrimack
7/17/1968	2	0	0	Hillsborough
7/19/1968	1	0	0	Cheshire
8/20/1968	1	0	0	Hillsborough
8/20/1968	3	0	1	Hillsborough
6/6/1969	2	0	0	Cheshire
8/25/1969	?	0	0	Grafton
7/16/1970	?	0	0	Hillsborough
7/28/1970	?	0	0	Carroll
8/17/1970	?	0	0	Cheshire
10/3/1970	0	0	0	Rockingham
5/31/1972	1	0	0	Belknap

State of New Hampshire Tornado History 1951-2013 Cont

Date	Fujita	Fatalities	Injuries	Affected Counties
5/31/1972	1	0	0	Merrimack
7/3/1972	2	0	7	Belknap
7/19/1972	1	0	0	Hillsborough
7/21/1972	1	0	0	Grafton
7/21/1972	1	0	0	Grafton
8/9/1972	1	0	0	Carroll
8/25/1972	0	0	0	Carroll
5/11/1973	2	0	0	Grafton
8/27/1974	0	0	0	Coos
5/3/1976	2	0	0	Strafford
8/15/1976	1	0	5	Merrimack
6/9/1978	0	0	0	Rockingham
6/19/1978	0	0	0	Hillsborough
7/23/1978	1	0	0	Belknap
8/8/1980	0	0	0	Coos
6/22/1981	2	0	0	Strafford
7/5/1984	1	0	0	Cheshire
7/5/1984	1	0	0	Hillsborough
6/16/1986	1	0	0	Cheshire, Hillsborough
8/7/1986	1	0	0	Carroll
8/7/1986	1	0	0	Carroll
8/7/1986	1	0	0	Carroll
7/14/1988	1	0	0	Cheshire
5/31/1991	0	0	0	Cheshire
8/2/1993	0	0	0	Strafford
7/2/1994	0	0	0	Coos
7/23/1995	1	0	0	Belknap
7/3/1997	1	0	1	Cheshire
5/31/1998	2	0	0	Hillsborough
7/6/1999	2	0	0	Merrimack, Belknap, Strafford
8/13/1999	1	0	0	Sullivan, Grafton

State of New Hampshire Tornado History 1951-2013 Cont

Date	Fujita	Fatalities	Injuries	Affected Counties
8/13/2004	0	0	0	Belknap
5/21/2006	2	0	2	Rockingham
9/29/2006	0	0	0	Carroll
7/24/2008	2	1	2	Rockingham, Merrimack, Belknap, Strafford, Carroll

Table 2.10

Fujita Scale

(Used to rate the intensity of a tornado by examining the damage caused by the tornado once it has passed)

F-Scale Number	Intensity Phase	Wind Speed	Type of damage
F-0	Gale Tornado	40-72 mph	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages sign boards.
F-1	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.
F-2	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.
F-3	Severe Tornado	158-206 mph	Roof and some walls torn off well constructed houses; trains overturned; most trees in forest uprooted
F-4	Devastating Tornado	207-260 mph	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
F-5	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
F-6	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

Table 2.11. <http://www.tornadoproject.com/fscale/fscale.htm>

Hurricane/Tropical Cyclones

The State Hazard Mitigation Planning Committee (SHMPC) Natural Hazards Specialist reviewed the previous information from the 2010 plan. A tropical cyclone is the generic term for a non-frontal, low-pressure system over tropical or sub-tropical waters with organized convection (i.e. thunderstorm activity), and definite cyclonic surface wind circulation (*Holland 1993*).

State of NH Hurricane/Tropical Cyclones Events	
Probability	1
Severity	2
Overall Risk	2

Depending on their location and strength, tropical cyclones are known by various terms such as: hurricane, typhoon, tropical storm, cyclonic storm and tropical depression. For the purpose of this Plan there will be a focus on tropical depressions, tropical storms and hurricanes.

Structurally, a tropical cyclone is a large, rotating system of clouds, wind and thunderstorms. Its primary energy source is from the release of heat from water vapor condensing at high altitudes the heat being ultimately derived from the Sun. Therefore, a tropical cyclone can be visualized as a giant vertical heat engine, supported by mechanics driven by physical forces such as the rotation and gravity of the Earth.

Tropical cyclones with maximum sustained winds of less than 39 mph (34 kts) are called tropical depressions. Once the tropical cyclone reaches winds of at least 39 mph (34 kts), they are typically called a tropical storm and assigned a name. If winds reach 74 mph (64 kts) or greater, they are called a hurricane



Plymouth, DR-4026 NH HSEM Staff Photo

Some of the impacts likely to be encountered after a damaging hurricane or tropical storm (depending on its magnitude and location) could be:

- Flooding of major rivers and streams
- Coastal erosion
- Flooding of small streams and roadways
- Dam failures
- Road washouts
- Partial or complete collapse of buildings

- Extensive vegetative damage (crops, trees, etc.)
- Roadways impassable for days or weeks
- Loss of utilities for an extensive period of time (electricity could be out for over a month in some areas)
- Loss of life and injuries

The Saffir-Simpson Hurricane Wind Scale is a 1 to 5 rating system based on a hurricane's sustained wind speed. This scale estimates potential property damage. Hurricanes reaching Category 3 and higher are considered major hurricanes because of their potential for significant loss of life and damage. Category 1 and 2 storms are still dangerous, however, and require preventative measures. In the western North Pacific, the term "super typhoon" is used for tropical cyclones with sustained winds exceeding 150 mph. (<http://www.nhc.noaa.gov/aboutsshws.php>)

Category	Sustained Winds	Types of Damage
1	74-95 mph 64-82 kts	Very dangerous winds will produce some damage: Well-constructed frame homes could have damage to roof, shingles, vinyl siding and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days
2	96-110 mph 83-95 kts	Extremely dangerous winds will cause extensive damage: Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.
3	111-129 mph 96-112 kts	Devastating damage will occur: Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.
4	130-156 mph 113-136 kts	Catastrophic damage will occur: Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months.
5	157 mph or higher 137 kts or higher	Catastrophic damage will occur: A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months

Table 2.12 <http://www.nhc.noaa.gov/aboutsshws.php>

HURRICANES AND TROPICAL STORMS FROM 1938 TO 2012				
Name	Date	Category	Area Impacted	NH Damages
THE GREAT NEW ENGLAND HURRICANE	Sep 21, 1938	3	Southern New England	13 Deaths, 1,363 families received assistance, interruption of electric and telephone services for weeks, 2 billion feet of marketable lumber blown down, flooding throughout the State, in some cases equaling and surpassing the Flood of 1936. Total Direct Losses - \$12,337,643 (1938 Dollars) This does not include indirect losses, such as loss of trade and the impact to the timber industry.
HURRICANE CAROL	Aug 31, 1954	3	Southern New England	Extensive amount of trees blown down and property damage, large crop loss, localized flooding.
HURRICANE EDNA	Sep 11, 1954	3	Massachusetts	This Hurricane moved off shore but still cost 21 lives and \$40.5 million in damages throughout New England. Followed so close to Carol it made recovery difficult for some areas. Heavy rain in New Hampshire.
HURRICANE DONNA	Sep 12, 1960	3	Southern and Central New Hampshire	Heavy flooding in Massachusetts and Southern New Hampshire.
TROPICAL STORM DAISY	Oct 7, 1962	N/A	Southern and Central New Hampshire	Heavy swell and flooding coastal New Hampshire.
TROPICAL STORM DORIA	Aug 28, 1971	N/A	Southern and Central New Hampshire	Center passed over New Hampshire resulting in heavy rain and damaging winds.
HURRICANE BELLE	Aug 10, 1976	1	Southern New England	Primarily rain with resulting flooding in New Hampshire.
HURRICANE GLORIA	Sept 27, 1985	2	Southern New England	This hurricane fell apart upon striking Long Island with heavy rains, localized flooding, and minor wind damage in New Hampshire.
HURRICANE BOB	Aug 19, 1991	2	Southern New England	Hurricane Bob struck southern New England then curved off the coast, to the east, causing it to miss New Hampshire. Yet 3 persons were killed and \$2.5 million in damages were suffered along coastal New Hampshire.
TROPICAL STORM FLOYD	Sep 16-18, 1999	N/A	New Hampshire wide	This was originally a Hurricane that heavily impacted North Carolina and dumped heavy rains on New England, resulting in a Presidential Declaration of Disaster in NH; FEMA DR-1305-NH with the counties of Belknap, Grafton and Cheshire designated.
Tropical Storm Irene	August 26, - September 6, 2011	N/A	New England	Storm dumped heavy rains on New England causing significant damage resulting in a Presidential Declaration of Disaster in NH; FEMA DR-4026-NH with the counties of Belknap, Carroll, Coos, Grafton, Merrimack, Strafford, and Sullivan designated.

HURRICANES AND TROPICAL STORMS FROM 1938 TO 2012				
Name	Date	Category	Area Impacted	NH Damages
Hurricane Sandy	October 29, 2012	1	New England, NYC and New Jersey	Strong Storm surge and heavy rains across New England, NYC and New Jersey caused significant damage resulting in an emergency declaration EM-3360 for Direct Federal Assistance and Category B (Emergency Protective Measures).

Table 2.13

Lightning

The State Hazard Mitigation Planning Committee (SHMPC) reviewed the previous information from the 2010 Plan. By definition, all thunderstorms contain lightning.

State of NH Lightning Events	
Probability	1
Severity	1
Overall Risk	1



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 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. After the discharge, the air contracts quickly as it cools back to ambient temperatures. This rapid expansion and contraction of the air causes a shock wave that we hear as thunder, a shock wave that can damage building walls and break glass. In the United States, it is reported that an average of 54 people are killed by lightning annually. According to <http://www.lightningsafety.noaa.gov/> To date, there have

been 27 lightning fatalities in 2012 in 16 states. Florida, sadly, numbers 4 deaths; New Jersey and Texas, 3 Alabama, Louisiana, and Pennsylvania, 2.

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

United States Lightning Fatalities 2012								
No.	Date	Day	ST	City	Age	Sex	Location	Activity
1	3/30	Fri	AL	Greenville	12	M	Under Tree	Playing
2	4/11	Wed	LA	Ponchatoula	54	M	Small metal structure under tree	Had been fishing
3	4/11	Wed	LA	Ponchatoula	33	M	Small metal structure under tree	Had been fishing
4	6/8	Fri	FL	Lake Okeechobee	51	M	Boat in lake	Fishing
5	6/23	Sat	VT	Post Mills	16	M	Farm field	Harvesting
6	6/30	Sat	TX	Houston	33	M	Open area	Utility repair
7	7/3	Tue	OH	Zanesville	60	M	Under tree	Working in Yard
8	7/7	Sat	NJ	Monmouth Beach	48	F	Beach	Family Outing
9	7/7	Sat	KS	Coffey County	68	M	Front Yard	Family gathering
10	7/7	Sat	IL	Nashville	51	M	Outside home	Stepping out door
11	7/13	Fri	GA	Peachtree City	52	M	Under tree by boat ramp	Fishing
12	7/13	Fri	OK	Ada	61	M	Driveway of home	
13	7/15	Sun	TX	Aldine	27	M	Under tree	Soccer
14	7/15	Sun	TX	Aldine	26	M	Under tree	Soccer

United States Lightning Fatalities 2012 Cont.								
No.	Date	Day	ST	City	Age	Sex	Location	Activity
15	7/16	Mon	AL	Huntsville	40	M	Driveway of Home	
16	7/21	Sat	UL	Boulder Mtn	24	M	Under tree	Fishing
17	7/23	Mon	CA	Nevada County	71	M	Near trees	Camping
18	7/24	Tue	PA	Garrett	36	F	Under tree	Picking Berries
19	7/26	Thu	KY	Lexington	67	F	Outside	Installing watering system
20	8/5	Sun	PA	Long Pond	41	M	Parking lot	NASCAR race
21	8/6	Mon	FL	Shell Island	42	M	Beach	Walking to boat
22	8/6	Mon	FL	Shell Island	14	M	Beach	Being carried
23	8/15	Wed	NJ	Long Branch	41	M	Beach	Fishing
24	8/18	Sat	MN	Duluth	9	M	Beach	Sailing
25	8/19	Sun	NC	Wilmington	50	M	Near tree	Fishing
26	9/7	Fri	NJ	Demarest	71	M	Near tree	Watching soccer game
27	9/7	Fri	FL	Lakeland	16	M	Under tree	Moving bike

Table 2.14 <http://www.lightningsafety.noaa.gov/>

Historical Events

We are fortunate in Northern New England to have less lightning than most other areas of the country. On average, much of New Hampshire and Maine have less than 2 cloud-to-ground lightning strikes per square mile per year. Only several states in the Western U.S. have lightning flash density rates as low. In comparison, many states in the Midwest and South have flash density rates of 10 flashes per square mile per year. Parts of Florida experience as many as 30 flashes per square mile per year. Despite the relatively low incidence of lightning in New Hampshire and Maine, these States have relatively high casualty rates (combined injury/death rate) due to lightning.

While there are several factors contributing to the high rate in the Midwest and the south, residents and visitors to Northern New England are likely to be more vulnerable to being struck by lightning because of the activities with which they are involved, particularly on those warm summer days when lightning is most likely to occur. Often, many people are outside enjoying the variety of recreational activities that attract people to Northern New England during the summer when the vulnerability to lightning strike is highest.



Union Leader 08/04/2012 Lightning strike

Such summer attractions include events at the New Hampshire Motor Speedway located in Loudon NH, which has emergency plans in place after a death occurred in Pennsylvania during a NASCAR race. They have plans in place to evacuate the stands, and there will be a new alarm system being placed in the year 2013 to help alert campers.

State of NH Lightning Historical Events			
Community	Location	Date	Impacts
Portsmouth	Sarah Long Bridge	06/25/2012	Lift mode function damaged, gauges knocked out. Bridge was closed for hours while repairs took place.
Laconia	Residence	07/04/2012	3 people injured with non-life threatening injuries when lightning struck the ground nearby
Goffstown	Goffstown Babe Ruth League	08/04/2012	\$ 200,000.00 in damages to include equipment replacement as well as building,

Table 2.15

Severe Winter Weather

The State Hazard Mitigation Planning Committee (SHMPC) reviewed the previous information from the 2010 Plan Severe winter weather in New Hampshire may include heavy snow storms, blizzards, nor'easters and ice storms. Generally speaking, New Hampshire will experience at least one of these hazards during any winter season. A heavy *snowstorm* is generally considered to be one that deposits four or more inches of snow (or 10 cm) in a twelve-hour period. A *blizzard* is a violent snowstorm with winds blowing at a minimum speed of 35 miles (56 kilometers) per hour and visibility of less than one-quarter mile (400 meters) for three hours. A *Nor'easter* is a large weather system traveling from south to north, passing along the coast. As the storm's intensity increases, the resulting counterclockwise winds which impact the coast and inland areas in a Northeasterly direction. Winds from a Nor'easter can meet or exceed hurricane force winds. *Ice Storms* occur when a mass of warm, moist air collides with a mass of cold, arctic air. The less dense warm air will rise and the moisture may precipitate out in the form of rain. When this rain falls through the colder, denser air and comes in contact with cold surfaces, ice will form and may continue to form until the ice is as thick as several inches.

State of NH Severe Winter Weather Events

Probability	3
Severity	1
Overall Risk	3



Historical Events

During the years from 1955 through 1985, a number of winter storms have attained historic stature in the Northeast. The blizzards of February 1958 and January 1966, the

triple snowstorms of the 1960/1961 winter, the great New England Blizzard of February 1978, and the "Presidents' Day Storm" of February 1979 are the most notable events of this period. See Appendix C for a complete history of snowfall events.



State of NH Severe Winter Storm Events			
Date	Location	Event	Impacts
Dec 17-20, 1929	State wide	Ice Storm	Unprecedented disruption and damage to telephone, telegraph and power system.
Feb 14-17, 1958	State Wide	Heavy Snow	Only information available states that New England experienced 10-20" of snowfall.
Dec 12, 1960	State wide	Heavy Snow and Wind	Between 13-17" of snowfall across New England and winds between 36-51MPH
Jan 19-20, 1961	State wide	Heavy Snow	24" of Snowfall.
Feb 3-4, 1961	State wide	Heavy Snow and Wind	Only information available states that 8-40" of snow fell across the New England area along with gale force hurricane winds.
Jan 27-31, 1966	State wide	Severe Winter Storm	Large amount of snowfall resulting in disruption of power and transportation services.
Feb 6-7, 1978	State Wide	Heavy Snow and Wind	Snowfall amounts ranged 17-50" in the New England Area along with hurricane force winds.
Jan 8-25, 1979	State wide	Ice Storm	Major disruptions to power and transportation.
Feb 14-15, 1986	State wide	Ice Storm	Fiercest ice storm in 30 years in the higher elevations in the Monadnock region. It covered a swath about 10 miles wide from the Massachusetts border to New London, New Hampshire.
March 3-6, 1991	Southern NH	Ice Storm	Numerous outages from ice-laden power lines .
March 16, 1993	State wide	Heavy Snow	\$832,396 worth of damages DR 3101 Numerous power outages.
Jan 15, 1998	State wide	Ice Storm	Severe ice storm that spread throughout New England, causing major damage to private and public utilities.
March 2001	Statewide	Snow	\$4,500,000 in damages DR 3166 Numerous outages.
February 17-18 2003	Cheshire, Hillsborough, Merrimack, Rockingham and Strafford	Snow Emergency	\$3,000,000 in damages EM 3177 Numerous power outages.
March 11, 2003			
January 15, 2004	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack and Sullivan	Snow Emergency	\$3,200,000 in damages , EM-3193 Numerous power outages.
March 30, 2005	Belknap, Carroll, Cheshire, Grafton, Hillsboro, Merrimack, Rockingham, Strafford and	Snow Emergency	\$4,654,738 in damages, EM 3207 numerous power outages.

	Sullivan		
April 28, 2005	Carroll, Cheshire, Hillsborough, Rockingham and Sullivan	Snow Emergency	\$2,677,536 in damages. EM 3211 Numerous power outages.
Dec 12, 2008	State wide	Ice Storm	DR-1199 Severe ice storm that spread throughout New England, causing major damage to private and public utilities six injuries and one fatality and \$17+ million in damages to Public Service of NH.
February 2010	Belknap, Carroll, Cheshire, Coos, Grafton, Hillsborough, Merrimack, Rockingham, Strafford, and Sullivan	Severe Winter Storm	\$19,789,657 in damages, DR 1812 extreme winds and power outages along with massive amount of debris.
March 29, 2010	Merrimack, Rockingham, Strafford, and Sullivan	Severe Winter Storm	\$9,103,138 in damages, DR 1892. Extreme winds and power outages.
December 7, 2011	Hillsborough and Rockingham	October Nor'Easter	\$4,411,457 in damages, DR 4065 Wide spread power outages due to heavy snow and debris.
February 8-10, 2013	Belknap, Carroll, Cheshire, Hillsborough Merrimack, Strafford, Rockingham	February Blizzard 'Nemo'	Exceeded previous snow fall amounts, received snow assistance along with Category B declaration DR 4105.

Table 2.16

Snow Avalanche

The State Hazard Mitigation Planning Committee (SHMPC) reviewed the previous information from the 2010 Plan. A snow avalanche is a slope failure consisting of a mass of rapidly moving, fluidized snow that slides down a mountainside. The flow can be composed of ice, water, soil, rock and trees. The amount of damage depends on the type of avalanche, the composition and consistency of the material contained in the avalanche, the velocity and force of the flow and the avalanche path. Natural and human-caused snow avalanches most often result from structural weaknesses.

State of NH Snow Avalanche Events	
Probability	.5
Severity	1
Overall Risk	.5



They are caused by changes in the type and thickness of the snow cover layer resulting from thermal fluctuations or multiple snowfall events. The potential for snow avalanches increases with significant temperature influences, which cause metamorphic crystal changes in the snow layer, and with the accumulation of dry and wet snow over time.

Snow avalanches occur on slopes averaging from 25 to 50 degrees, the majority occurring on slopes from 30 to 40 degrees. They are triggered by natural events, such as thermal changes, blizzards, and seismic activity and by human activity such as that of skiers,

hikers and snowmobilers; and elastic sound waves, such as those created by explosions.

Crevasse in Tuckerman's Ravine 05/18/2012

<http://www.mountainwashingtonavalanchecenter.org/avalanche-safety/publications/avalanche-terrain-and-conditions-in-the-presidential-range-nh/>

Historical Events

Snow avalanches are not considered a major natural hazard nationally given the relatively limited geographic areas vulnerable to the effects of this type of event, the proximity of population centers to vulnerable areas and the seasonal nature of the vulnerability in most regions. However, Northern New Hampshire is an area with particularly vulnerable areas such as

Danger Scale Legend

5	Extreme Avalanche Danger
4	High Avalanche Danger
3	Considerable Avalanche Danger
2	Moderate Avalanche Danger
1	Low Avalanche Danger

the Presidential Range in the White Mountains, which Mount Washington is a part of. Over the past 140 years, at least 135 deaths and many significant injuries have been documented in the Presidential Range and elsewhere due to snow avalanches and related causes. In the year 2012 there were 2 confirmed deaths (and 10 rescues) on Mount Washington, On January 3, 2012 two skiers triggered a R2D1.5*avalanche.



*Photo taken by one of the skiers (that triggered the avalanche) during their approach in Central Gully.
<http://www.mountwashingtonavalanchecenter.org/search-rescue/2011-2012-summaries/>*

Avalanche Classification

Data Code	Avalanche Size	Data* Code	Avalanche Destructive Potential
R1	Very small, relative to the path	D1	Relatively harmless to people
R2	Small, relative to the path	D2	Could bury, injure or kill a person
R3	Medium, relative to the path	D3	Could bury and destroy a car, damage a truck, destroy a wood frame house, or break a few trees.
R4	Large, relative to the path	D4	Could destroy a railway car, large truck, several buildings, or a substantial amount of Forest.
R5	Major or Maximum relative to the path	D5	Could gouge the landscape. Largest snow Avalanche known.

Table 2.17 http://www.avalanche.org/research/guidelines/pdf/Form_avidata_codes.pdf

*The use of half-sizes may be used to signify an avalanche that is on the high end of a single class

Epidemic

The State Hazard Mitigation Planning Committee's (SHMPC) contacts at the Department of Health and Human Services (DHHS) reviewed the previous information from the 2010 Plan. An epidemic is defined as an unusually high occurrence of disease.² Whether levels of disease occurrence are unusually high is often circumstantial and is dependent on an expected baseline. Epidemics may be point-source, in which case there is one source of exposure to the causal agent, or they may be propagated, where the causal agent continues to spread through the population. Epidemics may affect humans, domestic and wild animals, and crops. At this time the State of New Hampshire has identified epidemic as an actual hazard

State of NH Epidemic Events	
Probability	2
Severity	2
Overall Risk	4

In addition to being categorized by the type of transmission (point-source or propagated), epidemics may occur as outbreaks or pandemics.

Outbreak

An outbreak is a sudden increase of disease. It is a type of epidemic, focused to a specific area or group of individuals.

Pandemic

A pandemic is an epidemic that spreads worldwide, or throughout a large geographic area.

Epidemics may be caused by infectious diseases, which can be transmitted through food, water, the environment or person-to-person or animal-to-person (zoonoses), and non-infectious diseases, such as a chemical exposure that causes increased rates of illness. Infectious disease that may cause an epidemic can be broadly categorized into the following groups³:

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

An epidemic may also result from a bioterrorist event in which an infectious agent is released into a susceptible population, often through an enhanced mode of transmission, such as aerosolization (inhalation of small infectious disease particles).

² Rothman, Kenneth J. *Epidemiology, An Introduction*. New York, NY: Oxford University Press, Inc., 2002. p.38.

³ Friis, Robert H. and Sellers, Thomas A. *Epidemiology for Public Health Practice*, 2nd Ed. Gaithersburg, MD: Aspen Publishers, Inc., 1999. p.336.

With regard to foodborne and waterborne outbreaks, the epidemic hazard involves the safety of the food supply. This food safety may be jeopardized as a result of a fire, flood, hurricane, earthquake, or other natural, technological or man made disaster.

History and Probability of Occurrence

Every year New Hampshire experiences a variety of outbreaks, some of which lead to an epidemic. In 2005, for example, an increased number of Hepatitis A cases (82), occurred throughout the State, which was over 300% higher than the annual mean of previous years (2000-2004), and clearly an epidemic. Food borne outbreaks are also common in New Hampshire and, on average, 7-10 occur each year. Others that regularly occur in NH include outbreaks and/or epidemics of gastrointestinal illness, respiratory illness, and rash. The causal agent often differs, and the severity of the outbreak is dependent on a variety of factors such as virulence of the agent, susceptibility of the population at risk, and the mode of transmission.

Using 2011 as a recent example, the NH Department of Health and Human Services (NH DHHS) Division of Public Health Services (DPHS) was notified and responded to a total of 112 outbreaks: 67 gastrointestinal illness (7 of which were foodborne), 38 respiratory illness, 5 rash illness and 2 environmental exposure outbreaks.

During the 2009 H1N1 pandemic between late April 2009 and February 2010, New Hampshire saw an elevated number of novel influenza A(H1N1)-related hospitalizations (754) and deaths (10). This was classified as a Category 1 pandemic by the World Health Organization.

Potential Impact and Vulnerability

Theoretically, New Hampshire's entire population is vulnerable to the hazard of an epidemic. However, epidemics often occur among a specific age group or a group of individuals with similar risk factors and types of exposure. For example, the Hepatitis A epidemic of 2005 occurred primarily among the illicit drug using population. Similarly, Pertussis (whooping cough) outbreaks most often occur among school-aged children. Many times congregate settings, such as child-care facilities and schools, offer the opportunity for increased person-to-person transmission because of the proximity of individuals within those settings.

Outbreaks where the source is contaminated food are non-discriminatory and can affect any individual who eats the food. Bioterrorist events are also non-discriminatory in that the agents involved may cause illness in anyone exposed. Immuno-compromised individuals, such as the elderly, infants, or severely ill, are often at increased risk because their natural defenses to fight illness may be weakened.

Some diseases occur seasonally, which allows minimal predictability in preparing for outbreaks and epidemics. For example, Influenza most often occurs in the winter months

while West Nile Virus occurs in the summer months. Therefore, appropriate resources may be designated for those applicable seasons.

Rates of illness, duration of disease, and the ability to treat or prevent illness once the causative agent is identified are just a few factors that will further determine the vulnerability of the population. Epidemics have the potential to cause a significant loss of life and/or widespread illness throughout the State. The threat of a pandemic influenza exemplifies a devastating situation where there may be an extreme shortage of essential service workers, a rapid transmission of disease from person-to-person, and no effective vaccination to prevent the illness. Additional vulnerabilities that may influence the NH DHHS response to an epidemic include those of the Food Protection Section (FPS), the NH Public Health Laboratories (PHL), and the Bureau of Infectious Disease Control (BIDC). Each unit may have specific vulnerabilities that may be categorized into three main areas: staffing, equipment and supplies. However, each unit has also developed specific skills or capacities to respond and mitigate a potential threat or to an event. For example, if the Bio-safety-Level 3 (BSL-3) equipment in the PHL was destroyed, NH could no longer test for the category of bioterrorist agents that require this type of protective testing equipment, as no other lab in NH has this capability. And, if the FPS inspectors were hindered from physically reporting to NH DHHS, they would not be able to serve as the back-up team of investigators.

During the 2009 H1N1 pandemic described earlier an enormous strain was placed on resources within the Division of Public Health Services, including personnel, equipment (i.e., laboratory), and office supplies. During this time frame the demand for flu testing by the New Hampshire Public Health Laboratories significantly increased, with a total of 4,192 specimens tested and 786 cases of novel H1N1 infections confirmed by PCR laboratory testing. The demand for testing was so high that the PHL eventually needed to limit the specimens it would accept to a narrower subset of ILI cases, which included hospitalized patients, healthcare workers, patients of ILINet providers, or persons who were part of a respiratory outbreak investigation.

A moderate influenza pandemic will also put an enormous strain on the broader public health and health care system throughout New Hampshire. The following projections are based on a Category 3 pandemic as defined by the World Health Organization.

Human Impact and Demand on Services	
Fatalities	Increase of 580% at peak
Illness Requiring EMS Response	Increase of 65%
Outpatient Visits	Increase of 21% per day over 8 - 12 week

Human Impact and Demand on Services Cont.	
Hospital ED Visits	Increase of 65% per day at peak. Event duration (first wave) 8 - 12 weeks
Hospitalizations	Increase of 108% per day at peak. Event duration (first wave) 8 - 12 weeks
Pediatric Illness	Increase of 80% per day at peak. Event duration (first wave) 8 - 12 weeks
Mental Health Services	Unknown level of increase in long term needs
Population Requiring Isolation	Unlikely. Depends on epidemiological characteristics of an outbreak
Population Requiring Medical Countermeasures	Increase of .8%
Interruption of Health Care Services	
Basic EMS	Reduction of 13% in the regular capacity at peak due to staff illness
Hospital ED Services	Reduction of 20% in the regular capacity at peak due to staff illness
Outpatient Services	Reduction of 26% in the regular capacity at peak due to staff illness
Inpatient Services	Reduction of 20% in the regular capacity at peak due to staff illness
Mental Health Services	Reduction of 26% in the regular capacity at peak due to staff illness
Impact on Public Health Services	
Personnel	Reduction of 26% in the regular capacity at peak
FTEs required for critical public health functions:	
Disease Investigation	Increase of 50% early in outbreak
Incident Management	Increase of 100%
Public Information	Increase of 100%
Mass Vaccination Clinics	Requires 21 staff per 1000 people vaccinated per day, based on 12 hour shift, 7 days/week of operation.

Table 2.18

Radiological

The State Hazard Mitigation Planning Committee (SHMPC) reviewed the previous information from the 2010 Plan. Radiological hazards exist, and radiological accidents can occur wherever and whenever radioactive materials are used, stored or transported. Radiological hazards can range from relatively localized incidents involving small amounts of radioactive materials in shipment, storage, or use, to large-scale catastrophic events involving fixed nuclear power facilities or detonation of a nuclear weapon. Smaller sources of radiation hazard are found in medical facilities and some industrial and laboratory facilities where radioactive materials and/or radiation-producing devices are used. In other words, nuclear power plants, hospitals, universities, research laboratories, industries, major highways, railroads and shipping yards could each be the site of a radiological accident. Some radiation (e.g. radon as previously mentioned) is produced naturally, from decomposition of radioactive isotopes in soils and underlying strata.

State of NH Radiological Events	
Probability	1
Severity	2
Overall Risk	2

Although frequently considered a type of “hazardous material,” radioactive material involved in a radiological accident requires a unique and specialized response. The NH Department of Public Health Radiological Health Section is the State’s radiation control program. Their staff is duly trained and experienced to provide technical oversight during such responses.

New Hampshire has one nuclear power generator, Seabrook Station, located in Seabrook, New Hampshire. Seabrook Station is an 1150-megawatt pressurized water reactor (PWR), which began operation in 1990 and is licensed to operate until 2026. Vermont's only nuclear power generator, Vermont Yankee, is located in Vernon, Vermont, immediately across the Connecticut River from Hinsdale, N.H. This 540-megawatt boiling water reactor (BWR) began operation in 1972. The spent fuel from both these reactors is stored onsite. Wet storage facilities at Seabrook Station reached capacity in 2010.

The Portsmouth Naval Shipyard conducts maintenance and refueling of nuclear submarines at its facilities on the Piscataqua River. Depot modernization maintenance typically requires less than a year in port, and an engineered refueling overhaul is a two year operation. The shipyard services up to four submarines at a time. All spent fuel removed from submarines is transported to the US Department of Energy's Idaho National Engineering and Environmental Laboratory.

The Division of Public Health Services' Radiological Health Section currently has 82 specific radioactive material licensees.

At this time, the State of New Hampshire has identified radiological emergencies as a real hazard.

Historical Events

No deaths or serious injuries have ever been attributed to a radiological incident or event in the State of New Hampshire.

Fire and Hazardous Materials

General Description

The State Hazard Mitigation Planning Committee (SHMPC) member from the State Fire Marshals Office reviewed the previous information from the 2010 Plan.

Fire and Hazardous Material (HAZMAT) incidents continue to occur frequently around the State. New Hampshire's changing population and businesses continues to necessitate the need to improve our efficiency in providing life saving services as well as property protection and environmental preservation to the citizens and visitors to our State.

The risk of injury or death to the public is devastating. (Fire also has a significant impact on our economy as it destroys personal property and taxable property, increased costs for suppression, increase insurance costs causes loss of productivity of affected families and the costs for health to an injured party).

State of NH Fire and Hazardous Material Events	
Probability	1
Severity	1
Overall Risk	1



photo, June 27, 2012 I-393 Rollover. HSEM Staff Photo.

Hazardous Materials continue to evolve as new chemical formulas are created. This requires constant oversight to ensure our first responders are educated on the new chemicals, their characteristics and how to respond to incidents involving them.

With the continuing development of new alternative fuels, we have to adapt to new fire suppression methods for these hazardous materials due to existing fire suppression methods being ineffective. New methods for illegal drug production have increased the potential for fires caused by reactivity between the different hazardous materials involved in the process.



Left Photo, Submarine Fire-Shipyard photo by Ionna Raptis/The Herald/AP

State of NH Fire and Hazardous Material Historical Events		
Date	Location	Damages and Impacts
December 24, 2009	Durham	DHHS was notified of a confirmed case of gastrointestinal Anthrax in the State. DHHS, along with NH Department of Public Health, NH Department of Environmental Services, Town of Durham, CDC, FBI, 12 th CST, and the Seacoast Regional HazMat Team (START) worked to identify and test suspect areas to look for the source. The Center for Disease Control stated this was the first case of gastrointestinal Anthrax in the United States. This event is anticipated to end with the Final After Action report sometime in August. Being the first of its kind in the US, we did not have any previous history on how this was going to react and how we were going to control the situation.
February 12, 2012	Hinsdale	A Tritium leak at Vermont Yankee Nuclear Power Plant. An initial meeting was established with NH Public Health, NH RAD, HSEM, and NHDES to review the situation and set up a technical team to sample areas of concern in Hinsdale, NH. Our HazMat coordinator assisted in the formation of the team, PPE selection and participated as the Safety Officer for the sampling program which is still ongoing.
May 14, 2010	Colebrook	An explosion at an ammunition facility. Two fatalities occurred
January 5, 2011	Andover	Dioxide incident at Procter Academy hockey arena
February 9, 2011	Concord	Train derailment
March 21, 2011	Littleton	Tour bus rollover on Interstate 93
May 24, 2011	Auburn	Tractor trailer rollover
June 7, 2011	Manchester	Improvised Chemical Devices explosion
July 6, 2011	New Hampton	Tractor trailer rollover on Interstate 93
July 12, 2011	Hopkinton	Boat explosion.
September 29, 2011	Cheshire County	Numerous hazardous materials floating in Connecticut River near Chesterfield/Hinsdale, due to heavy rains
September 29, 2011	Carroll County	Numerous hazardous materials floating in waterways in Conway, Shelburne and Woodstock due to heavy rains
November 5, 2011	Whitefield	Airplane accident
December 22, 2011	Goffstown	Propane tank truck rollover
May 2, 2012	Lebanon	Chemical reaction due to mixed hazardous waste inside commercial facility
May 24, 2012	Portsmouth	Nuclear Submarine Fire Portsmouth at Navy Yard. Fire on board nuclear submarine being repaired in dry-dock area
June 27, 2012	Concord	Tractor trailer rollover in Concord on I-393
June 28, 2012	Manchester	Leaking dangerous chemical inside tractor trailer.
August 1, 2012	Ashland	Tractor trailer rollover
September 4, 2012	Milford	Tractor trailer rollover

Table 2.19

Terrorism

The State Hazard Mitigation Planning Committee (SHMPC) which consisted of subject matter experts (from the FBI, USSS, and NHSP), reviewed the previous information from the 2010 Plan. Terrorism is the unlawful use, or threat of use, of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives by a non sovereign entity.

State of NH Terrorism Events	
Probability	1
Severity	1
Overall Risk	1

Terrorist activities are conducted in an effort to:

- Create fear among the public.
- Try to convince citizens that their government is powerless to prevent terrorism.
- Get immediate publicity for their causes.
- Raise funds for continued terror operations.
- Generate recruitment of new members or increase overall radicalization.
- Exploit weaknesses in other nations in an effort to derail political processes.

Terrorist or terrorist support activities that may occur throughout the world and New Hampshire include, but are not limited to: communicated threats, money laundering, narco-terrorism, fraud, espionage, assassinations, kidnappings, hijackings, bomb threats and bombings, cyber attacks (computer-based), and the potential use of chemical, biological, nuclear and radiological weapons of mass destruction (WMDs).

High-risk targets for acts of terrorism include: military and civilian government facilities, commercial airports, large cities and high-profile landmarks, large public gatherings, water and food supplies, utilities and corporate centers. Furthermore, terror groups have recognized the capability of spreading fear by sending explosives or chemical and biological agents through the mail.

Within the immediate area of a terrorist event, police, fire and other public officials are relied on for direction and on-scene emergency management. However, preparations for a terrorist event are made in much the same way as for other crisis events wherein foundational emergency management principals are followed. Current threats, and reports from international attacks, also warrant continued training in an effort to identify secondary attack potentials and ensure first responders remain cognizant of the potential for continued attacks after the first occurrence of such.

Since September 11, 2001, the overriding concern has been focused on the threat of a terrorist attack carried out by international groups who are able to capitalize on perceived weaknesses in the United States. This terror threat is compounded by the threat of homegrown violent extremists (HVE) as well as the threat of domestic terror groups and

lone wolf offenders. A HVE is inspired by a global terrorist organization that prepares plans and executes their attacks without direct support or guidance from the terrorist organization. Lone wolf offenders are not being directed or controlled by any specific terror group, but are often inspired by domestic terror group beliefs, grievances, and rhetoric.

The threat of a terror attack by HVE's or lone wolf offenders is of significant concern based on their lack of connection to a larger conspiracy, their autonomy and low profile, which thus limits the ability of law enforcement to detect and disrupt such plots. Further, attacks of this nature present equal risk to every state, city, town, and municipality in the U.S., as the symbolic targeting of key infrastructure and population locations is often focused around the nearest available target rather than the national visibility of that target.

The cyber threat in New Hampshire and the United States is of significant concern. Terrorists are increasingly using the cyber domain to conduct attacks and other activities, i.e., fund raising through fraud. With the growing dependence on computers and internet-based, critical programs, comes the opportunity for cyber criminals to do harm and exploit weaknesses within information technology systems.

Terrorists historically have taken advantage of civil unrest. Title 18 U.S. Code, Subsection 232 describes civil disorder as “any public disturbance involving acts of violence by assemblages of three or more persons causing immediate danger, damage, or injury to the property or person of another individual.” New Hampshire is not immune to public disorder and has experienced incidents in the past at Hampton Beach, the annual Laconia Motorcycle Rally, the Seabrook Nuclear Power Plant and the University of New Hampshire. Civil disorder is recognized as a societal hazard in New Hampshire because of the associated potential for loss of life, injury, property damage and economic disruption.

Location

The location and form of many natural hazards are identifiable and sometimes predictable. No portion of the state of New Hampshire is immune from terrorism or public disorder.

The rural landscape of New Hampshire together with a porous northern border with Canada, lends itself to the “lone wolf” offender or HVE operating in autonomy, as well as a means for international terrorists to enter the county undetected.

Based on previous world events, it is presumed that critical infrastructure facilities and services as well as large public gatherings are at a high risk.

The overall management for New Hampshire's Critical Infrastructure Protection Program (CIPP) is the responsibility of the NH Information and Analysis Center. NH developed specific sector criteria for 19 sectors; NH has the Special Events Sector that is in addition to the 18 original sectors of the National Infrastructure Protection Plan. Assets have been identified within each sector, as applicable based on state criteria, and include state, local

and private sector facilities. The adopted database utilized to categorize NH assets is the Automated Critical Asset Management System (ACAMS).

The overarching goal of the CIPP is to build a safer, more secure, and more resilient state by preventing, deterring, neutralizing, or mitigating the effects of a terrorist attack or natural disaster, and to strengthen preparedness, response, and recovery in the event of an emergency.

Critical infrastructure protection is important to NH:

- Attacks on critical infrastructure could significantly disrupt the functioning of government and business alike and will produce a cascading effect far beyond the targeted sector and physical location of the incident.
- Direct terrorist attacks and natural, manmade, or technological hazards could produce catastrophic losses in terms of human casualties, property destruction, and economic effects, as well as profound damage to public morale and confidence.
- Attacks using components of the nation's critical infrastructure as weapons of mass destruction could have even more devastating physical and psychological consequences.

Critical infrastructure protection includes actions to mitigate the overall risk to Critical Infrastructure and Key Resource (CIKR) assets, systems, networks, functions, or their inter-connecting links. In the context of the CIPP, this includes actions to deter the threat, mitigate vulnerabilities, or minimize the consequences associated with a terrorist attack or other incident. Protection can include a wide range of activities, such as improving security protocols, hardening facilities, building resiliency and redundancy, incorporating hazard resistance into facility design, initiating active or passive countermeasures, installing security systems, leveraging “self-healing” technologies, promoting workforce surety programs, implementing cyber security measures, training and exercises, business continuity planning, and restoration and recovery actions, among various others.

Historical Occurrences

Terrorism within the United States includes such large-scale attacks as the September 11, 2001 attack on the World Trade Center and the Pentagon; the 2001 anthrax attacks; the 1995 bombing of the Murrah Federal Building in Oklahoma City; and the 1993 attack on the World Trade Center.

While New Hampshire has been fortunate to escape a major terrorist attack, it has not been immune from terrorist incidents. In 1972 a pipe bomb was detonated and destroyed portions of the main tower at the Manchester Airport. In 1998 a pipe bomb was partially detonated within the Concord City Library causing a fire. A short time later, a second pipe bomb was found on the steps of the New Hampshire State Library. This incident followed an anonymous letter sent to the Governor’s office which indicated that bombs

would be detonated within the City of Concord. Since that time, there have been numerous bomb threats throughout New Hampshire requiring the response of emergency officials.

New Hampshire Terrorism Related Incidents			
Category	Threat	Actual	Total
Biological Terrorism: Threat: White Powder responses with a threatening letter. Actual: Known biological exposure or event*	20	0	20
Chemical Terrorism Threat: Unknown release of chemical material requiring a response Actual: Intentional release**	15	0	15
Conventional Terrorism Threat: Threat of OR a suspicious package Actual: Improvised device or material. ***	70	46	116
Notes			
* Authorities responded to a number of suspicious powder / substance calls. Most of these involved material that was delivered through the U.S. postal system, most often with an accompanying threatening letter. Some of the suspicious powder incidents involved the material being left in various locations of the state, including major businesses, shopping facilities and identified critical infrastructure sites, where the site itself raised the level of concern. None were found to contain hazardous or toxic substances.			
**Authorities responded to a number of incidents in which chemical materials and/or the location of the materials caused a higher level of concern. None of these incidents were actual chemical terrorism related			
*** The “Actual” numbers include items recovered and rendered-safe by the State Police EOD Unit as well as post-blast scenes. Some of the events involved the use of improvised over-pressure explosive devices (chemical reaction bottle bombs), Molotov cocktails and pipe bombs.			
**** NH RSA 158:31(II) states as follows: “For the purposes of statistical reporting and intelligence information gathering, criminal threats which are conveyed by any means of communication and which involve the potential use of any explosive device, radiological or nuclear material, or any chemical or biological agent, military or otherwise, or any combination of such agents or materials, shall be reported to the director of the division of state police.”			

Table 2-20

Data for table 2-20 is information collected by the NHIAC from the New Hampshire, the State Police Explosives Ordnance Disposal (EOD) Unit and the New Hampshire Fire Marshal's Office. Occurrences of terrorism related incidents in New Hampshire from January 2010 through October 2012. Receipt of data from other agencies within New Hampshire has been intermittent and therefore proper evaluation is not possible****

Probability

It has been seen that terrorism, in all its forms, can strike communities of any size, not just large metropolitan cities. While difficult to estimate, the probability for a terrorism incident within New Hampshire is Low to Moderate. However, given the increasing reliance on cyber-technology, the probability of a cyber-terror incident is high within the next twenty-five years.

Impact and Vulnerability

All people and property within New Hampshire are exposed to the risk of a terrorist event within the state. Due to the increased population as well as the higher number of critical infrastructure targets located in the southern and south eastern part of the state, the risk may be somewhat elevated.

Due to the nature of the hazard, it's not possible to predict what or where the impact of terrorism events in New Hampshire may be. The impact may be small from an isolated event, to catastrophic in nature. In any terrorist event, there will undoubtedly be an adverse economic impact.

In today's threat environment, creating a unified effort and sharing information across all levels of government is essential in preventing terrorist attacks. It is vital that law enforcement officers, homeland security officials, and first responders at all levels, have the crucial and pertinent information to do their jobs. The New Hampshire Information and Analysis Center (NHIAC) continue to strengthen its relationship with stakeholders to ensure that information is provided in a timely manner and in the most useful format. As part of the outreach plan to stakeholders, the NHIAC has implemented an Intelligence Liaison Officer (ILO) program. The ILO program has initially involved the engagement of local and county law enforcement officials in the furtherance of cooperation and collaboration within the mission of the center. The continued utilization of this program is crucial in preventing terrorist attacks. The NHIAC will extend this program beyond the law enforcement community to other hometown security partners, to include fire services, corrections and emergency management.

While we may not be able to prevent a terrorist incident, it is within the NHIAC's ability to lessen the likelihood and /or effects of an incident. Communities within New Hampshire continue to improve readiness to respond to an incident through participation in state and federal programs that provide training and equipment that would respond to a terrorist incident. Small and large-scale exercises are also conducted to improve agency coordination and test local response plans.

New Hampshire Homeland Security and Emergency Management (NH HSEM) and the NHIAC work collectively to provide critical infrastructure resilience. NH HSEM and the NHIAC, consider critical infrastructure to be a system or an asset within the State of NH that if it were to be incapacitated or damaged, would have a debilitating impact on the security of the public's health or safety, economic security or combination of these circumstances.

NH HSEM and NH IAC realize that it's not always possible to eliminate vulnerabilities to the State's critical infrastructure and key resources, but recognize that through the power of agency collaboration, improvements can be made to further protect and secure the State of New Hampshire.

Potential Terrorist Threats to the State of New Hampshire				Key
				0-N/A
				1-Low
				2-Moderate
				>3-High
Potential Terrorist Activity	State of NH Vulnerabilities	Probability of Occurrence (within 25 year period)	Severity of Impact	Relative Threat (Probability x severity)
Lone Wolf/Domestic Terror Threat	Statewide schools, political events.	3	3	9
Cyber security Breach	Statewide security systems, prisons.	3	3	9
Chemical Terrorism	Statewide	1	3	3
Biological Terrorism	Statewide	1	3	3
Radiological Terrorism	Statewide	1	3	3
Nuclear Terrorism	Statewide	1	3	3
Explosive	Statewide	3	3	9

Table 2-21

Hazard Vulnerability Assessment Tool-State of New Hampshire

0-N/A 1-Low 2-Moderate 3-High	Human Impact Probability of death or injury	Property Impact Physical losses and damages	Business Impact Interruption of Service	Probability Likelihood this will occur in 25 years	Severity Avg. of human/property business	Relative Threat Severity-x-Probability 0-1=Low 2-3=Moderate >4=High
Event						
Flooding	1	3	1	3	2	6
Coastal Flooding**	1	2	2	2	2	4** Coastal NH Only
Dam Failure	3	3	1	1	2	2
Drought	1	1	1	1	1	1
Wild Fire	1	2	1	1	1	1
Earthquake	3	3	3	1	3	3
Landslide	1	1	1	1	1	1
Radon	1	1	1	2	1	2
Tornado/Downburst	1	2	2	1	2	2
Hurricane	1	2	2	1	2	2
Lightning	1	1	1	1	1	1
Severe Winter Weather	1	1	2	3	1	3
Snow Avalanche	.5	.5	1	.5	1	.5
Epidemic	3	0	2	2	2	4
Radiological	1	2	2	1	2	2
Hazardous Materials	1	1	1	1	1	1
Terrorism	2	1	1	1	1	1

Table 2-21

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Chapter III History and Demographics

History

New Hampshire has been described as a low rolling coast followed by countless hill and mountains rising out of a central plateau. Mount Washington, the highest peak in the eastern United States, standing at 6,288 feet, looms over the Presidential mountains. New Hampshire is one of the original thirteen states, measuring about 8,952.65 square miles, with 147 people per square mile (<http://www.indexmundi.com/facts/united-states/quick-facts/new-hampshire/population-density#map>). New Hampshire is neighbored by Quebec, Canada to the North, Maine to the East, the Connecticut River bordering Vermont to the West, and Massachusetts to the South. NH also has eighteen miles of seacoast, the beautiful White Mountains and the Lakes Region that contains Lake Winnipesaukee, a twenty two mile long serene and pristine lake. The State has the nickname of The Granite State and a motto of 'Live Free or Die'. It contains a total of 234 communities; 13 of those 234 are considered cities, with Manchester and Nashua being two of the largest. The City of Concord is the State capital nestled in Central NH. There are ten counties in New Hampshire, which provide security, correctional facilities and limited social services to communities. The County Risk Assessment is based on the State of New Hampshire's review of local Hazard Mitigation Plans. New Hampshire's Legislature is made up of a 400-member House, the third largest in the English-speaking world, and a 24-member Senate.



Source: Geology.com

Many of the attractions of New Hampshire are enjoyed all year long. With a population of 1.3 million, New Hampshire is a small contender on the national scale. According to <http://www.nh.gov/nhinfo/history.html>, it is believed that New Hampshire was established as a fishing colony in 1623 with an original name of North Virginia, and eventually received the name New Hampshire after the English county of Hampshire. After a succession of Royal Governors made New Hampshire an attractive area for settlers, Governor Wentworth progressed to '*grant towns to prospective settlers as equally as possible*', and the tradition of migration into New Hampshire began. Governor Wentworth was succeeded by Sir John Wentworth, who continued with the progression of the State by such acts as the formation of the first State Militia, founding of Dartmouth College, and the building of the Wentworth House. New Hampshire's history is rich '*it was the first to declare its independence and adopt its own constitution, New Hampshire was the ninth and deciding state in accepting the National Constitution as that of a republic, never to be known under any other form of government.*' New Hampshire has been an imperative part of the Nation's history, with close proximity to historical Boston, our increasing metropolitan area's, small mill towns and villages that lead through the Industrial Revolution.

Population Trends

Over the course of ten years, from 2000 to 2010, New Hampshire's population had an increase of 80,700, the smallest gain in New Hampshire's history over the past 50 years. A dwindling population growth is partly to blame: less migration (51.8 % of residents were not born in the state), into New Hampshire from other states over the course of the past decade. Another reason can be attributed to more deaths than births are occurring and young adults and families are migrating out of New Hampshire. Over the course of the past three years since the last plan update the State has experienced seven presidentially-declared disasters, mostly flooding, impacts from Tropical Storms and hurricanes and significant snow fall. The population trends for each county are reflected within the Plan.

The analysis performed by the Carsey Institute and University of New Hampshire, **New Hampshire Demographic Trends in the Twenty-First Century**, is projecting that, while New Hampshire is still not considered to currently have an old population, the median age for the State of New Hampshire is 40.3. "The population age 65 and over will almost certainly double in the next two decades." The analysis also points out that education and health care are considerably impacted by changes in the youngest and oldest age groups. With the population in the State of New Hampshire growing older, the need for health care will become more in demand. With the vast majority of New Hampshire's working group falling into the category of aging population, the lack of growth in other areas in New Hampshire though the decrease in migration of families will have a momentous impact on the States resources.

Review of the Hazard Mitigation Plans (local hazard mitigation plans) will support the fact there have been little to no significant changes with development across the State of

New Hampshire over the past five years. Further review of the demographics will show which counties are the most vulnerable to hazards within the State of NH. The State has County wide government, but it is limited in its capacity as a governing entity on behalf of local jurisdictions. When a Presidential Declaration is received, the declared county(ies) is/are eligible. The purpose of the table below is to document the areas of the State that have received the most declarations and show the vulnerability to the array of hazards that impact our State. As the chart reflects, Merrimack has been part of the most declarations, with Hillsborough and Cheshire counties close behind. All communities within each county are listed within the county demographics.

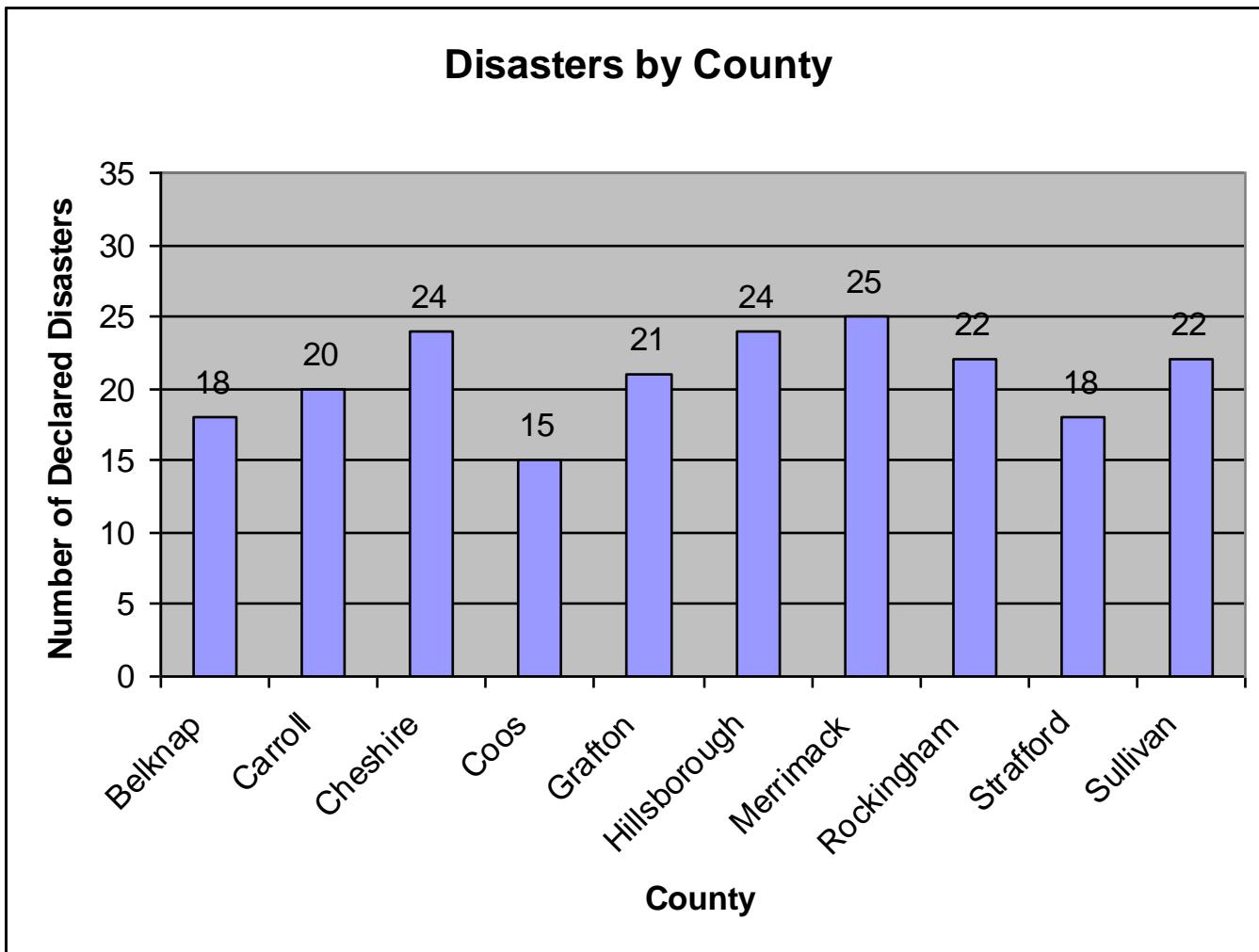


Table 3.1

Population Change in New Hampshire

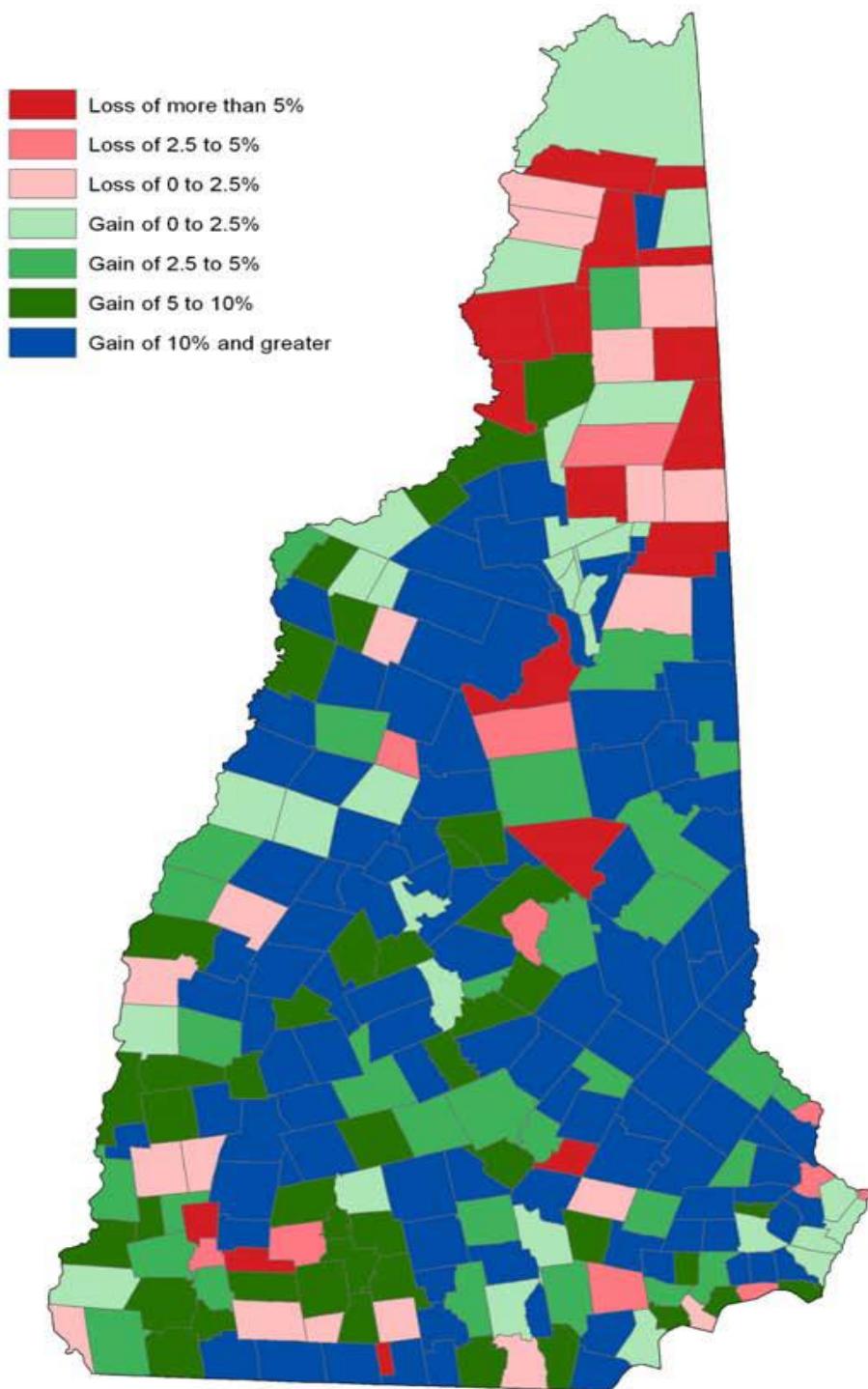


Table 3.2 Population Change in New Hampshire 2000-2010 Source New Hampshire Demographic Trends in the Twenty First CenturySource: U.S. Census 2000, 2010

Belknap County

History

Belknap County was established in 1840 from portions of Strafford County. The county was named for Dr. Jeremy Belknap, Dover Congregational Church minister and author of *The History of New Hampshire*, which chronicled the early history of the state. Belknap is one of two counties in the state without an interstate border; Merrimack is the other. A large part of Lake Winnipesaukee, all of Lake Winnisquam, and many smaller lakes cover nearly one-sixth of the county, which is the largest amount of inland water among New Hampshire's counties. Belknap County contains 400.2 square miles of land area and 68.4 square miles of inland water area. Based on the 2010 Census, the population density is 150.1 persons per square mile. Belknap County includes one city, Laconia, and ten towns, which are listed within the map of Belknap County.



Population Trends

Belknap County experienced its highest rate of growth from 1970 to 1980, when the population grew by 32.5 percent, adding 10,500 residents. The County was ranked the eighth-largest until 1970, when it ranked seventh; it has held that rank ever since. The population increase between 1990 and 2000 was just over 6,000 residents. Between 2000 and 2010, the rate of growth slowed a little, increasing by 6.68 percent, adding 3,763 residents. Belknap County residents are generally older as well, having the third-highest median age in New Hampshire. The median age of women is higher



than that of men by about one year.

Downtown Meredith- WMUR ULocal
Belknap Housing Development Changes by Jurisdiction

Geographic Area	Total population	Housing units		
		Total	Occupied	Vacant
Alton town	5,250	4,281	2,145	2,136
Barnstead town	4,593	2,319	1,727	592
Belmont town	7,356	3,615	2,941	674
Center Harbor town	1,096	795	472	323
Gilford town	7,126	5,111	3,007	2,104
Gilmanton town	3,777	2,118	1,452	666
Laconia city	15,951	9,879	6,838	3,041
Meredith town	6,241	4,728	2,708	2,020
New Hampton town	2,165	1,083	848	235
Sanbornton town	2,966	1,612	1,166	446
Tilton town	3,567	1,845	1,462	383

Table 3.3 GCT-PL2. Population and Housing Occupancy Status: 2010
from NH OEP Belknap County

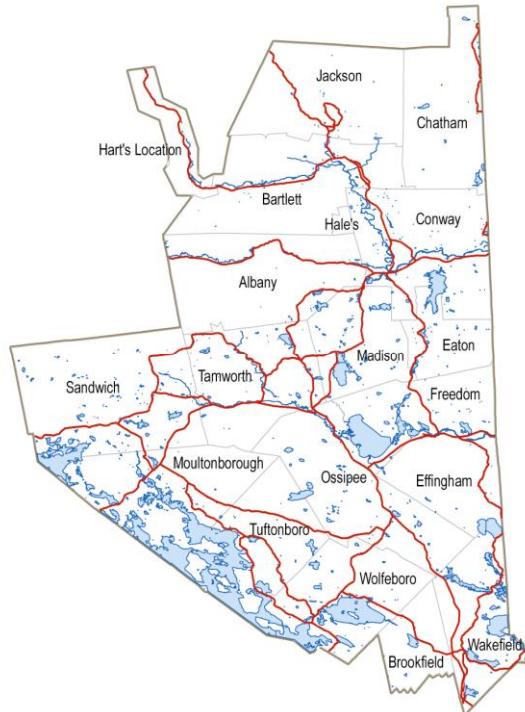
Carroll County

History

Carroll County surrounds the north-south midpoint of the state's eastern border. Established in 1840, the county was named for Charles Carroll of Carrollton, Virginia, a signer of the Declaration of Independence. It adjoins Maine along a 53-mile, almost perfectly straight, line. It is the second least populated county, falling after Coös County. About a quarter of the county is within the White Mountain National Forest. A ten-mile long thumb of land encompassing Crawford Notch and Hart's Location juts out between Coös and Grafton Counties. There are no cities located within Carroll County. Carroll County contains 931.1 square miles of land area and 61.4 square miles of inland water area. Based on the 2010 Census population, the population density is 51.4 persons per square mile. Carroll County includes 18 towns and one unincorporated place, Hale's Location; all of which are shown on the map on this page.

Population Trends

The third smallest county in population, Carroll County is about the same in square miles as Merrimack County, but the population density is about a third of that for Merrimack. Between 1970 and 1980, Carroll County experienced a major population growth spurt, increasing by 50.6 percent. That was the highest rate of population growth for any county for any decennial period since 1950. The growth rate for Carroll County was the highest among the counties between 1990 and 2000 at 23.3 percent. Between 2000 and 2010, the rate of growth slowed a little, increasing by 9.4 percent, adding 4,090 residents. Carroll County residents are generally older as well. At 48.3 years, Carroll has the highest median age in New Hampshire. Carroll County is also the only county that has a multi-jurisdictional local hazard mitigation plan for the Towns of Bartlett and Harts Location in the State. One town located in Carroll County is one of three NH communities that do not have a local Hazard Mitigation Plan.



Carroll County Housing Development Changes by Jurisdiction

Geographic Area	Total population	Housing units		
		Total	Occupied	Vacant
Albany town	735	560	318	242
Bartlett town	2,788	4,115	1,307	2,808
Brookfield town	712	338	292	46
Chatham town	337	270	139	131
Conway town	10,115	6,921	4,479	2,442
Eaton town	393	291	196	95
Effingham town	1,465	963	621	342
Freedom town	1,489	1,580	699	881
Hale's location	120	102	64	38
Hart's Location town	41	54	21	33
Jackson town	816	1,009	399	610
Madison town	2,502	1,877	1,075	802
Moultonborough town	4,044	4,940	1,741	3,199
Ossipee town	4,345	3,057	1,826	1,231
Sandwich town	1,326	1,057	617	440
Tamworth town	2,856	1,969	1,292	677
Tuftonboro town	2,387	2,435	1,029	1,406
Wakefield town	5,078	3,832	2,098	1,734
Wolfeboro town	6,269	4,443	2,839	1,604

Table 3.4 GCT-PL2. Population and Housing Occupancy Status: 2010
from NH OEP Carroll County

Cheshire County

History

Cheshire County, one of the five original counties, occupies the southwest corner of the state. It is separated from Vermont by a 41-mile length of the Connecticut River, and borders Massachusetts along a 27-mile straight line to the south. Established in 1769, the county was named for Cheshire County in England. Cheshire is New Hampshire's median county. It ranks sixth among the ten counties in total area, land area, water area, population, and population density. Cheshire County is the location of Mount Monadnock, one of the most-hiked peaks in the World. Cheshire County contains 707.0 square miles of land area and 22.4 square miles of inland water area. Based on the 2010 Census, the population density is 109.1 persons per square mile. Cheshire County includes one city, Keene, and 22 towns. Those towns are noted within the map located on this page.



Population Trends

Cheshire County's population for 2010 was slightly under twice the 1950 population. Over the last five decennial periods, Cheshire County has experienced population growth below the state average rate, with no significant growth spurts. Cheshire's population has ranked sixth among New Hampshire's counties for six decades. The highest rate of increase was from 1960 to 1970, when the population grew by 20.8 percent. The county had its smallest population increase from 2000 to 2010, growing by 4.5 percent adding 3,292 residents. While Cheshire County is similar in land area to Rockingham County, it is far less densely populated.

Cheshire County Housing Development Changes by Jurisdiction

Geographic Area	Total population	Housing units		
		Total	Occupied	Vacant
Alstead town	1,937	991	809	182
Chesterfield town	3,604	1,802	1,459	343
Dublin town	1,597	785	620	165
Fitzwilliam town	2,396	1,257	973	284
Gilsum town	813	378	326	52
Harrisville town	961	695	446	249
Hinsdale town	4,046	1,827	1,681	146
Jaffrey town	5,457	2,547	2,234	313
Keene city	23,409	9,719	9,052	667
Marlborough town	2,063	946	866	80
Marlow town	742	408	311	97
Nelson town	729	460	303	157
Richmond town	1,155	492	417	75
Rindge town	6,014	2,224	1,805	419
Roxbury town	229	101	90	11
Stoddard town	1,232	1,044	502	542
Sullivan town	677	309	274	35
Surry town	732	324	310	14
Swanzey town	7,230	3,205	2,957	248
Troy town	2,145	932	867	65
Walpole town	3,734	1,715	1,576	139
Westmoreland town	1,874	680	637	43
Winchester town	4,341	1,932	1,689	243

Table 3.5 GCT-PL2. Population and Housing Occupancy Status: 2010
from NH OEP Cheshire County

Coös County

History

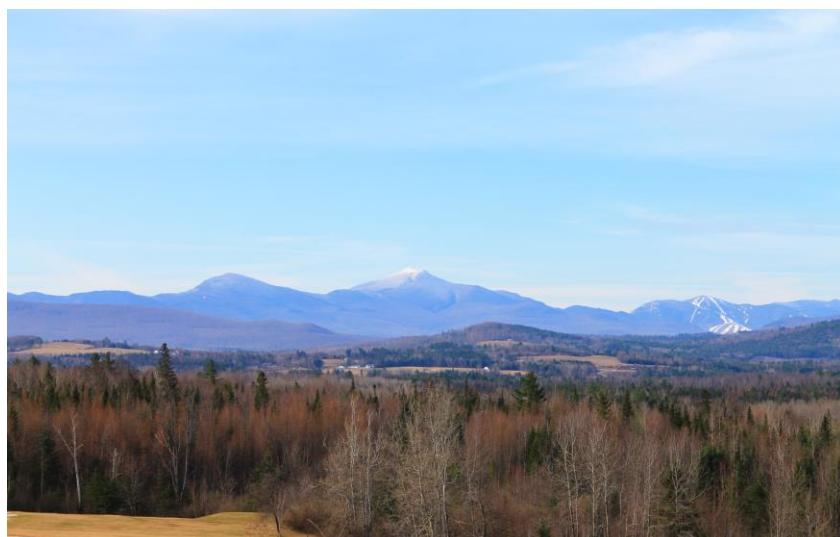
Coös County covers the top fifth of New Hampshire, sharing a 71-mile straight border with Maine to the east, an 85-mile border with Vermont to the west, and a 58-mile border with Canada to the north. Established in 1803, the county was named after the Indian word 'cowass' or 'kohass,' meaning 'crooked river' because of the bend in the Connecticut River. The White Mountain National Forest and Nash Stream State Forest cover a sizable portion of the county. Coös County contains 1,795.0 square miles of land area and 35.1 square miles of inland water area. Based on the 2010 Census, the population density is 18.4 persons per square mile. Coös County includes one city, Berlin, 19 towns, and 23 unincorporated places, 15 of which are unpopulated. All of those areas are listed on the map located within this page. (not all unincorporated areas are listed).



Population Trends:

Coös County claimed the smallest population among New Hampshire's ten counties in 2010, but it has held that position only since the 1990 Census. Prior to 1980, Belknap, Carroll, and Sullivan Counties all had fewer residents. Population in Coös County grew between 1950 and 1960, and then experienced its greatest loss of population between 1960 and 1970, decreasing by 7.7 percent. After a small gain between 1970 and 1980, the county decreased in population over the next two decades. In 2010, decennial population

change was nearly flat dropping by just 56 residents since 2000. Between 2000 and 2010, the rate of growth slowed dramatically with only a .1 percent increase, adding 25 residents.



Mount Lafayette and Cannon Mountain from Mountain View Grand Resort, Whitefield, NH Photo courtesy -E. Peck

Coos County Housing Development Changes by Jurisdiction

Geographic Area	Total population	Housing units		
		Total	Occupied	Vacant
Atkinson and Gilmanton Academy grant	0	4	0	4
Beans grant	0	0	0	0
Beans purchase	0	0	0	0
Berlin city	10,051	4,910	4,178	732
Cambridge township	8	40	4	36
Carroll town	763	898	309	589
Chandlers purchase	0	0	0	0
Clarksville town	265	439	127	312
Colebrook town	2,301	1,429	1,073	356
Columbia town	757	518	327	191
Crawfords purchase	0	0	0	0
Cutts grant	0	0	0	0
Dalton town	979	577	429	148
Dixs grant	1	15	1	14
Dixville township	12	33	7	26
Dummer town	304	294	129	165
Errol town	291	507	151	356
Ervings location	0	0	0	0
Gorham town	2,848	1,487	1,301	186
Greens grant	1	5	1	4
Hadleys purchase	0	0	0	0
Jefferson town	1,107	676	476	200
Kilkenny township	0	2	0	2
Lancaster town	3,507	1,687	1,399	288
Low and Burbanks grant	0	0	0	0
Martins location	0	1	0	1
Milan town	1,337	809	577	232
Millsfield township	23	61	9	52
Northumberland town	2,288	1,121	984	137
Odell township	4	73	1	72
Pinkhams grant	9	0	0	0
Pittsburg town	869	1,748	414	1,334
Randolph town	310	312	153	159
Sargents purchase	3	1	1	0
Second College grant	0	10	0	10

Shelburne town	372	217	166	51
Stark town	556	445	233	212
Stewartstown town	1,004	920	381	539
Stratford town	746	574	345	229
Success township	0	63	0	63
Thompson and Meserves purchase	0	0	0	0
Wentworth location	33	106	19	87
Whitefield town	2,306	1,339	976	363

Table 3.6 GCT-PL2. Population and Housing Occupancy Status: 2010
Housing Development Changes from NH OEP Coös County

Grafton County

History

Grafton County occupies the west central border of the state, halfway between north and south. It is separated from Vermont by an 89-mile stretch of the Connecticut River. Like Coös County, Grafton covers nearly one-fifth of the state. It was one of the five original counties established in 1769, and was comprised of all of the current Grafton and Coös Counties until 1803. The county, like the town, takes its name from Augustus Henry Fitzroy, Duke of Grafton, and an enthusiastic supporter of the American cause prior to the Revolution. The county contains a substantial amount of inland water, most of which is Newfound Lake or part of Squam Lake, and includes half of the White Mountain National Forest. Grafton County contains 1,709.0 square miles of land area and 40.8 square miles of inland water area. Based on the 2010 Census, the population density is 52.2 persons per square mile. Grafton County includes one city, Lebanon, 38 towns, and one unincorporated place, Livermore. All of those areas are listed within the map located on this page. There is one community located in this county that does not have a local hazard mitigation plan.



Census, the population density is 52.2 persons per square mile. Grafton County includes one city, Lebanon, 38 towns, and one unincorporated place, Livermore. All of those areas are listed within the map located on this page. There is one community located in this county that does not have a local hazard mitigation plan.

Population Trends

Over the last five decennial periods, Grafton County has experienced population growth below the state average rate, with no substantial growth spurts. The county's fastest rate

of growth was from 1970 to 1980, when the population increased by 19.8 percent. Grafton is the second largest county in land area, following Coös County. Population density for Grafton County is about equal to that of Carroll County, which is about 777 square miles smaller. Between 2000 and 2010, the rate of growth increased 9.0 percent, adding 7,378 residents.



Grafton County Housing Development Changes by Jurisdiction

Geographic Area	Total population	Housing units		
		Total	Occupied	Vacant
Alexandria town	1,613	967	634	333
Ashland town	2,076	1,355	980	375
Bath town	1,077	579	434	145
Benton town	364	164	106	58
Bethlehem town	2,526	1,517	1,103	414
Bridgewater town	1,083	995	471	524
Bristol town	3,054	2,488	1,283	1,205
Campton town	3,333	2,208	1,407	801
Canaan town	3,909	1,930	1,588	342
Dorchester town	355	240	148	92
Easton town	254	206	120	86
Ellsworth town	83	96	40	56
Enfield town	4,582	2,508	2,044	464
Franconia town	1,104	859	484	375
Grafton town	1,340	839	564	275
Groton town	593	436	262	174
Hanover town	11,260	3,445	3,119	326
Haverhill town	4,697	2,379	1,928	451
Hebron town	602	600	268	332
Holderness town	2,108	1,510	860	650
Landaff town	415	230	179	51
Lebanon city	13,151	6,649	6,186	463
Lincoln town	1,662	2,988	794	2,194
Lisbon town	1,595	809	659	150
Littleton town	5,928	3,065	2,673	392
Livermore town	0	0	0	0
Lyman town	533	369	240	129
Lyme town	1,716	810	705	105
Monroe town	788	372	332	40
Orange town	331	167	132	35
Orford town	1,237	656	535	121
Piermont town	790	474	334	140
Plymouth town	6,990	2,231	1,953	278
Rumney town	1,480	933	593	340
Sugar Hill town	563	429	254	175
Thornton town	2,490	1,862	1,070	792
Warren town	904	612	381	231
Waterville Valley town	247	1,189	117	1,072
Wentworth town	911	533	382	151
Woodstock town	1,374	1,421	624	797

Table 3.7 GCT-PL2. Population and Housing Occupancy Status: 2010
Housing Development Changes from NH OEP Grafton County

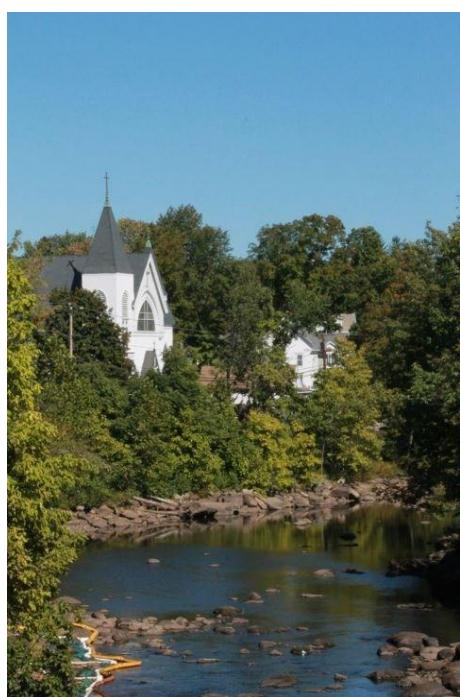
Hillsborough County

History

Hillsborough County occupies the south central portion of the state along a 36-mile border with Massachusetts. Hillsborough was one of the original five counties, created by the Provincial Act in 1769, authorized by Governor John Wentworth. It was named in honor of Wills Hill, Earl of Hillsborough, and a councilor of King George III. The town of Hillsborough was the birthplace of Franklin Pierce, the only United States president from New Hampshire. The town, first granted in 1735 and incorporated in 1772, was probably named not for the Earl, but for landowner Colonel John Hill. Hillsborough County contains 876.1 square miles of land area and 16.1 square miles of inland water area. Based on the 2010 Census, the population density is 457.4 persons per square mile, highest among the counties.



Hillsborough County includes two cities, Manchester and Nashua, and 29 towns. All the communities within the County of Hillsborough are listed within the map located on this page.



Milford, NH Photo Courtesy- E. Peck

Population Trends

Hillsborough County has been the state's largest since the 1850 Census, and was the first county to exceed 100,000 residents, which it did in 1900. It was also the first county to exceed 200,000 residents (1970), 300,000 residents (1990), and 400,000 residents (2010). After population increases of at least 20 percent per decade between 1960 and 1990, the rate of growth for Hillsborough County has slowed, increasing by 13.4 percent from 1990 to 2000, and by just 5.2 percent from 2000 to 2010 adding 19,880 residents. Hillsborough County residents are generally younger, with a median age of 39.3, the second-youngest among New Hampshire's counties.

Hillsborough County Housing Development Changes by Jurisdiction

Geographic Area	Total population	Housing units		
		Total	Occupied	Vacant
Amherst town	11,201	4,280	4,063	217
Antrim town	2,637	1,329	1,055	274
Bedford town	21,203	7,634	7,364	270
Bennington town	1,476	666	564	102
Brookline town	4,991	1,700	1,631	69
Deering town	1,912	932	740	192
Francestown town	1,562	755	610	145
Goffstown town	17,651	6,341	6,068	273
Greenfield town	1,749	699	618	81
Greenville town	2,105	933	861	72
Hancock town	1,654	864	724	140
Hillsborough town	6,011	2,896	2,392	504
Hollis town	7,684	2,929	2,811	118
Hudson town	24,467	9,212	8,900	312
Litchfield town	8,271	2,912	2,828	84
Lyndeborough town	1,683	687	643	44
Manchester city	109,565	49,288	45,766	3,522
Mason town	1,382	571	529	42
Merrimack town	25,494	9,818	9,503	315
Milford town	15,115	6,295	5,929	366
Mont Vernon town	2,409	868	838	30
Nashua city	86,494	37,168	35,044	2,124
New Boston town	5,321	1,967	1,883	84
New Ipswich town	5,099	1,916	1,756	160
Pelham town	12,897	4,598	4,357	241
Peterborough town	6,284	2,956	2,713	243
Sharon town	352	164	144	20
Temple town	1,366	542	503	39
Weare town	8,785	3,466	3,128	338
Wilton town	3,677	1,530	1,418	112
Windsor town	224	137	83	54

Table 3.8 GCT-PL2. Population and Housing Occupancy Status: 2010
Housing Development Changes from NH OEP Hillsborough County

Merrimack County

History

Nestled in the south central portion of the state, equidistant from both the Maine and Vermont borders, Merrimack County is one of two counties that has no interstate borders; Belknap is the other. It is the location of Concord, the state capitol, which is tucked into a bend in the Merrimack River. The county takes its name from the Merrimack River, whose name was adapted from an Abenaki Indian word meaning "deep." The county was formed in 1823 from towns in Hillsborough and Rockingham counties. Merrimack County contains 934.1 square miles of land area and 22.3 square miles of inland water area. Based on the 2010 Census, the population density is 156.8 persons per square mile. Merrimack County includes two cities, Concord and Franklin, and 25 towns. All the communities within the county of Merrimack are listed on the map located on this page.



Population Trends

Merrimack County has long been the third largest county in population, and is about equal in square miles of land to Carroll County. It is, however, the fourth most densely populated county, with less than half the population density of Strafford County, the third highest. Population in Merrimack County increased at about the same rate for three consecutive decades from 1960 to 1990, with population growth rates of 19.4 percent, 21.5 percent, and 22.3 percent. Since then the rate of growth has slowed, increasing by 13.3 percent between 1990 and 2000, and 7.5 percent through 2010 adding 10,220 residents. Currently there are six jurisdictions within Merrimack County which have both active growth management ordinances as well as impact fees imposed by New Hampshire Office of Energy and Planning (OEP).

On November 26, 2012, Concord City Council voted to accept a plan which included \$4.71 million in a federal TIGER (Transportation Investment Generating Economic Recovery) grant to revitalize Main Street in hopes to boost the local economy and business development in the downtown Concord area. It is the City's goal that this project will increase visitors to the area as well as increase the population of the city. Clearly the hazard profile of the downtown Concord area will need to be adjusted at the conclusion of the project. Changes to buildings, roadways, and the potential increase of population (residential and visitor) will raise the anticipated effects of the identified hazards to this area as identified in the Merrimack County Risk Assessment section.

Merrimack County Housing Development Changes by Jurisdiction

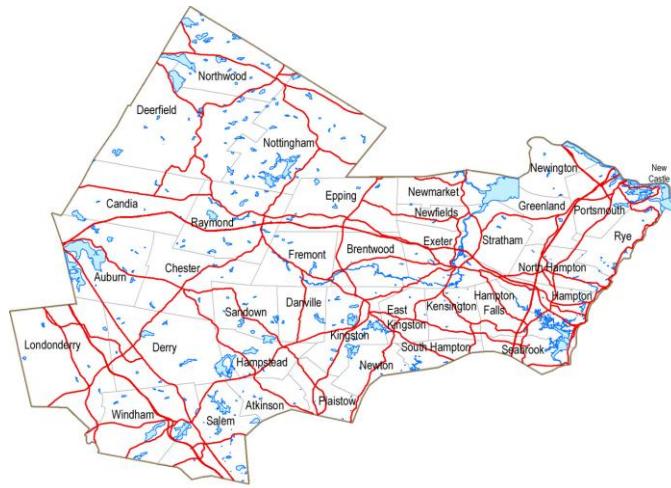
Geographic Area	Total population	Housing units		
		Total	Occupied	Vacant
Allenstown town	4,322	1,881	1,756	125
Andover town	2,371	1,121	890	231
Boscawen town	3,965	1,453	1,369	84
Bow town	7,519	2,807	2,706	101
Bradford town	1,650	917	667	250
Canterbury town	2,352	1,002	913	89
Chichester town	2,523	963	918	45
Concord city	42,695	18,852	17,592	1,260
Danbury town	1,164	684	490	194
Dunbarton town	2,758	1,077	1,015	62
Epsom town	4,566	1,839	1,706	133
Franklin city	8,477	3,938	3,407	531
Henniker town	4,836	1,928	1,780	148
Hill town	1,089	512	413	99
Hooksett town	13,451	5,184	4,926	258
Hopkinton town	5,589	2,381	2,204	177
Loudon town	5,317	2,081	1,966	115
Newbury town	2,072	1,559	869	690
New London town	4,397	2,303	1,666	637
Northfield town	4,829	1,969	1,843	126
Pembroke town	7,115	2,872	2,710	162
Pittsfield town	4,106	1,769	1,579	190
Salisbury town	1,382	598	513	85
Sutton town	1,837	985	757	228
Warner town	2,833	1,358	1,116	242
Webster town	1,872	849	734	115
Wilmot town	1,358	659	564	95

Table 3.9 GCT-PL2. Population and Housing Occupancy Status: 2010
Housing Development Changes from NH OEP Merrimack County

Rockingham County

History

Covering the southeast corner of the state, Rockingham County contains all of the state's 18 miles of Atlantic Ocean coastline, the shortest coastline of any state in the US. The Piscataqua River and Portsmouth Harbor separate the county from Maine on a nine-mile stretch to the northeast, and it shares a 56-mile border to Massachusetts on the southern side. Rockingham was one of the five original counties established in 1769, and at one time covered Concord and all of the current Merrimack County towns east of the Merrimack River. It was named for Charles Watson-Wentworth Marquis of Rockingham. The seacoast town of Rye was one of the first places to be settled in New Hampshire. Rockingham County contains 694.7 square miles of land area and 100.4 square miles of inland water area. Based on the 2010 Census, the population density is 425.0 persons per square mile. Rockingham County includes one city, Portsmouth, and 36 towns. All the communities within the county of Rockingham are listed on the map located on this page.



Population Trends

Rockingham County was the location of the first settlement and seat of government for the young State of New Hampshire. The county had the largest population from the first Census in 1783 through 1840. After 160 years of modest growth, the county saw a population explosion between 1950 and 1990. Population increased over 40% each decade from 1950 to 1970, the population increased 37% from 1970 to 1980, and 29% from 1980 to 1990. The rate of growth has since slowed; only increasing by 12.8% from 1990 to 2000 and 6.4% from 2000 to 2010 adding 17,864 residents.

Rockingham County Housing Development Changes by Jurisdiction

Geographic Area	Total population	Housing units		
		Total	Occupied	Vacant
Atkinson town	6,751	2,788	2,666	122
Auburn town	4,953	1,814	1,765	49
Brentwood town	4,486	1,350	1,319	31
Candia town	3,909	1,494	1,450	44
Chester town	4,768	1,596	1,534	62
Danville town	4,387	1,684	1,569	115
Deerfield town	4,280	1,743	1,537	206
Derry town	33,109	13,277	12,537	740
East Kingston town	2,357	907	862	45
Epping town	6,411	2,723	2,466	257
Exeter town	14,306	6,496	6,114	382
Fremont town	4,283	1,573	1,508	65
Greenland town	3,549	1,443	1,372	71
Hampstead town	8,523	3,727	3,396	331
Hampton town	15,430	9,921	6,868	3,053
Hampton Falls town	2,236	900	834	66
Kensington town	2,124	806	761	45
Kingston town	6,025	2,480	2,288	192
Londonderry town	24,129	8,771	8,438	333
New Castle town	968	537	449	88
Newfields town	1,680	591	575	16
Newington town	753	322	292	30
Newmarket town	8,936	4,139	3,857	282
Newton town	4,603	1,751	1,667	84
North Hampton town	4,301	1,914	1,760	154
Northwood town	4,241	2,129	1,605	524
Nottingham town	4,785	1,986	1,734	252
Plaistow town	7,609	3,016	2,911	105
Portsmouth city	20,779	10,625	10,014	611
Raymond town	10,138	4,254	3,925	329
Rye town	5,298	2,852	2,252	600
Salem town	28,776	11,810	11,145	665
Sandown town	5,986	2,214	2,072	142
Seabrook town	8,693	4,544	3,706	838
South Hampton town	814	504	315	189
Stratham town	7,255	2,864	2,746	118
Windham town	13,592	5,164	4,724	440

Table 3.10 GCT-PL2. Population and Housing Occupancy Status: 2010
Housing Development Changes from NH OEP Rockingham County

Strafford County

History

Strafford County is located on the eastern border of the state. A 45-mile stretch of the Salmon Falls River, pouring into the Piscataqua River, separates the county from Maine. It is the only county with three cities—Rochester, Dover, and Somersworth. It was one of the five original counties established in 1769, once encompassing all of what is now Belknap County and the portion of what is now Carroll County not in the White Mountain National Forest. The county was named for the Earl of Strafford, a title held by the Wentworth family in England, who were prominent in New Hampshire politics in colonial days. Dover, along with Rye, was one of the first places to be settled in New Hampshire. Strafford County contains 369.0 square miles of land area, the smallest among the counties, and 15.0 square miles of inland water area. Based on the 2010 Census population, the population density is 333.7 persons per square mile. Strafford County includes three cities, and ten towns. All the communities within the county of Strafford are listed on the map located on this page.



Population Trends

Though it is the smallest in land area, Strafford County is the third largest in population density. As the site of one of the State's first settlements, population in this county grew fairly quickly until the Civil War. The population did not increase by more than 20% until the 1970-1980 time periods. Between 1980 and 1990 the county's population grew by 22 percent, then growth slowed again, increasing by 7.7 percent between 1990 and 2000. Between 2000 and 2010, the rate of growth was 9.7 percent, adding 10,910 residents. Strafford County, where the University of New Hampshire is located, ranks as the state's youngest county, with a median age of 36.9, 2.4 years younger than the next oldest, Hillsborough County.

Strafford County Housing Development Changes by Jurisdiction

Geographic Area	Total population	Housing units		
		Total	Occupied	Vacant
Barrington town	8,576	3,661	3,229	432
Dover city	29,987	13,685	12,827	858
Durham town	14,638	3,092	2,960	132
Farmington town	6,786	2,832	2,592	240
Lee town	4,330	1,765	1,661	104
Madbury town	1,771	653	626	27
Middleton town	1,783	851	661	190
Milton town	4,598	2,181	1,800	381
New Durham town	2,638	1,523	1,014	509
Rochester city	29,752	13,372	12,378	994
Rollinsford town	2,527	1,099	1,032	67
Somersworth city	11,766	5,199	4,862	337
Strafford town	3,991	1,784	1,458	326

Table 3.11 GCT-PL2. Population and Housing Occupancy Status: 2010
Housing Development Changes from NH OEP Strafford County

Sullivan County

History

Sullivan County is located on the western border of the state, south of center. It borders Vermont to the west with a 36-mile stretch of the Connecticut River. Sullivan County came into existence in 1827, made up of communities taken from Cheshire County. The county's name was in honor of General John Sullivan, a Revolutionary War hero and author of New Hampshire's motto: "Live Free or Die." General Sullivan served as a member of the Continental Congress, Adjutant General to George Washington, and Major General of the Northern Army. He was elected "President" of New Hampshire in 1786. The town of Sullivan, in Cheshire County was named for him in 1787. Sullivan County contains 537.3 square miles of land area and 14.7 square miles of inland water area. Based on the 2010 Census, the population density is 81.4 persons per square mile. Sullivan County includes one city, Claremont, and 14 towns. All the communities within the county of Sullivan are listed on the map located on this page. There is one community within the county that does not have a local hazard mitigation plan.



Population Trends:

Sullivan County is moderately small in both square miles and population, and holds the third-lowest population density among the counties. The county has not experienced any dramatic increases or decreases in population as other counties have. Decennial population growth was above ten percent only three times in Sullivan County history:



1930, 1970, and 1980. Since 1950, the population has grown well below the statewide average rate. Between 2000 and 2010, the rate of growth only increased by 8.1 percent, adding 3,284 residents.

*Lake Sunapee, Sunapee
NH –WMUR ULocal*

Sullivan County Housing Development Changes by Jurisdiction

Geographic Area	Total population	Housing units		
		Total	Occupied	Vacant
Acworth town	891	556	380	176
Charlestown town	5,114	2,263	2,117	146
Claremont city	13,355	6,293	5,697	596
Cornish town	1,640	747	687	60
Croydon town	764	396	324	72
Goshen town	810	444	344	100
Grantham town	2,985	1,773	1,249	524
Langdon town	688	306	282	24
Lempster town	1,154	679	479	200
Newport town	6,507	2,938	2,629	309
Plainfield town	2,364	984	923	61
Springfield town	1,311	702	512	190
Sunapee town	3,365	2,431	1,443	988
Unity town	1,671	736	601	135
Washington town	1,123	1,093	459	634

Table 3.12 GCT-PL2. Population and Housing Occupancy Status: 2010
Housing Development Changes from NH OEP Sullivan County

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Chapter IV

Risk Assessment

General Description

Risk assessment is the process of measuring the potential loss of life, personal injury, economic injury, and property damage resulting from various hazards by assessing the vulnerability of people, buildings and infrastructure. According to the *State and Local Mitigation Planning How-to-Guide* published by FEMA, risk assessment answers the fundamental question that fuels the hazard mitigation planning process: *What would happen if a hazard event occurred in your community or state?*

Risk assessment provides the foundation for the rest of the mitigation planning process. The risk assessment process focuses attention on areas that are most in need by evaluating which populations and facilities are most vulnerable to the hazards and to what extent injuries and damages may occur. A complete risk assessment will reflect the following:

- Hazards which the State is susceptible to.
- What these hazards can do to assets (physical, social and economic)
- Which areas are most vulnerable from these hazards
- The result in cost of damages or the costs avoided through future mitigation projects.

This chapter provides an updated risk assessment for both the State and local level. The State experienced little change in development or growth over the period of 2010 to 2013. While the State experienced seven Presidential declared disasters and numerous storm events during this time frame,, there still has not been a dramatic change with the development or growth overall in the State. Local Hazard Mitigation Plans were able to provide invaluable information. The information that was pulled from these plans includes hazard impacts as well as demographic statistics. These plans, as well as surveys conducted with Survey Monkey to facilitate public input, allowed the committee to determine what the local communities and the public viewed as the biggest hazards to their respective communities.

Counties within the State have varied in their growth and development since 2000. Table 4.1 reflects those changes. Strafford County had the most significant development with a 9.7% increase and Coös County with only a 0.1% increase. The table on page 94 displays Merrimack, Hillsborough and Cheshire as the counties with the most declared disasters. Although Hillsborough is the most populated county in the state, there are six counties that have experienced a greater increase in population during this same period; therefore population trends do not correlate with an increase in disasters.

County	2000	2010	Numeric Changes	Percent
Belknap	56,325	60,088	3,763	6.68%
Carroll	43,608	47,698	4,090	9.4%
Cheshire	73,825	77,117	3,292	4.5%
Coos	32,936	32,961	25	.1%
Grafton	81,740	89,118	7,378	9.0%
Hillsborough	380,841	400,721	19,880	5.2%
Merrimack	136,225	146,445	10,220	7.5%
Rockingham	277,359	295,223	17,864	6.4%
Strafford	112,233	123,143	10,910	9.7%
Sullivan	40,458	43,742	3,284	8.1%

Table 4.1

*Population of NH Towns and Counties 1960-2010, March 31, 2011
<http://www.nh.gov/oep/programs/DataCenter/2010Census/index.htm>*

Review of Potential Loss at Local Level

Homeland Security and Emergency Management (HSEM) provided a grant to the University of New Hampshire (UNH) to conduct an Essential Facilities Survey for every county in the State. UNH assembled a team to inspect, structurally evaluate and photograph essential facilities identified in the HAZUS 99 program. A full report for all facilities is available from HSEM and has been provided to the Regional Planning Commissions to be added to local hazard mitigation plans. Based upon the information in the UNH project, the table below summarizes the potential loss of essential facilities by county. UNH is currently in process of updating all data by working with HSEM, local communities and their respective governments, as well as other available open source local data for specific critical infrastructure and key resources (CIKR) of concern. This statewide update was 80% complete at time of this plans submittal and will be incorporated into the 2016 plan update. Table 4.2 on the following page contains information from the previous essential facilities analysis due to no new data available at time of plan. CIKR specifics are not included in this plan pursuant to provisions of New Hampshire RSA 91-A.

Local Essential Facilities – Potential Loss Analysis			
County	Building Replacement Cost	Content Value	Total
Belknap	\$40,645	\$73,895	\$114,540
Carroll	\$34,819	\$32,860	\$67,679
Cheshire	\$294,050	\$31,341	\$325,391
Coos	\$69,323,840	\$58,358,000	\$127,681,840
Grafton	\$376,777	\$267,599	\$644,376
Hillsborough	\$25,559,435	\$2,444,275	\$28,003,710
Merrimack	\$159,761,096	\$1,543,587	\$161,304,683
Rockingham	\$413,798	\$291,811	\$705,609
Strafford	\$194,348	\$133,933	\$328,281
Sullivan	\$22,336	\$15,595	\$37,931
TOTAL	\$256,021,144	\$63,192,896	\$319,214,040

Table 4.2

Summary of Potential Loss at Local Level:

- As shown from the above table 4.2; if the loss to the essential facilities and their contents were to occur, the total damage it would cost over \$300 million.
- Carroll and Sullivan Counties have the lowest estimated potential loss to their essential facilities.
- Hillsborough County has the highest total potential loss value. A contributing factor to this amount is that Hillsborough has the second highest number of communities in the State (31). Coös and Merrimack Counties also have a noticeably higher potential loss value due to the many regional services these counties provide. It is important to note that there are quite a few larger municipalities not included in this study (i.e. Manchester, Plymouth, Laconia, Hampton, etc.), that (as noted below) may skew the data, resulting in a lower potential loss for the other counties.

Summary of Risk by County

After a review of the 2010 State Hazard Mitigation Plan the SHMPC and members of the public identified the counties most vulnerable to each hazard identified below. Members of the community were able to provide their input via Survey Monkey as well as information retrieved from local hazard mitigation plans. The counties that are no longer identified as being most vulnerable have been removed.

Hazard	Counties Most Vulnerable
Flooding	All
Costal Flooding	Rockingham, Strafford
Dam Failure	All
Drought	Merrimack, Rockingham
Wildfire	Coos, Grafton, Carroll
Earthquake	All
Landslide	Carroll, Coos, Grafton
Radon	All
Tornado/Downburst	Merrimack, Hillsborough, Rockingham
Hurricane	Rockingham, Strafford
Lightning	All
Severe Winter Weather	All
Snow Avalanche	Carroll, Coos
Epidemic	All
Fire and Hazardous Materials	Merrimack, Hillsborough, Rockingham, Strafford
Terrorism	Hillsborough, Merrimack, Rockingham, Strafford

Table 4.3

The following pages provide a summary of potential natural hazards by county; as declarations are based on county thresholds. The SHMPC reviewed the 2010 Plan as well as many local hazard mitigation plans and updated the State plan as needed. The human-caused hazards that can affect New Hampshire are identified in Chapter II. State owned Critical Infrastructure and Key Resources that are vulnerable to these hazards are identified by County.

The following tables summarize the value of State owned real property per county as obtained from the State Owned Real Property Supplement from the Fiscal Year 2012 Annual Financial Report for the State of New Hampshire. Changes to the value of State owned property are reflected within this chapter. Every county within the State of New Hampshire has identified essential critical facilities owned by local communities and the State. All community-owned critical facilities are addressed within the Local Hazard Mitigation Plans. This Plan focuses on State owned essential critical facilities. For the purpose of this plan, the SHMPC felt the focus should stay with the departments listed below.

- Adjutant General
- Administrative Services
- Department of Agriculture
- Department of Safety
- Employment Security
- Historical Resources
- Department of Resource and Economic Development
- Youth Development Services
- NH Veterans Home
- Environmental Services
- Water Resources Council
- Department of Corrections
- Fish and Game
- Department of Transportation

BELKNAP COUNTY RISK ANALYSIS

Flooding: Belknap County lies in the upper-central portion of the Merrimack River Watershed. Flooding is experienced along the Pemigewasset River on the county's eastern border and within the Lake Winnipesaukee basin, Winnipesaukee River, and connecting lakes. The Winnipesaukee River drains Lake Winnipesaukee, as it is passing through the heart of downtown Laconia through Lake Winnisquam, Silver Lake in Tilton, bifurcating Tilton and Northfield and emptying into the Merrimack River.

Effects of "Shove Ice" from lake-forming ice are more a threat to property in this county than the effects of River Ice per se. The large lakes in the area form ice seasonally which may impact docks, wharfs, boathouses, nearby roads, bridges, culverts, and other infrastructure.

Drought: Belknap County was impacted by the 'Drought Event of the 1960's', as was the rest of the State. The county hosts significant agricultural and livestock assets that are negatively impacted by such events. At the time of the preparation of this Plan, the State has located no specific data as to the losses from drought events for this county.

Wildfire: Significant debris still remains in the county forests from the 2008 ice storm. All the data for this hazard is presented in Chapter II of this Plan.

Earthquake: New Hampshire lies in a zone of moderate seismic vulnerability generally. The county is in an area of particularly high seismicity that is evident in a crescent of historical events beginning in the Ossipee Range and following the general contour of the Merrimack River Valley

Landslide: At the time of the submission of this Plan, the State was unable to locate any county specific data with respect to this hazard type

Radon: NH State Legislature abolished the NH Radon Program in 2011. From available data, it would appear that Radon is a moderate risk in this county

Tornadic Activity: Belknap County has experienced one known F2 event since July 3, 1972. The compilation of data from www.tornadoproject.com lists a total of seven tornadic events (all F1 events) from June 24, 1960 to June 25, 2012. Since the 2010 plan there has been one tornado; which occurred on June 25, 2012

Hurricane: Belknap County has experienced high winds from some hurricane events, but is at a more significant risk to flooding from the associated rainfall from hurricanes. Since 2010, the county recently experienced Tropical Storm Irene in August 2011.

Downburst: At the time of the submission of this Plan, the town of Tilton experienced a microburst with winds up to 80 MPH, on July 4th, 2012.

Lightning: At the time of the submission of this Plan, three people were injured by lightning when it stuck the ground next to where they were standing in the City of Laconia.

Severe Winter Weather: Belknap County is viewed to be vulnerable to severe winter weather. At the time of the submission of this Plan, the State was unable to locate any county specific data with respect to this hazard type.

Ice Storm: Significant debris remains in the forests from the 2008 ice storm. During the recent 1998 Ice Storm, the only failure of a communications tower was in Belknap County. At the time of the submission of this Plan, the editor was unable to locate any county specific data with respect to this hazard type.

Avalanche: Belknap County has a low risk for avalanche hazards.

For a detailed list of participating jurisdictions in Belknap County whose hazard vulnerabilities have been reviewed by the state, see table on page 101.

Belknap County State Owned Real Property		
Function	Total Value of Land & Buildings	Acres
Adjutant General	No Data	No Data
Admin Services	\$16,023,842.00	278.20
Department of Agriculture	\$108,941.00 (land only)	50.83
Department of Safety	\$1,820,100.00	8.13
Employment Security	\$475,020.00	1.13
Historical Resource	No Data	No Data
Department Resource & Economic Dev.	\$1,833,794.00	3993.40
Youth Development Services	No Data	No Data
NH Veterans Home	\$30,614,422.00	30.75
Environmental Services	\$498,341.00	4.15
Water Resources Council	\$1,619,437.00	22.27
Department of Corrections	No Data	278.20
Fish and Game	\$5,660,433	4,380.33
Department of Transportation	\$2,369,470	98.04
TOTAL:	\$61,023,800.00	9145.43

Table 4.4

State of NH State Owned Real Property Supplemental Financial Data to the Comprehensive Annual Financial Report
06/30/2011

CARROLL COUNTY RISK ANALYSIS

Flooding: In the southern area of Carroll County is Lake Winnipesaukee, which feeds the Merrimack River watershed. The remainder of the county includes the Saco River Watershed. Extremely large amounts of rainfall have been recorded in the mountainous areas of the county that contributes to the “flashy” nature of the flooding in the Saco and its tributaries

Effects of “Shove Ice” from lake-forming ice are a threat to property in the Southern part of this county. The large lakes in the area form ice seasonally which may impact docks, wharfs, boathouses and nearby roads, bridges, culverts and other infrastructure. The Rivers to the north are vulnerable to River Ice conditions. Erosion accelerated by the destabilizing effects on riverbanks is a significant issue all along the Saco River as well as many other State Rivers.

Drought: Carroll County was impacted by the drought events of 1960 and 2000-2002. The County hosts significant agricultural and livestock assets that are negatively impacted by such events. At the time of the preparation of this Plan, the State has located no new data as to the losses from drought events specific for this county.

Wildfire: Significant debris still remains in the forests from the 2008 ice storm. Aside from the data presented in Chapter II. The State was unable to locate any new county specific data with respect to this hazard type.

Earthquake: New Hampshire lies in a zone of moderate seismic vulnerability. The county is in an area of particularly high seismicity that is evident in a crescent of historical events beginning in the Ossipee Range and following the general contour of the Merrimack River Valley

Landslide: At the time of the submission of this Plan, the State was unable to locate any county specific data with respect to this hazard type.

Radon: NH State Legislature abolished the NH Radon Program in 2011. From available data, it would appear that Radon is a relatively high risk in this county.

Tornadic Activity: This County has experienced one known F2 event on July 18, 1963. The data from www.tornadoproject.com lists a total of nine tornadic events (all F1 or less events) from July 18, 1963 to August 7, 1986. There has been no additional tornadic activity since the 2010 Plan.

Hurricane: The County has experienced high winds from some hurricane events but is at a more significant risk to flooding from the associated rainfall from hurricanes. Since 2010, the county recently experienced Tropical Storm Irene in August 2011.

Downburst: At the time of the submission of this Plan, the State was unable to locate any county specific data with respect to this hazard type.

Lightning: At the time of the submission of this Plan, the State was unable to locate any county specific data with respect to this hazard type.

Severe Winter Weather: Carroll County is viewed to be vulnerable to severe winter weather. At the time of the submission of this Plan, the State was unable to locate any new county specific data with respect to this hazard type.

Ice Storm: Significant debris still remains in the forests from the 2008 ice storm event. At the time of the submission of this Plan, the State was unable to locate any new county specific data with respect to this hazard type.

Avalanche: This County has a moderate risk to avalanche due to the presence of slopes ranging from 25 to 50 degrees.

For a detailed list of participating jurisdictions in Carroll County whose hazard vulnerabilities have been reviewed by the state, see table on page 103.

Carroll County State Owned Real Property		
Function	Total Value of Land & Buildings	Acres
Adjutant General	No Data	No Data
Admin Services	\$5,373,722.00	6.35
Department of Agriculture	No Data	No Data
Department of Safety	\$513,128.00	10.00
Employment Security	\$693,000.00	2.16
Historical Resource	No Data	No Data
Department Resource & Economic Dev.	\$8,380,295.00	22797.40
Youth Development Services	No Data	No Data
NH Veterans Home	No Data	No Data
Environmental Services	\$559,012.00	6.14
Water Resources Council	\$1,671,600.00	23.70
Department of Corrections	No Data	No Data
Fish and Game	\$1,317,632.00	1,781.97
Department of Transportation	\$6,869,070.00	103.27
TOTAL:	\$25,377,459.00	1,885.24

Table 4.5

State of NH State Owned Real Property Supplemental Financial Data to the Comprehensive Annual Financial Report
06/30/2011

CHESTERFIELD RISK ANALYSIS

Flooding: Cheshire County is located in the southwestern corner of the State, and is bounded by the Connecticut River to the West. The City of Keene lies in the center of the county and encompasses a significant area of the floodplain of the upper Ashuelot River. The Ashuelot River also contributes to flooding in the towns of Winchester and Hinsdale.

River Ice related flooding along the Connecticut River is a periodic issue in Chesterfield among other towns. Erosion accelerated by the destabilizing effects on riverbanks is a significant issue all along the Connecticut River as well as other state rivers. Additionally, River Ice may directly impact docks, wharfs, boathouses, nearby roads, bridges, culverts and other infrastructure.

Drought: Cheshire County was impacted by the Drought event of the 1960's, as was the rest of the State. The county hosts significant agricultural and livestock assets that are negatively impacted by such events. At the time of the preparation of this Plan, the State has located no new specific data as to the losses from Drought events for this county.

Wildfire: Significant debris still remains in the forests from the 2008 ice storm. Aside from the data presented in Chapter II, the State was unable to locate any new county specific data with respect to this hazard type.

Earthquake: New Hampshire lies in a zone of Moderate seismic vulnerability. At the time of the preparation of this Plan, the State has located no new specific data of losses from earthquake events for this county.

Landslide: At the time of the submission of this Plan, the State was unable to locate any new county specific data with respect to this hazard type. Some land formations along the Connecticut River are generally considered to be conducive to landslide activity.

Radon: NH State Legislature abolished the NH Radon Program in 2011. From available data, it would appear that Radon is a moderate risk in this county.

Tornadic Activity: Risk of tornadoes is considered to be high in Cheshire County. It has experienced five known F2 events in the past. The compilation of data from www.tornadoproject.com lists a total of fourteen tornadic events (all additional are F1 or less events) from August 27, 1959 to July 3rd, 1997. There has been no additional tornadic activity since the 2010 Plan.

Hurricane: Cheshire County has experienced high winds from some hurricane events but is at a more significant risk to flooding from the associated hurricane rainfall. The 1938 event devastated this county because it received a direct hit.

Downburst: At the time of the submission of this Plan, the State was unable to locate any new county specific data with respect to this hazard type.

Lightning: At the time of the submission of this Plan, the State was unable to locate any new county specific data with respect to this hazard type

Severe Winter Weather: Cheshire County is viewed to be vulnerable to severe winter weather. At the time of the submission of this Plan, the State was unable to locate any new county specific data with respect to this hazard type.

Ice Storm: Significant debris still remains in the forests from the 2008 event. At the time of the submission of this Plan, the State was unable to locate any new county specific data with respect to this hazard type

Avalanche: This County has a low risk for avalanche hazards

For a detailed list of participating jurisdictions in Cheshire County whose hazard vulnerabilities have been reviewed by the state, see table on page 105.

Cheshire County State Owned Real Property		
Function	Total Value of Land & Buildings	Acres
Adjutant General	\$1,531,873.00	6.50
Admin Services	66,500.00	6.35
Department of Agriculture	\$2,246,650.00 (land only)	913.33
Department of Safety	\$632,776.00	11.44
Employment Security	No Data	No Data
Historical Resource	No Data	No Data
Department Resource & Economic Dev.	\$8,058,732.00	22,672.90
Youth Development Services	No Data	No Data
NH Veterans Home	No Data	No Data
Environmental Services	\$290,515.00	11.00
Water Resources Council	\$1,223,662.00	134.71
Department of Corrections	No Data	No Data
Fish and Game	\$1,059,528.00	367.29
Department of Transportation	\$3,614,526.00	37.75
TOTAL:	\$18,724,462.00	405.04

Table 4.6

State of NH State Owned Real Property Supplemental Financial Data to the Comprehensive Annual Financial Report
06/30/2011

COÖS COUNTY RISK ANALYSIS

Flooding: Coös County is divided with the Connecticut River watershed to the West and the Androscoggin River watershed to the East. The Connecticut River borders the county from its southwestern-most tip to the Canadian Border (near Stewartstown), where it is then bordered by the forests of the Province of Quebec, which also borders it to the North. The western side of the county is bordered by the forests of Maine. The White Mountains to the South receive considerable amounts of rainfall and the snowpack which forms in both the high and mid elevations may present a significant seasonal flood hazard. The weather patterns north of the White Mountains may vary considerably from the rest of the State and this has led to significant losses from flooding which have gone “undeclared” as they were not in synchronicity with the declared losses in the southern areas of the State.

Flooding from River Ice is a significant issue throughout this county and the effects of flooding as well as the direct impact on structures have been recorded in Lancaster; from the Israel River, and Gorham; with the Androscoggin, Moose and Peabody Rivers among other areas. Erosion accelerated by the destabilizing effects on riverbanks is a significant issue.

Drought: Coös County was impacted by the drought event of the 1960's, as was the rest of the State. The county hosts significant agricultural and livestock assets that are negatively impacted by such events. At the time of the preparation of this Plan, the State has located no new specific data as to the losses from drought events for this county.

Wildfire: Significant debris still remains in the forests from the 2008 ice storm. Aside from the data presented in Chapter II, the State was unable to locate any new county specific data with respect to this hazard type. Given the heavy forest cover countywide, this hazard type is of particular concern during dry periods.

Earthquake: New Hampshire lies in a zone of moderate seismic vulnerability. Areas to the north of the county lie close to the St. Lawrence River Valley and areas of very significant seismicity. Toward the southeastern portion of the county is the Ossipee Range, the center of the highest seismicity within the boundary of the State.

Landslide: Indications are that the land formations throughout large areas of this county predispose some areas to this hazard type. At the time of the submission of this Plan, however, the State was unable to locate any new county specific data with respect to this hazard type.

Radon: NH State Legislature abolished the NH Radon program in 2011. From available data, it would appear that Radon is a moderate risk in this county.

Tornadic Activity: The County has experienced one known F2 event in the recent past (May 5, 1929). The data from www.tornadoproject.com lists a total of five tornadic events (all additional are F1 or less events) from July 9, 1956 to July 2, 1994. There have been two additional tornados since the 2010 plan; one on August 21, 2011 (F1) and the other on July 17, 2012 (F0).

Hurricane: Coös County has experienced high winds from some hurricane events but is at a more significant risk to flooding from the associated hurricane rainfall. Since 2010, the county recently experienced Tropical Storm Irene in August 2011.

Downburst: At the time of the submission of this Plan, the State was unable to locate any new county specific data with respect to this hazard type.

Lightning: At the time of the submission of this Plan, the State was unable to locate any new county specific data with respect to this hazard type.

Severe Winter Weather: Coös County is viewed to be vulnerable to severe winter weather. At the time of the submission of this Plan, the State was unable to locate any new county specific data with respect to this hazard type.

Ice Storm: Significant debris still remains in the forests from the 2008 ice storm event. At the time of the submission of this Plan, the State was unable to locate any new county specific data with respect to this hazard type.

Avalanche: This County has the highest risk for avalanche hazards due to heavy snowfall amounts and slopes ranging from 25 to 50 degrees.

For a detailed list of participating jurisdictions in Coos County whose hazard vulnerabilities have been reviewed by the state, see table on page 107-108.

Coös County State Owned Real Property		
Function	Total Value of Land & Buildings	Acres
Adjutant General	\$3,421,528.00	6.00
Admin Services	\$4,299,835.00	5.75
Department of Agriculture	\$1,280,800.00 (land only)	2,348.30
Department of Safety	\$413,462.00	4.40
Employment Security	\$596,000.00	.75
Historical Resource	\$47,800.00	7.50
Department Resource & Economic Dev.	\$45,947,248.00	240,009.10
Youth Development Services	No Data	No Data
NH Veterans Home	No Data	No Data
Environmental Services	\$106,446.00	.02
Water Resources Council	\$2,689,937.00	6,438.00
Department of Corrections	\$31,063,999	113.60
Fish and Game	\$12,715,623.00	31,049.82
Department of Transportation	\$3,596,337.00	84.27
TOTAL:	\$106,178,915.00	37,685.71

Table 4.7

State of NH State Owned Real Property Supplemental Financial Data to the Comprehensive Annual Financial Report
06/30/2011

GRAFTON COUNTY RISK ANALYSIS

Flooding: Grafton County is bordered to the West and North by the Connecticut River, to the Northwest by the White Mountains and to the South by Sullivan and Belknap counties. Communities along the Connecticut River experience periodic flooding and the snowpack and rainfall captured by the White Mountains contributes to flash flood conditions along the Pemigewasset (Pemi), the Ammonoosuc and their tributaries. The Pemi, Baker, Beebe, Mad and other rivers that drain into the White Mountains are well known to be extremely “flashy.” Grafton has been hit hard with flooding since 2010, and has been involved with 2 of the 4 presidentially declared disasters.

River Ice related flooding along the Connecticut is a periodic issue in Lebanon, Littleton and several of the smaller communities along the river. Erosion accelerated by the destabilizing effects on riverbanks is a significant issue all along the Connecticut River and other state rivers. Additionally, River Ice may directly impact docks, wharfs, boathouses nearby roads, bridges, culverts and other infrastructure. River Ice is an issue for the Town of Plymouth, which lies at the confluence of the Pemi and Baker Rivers.

Drought: Grafton County was impacted by the ‘Drought event of the 1960’s’, as was the rest of the State. The county hosts significant agricultural and livestock assets that are negatively impacted by such events. At the time of the preparation of this Plan, the State has located no new specific data as to the losses from drought events for this county.

Wildfire: Significant debris still remains in the forests from the 2008 ice storm event. Aside from the data presented in Chapter II of this Plan, the State was unable to locate any new county specific data with respect to this hazard type. Given the heavy forest cover countywide, this hazard type is of particular concern during dry periods.

Earthquake: New Hampshire generally lies in a zone of Moderate seismic vulnerability. At the time of the preparation of this Plan, the State has located no new specific data as to the losses from earthquake events for this county.

Landslide: At the time of the submission of this Plan, the State was unable to locate any county specific data with respect to this hazard type. Some land formations along the Connecticut River are generally considered to be conducive to landslide activity

Radon: NH State Legislature abolished the NH Radon Program in 2011. From available data, it would appear that Radon is a moderate risk in this county.

Tornadic Activity: Grafton County has experienced two known F2 events in the past. The compilation of data from www.tornadoproject.com lists a total of 8 tornadic events (six additional are F1 or less events) from July 14, 1963 to June 11, 1973. There have been two events since the 2010 plan; one on August 21, 2011 (F1) and the other on July 17, 2012 (F0).

Hurricane: Grafton County has experienced high winds from some hurricane events but is at a more significant risk to flooding from the associated hurricane rainfall. August 2011 Tropical Storm Irene had a significant flooding impact on Grafton County.

Downburst: At the time of the submission of this Plan, the state was unable to locate any new county specific data with respect to this hazard type.

Lightning: At the time of the submission of this Plan, the state was unable to locate any new county specific data with respect to this hazard type

Severe Winter Weather: Grafton County is viewed to be vulnerable to severe winter weather. At the time of the submission of this Plan, the editor was unable to locate any new county specific data with respect to this hazard type.

Ice Storm: Significant debris still remains in the forests from the 2008 ice storm event. At the time of the submission of this Plan, the editor was unable to locate any new county specific data with respect to this hazard type.

Avalanche: This County has a low risk for avalanche hazards

For a detailed list of participating jurisdictions in Grafton County whose hazard vulnerabilities have been reviewed by the state, see table on page 110.

Grafton County State Owned Real Property		
Function	Total Value of Land & Buildings	Acres
Adjutant General	\$5,988,544.00	33.00
Admin Services	\$3,678,177.00	3.61
Department of Agriculture	\$2,799,977.00 (land only)	1,936.19
Department of Safety	No Data	No Data
Employment Security	No Data	No Data
Historical Resource	No Data	No Data
Department Resource & Economic Dev.	\$31,675,373.00	20,527.56
Youth Development Services	No Data	No Data
NH Veterans Home	No Data	No Data
Environmental Services	\$2,442,999.00	600.54
Water Resources Council	\$2,539,421.00	723.88
Department of Corrections	No Data	No Data
Fish and Game	\$7,768,219.00	8,656.72
Department of Transportation	\$6,640,834.00	347.10
TOTAL:	\$63,533,544.00	9,003.82

Table 4.8

State of NH State Owned Real Property Supplemental Financial Data to the Comprehensive Annual Financial Report
06/30/2011

HILLSBOROUGH COUNTY RISK ANALYSIS

Flooding: Hillsborough County, the most populated County in New Hampshire, it is bordered to the South by Massachusetts and also comprises much of the Southern and western Merrimack River Watershed. The Merrimack River flows through the eastern portion of this county through the heavily populated cities of Manchester, Merrimack and Nashua. Urban development and land use exacerbate storm water runoff issues in the eastern areas of the county while the western areas are moderately to heavy forested areas flooding in the western portions of the county periodically occurs along the Contoocook River from Peterborough to Hillsborough.

Flooding from River Ice is a less significant threat in this region than in other portions of the State but the communities in the western regions, principally along the Contoocook River, periodically experience this hazard.

Drought: Hillsborough County was impacted by the ‘Drought Event of the 1960’s’, as was the rest of the State. The county hosts significant agricultural and livestock assets that are negatively impacted by such events. At the time of the preparation of this Plan, the State has located no new specific data as to the losses from drought events for this county.

Wildfire: Significant debris still remains in the forests from the 2008 ice storm. Aside from the data presented in Chapter II of this Plan, the State was unable to locate any new county specific data with respect to this hazard. Given the heavy forest cover countywide, this hazard type is of particular concern during dry periods.

Earthquake: New Hampshire generally lies in a zone of moderate seismic vulnerability. Hillsborough County is in an area of particularly high seismicity that is evident in a crescent of historical events beginning in the Ossipee Range and following the general contour of the Merrimack River Valley.

Landslide: At the time of the submission of the Plan, the State was unable to locate any new county specific data with respect to this hazard type. Some land formations along the Merrimack River are generally considered to be conducive to landslide activity.

Radon: NH State Legislature abolished the NH Radon Program in 2011. From available data, it would appear that Radon is a moderate to high risk in this county.

Tornadic Activity: Risk of tornadoes is considered to be high in this county. Hillsborough County has experienced three known F2 events and one F3 event. The compilation of data from www.tornadoproject.com lists a total of eighteen tornadic events (all F1 or less events) from July 27, 1956 to June 16, 1986. There has been no additional tornadic activity since the 2010 plan.

Hurricane: Hillsborough County has experienced high winds from some hurricane events but is at a more significant risk to flooding from the associated rainfall from hurricanes. The 1938 hurricane devastated this county, because it received a direct hit.

Downburst: At the time of the submission of this Plan, the State was unable to locate any new county specific data with respect to this hazard type.

Lightning: At the time of the submission of this Plan, the Town of Goffstown has a lightning strike at their Babe Ruth League facility, and caused \$200,000 in damage.

Severe Winter Weather: Hillsborough County is viewed to be vulnerable to severe winter weather. The County of Hillsborough received a presidential declaration for an October Nor'easter that dropped heavy snow, caused wide spread power outages and debris.

Ice Storm: Significant debris still remains in the forests from the 2008 ice storm event. At the time of the submission of this Plan, the State was unable to locate any new county specific data with respect to this hazard type.

Avalanche: Hillsborough County has a low risk for avalanche hazards.

For a detailed list of participating jurisdictions in Hillsborough County whose hazard vulnerabilities have been reviewed by the state, see table on page 112.

Hillsborough County State Owned Real Property		
Function	Total Value of Land & Buildings	Acres
Adjutant General	\$10,464,305.00	32.20
Admin Services	\$32,885,423.00	5.32
Department of Agriculture	\$2,647,834.00 (land only)	557.28
Department of Safety	\$739,810.00	2.05
Employment Security	\$3,645,831.00	6.27
Historical Resource	No Data	No Data
Department Resource & Economic Dev.	\$4,425,353.00	7,030.60
Youth Development Services	\$36,348,601.00	145.79
NH Veterans Home	No Data	No Data
Environmental Services	\$3,908,800.00	747.69
Water Resources Council	\$2,453,009.00	265.91
Department of Corrections	\$2,052,314.00	.34
Fish and Game	\$2,659,142.00	2,985.87
Department of Transportation	\$11,657,739.00	258.36
TOTAL:	\$113,888,161.00	4,258.17

Table 4.9

State of NH State Owned Real Property Supplemental Financial Data to the Comprehensive Annual Financial Report
06/30/2011

MERRIMACK COUNTY RISK ANALYSIS

Flooding: Merrimack County, as its name reflects, lies almost exclusively in the Merrimack River Watershed. At the confluence of the Pemigewasset, the Winnipesaukee and the Merrimack Rivers, the Town of Franklin has seen such significant flooding that it is the site of a U.S. Army Corps of Engineers Flood Control Dam. Flash flooding along the Contoocook River and its tributaries is repetitive. Related flooding is experienced at the confluence of the Contoocook and Merrimack Rivers during peak events.

Flooding from River Ice is less significant a threat in this region than in other portions of the State, but the communities in the western part of the county, (principally along the Contoocook), experience this hazard periodically.

Drought: Merrimack County was impacted by the ‘Drought Event of the 1960’s’, as was the rest of the State. The county hosts significant agricultural and livestock assets, which are negatively impacted by such events. At the time of the preparation of this Plan, the State has located no new specific data as to the losses from Drought events for this county.

Wildfire: Significant debris still remains in the forests from the 2008 flooding event. Aside from the data presented in Chapter II of this Plan, the State was unable to locate any new county specific data with respect to this hazard type. Given the heavy forest cover countywide, this hazard type is of particular concern during dry periods.

Earthquake: New Hampshire generally lies in a zone of moderate seismic vulnerability. Merrimack County is in an area of particularly high seismicity that is evident in a crescent of historical events beginning in the Ossipee Range and following the general contour of the Merrimack River Valley. At the time of the submission of this plan, there was a small 1.2 earthquake felt in Concord in September 2012.

Landslide: At the time of the submission of this Plan, the State was unable to locate any new county specific data with respect to this hazard type. Some land formations along the Merrimack River are generally considered to be conducive to landslide activity.

Radon: NH State Legislature abolished the NH Radon Program in 2011. From available data, it would appear that Radon is a moderate risk in this county.

Tornadic Activity: Merrimack county has experienced three F1 events according to the compilation of data from www.tornadoproject.com) from July 12, 1967 to August 15, 1976. There has been no additional tornadic activity since the 2010 Plan.

Hurricane: Merrimack County has experienced high winds from some hurricane events but is at a more significant risk to flooding from the associated rainfall from hurricanes. August 2011 Tropical Storm Irene had a significant impact on Merrimack County.

Downburst: The Town of Bow experienced a microburst September 6, 2011 with winds exceeding 60 MPH.

Lightning: At the time of the submission of this Plan, the State was unable to locate any new county specific data with respect to this hazard type.

Severe Winter Weather: Merrimack County is viewed to be vulnerable to severe winter weather. At the time of the submission of this Plan, the State was unable to locate any new county specific data with respect to this hazard type.

Ice Storm: Significant debris still remains in the forests from the 2008 ice storm event. At the time of the submission of this Plan, the State was unable to locate any new county specific data with respect to this hazard type.

Avalanche: This County has a low risk for avalanche hazards.

For a detailed list of participating jurisdictions in Merrimack County whose hazard vulnerabilities have been reviewed by the state, see table on page 114.

Merrimack County State Owned Real Property		
Function	Total Value of Land & Buildings	Acres
Adjutant General	\$67,322,249.00	373.95
Admin Services	\$114,491,723.00	29.56
Department of Agriculture	\$2,077,011 (land only)	1,410.06
Department of Safety	\$42,489,266.00	21.20
Employment Security	\$2,392,545.00	2.68
Historical Resource	\$33,000.00	No Data
Department Resource & Economic Dev.	\$31,451,397.00	27,650.60
Youth Development Services	No Data	No Data
NH Veterans Home	No Data	No Data
Environmental Services	\$77,112,168.00	89.75
Water Resources Council	\$1,409,431.00	194.06
Department of Corrections	\$2,052,314.00	.34
Fish and Game	\$10,008,609.00	6,401.90
Department of Transportation	\$42,552,715.00	939.60
TOTAL:	\$393,392,428.00	7,625.65

Table 4.10

State of NH State Owned Real Property Supplemental Financial Data to the Comprehensive Annual Financial Report
06/30/2011

ROCKINGHAM COUNTY RISK ANALYSIS

Flooding: Rockingham County the second most heavily populated county, it is bordered to the South by Massachusetts. The county is divided between the southern portion of the Piscataqua and the southeastern Merrimack River Watersheds. The region is primarily low rolling hills and floodplain; consequently, inundation flooding is typical. The county also possesses the only direct seacoast in the State and is therefore positioned with exposure to coastal flooding damage from hurricanes, Nor'easters and possibly tsunami events.

Flooding from River Ice has not proven to be a significant hazard in this county in the recent past. At the time of the submission of this Plan, the State was unable to locate any county specific data with respect to this hazard type. Given the moderating effects on the seasonal temperatures from the Southern latitude and coastal exposure, the county is viewed as having a limited risk from this hazard type.

Drought: The County was impacted by the 'Drought Event of the 1960's', as was the rest of the State. The county hosts significant agricultural and livestock assets, which are negatively impacted by such events. At the time of the preparation of this Plan, the State has located no new specific data as to the losses from drought events for this county.

Wildfire: Significant debris remains in the forests from the 2008 Ice Storm. Given the salt marsh environments in the county, wildland fire hazards related to Phragmites Australis along the coast are viewed as significant. At the submission of this plan the State was unable to locate any new county specific data with respect to this hazard type.

Earthquake: New Hampshire generally lies in a zone of Moderate seismic vulnerability. Rockingham County is in an area of particularly high seismicity that is evident in a crescent of historical events beginning in the Ossipee Range and following the general contour of the Merrimack River Valley. Additionally, it is believed that the largest earthquake of record in New England was the 1755 "Cape Ann" event, just offshore of the New Hampshire coast. At the submission of this plan the State was unable to locate any new county specific data with respect to this hazard type.

Landslide: This County, due to its low elevation is not prone to landslide hazards.

Radon: NH State Legislature abolished the NH Radon Program in 2011. From available data, it would appear that Radon is a moderate to high risk in this county.

Tornadic Activity: Risk of tornadoes is considered to be high in this county. The county has experienced four known F2 events and one F3 event in the past. The compilation of data from www.tornadoproject.com lists a total of five additional tornadic events (all additional are F1 or less events) from July 31, 1954 to July 24, 2008. There has been no additional tornadic activity since 2010 Plan.

Hurricane: Rockingham County has experienced high winds from some hurricane events and is positioned to experience storm surge related flooding, beach erosion and

significant wind damage from these events. At the submission of this plan the State was unable to locate any new county specific data with respect to this hazard type.

Downburst: As recorded in Chapter II of this document, the community of Stratham received a presidential declaration from downburst activity. As with tornadoes, this is perceived to be a significant hazard in Rockingham County. At the submission of this plan the State was unable to locate any new county specific data with respect to this hazard type.

Lightning: At the time of the submission of this Plan, the State was unable to locate any new county specific data with respect to this hazard type.

Severe Winter Weather: Rockingham County is viewed to be vulnerable to severe winter weather. At the time of the submission of this Plan, the county received a presidential declaration for an October Nor'easter that dropped heavy snow, caused wide spread power outages and debris.

Ice Storm: Significant debris still remains in the forests from the 2008 ice storm event. At the time of the submission of this Plan, the State was unable to locate any new county specific data with respect to this hazard type.

Avalanche: Rockingham County has no risk for avalanche hazards.

For a detailed list of participating jurisdictions in Rockingham County whose hazard vulnerabilities have been reviewed by the state, see table on page 116.

Rockingham County State Owned Real Property		
Function	Total Value of Land & Buildings	Acres
Adjutant General	\$1,338,520.00	5.33
Admin Services	\$12,050,733.00	23.61
Department of Agriculture	\$667,889.00 (land only)	223.07
Department of Safety	\$530,306.00	5.95
Employment Security	\$2,082,000.00	4.54
Historical Resource	No Data	No Data
Department Resource & Economic Dev.	\$17,695,353.00	9,949.08
Youth Development Services	No Data	No Data
NH Veterans Home	No Data	No Data
Environmental Services	\$1,132,100.00	80.59
Water Resources Council	\$168,183.00	No Data
Department of Corrections	No Data	No Data
Fish and Game	\$29,539,731.00	4,377.95
Department of Transportation	\$10,547,786.00	461.07
TOTAL:	\$75,752,601.00	4,839.02

Table 4.11

State of NH State Owned Real Property Supplemental Financial Data to the Comprehensive Annual Financial Report
06/30/2011

STRAFFORD COUNTY RISK ANALYSIS

Flooding: Bordered to the North and West by the Salmon Falls and Piscataqua Rivers, Strafford County lies primarily in the Piscataqua River Watershed. The region is primarily low rolling hills and floodplain, consequently, inundation flooding is typical. The county also possesses tidal river, estuarine and salt marsh environments. Therefore, these areas are positioned with exposure to coastal flooding damage from hurricane, nor'easters and possibly tsunami events.

Flooding from River Ice has not proven to be a significant hazard in this county in the recent past. At the time of the submission of this Plan, the State was unable to locate any county specific data with respect to this hazard type. Given the moderating effects on the seasonal temperatures from the southern latitude and coastal exposure, the county is viewed as having a limited risk from this hazard type.

Drought: Strafford County was impacted by the ‘Drought Event of the 1960’s’, as was the rest of the State. The county hosts significant agricultural and livestock assets that are negatively impacted by such events. At the time of the preparation of this Plan, the State has located no new specific data as to the losses from drought events for this county.

Wildfire: Significant debris still remains in the forests from the 2008 ice storm. Given the salt marsh environments in the county, wildland fire hazards related to Phragmites Australis along the coast are viewed as significant. At the submission of this plan the State was unable to locate any new county specific data with respect to this hazard type.

Earthquake: New Hampshire generally lies in a zone of Moderate seismic vulnerability. The county is in an area of particularly high seismicity that is evident in a crescent of historical events beginning in the Ossipee Range and following the general contour of the Merrimack River Valley (See Section III of this document). Additionally, it is believed that the largest earthquake of record in New England was the 1755 “Cape Ann” event, just offshore of the New Hampshire coast. At the submission of this plan the State was unable to locate any new county specific data with respect to this hazard type.

Landslide: Strafford County, due to its low elevation, is not prone to landslide hazards.

Radon: NH State Legislature abolished the NH Radon Program in 2011. From available data, it would appear that Radon is a medium to high risk in this county.

Tornadic Activity: Strafford County has experienced three known F2 events in the past. The compilation of data from www.tornadoproject.com lists a total of two additional tornadic events (both additional are F1 or less events). There has been no additional tornadic activity since the 2010 plan.

Hurricane: Strafford County has experienced high winds from some hurricane events and is positioned to experience storm surge related flooding, beach erosion and significant wind damage from these events. August 2011 Tropical Storm Irene had a significant impact on Strafford County.

Downburst: As recorded in Chapter II of this document, the community of Stratham received a presidential declaration from downburst activity. As with tornadoes, this is perceived to be a significant hazard in this County. At the submission of this plan the State was unable to locate any new county specific data with respect to this hazard type.

Lightning: At the time of the submission of this Plan, the State was unable to locate any new county specific data with respect to this hazard type.

Severe Winter Weather: Strafford County is viewed to be vulnerable to severe winter weather. At the time of the submission of this Plan, the State was unable to locate any new county specific data with respect to this hazard type.

Ice Storm: Significant debris still remains in the forests from the 2008 ice storm event. At the time of the submission of this Plan, the State was unable to locate any new county specific data with respect to this hazard type.

Avalanche: This County has a low risk for avalanche hazard.

For a detailed list of participating jurisdictions in Strafford County whose hazard vulnerabilities have been reviewed by the state, see table on page 118.

Strafford County State Owned Real Property		
Function	Total Value of Land & Buildings	Acres
Adjutant General	\$5,572,521.00	119.70
Admin Services	\$4,750,737.00	.60
Department of Agriculture	\$274,667.00 (Land only)	134.67
Department of Safety	\$784,279.00	No Data
Employment Security	\$1,354,200.00	1.94
Historical Resource	No Data	No Data
Department Resource & Economic Dev.	\$1,050,218.00	1,916.60
Youth Development Services	No Data	No Data
NH Veterans Home	No Data	No Data
Environmental Services	\$1,297,410.00	63.50
Water Resources Council	\$168,183.00 (Land only)	No Data
Department of Corrections	No Data	No Data
Fish and Game	\$23,677,723.00	4,277.78
Department of Transportation	\$4,220,338.00	168.24
TOTAL:	\$43,150,279.00	4,446.02

Table 4.12

State of NH State Owned Real Property Supplemental Financial Data to the Comprehensive Annual Financial Report
06/30/2011

SULLIVAN COUNTY RISK ANALYSIS

Flooding: Sullivan County lies in the Southwestern area of the State and is bound by the Connecticut River to the west. The City of Claremont lies in the center of the county and encompasses a significant area of the floodplain of the upper Sugar River.

River Ice related flooding along the Connecticut River is a periodic issue in Charlestown and other towns. Erosion accelerated by the destabilizing effects on riverbanks is a significant issue all along the Connecticut and other State Rivers. Additionally, River Ice may directly impact upon docks, wharfs, boathouses and nearby roads, bridges, culverts, and other infrastructure

Drought: Sullivan County was impacted by the ‘Drought event of the 1960’s’, as was the rest of the State. The county hosts significant agricultural and livestock assets that are negatively impacted by such events. At the time of the preparation of this Plan, the State has located no new specific data as to the losses from Drought events for this county.

Wildfire: Significant debris still remains in the forests from the 2008 flooding event. Aside from the data presented in Chapter II of this Plan, the State was unable to locate any new county specific data with respect to this hazard type. Given the heavy forest cover countywide, this hazard type is of particular concern during dry periods.

Earthquake: New Hampshire generally lies in a zone of moderate seismic vulnerability. Sullivan County is in an area of particularly high seismicity that is evident in a crescent of historical events beginning in the Ossipee Range and following the general contour of the Merrimack River Valley. At the time of this submission there has been no new activity with this hazard.

Landslide: Some land formations along the Connecticut River are generally considered to be conducive to landslide activity. At the time of the submission of this Plan, the State was unable to locate any new county specific data with regard to this hazard type. Additional research is ongoing.

Radon: NH State Legislature abolished the NH Radon Program in 2011. From available data, it would appear that Radon is a low risk in this county.

Tornadic Activity: Sullivan County has experienced four known events (all F1 or less events) in the past. The compilation of data from www.tornadoproject.com lists four additional tornadic events from October 24, 1955 to July 16, 1963. There has been no additional tornadic activity since the 2010 Plan.

Hurricane: Sullivan County has experienced high winds from some hurricane events but is at a more significant risk to flooding from the associated hurricane rainfall. The 1938 hurricane event impacted this county because it received a near direct hit as well as Tropical Storm Irene in August 2011.

Downburst: At the time of the submission of this Plan, the State was unable to locate any new county-specific data with respect to this hazard type.

Lightning: At the time of the submission of this Plan, the State was unable to locate any new county specific data with respect to this hazard type.

Severe Winter Weather: Sullivan County is viewed to be vulnerable to severe winter weather. At the time of the submission of this Plan, the State was unable to locate any new county specific data with respect to this hazard type.

Ice Storm: Significant debris still remains in the forests from the 2008 ice storm event. At the time of the submission of this Plan, the State was unable to locate any county specific data with respect to this hazard type.

Avalanche: This County has a low risk for avalanche hazards.

For a detailed list of participating jurisdictions in Sullivan County whose hazard vulnerabilities have been reviewed by the state, see table on page 120.

Sullivan County State Owned Real Property		
Function	Total Value of Land & Buildings	Acres
Adjutant General	No Data	No Data
Admin Services	\$1,667,818.00	.19
Department of Agriculture	\$2,298,424.00(land only)	1,472.88
Department of Safety	No Data	No Data
Employment Security	\$898,000.00	1
Historical Resource	No Data	No Data
Department Resource & Economic Dev.	\$5,079,484.00	22,751.90
Youth Development Services	No Data	No Data
NH Veterans Home	No Data	No Data
Environmental Services	\$2,139,292.00	316.90
Water Resources Council	\$34,889.00 (Land only)	.25
Department of Corrections	No Data	No Data
Fish and Game	\$758,856.00	1,047.78
Department of Transportation	\$2,765,229.00	41.78
TOTAL:	\$15,641,992.00	1,089.56

Table 4.13

State of NH State Owned Real Property Supplemental Financial Data to the Comprehensive Annual Financial Report
06/30/2011

Summary of State Owned Real Property for Fiscal year 2012:

- The updated total value of all the State owned buildings and land is \$1,161,318,650.00.
- The two counties with the highest level of risk (as derived in Table 4.16) comprise more than 44% of the total value of state owned buildings (\$507,280,589.00).
- The two counties with the highest level of risk do not reflect the heaviest populated counties. (30,100)
- There is no detailed information available to determine the potential loss to state facilities on a hazard specific basis. This requires an extensive assessment and is not within the funding capabilities of this Plan update.
- Further information regarding State owned facilities (building types, building use and number of staff) is still in the process of being gathered and should be available at the next revision of this Plan.

The table on the following page provides an inventory of all State-owned critical facilities to be noted in the event of a natural or human caused disaster and therefore have an inherent value that cannot be assigned. The figures; however, reflect the assessed value of the building and the land that it is on. All Critical Infrastructure and Key Resources in New Hampshire are susceptible to all of the hazards that impact the State.

Facility	Name/Location	Owner	Size (sq.ft.)	Building & Land Value (\$)	Hazard Type
Capital Building	State House	Admn. Services	84,698	3,917,536	All
	State House Annex	Admn. Services	76,650	2,871,609	All
Primary EOC	NH HSEM	Dept. of Safety	27,840	9,939,451	All
Secondary EOC	NH National Guard Training Center, Center Stafford, NH	Adjutant Gen.	29,155	3,076,270	All
State Police	James H. Hayes Building	Dept. of Safety	117,113	9,827,533	All
	Airport Building	Dept. of Safety	8210	230,000	All
	State Police Troop Station D: Concord	Dept. of Safety	12,135.	1,495,204	All
	State Police Troop Station B: Milford	Dept. of Safety	7,016	711,310	All
	State Police Troop Station E: Tamworth	Dept. of Safety	7,431	513,128	All
	State Police Troop Station F: Carroll	Dept. of Safety	7,431	413,462	All
	State Police Troop Station A: Rockingham	Dept. of Safety	7,696	250,834	All
	Police Standards & Training Facility	Dept. of Safety	33,400	7,419,796	All
Fire Facilities	Richard M. Flynn Fire Academy	Dept. of Safety	43,415	4,708,605	All
	Fire Standards & Training Comm. Bldg.	Dept. of Safety	Not Avail.	359,899	All
	Fire Standards & Training Dormitory	Dept. of Safety	12,800.	2,700,109	All
	Fire Standards & Training Dormitory Add	Dept. of Safety	16,476	2,601,821	All
	Ladder Training Tower	Dept. of Safety	Not Avail.	406,418	All
	Aircraft Rescue Facility	Dept. of Safety	3,156	700,001	All
Communications	State Police Radio – Clinton Street	Dept. of Safety	1,680	85,000	All
	State Police Radio System Towers – on various NH Mts.	Dept. of Safety	N/A	6,011,052	All
	State Police Microwave System	Dept. of Safety	N/A	2,400,000	All
Hospital	NH Veterans home	NH Veterans Home	167,625	30,614,422	All
	NH Hospital – Hospital Grounds	Div. of Mental Health	337,611	20,742,640	All
	NH Hospital-All	NH Hospital	263,348	35,301,948	All
Public Works Facilities	District 1 Facilities	Dept. Transport.	211,155	4,910,225	All
	District 2 Facilities	Dept. Transport.	232,511	6,991,759	All
	District 3 Facilities	Dept. Transport.	343,317	12,099,941	All
	District 4 Facilities	Dept. Transport.	182415	4,915,347	All
	District 5 Facilities	Dept. Transport.	247217	9,586,748	All
	District 6 Facilities	Dept. Transport.	152577	3,096,348	All

Facility	Name/Location	Owner	Size (sq.ft.)	Building & Land Value (\$)	Hazard Type
Prison Facilities	Berlin Correctional Facility	Dept. of Corrections	No Data	31,063,999	All
	NH State Prison: Concord Compound	Dept. of Corrections	443,757	287,235,327	All
	NH State Women's Prison	Dept. of Corrections	8,350	1,945,794	All
	Lakes Region Facility	Dept. of Corrections	335,793	No Data	All
Education Facilities	MCauliffe-Shepard Discovery Center	CCSNH	45,113	9,189,502	All
	CCSNH – Manchester Campus	CCSNH	196,600	23,496,108	All
	CCSNH – Stratham Campus	CCSNH	99,000	26,648,181	All
	NH Technical Institute – Concord	CCSNH	294,385	44,951,207	All
	CCSNH – Berlin Campus	CCSNH	101,860	8,017,165	All
	CCSNH – Laconia Campus	CCSNH	64,138	11,887,287	All
	CCSNH – Claremont Campus	CCSNH	70,938	7,342,233	All
	CCSNH – Nashua Office	CCSNH	128,000	25,613,896	All
Historic Resources	Contoocook Covered Railroad Bridge	Historical Res.	N/A	33,000	All
	Native American Burial Ground-Shelburne	Historical Res.	N/A	7,800	All

Table 4.14
 State of NH State Owned Real Property Supplemental Financial Data to the Comprehensive Annual Financial Report
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Summary

In summary, the entire State has high risk to flooding, the counties of Hillsborough and Merrimack have a high vulnerability due to the large population concentration and high value of State owned buildings as well as high risk to flooding, terrorism and epidemic. Grafton, Belknap, Coös, Rockingham and Strafford counties have a large population concentration and high value of State owned buildings to flooding, terrorism and epidemic.

By weighing both the building value and population, the SHMPC assigned each county a Vulnerability Level, as seen in Table 4.16. The vulnerability and risk of each county is compared by hazard in the following table (Table 4.15).

Hazard Risk by County																	
County	Flood (coastal)	Dam Failure	Drought	Wild Fire	Earthquake	Landslide	Radon	Tornado/ Downburst	Hurricane	Lightning	Severe Winter Weather	Snow Avalanche	Epidemic	Radiological	Haz Mat	Terrorism	
Belknap	6	2	2	1	3	1	1	2	2	2	3	1	4	1	1	1	
Carroll	6	2	2	2	3	2	1	2	2	2	3	2	4	1	1	1	
Cheshire	6	2	2	1	3	1	1	2	2	2	3	1	4	3	1	1	
Coös	6	2	2	2	3	2	1	2	2	2	3	2	4	1	1	1	
Grafton	6	2	2	2	3	2	1	2	2	2	3	2	4	1	1	1	
Hillsborough	6	2	2	1	3	1	1	2	2	2	3	0	4	1	4	4	
Merrimack	6	2	1	1	3	1	1	2	2	2	3	0	4	1	1	4	
Rockingham	6 (4)	2	1	1	3	0	1	2	2	2	3	0	4	1	1	4	
Strafford	6 (1)	2	2	1	3	0	1	1	2	2	3	0	4	1	4	4	
Sullivan	6	2	2	1	3	1	1	2	2	2	3	0	4	1	1	1	

Table 4.15

Vulnerability Level by County				
County	Total Value of State Owned Buildings & Land	Population	Total Weighted Pts.**	Vulnerability Level**
Belknap	\$61,023,800	60,088	3+3=6	Medium
Carroll	\$25,377,459	47698	2+2=4	Low
Cheshire	\$18,724,462	77117	1+3=4	Low
Coos	\$106,178,915	32961	5+2=7	Medium
Grafton	\$63,533,544	89,118	3+4=7	Medium
Hillsborough	\$113,888,161	400,721	5+15=20	High
Merrimack	\$393,392,428	146445	11+6=17	High
Rockingham	\$75,752,601	295223	4+2=6	Medium
Strafford	\$43,150,279	123,143	2+5=7	Medium
Sullivan	\$15,641,992	43742	1+2=3	Low
TOTAL:	\$888,363,641.00	1,346,256		

Table 4.16

Population of NH Counties, March 31, 2011

<http://www.nh.gov/oep/programs/DataCenter/2010Census/index.htm>

In order to provide a State risk assessment utilizing all of the previous data and information, a Vulnerability Level for each county is assigned values for:

- Total **value** of state owned buildings by county; and
- Total **population** by county

Value of Bldgs in Millions	Weighted Value in Points	Population in Thousands	Weighted Value in Points	Total Weighted Pts (Value of Bldg + Population)	Vulnerability Level
1-25	1	0-25	1	1-5 pts	Low
25-50	2	25-50	2	6-10 pts	Medium
50-75	3	50-75	3	10+ pts	High
75-100	4	75-100	4		
100-125	5	100-125	5		
125-150	6	125-150	6		
150-175	7	150-175	7		
175-200	8	175-200	8		
200-225	9	200-225	9		
225-250	10	225-250	10		
250-275+	11	250-275	11		
		275-300	12		
		300-325	13		
		325-350	14		
		350-375+	15		

Chapter V.

Capability Assessment

Integration of Plan with State Planning Efforts

New Hampshire Mitigation Strategy

The Hazard Mitigation Strategy establishes a comprehensive program to effectively and efficiently mobilize and coordinate the State's services and resources to make communities more resistant to the human and economic impacts of disasters. The strategy achieves this purpose through the development of the State Hazard Mitigation Plan and the following strategies:

- Define the goals, objectives and priorities of the State of New Hampshire related to hazard mitigation and aid with the protection of the public before during and after a hazard.
- Identify State hazard mitigation initiatives, programs and projects prior to a disaster, as well as prioritizing their sequence of implementation. Protect existing properties and structures. Provide resources to residents of New Hampshire to become more resilient to hazards that impact the State.
- Improve the general public's awareness of the natural and human caused hazards confronting the people, property, businesses, institutions, and other critical infrastructure within the State of New Hampshire.
- Develop and implement programs to promote hazard mitigation to protect infrastructure throughout the State.
- Work regionally to increase the identification of mitigation opportunities and maximize the use of available sources of funding, through a local mitigation planning process.
- Facilitate coordination between Homeland Security and Emergency Management (HSEM) and Federal Emergency Management Agency (FEMA) and other federal, state, regional, local and private sector programs related to hazard mitigation.
- Encourage public participation and involvement in the development, implementation and maintenance of local mitigation strategies.

Mission Statement

To protect the lives, property and environment of the people of New Hampshire from the threat or occurrence of emergencies resulting from any natural or human caused disaster, including but not limited to flood, fire, earthquake, technological incidents, drought, terrorism, epidemic, hurricanes and tornadoes. The preparation for and carrying out of all emergency functions shall be accomplished through the five phases of emergency management: mitigation, preparedness, response and recovery. Activities to meet this end include coordination, planning, training, drills, exercises, and financial assistance.

Each member of the SHMPC and subject matter experts reviewed specific areas of expertise and made the appropriate changes that were felt as necessary. All changes are reflected in blue text. Many felt that the information from the 2010 Plan was still vital and pertinent and remains in the Plan unchanged.

Role of the Homeland Security and Emergency Management

Homeland Security and Emergency Management (HSEM) is responsible for developing, implementing and maintaining the New Hampshire Hazard Mitigation Strategy, including the programs, tasks and responsibilities delineated herein. In so doing, HSEM will establish and maintain an interagency effort, utilizing a process of coordination and consultation with other federal, state, regional and local agencies and organizations as they implement their programs and responsibilities related to hazard mitigation and post disaster redevelopment. HSEM solicits mitigation project initiatives with the Department of Transportation, Department of Environmental Services, Department of Resources and Economic Development and the Office of Energy and Planning and provides a supporting role for many of the State agencies and their projects.

Where appropriate, the mitigation projects identified by these agencies are integrated into this Plan. In addition, the State Hazard Mitigation Officer (SHMO) coordinates with the Office of Energy & Planning and its National Flood Insurance Program staff to identify problem hazard areas and integrate them into future state planning efforts. Through this interagency communication, the State Hazard Mitigation Plan is coordinated with other ongoing state planning efforts.

The State of New Hampshire and HSEM actively promote mitigation initiatives throughout the State. There is no specific line item in the state budget for mitigation; however, the State assures that match will be provided for the numerous federally funded grants identified on the following pages. The State Hazard Mitigation Planning Committee (SHMPC) and SHMO reviewed legislation, programs and funding sources within the State that promote hazard mitigation. In summary, there are many funding capabilities and policies that address Pre- and Post-Disaster initiatives, as well as other supplemental programs. These funding sources and policies are described in more detail below.

Pre-Disaster Mitigation Policies and Funding Capabilities

As part of the 2013 State Hazard Mitigation Plan update the Hazard Mitigation Planning Committee reviewed and evaluated the effectiveness of both the Pre-disaster and Post disaster mitigation capabilities for the State of New Hampshire. It was determined that all listed policies and capabilities have been deemed effective and will remain in full force. The capabilities for Hazardous Materials and Fire Investigation have been added in this update.

1. Associated Legislation

- Section 322, Mitigation Planning, of the Robert T. Stafford Disaster Relief and Emergency Assistance Act.

- NH Revised Statutes Annotated (RSA), 21-P:37, Emergency Management Powers Conferred, authorizes the establishment of a “comprehensive plan and program for the emergency management of this state, such plan and program to be integrated into and coordinated with the emergency management plans of the federal government and of other states to the greatest possible extent, and to coordinate the preparation of plans and programs for emergency management by the political subdivisions of this state and private agencies, such plans to be integrated into and coordinated with the emergency management plan and program of this state to the greatest possible extent.”
- NH RSA 674:2 states that a Master Plan adopted under this statute may include a “natural hazards section which documents the physical characteristics, severity, frequency, and extent of any potential natural hazards to the community. It should identify those elements of the built environment at risk from natural hazards as well as extent of current and future vulnerability that may result from current zoning and development policies.”
- NH RSA 9-A, State Development Plan which states, “There shall be a comprehensive state development plan which establishes state policy on development related issues....[including] A natural hazards section which identifies actions to improve the ability of the state to minimize damages from future disasters that affect land and property subject to such disasters.

NH Homeland Security and Emergency Management works closely with the Regional Planning Commissions and the Office of Energy and Planning to ensure that state initiatives are carried out to the local communities and their local mitigation plan.

2. Development in Hazard Prone Areas

Currently the State implements State Executive Order 96-4, *an Order for State agencies to comply with floodplain management requirements*. This Executive Order, signed by Governor Merrill in 1996 requires all State agencies to comply with the flood plain management requirements of all local communities participating in the National Flood Insurance Program in which State-owned properties are located.

All other development requirements for hazard areas (i.e. floodplains, steep slopes, wetlands, etc) are implemented at the local level through community Zoning Ordinances, Subdivision Regulations and Site Plan Regulations.

The State of New Hampshire, is considered a “home rule state,” therefore the adoption of regulations and ordinances such as those listed in the paragraph above are at the discretion of the local community.

The State of New Hampshire has adopted building codes which govern both residential and non-residential structures. The NH State Building Code uses the **2009 International Residential Code (IRC)** and the **2009 International Building Code (IBC)** as base standards for the State codes for residential and non-residential structures, respectively. There are other code standards which govern non-structural areas of design, all of which can be found at the State of NH Building Code website.

The **2009 IBC** references **ASCE 7-05, “Minimum Design Loads for Buildings and Other Structures”**, for snow loads in the state. The majority of NH requires case studies to determine ground snow loads in a specific community. Case studies have been performed for all cities, towns and unincorporated townships in the state, and are available in the publication **“Ground Snow Loads for New Hampshire”, US Army Corps of Engineers, ERDC/CRREL TR-02-6, February, 2002**. The NH State Building Code Amendments now permit use of this document for determining ground snow loads in the state.

Many communities in New Hampshire do not have building code enforcement officials. This does not relieve the owner or design professional from meeting the requirements of the NH State Building Code in those communities without code enforcement. Not every community in NH enforces the requirements in **IBC 2009, Chapter 17**, for *special inspections* of structures. (view additional information at source http://www.senh.org/new_hampshire_building_codes)

Upon review of local hazard mitigation plans, many of the NH communities follow their own guidelines when it comes to planning and development in hazard prone areas.

3. Emergency Management Performance Grant (EMPG)

The purpose of the Emergency Management Preparedness Grants (EMPG) Program is to provide grants to assist state and local governments and other eligible agencies in preparing for all hazards. EMPG focuses on planning, organization/administrative, equipment, training, exercises, mitigation and maintenance/sustainment to enhance and sustain all-hazards emergency management capabilities.

Title VI of the Robert T. Stafford Disaster Relief and Emergency Assistance Act authorizes FEMA to make grants for the purpose of providing a system of emergency preparedness for the protection of life and property in the United States from hazards and to vest responsibility for emergency preparedness jointly in the federal government and the states and their political subdivisions. The federal government, through the EMPG Program, provides necessary direction, coordination, and guidance, and provides necessary assistance, as authorized in this title so that a comprehensive emergency preparedness system exists for all hazards. The EMPG plays an important role in the implementation of Presidential Policy Directive-8 (PPD-8) by supporting the development and sustainment of core capabilities to fulfill the National Preparedness Goal (NPG).

4. Pre-Disaster Mitigation (PDM)

The Pre-Disaster Mitigation (PDM) competitive grant program provides funds to State, Tribal, and local governments for pre-disaster mitigation planning and projects primarily addressing natural hazards. Cost-effective pre-disaster mitigation activities reduce risk to life and property from natural hazard events before a natural disaster strikes, thus reducing overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations. Funds will be awarded on a competitive basis to successful Applicants for mitigation planning and project applications intended to make communities more resistant to the pacts of future natural disasters. PDM is a 75/25% match and is utilized to help fund local hazard mitigation plans, Fluvial Erosion Hazard plans and as well as adaptation plans. Local hazard mitigation plans are required to be updated every 5 years; however communities are strongly

encouraged to update their plans annually and after a significant disaster. The Planning Section has processed 43 formally approved local hazard mitigation plans for FY 2013, 15 conditionally approved plans (awaiting town adoption) and 10 plans are with FEMA for initial review. NH is one of the most compliant states with local Hazard Mitigation Plans with 231 communities out of 234 have an approved plan or a plan within the approval process. The three communities that do not have a local hazard mitigation plan are in the counties of Carroll, Grafton and Sullivan. Page 172 contains a chart that shows the status of the local hazard mitigation plans since the previous 2010 plan was completed. Information from the review of these plans was used for the planning aspect of this plan.

5. Repetitive Flood Claim Program

The Repetitive Flood Claims (RFC) grant program was authorized by the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004 (P.L. 108–264), which amended the National Flood Insurance Act (NFIA) of 1968 (42 U.S.C. 4001, et al). Up to \$10 million has been available annually for FEMA to provide RFC funds to assist States and communities reduce flood damages to insured properties that have had one or more claims to the National Flood Insurance Program (NFIP). For fiscal year 2013 the RFC and Severe Repetitive Loss Program has become a part of the Flood Mitigation Assistance Program and are no longer stand alone programs.

6. Severe Repetitive Loss Program

The Severe Repetitive Loss (SRL) grant program was authorized by the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004, which amended the National Flood Insurance Act of 1968 to provide funding to reduce or eliminate the long-term risk of flood damage to severe repetitive loss (SRL) structures insured under the National Flood Insurance Program (NFIP). SRL Properties are residential properties:

- That have at least four NFIP claim payments over \$5,000 each, when at least two such claims have occurred within any ten-year period, and the cumulative amount of such claims payments exceeds \$20,000.
- For which at least two separate claims payments have been made with the cumulative amount of the building portion of such claims exceeding the value of the property, when two such claims have occurred within any ten-year period.

7. Comprehensive Emergency Management Planning for Schools (CEMPS)

CEMPS is an intensive two-day workshop, which brings together school, emergency management, fire and police personnel, as well as members of the community, to discuss methods of preparing schools, school personnel and the community for any emergency. Instructors for the CEMPS workshops include representatives from the private sector as well as State and local government, and cover varied fields of expertise. By utilizing the strengths and knowledge of these individuals, the workshop is able to tailor itself to the needs of the participants.

CEMPS relies on the all-hazards approach to emergency management. All five phases of emergency management (i.e., Prevention, Preparedness, Mitigation Response and Recovery) are included and discussed in detail. Emphasis is placed on the importance of including all five phases in school emergency planning procedures, which are based on the Incident Command System, are demonstrated through tabletop exercises that emphasize the team approach.

The multiple hazards faced by New Hampshire communities make it necessary to demonstrate actions and techniques that can be used for a variety of situations. For example, photographs of a New Hampshire school that was impacted by a tornado are shown, demonstrating how the “Drop, Cover and Hold” drill (that can also be utilized for an earthquake or an intruder), would protect staff and students. Techniques such as placing tinted plastic sheeting over windows are discussed. This may mitigate the potential of shards of glass injuring students during a severe wind event, an application which also inhibits intruders from looking through windows.

The importance of communications and advanced warning are also emphasized. The NHP is in the early stages of a program to facilitate the placement of Weather Warning Radios into all Superintendents’ offices throughout the State. This mitigation will work in conjunction with HSEM efforts to improve the coverage area of weather warning. One of the basic understandings of the CEMPS program is that planning is a process not an event. With this in mind, follow-up is another important element of CEMPS. After the initial workshop, CEMPS personnel are available for a variety of activities. These have included two-hour staff development presentations, review of plans, resource distribution and acting as advisors during school planning meetings.

8. Hurricane Tracking Chart Program

Started during the 1996 hurricane season, the National Hazards Program (NHP) and HSEM, in cooperation with WMUR TV-9, the State's largest television station, has been giving away hurricane-tracking charts. Utilizing the FEMA/ARC/NOAA chart, the NHP has added (with permission) HSEM's and WMUR's logos. Announcements of the chart's availability coincide with weather broadcasts and serve to heighten public awareness of hurricanes, the State's risk from natural hazards and HSEM's programs.

Response to this program has been wonderful with more than 10,000 responses in three seasons. The tracking chart serves as a leader to attract the public's attention. Informational materials on mitigation and preparedness are included in the packages to better inform the citizenry on steps they can take to reduce the impact from a damaging hurricane.

9. Family Preparedness Presentations

Homeland Security and Emergency Management has been conducting Family Preparedness Presentations for over six years. On average, between 35 and 45 presentations are conducted annually, each emphasizing the five phases of emergency management (prevention, mitigation, preparedness, response and recovery), vulnerability to all hazards as well as mitigation and preparedness actions that can be taken before, during and after an event. In order to emphasize the many hazards New Hampshire citizens are vulnerable to, specific photographs from New Hampshire are used throughout the presentations (i.e. tornado, microburst and hurricane damage). Target audiences for these presentations are schools, civic groups and governmental organizations. Presentations are tailored to the various audiences.

10. State Building Code

The IBC 2009 building code specifies a new generation of natural hazards design provisions. These building standard improvements incorporate the new national seismic risk maps, soil classifications and design methodology. They supersede the current obsolete and unsafe Standard Building Code provisions and are backed up by a new earthquake engineering technology base. Please see section 2. on page 140 for further on the State Building Codes.

11. Emergency Alert System (EAS)

The State Emergency Communications Committee (SECC) and New Hampshire Homeland Security and Emergency Management (HSEM) have spent the last two years designing and implementing the Emergency Alert System (EAS), which replaced the Emergency Broadcast System.

The EAS incorporated digital technology that allows emergency messages to be broadcast automatically (or manually) to a specific area. The Federal Communication Commission has promulgated rules and regulations for the operation of EAS. The digital system will work with both new and established technologies, including satellite, broadcast, and cable systems, to make the disaster warning system more effective. The system emphasizes speed, reliability, and efficiency.

Because of the absence of a statewide commercial radio station, HSEM and the New Hampshire State Police act as the Primary Warning Point in the state. Both monitor WBZ radio for National Warning messages. Messages received from the National Weather Service are relayed to broadcast radio and television and other emergency messages may be originated at either site. Broadcasters are required to participate at the Federal level, as mandated in the Cable Act of 1992, but participation at the State and local level is voluntary.

The major features (or goals) of EAS include:

- A digital system that allows broadcast, cable, satellite and other services to send and receive alerting information.
- Multiple monitoring sources for emergency alerts.
- Shorter alerting tones (eight second minimum).
- Automated and remote-control operations (including abilities to turn on specially-equipped radios and televisions).
- Weekly tests which are unobtrusive to viewers and listeners and monthly on-air tests.
- Capability to issue alerts in languages other than English.
- Provisions for hearing and visually impaired people.
- Mandated protocol for sending messages.

The success of EAS will rely on new equipment within the National Weather Service through its Specific Area Message Encoder (WRSAME). WRSAME is an encoding device that puts a special message at the beginning and end of selected messages broadcast over NOAA Weather Radio (NWR). The code specifies the type of message and area, by county, to which it applies. Users within listening range of the NWR signal with a matching decoding device can choose which site-specific hazardous weather alerts they will receive. WRSAME is currently connected to a limited number of NWR consoles, but will eventually be part of all NWR stations as consoles are upgraded. Radio stations, television outlets, and cable television providers can now receive and transmit appropriate NWS emergency messages automatically.

12. Non-Commercial Service Announcements

The Homeland Security and Emergency Management (HSEM) Public Information Officer (PIO) manages the agency's public information outreach. This is carried out on two levels: during active emergencies that involve activation of the State Emergency Operations Center and during times when there is no active emergency and the emphasis is on preparation and planning.

During active emergencies, the PIO desk is generally staffed at least 18 hours a day to cover the deadlines and other informational needs of local, regional and occasionally national news organization. Since a major disaster is by definition an important news story, we have the attention of the media and use conventional news channels to convey information on the status of the emergency and specific information on safety issues and available assistance to people affected by the disaster. Local and regional media, in particular, are very helpful in reporting on road closures, evacuations, shelter locations and the like. Safety information, such as warnings about carbon monoxide hazards, proper emergency generator use and avoiding flood water are also well reported, thus helping to reduce injuries or fatalities related to the disaster.

When there is no active emergency, public outreach continues to encourage emergency preparedness by individuals, families, businesses and other organizations. This is done through Non-Commercial Sustaining Announcements (NCSAs) on New Hampshire radio stations and the ReadyNH website <http://www.nh.gov/readynh/>

NCSAs, produced cooperation with the N.H. Association of Broadcasters, are carried by all New Hampshire radio stations at scheduled times during peak listening hours. The announcements typically cover preparedness for floods, home emergency planning, generator safety, and school and business emergency planning, among other topics. They are the main outreach vehicle aimed at a general audience.

ReadyNH provides detailed emergency preparedness information on a variety of topics. It is a cooperative effort by the N.H. Departments of Safety and Health and Human Services, American Red Cross and other agencies. It is managed by the Department of Safety. The welcome page is kept current to reflect immediate issues and is supplemented by a Twitter account, which is used to promote ReadyNH itself and to provide up to the minute information on threatening conditions.

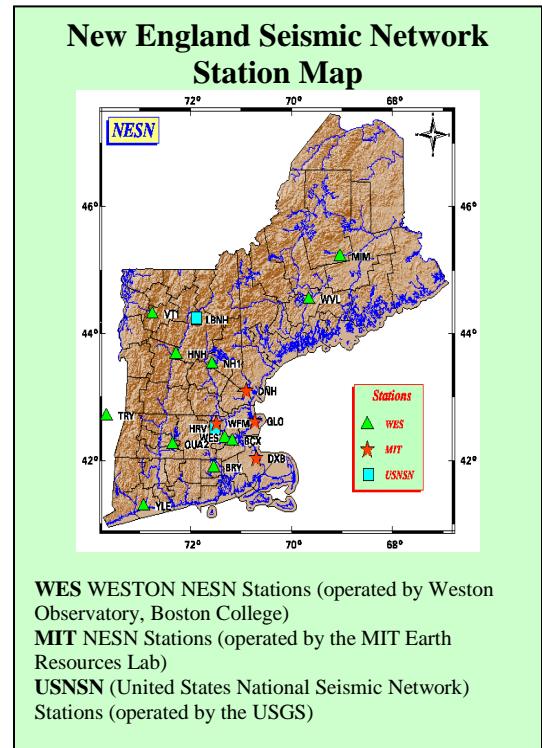
During active emergencies the ReadyNH Welcome Page is used to provide information on shelters and other sources of assistance.

13. New England Seismic Network (NESN)

The New England Seismic Network (NESN) is cooperatively operated by the Weston Observatory of Boston College and the Earth Resources Laboratory of MIT with funding from the U.S. Geological Survey under the National Earthquake Hazards Reduction Program. The purpose of the NESN is to monitor all earthquake activity in the vicinity of New England and to use the data from this seismic monitoring to better understand the seismic hazard of the region. Analysis of the earthquake data recorded by the NESN will help improve the understanding of the possible locations, magnitudes and probabilities of future strong and damaging earthquakes in our region, as well as enable accurate predictions of where, and how strong, damaging earthquake shaking can be expected. Furthermore, this information can be used by public and private officials to take Earthquake Hazard Mitigation steps to minimize the damage from future earthquakes in the region.

14. National Warning Alert System (NAWAS)

HSEM serves as the NAWAS State Alternate Warning Point (SAWP) while New Hampshire State Police (NHSP) functions as the State Primary Warning Point (SPWP). NAWAS provides HSEM and NHSP with a back up link to the National Warning Center (NWC), the Alternate National Warning Center (ANWC), and National Weather Service (NWS) offices in Gray, ME and Taunton, MA via protected landline circuits in the event of an emergency. In addition, HSEM and NHSP can communicate via NAWAS with 18 sites (Berlin, Claremont, Concord, Conway, Durham, Franklin, Grafton County, Hanover, Keene, Lakes Region Dispatch Center, Manchester, Nashua, Plymouth, Portsmouth, Rockingham County, NHSP Troop A, NHSP Troop F, and Mount Washington Observatory) within New Hampshire in the event of an emergency.



15. National Flood Insurance Program

The Office of Energy & Planning (OEP) administers and coordinates the State's role in the National Flood Insurance Program (NFIP). The NFIP is a Federal program administered by the Federal Emergency Management Agency (FEMA) that allows property owners in participating communities to purchase insurance protection against losses from flooding. Communities can voluntarily participate in the NFIP by making an agreement with FEMA and adopting and enforcing floodplain regulations to reduce the flood risks of new construction in FEMA's designated special flood hazard areas.

Currently 214 out of 235 NH communities that participate in the NFIP have adopted at least the minimum standards of the NFIP, which regulate development in the 100-year floodplain. The regulations mitigate flood damage by requiring new and substantially improved structures to be built or flood proofed to, or above the 100-year base flood elevation (BFE).

OEP conducts approximately 15 community assistance visits each year to ensure that participating communities have the proper regulations, as well as to educate the local officials as to their NFIP responsibilities and to offer technical assistance on the NFIP. This initiative is reflected in Goal X, Objective G of the State's Goals & Objectives in Chapter VII of this Plan. These community visits along with annual workshops and training, a quarterly NFIP newsletter, and a Floodplain Management Handbook play a vital role in ensuring that the primary goal of the NFIP, to reduce the loss of life and property due to flooding, is implemented.

With respect to hazard mitigation, the OEP NFIP staff's goal is to reduce the loss of life and property damage due to flooding. The OEP NFIP staff works with the State Hazard Mitigation Team in identifying and approving HMGP and FMA grants.

16. Flood Mitigation Assistance (FMA) Program

New Hampshire has been a participant in the Flood Mitigation Assistance Program (FMA) since 1996/97. Since 1997, the State was been awarded funds to assist communities in Flood Mitigation Projects. A prerequisite of accessing the project funds under FMA is that a community must have a FEMA-approved All-Hazards Mitigation Plan in place, as well as participating in the National Flood Insurance Program.

Communities that were awarded Flood Mitigation Assistance funding utilized this opportunity to do such projects as elevations and acquisitions. Some of the communities that have been awarded this funding are Londonderry, Epsom, Merrimack and Allenstown. Those communities' commitment to mitigate the flooding problems within their towns is a true model of how well the mitigation programs work.

Flood Mitigation Assistance Program Funding				
Fiscal Year	Planning Grant*	Technical Assistance*	Project Grant*	Total Grant
1996 / 97	\$ 10,900	\$ 10,860	\$ 97,740	\$ 119,500
1998	\$ 11,000	\$ 11,060	\$ 99,540	\$ 121,600
1999	\$ 10,900	\$ 11,160	\$ 100,440	\$ 122,500
2000	\$ 11,000	\$ 11,180	\$ 100,620	\$ 122,800
2001	\$ 10,900	\$ 11,150	\$ 100,350	\$ 122,400
2002	\$ 11,000	\$ 10,500	\$ 100,000	\$ 121,500
2003	\$ 11,000	\$ 10,500	\$ 100,000	\$ 121,500
2004				
2005	\$ 11,000	\$ 11,160	\$ 100,440	\$ 122,600
2006	\$ 11,700	\$ 11,870	\$ 106,830	\$ 130,400
2007	\$ 12,100	\$ 12,400	\$ 111,600	\$ 136,100
2008	\$ 12,307		\$2,869,366	\$ 2,88,167
2009			\$310,025.19	\$310,025.19
2010			\$266,424.74	\$266,424.74
2011			\$645,119.05	\$645,119.05

*Table 5.1 *These numbers show the amount of funds available each year under FMA for the State of NH. They do not necessarily represent the actual amounts received by the state, as project applications are often not submitted.*

17. Community Rating System (CRS)

The Community Rating System (CRS) is a voluntary incentive program that encourages communities to adopt and enforce floodplain regulations and activities that go beyond the NFIP minimum requirements. The objective of CRS is to reward communities that are doing more than meeting the NFIP requirements by reducing the flood insurance premiums of their residents by a certain percentage. Since the previous plan, the state of New Hampshire communities that currently participate in CRS has been reduced to four. These communities include Keene, Marlborough, Peterborough, and Winchester. Each one has a local hazard mitigation plan and is eligible to receive funding for flood mitigation projects.

CRS Communities in NH

COMMUNITY	CRS CLASS	PREMIUM DISCOUNT
Keene	8	10%
Marlborough	9	5%
Peterborough	8	10%
Winchester	9	5%

Table 5.2

18. Department of Environmental Services – Dam Safety Program

The Department of Environmental Service's (DES) Dam Bureau administers the State's Dam Safety Program. The primary focus of the Program is to ensure that all hazardous dams in the state are inspected at an interval appropriate to the severity of the hazards posed should failure occur. Further, those dams, which could cause loss of life or significant property damage downstream if they were to fail, are required to have a current emergency action plan in place which defines the area that would be inundated if the dam were to fail, as well as the proper responses should the dam develop a serious problem or be in a state of imminent failure. The results of the periodic inspections, which are carried out by State engineers familiar with dams, watershed hydrology and flood assessment, are issued to the dam owners so that maintenance and repair issues may be addressed to keep the dams in a safe operating condition.

DES regulates the construction of new dams, as well as the reconstruction of existing dams, to ensure that standard and sound engineering and construction practices are followed on any dam-related project. DES has developed administrative rules outlining the design standards, which become more stringent as the hazard posed by a failure of the dam increases that each new or reconstructed dam must meet.

DES is also a dam owner of approximately 110 structures throughout the State, and is responsible for performing the repair and reconstruction necessary on any of the 274 dams owned by the various state agencies in New Hampshire. It also has the in-house capability to perform routine operations, lake level management, and periodic maintenance and complete

construction activities. All work is coordinated through a team of engineers, technicians and construction professionals. Though nearly all DES dams are managed to promote recreational uses, most also enhance impoundment fisheries and support local wildlife. Several dams, most notably in the Baker (a tributary to the Pemigewasset River at Plymouth, NH) and Souhegan (a tributary of the Merrimack River at Merrimack, NH) River watersheds, were built for the specific purpose of flood control.

The Dam Bureau also maintains several real time lake/river level and meteorological stations. It also cooperates with other federal, state, local and private entities to provide useful data to predict and manage conditions related to extreme weather and flood conditions. Additionally, the Dam Bureau has an experienced team of construction professionals equipped with the necessary heavy machinery and tools to respond to dam-related incidents.

19. Department of Resources & Economic Development - Division of Forests & Lands

The Department of Resources and Economic Development's Division of Forests and Lands administers the State's Wildland Fire Management Program. In an effort to reduce the incidence and severity of wildfires, the primary focus of the Program is to provide wildland fire training, prevention, planning, and suppression assistance to communities throughout New Hampshire. The Division works with several partners, including the community fire departments, the U.S Forest Service State and Private Forestry, White Mountain National Forest, North Country RC&D, Northeast Forest Fire Protection Compact, NH Fire Standards and Training, and the NH Division of Homeland Security and Emergency Preparedness. The following is an overview of DRED's Wildland Fire Management Programs:

- 1) *Forest Fire Warden Program (RSA 227-L:7)*: New Hampshire has a Forest Fire Warden appointed in every town in the state, including unincorporated places, to carry out the duties and functions of the department. In addition to the Wardens, there are approximately 2,000 Deputy Wardens. Special Deputy Forest Fire wardens are also available to assist the state forest rangers.
- 2) *Mutual Aid Agreements (RSA 227-L:5)*: New Hampshire is a member of the Northeast Forest Fire Protection Compact. The Compact consists of all New England states, New York, and four Canadian provinces. It is a large mutual aid organization for the sharing of resources for the purposes of wildland fire training, prevention, and suppression. The state also has written mutual aid agreements with the White Mountain National Forest for the sharing of resources in-state, and a separate agreement with the United States Forest Service and US Dept. of the Interior for the sharing of resources across the nation.
- 3) *Training*: The training of community fire departments in wildland fire suppression is an important function of DRED's program. Each year the department trains several hundred firefighters in numerous topics. In addition, DRED conducts an annual weekend training that simulates a large wildland fire type incident command structure. DRED works closely with the Fire Academy to conduct training to structural firefighters in wildland topics. Employees of the department's Forest Protection Bureau receive nationally-accredited training in higher level incident command positions.

- 4) *Fire Weather and Class Day*: The department keeps daily track of weather conditions and uses the National Fire Danger Rating System to compute the fire class day based on a scale from one to five. Weather observations are collected from remote automated weather stations as well as collected from the tower staff. The department works closely with the National Weather Service for fire weather predictions and the issuance of Fire Weather Watches and Red Flag Warnings when conditions warrant. Class day and expected fire weather conditions are broadcast to fire departments and dispatch centers each day from spring through fall.
- 5) *Prevention/Public Outreach*: The department has a very active wildland fire prevention program. Highlights include Smokey Bear appearances at schools and large events, prevention posters, pamphlets, television PSA's, and a prevention trailer to take to fairs, etc. In addition, the two department forest rangers are trained in Firewise and give public talks to homeowner associations regarding the risks of wildland fires to rural homes. A third emphasis of the prevention program is the development of Community Wildfire Protection Programs to recognize and make recommendations for the mitigation of high hazard/risk areas.
- 6) *Law Enforcement*: The department has 11 sworn forest rangers that enforce various laws for the prevention of wildland fires. One of the most common laws is the requirement of a permit for any outdoor burning when the ground is not covered by snow. Other enforcement responsibilities include wildfire arson investigation and wildfire cause and origin determination.
- 7) *Wildland Fire Detection*: The department staffs and maintains 15 forest fire lookout towers at various high points across the state for the early detection of fires. These towers are staffed part-time on Class 3 and higher days. The department also uses the Civil Air Patrol to provide fixed-wing aerial detection of fires during periods of very high fire danger. Also, three mobile patrols are staffed spring through fall to assist in detection.
- 8) *Wildfire Suppression*: The department responds to and assists communities with the suppression of wildfires when they occur. The department maintains caches of tools and equipment specifically for wildfire suppression, as well as providing specialized experience and training in incident command and suppression tactics. The department also maintains several wildland engines that are available to respond and assist communities. Lastly, the department can access specialized equipment such as helicopters, fixed-wing aircraft, foam proportioners, etc. for suppression.

20. Department of Health and Human Services

The State of New Hampshire has many systems in place to mitigate the detrimental impact of an epidemic. Within the NH DHHS, Division of Public Health Services (DPHS), Bureau of Disease Control (BdDC), many sections collaborate to complete an outbreak investigation and an epidemic response. The Infectious Disease Investigation Prevention and Care Services Section (ID-PICS) have 8 Public Health Nurses who complete case and contact investigations for each reported outbreak. The public health nurses are supported by epidemiologists and program staff in the ID-PICS unit as well as the Infectious Disease Surveillance Section (IDSS) particularly for clusters or outbreaks that require more resources. These staff along with the Public Health

Laboratory staff, food protection staff, local health department staff and public information office staff forms the multidisciplinary Outbreak Team that meets on a weekly basis to discuss investigations and outbreaks.

Beyond the Outbreak Team, NH DHHS also consults the members of the Communicable Disease Epidemic Control Committee (CDECC) when developing public health response plans and in managing emerging infectious disease issues. CDECC consists of representatives from the two local health departments, physicians specializing in infectious diseases and epidemiology, representatives from the NH Department of Safety's (DOS) HSEM and Division of Fire Standards & Training and Emergency Medical Services (FSTEMS), the State and Deputy State Epidemiologists, other officials from NH DHHS, and partners such as the NH Hospital Association (NHHA).

In addition to response teams, NH DHHS also manages and provides oversight and reporting of many surveillance systems to monitor disease occurrences throughout the State. These systems are managed by the IDSS and are listed below:

- Automated Hospital Emergency Department Data (AHEDD). This system was implemented in 2005 and automatically collects real-time Emergency Department (ED) electronic data from hospitals using chief complaint and diagnosis codes (ICD-9 codes) from hospitals statewide. All 26 acute care hospitals in NH participate in the system. Two types of alerts are system generated (8 broad syndrome alerts based on historic data, and reportable disease diagnosis code alerts). Additionally, the system is used to monitor a number of communicable disease and health-risk conditions, and track Influenza-Like-Illness. A custom query tool feature, allows the rapid development of queries to meet unexpected health risk situations, such as the 2009-10 GI Anthrax case investigation and the recent Hepatitis C investigation.
- BioSense: A CDC maintained national integrated syndromic surveillance system that was launched in 2003, which monitors NH resident Veterans Administration and Department of Defense facility patient encounters for 11 syndromes and related LabCorp laboratory test results. NH is participating in the BioSense 2.0 redesign, which plans to integrate jurisdictional health department surveillance data for more timely nation-wide and regional situational awareness, and quicker outbreak and health event detection and response.
- Over-the-Counter Pharmaceutical Surveillance (OTC):

In NH, two OTC systems are used in parallel to obtain a representative sample of OTC sales data within the state. The first system obtains pharmaceutical sales from 158 pharmacies major chain within the state. Sales are categorized into 18 specific categories based on UPC codes. These categories include cough, cold, anti-diarrheal, anti-fever and rash treatment medications. The second system collects data through the Real-time Outbreak and Disease Surveillance (RODS, funding will no longer be provided after 2012) Laboratory National Retail Data Monitor (NRDM) system hosted by the University of Pittsburgh.

Real-time Outbreak and Disease Surveillance (RODS): Laboratory at the University of Pittsburgh is a public health surveillance tool that collects and analyzes daily sales data for OTC medications.

School Surveillance: Utilizes 5 syndromes to collect daily encounter data on school nurse visits from all 22 public schools within the Manchester School District.. This represents approximately 8% of all school-aged children within the state. This database, Syndrome Tracking Evaluation Management System (STEMS) is the database that is used to track

- **School Absenteeism:** Beginning with the 2009-2010 school year, an influenza-like illness (ILI) web-reporting tool for NH schools was implemented to better evaluate trends of ILI in communities over time. All public schools were asked to voluntarily report daily aggregate counts for student and staff absenteeism, those absent for ILI, total school nurse visits, and nurse visits for ILI. An analysis tool has been developed, and student absenteeism and student ILI rates, reported by SAU, are posted on the DHHS website each week.
- **New Hampshire Trauma and Emergency Medical Services Information System (NH TEMSIS):** This web-based system collects data from patient care reports entered by pre-hospital providers after each emergency medical response. This system is maintained by the NH Bureau of Fire Standards & Training and Emergency Medical Services (FSTEMS) and provides real-time data from across the state. All pre-hospital providers are required to file electronic incident reports within 24 hours of completing a call. This system provides statistical analysis for more than 84,000 annual calls. Each call, or run, is scored using a validity system which provides an added quality assurance/quality control feature to NH's EMS system. This system can be customized by the state as necessary; including a recently added section on potential ILI cases.
- **Death Data Surveillance:** NH maintains a unique query tool that facilitates access and prompt analytic capacity to electronically filed death records. These data are accessed from the NH Bureau of Vital Records database for the purpose of monitoring unusual or infectious death occurrences. The tool is used daily to access, query and analyze influenza and pneumonia-related causes of death. The query tool has expanded the ability to characterize cause of death by demographics such as geographic location, age and gender. This Access tool has also been used during outbreak investigations to confirm or rule out certain causes of death and if they are related to an incidence.
- **Early Warning Infectious Disease Surveillance (EWIDS):** This surveillance system is within the framework of the Security and Prosperity Partnership Agreement between the US, Canada, and Mexico, and it focuses upon the development of relationships and systems to effectively communicate disease information and minimize the impact when disease threatens to cross the US, Canadian, or Mexican borders. The system is comprised of email notifications to border public health partners and provides an early warning capacity to potential or actual border health events. Monthly conference calls between New York, New Hampshire, Maine, Vermont and certain Canadian provinces such as the Quebec Ministry of Health assist to share recent activities such as pertussis or influenza and associated state or regional public health or emergency responses.

- Influenza-specific Surveillance:

- Virologic surveillance: The NH Public Health Laboratories (PHL) isolates and subtypes influenza viruses year round and transmits these data electronically to CDC via the Laboratory Information Management System (LIMS) . Unusual specimens are sent to the CDC for further antigenic characterization.
- U.S. Influenza Sentinel Provider Surveillance Network Participation: Each year 25-32 volunteer NH health care providers (specializing in family practice, internal medicine, pediatric, student health, or urgent care) report the number of patient visits for ILI by age group, and the total number of patient visits, each week during the influenza season (beginning of October through mid-May). Approximately 10-15 sentinel providers continue to report weekly during the summer months to contribute to establishing a baseline for ILI activity in the summer months and to help detect any unusual influenza virus subtypes.
- Estimated influenza activity: Overall influenza activity in the State, reported weekly to CDC, is based on reports of ILI, reported numbers of patients with ILI or with fever and/or respiratory symptoms through the emergency department syndromic surveillance systems, reported outbreaks in facilities, and reports of confirmed influenza.

The data collected within these systems are assessed by the IDSS staff and monitored for changes, specifically any observed increases above baseline activity. Daily and weekly reports are compiled from these systems and used to characterize a potential or actual event and formulate a response strategy in collaboration with State and local agencies.

Food Protection is the State agency responsible for licensing and inspecting New Hampshire establishments where food is produced, manufactured, stored or sold. Our mission is to protect the safety and security of the NH food supply and to prevent foodborne illness and injuries. They also investigate complaints from consumers and reports of foodborne disease outbreaks. They also serve as an educational resource for consumers and the food service industry.

Under the authority of RSA 143-A, the New Hampshire Division of Public Health Services (DPHS) Food Protection Section licenses and inspects over 4,800 various types of food service establishments, including but not limited to, restaurants and retail food stores in 218 of the 234 cities and towns in NH. Inspections conducted at food establishments are usually unannounced. Inspectors check for compliance in food handling, food temperatures, employee health and hygiene and vermin control. The focus of inspections is on priority item violations. Priority item violations are the more serious violations that have been found to contribute to foodborne illness or injury.

The mission of the Public Health Laboratories (PHL) is to protect the public's health in NH through responsive, unbiased, quality laboratory testing; to actively participate in national and international surveillance networks; and to improve the quality of health and laboratory services in both the public and private sector. PHL fulfills its mission through the five core functions listed on the following page:

- **Laboratory Response for Critical Incidents**
- **Laboratory Analysis for Food Safety Assurance**
- **Laboratory Services for Infectious Disease Control**
- **Testing to Assess Occupational & Environmental Health Hazards**
- **Quality Assurance Leadership**

Also, NH DHHS utilizes the Health Alert Network (HAN), Communicator NXT! System to communicate with local providers, infection control practitioners, health officers, and other health professionals. The HAN is used to inform such professionals of infectious diseases and potential epidemic or outbreak situations, make them aware of current recommendations, and encourage reporting to NH DHHS as they encounter cases. The HAN is also used for notifications and drills of responders in public health to maintain 24/7 readiness to respond to an event.

21. New Hampshire Fire Marshal's Office:

New Hampshire experiences a variety of situations, not only fire investigations. The Division of Fire Safety also known as the NH State Fire Marshal's Office is involved in many aspects of investigation, law enforcement, code enforcement and public education. The division provides support to other state agencies and local departments. The division is divided into four bureaus; Investigations, Special Operations, Building Safety & Construction and Administration.

Bureau of Investigations

The Bureau of Investigations investigates all fires, building collapses and carbon monoxide releases (other than from a motor vehicle) that result in a death. (RSA 153:19). In addition, the bureau investigates all fires involving state owned property, as well as other fires and explosions at the request of the local officials. (RSA 153:18; RSA 153:12). The bureau investigates fires of suspicious origin seeking to arrest and prosecute those responsible (RSA 153:11). The division also provides coordination of all mutual aid districts in the state.

The Bureau conducts inspections of new and existing buildings upon complaint or when deemed necessary and orders the correction of fire hazards and other violations of the applicable fire and life safety codes. (RSA 153:14, II). The bureau provides assistance to local communities in the enforcement of the state fire code and local ordinances.

Part of the Bureau of Investigations includes the canine unit. The state has two accelerant detection canines who train constantly with their handlers. They are both certified by a regional canine certification authority. The canines are instrumental in the investigation of fires.

Bureau of Special Operations and Communications

The Bureau of Special Operations is responsible for four major functional areas. The sections within the bureau include the Hazardous Materials Section, Fireworks Section, Public Education Section and Data Analysis Unit.

The Hazardous Materials Section is staffed by the state Hazardous Materials Coordinator. The division is responsible for the coordination of all state level resources to any hazardous materials incident. The division is authorized to assume command of any hazardous materials incident at the request of the local fire chief or whenever it is deemed in the best interest of public safety. (RSA 153:4-a, III) The Haz-Mat Section also provides technical assistance and educational training for local officials in the recognition and mitigation of hazardous materials incidents.

The Fireworks Safety Section is responsible for the issuance of pyrotechnic licenses, code enforcement of mercantile fireworks stores, and enforcement of fireworks safety laws and rules. The fireworks safety section employees work very closely with the Division of State Police, Permits and Licensing Bureau with the enforcement of display fireworks laws and rules. This section conducts investigations into incidents involving fireworks and inspects facilities using pyrotechnics before a proximate audience. (RSA 160-B; RSA 160-C)

The Public Education Section is staffed with two part time educators who provide coordination and services involving fire and life safety education for the public. They produce many regular newsletters and bulletins that provide local officials, teachers and other related professionals with a variety of public education resources. The section also operates a cadre of loaner items such as a public safety education trailer, residential sprinkler demonstration trailer and several other smaller props that assist in the education of school children. (RSA 153:10-c)

The Data Analysis Unit is made up of members of The Bureau of Special Operations and the Bureau of Administration. This unit is responsible for operating several data collection programs which assist the division in the development of codes, identification of education target hazards and enforcement techniques. The largest program in this unit is the New Hampshire Fire Incident Reporting System (NHFIRS) which collects over 125,000 records each year from participating fire departments. NHFIRS is part of a national data system known as the National Fire Incident Reporting System (NFIRS) which has been in existence since 1977. The State of New Hampshire was a charter member of this system when it was first developed. Fire incident reporting is mandated by RSA 153:11.

Bureau of Building Safety and Construction

The Bureau of Building Safety and Construction houses three sections which include the Engineering Section, Mechanical Safety Section, and the Modular Building Section.

The Engineering Section is responsible for reviewing plans for construction and reviewing requests for variances. They also field thousands of calls each year on the interpretation of many codes and standards. The engineering section approves or disapproves all plans for construction involving all state and university system owned structures. In addition, the section reviews all educational facilities and health care facilities.

The Mechanical Safety Section is responsible for enforcing the laws and rules relative to the installation of gas fired equipment and systems and all plumbing laws. The section combined the gas fitters law inspectors and the plumbing inspectors in 2013 and became one section. The

enforcement of laws relative to gas fitting is covered in RSA 153:27. Plumbing enforcement is covered in RSA 329-A. The gas fitting law, known as Amelia's law went into effect in October of 2007.

The Modular Building Section provides oversight over the construction of any structure, except HUD certified manufactured housing, fabricated in a factory and then transported to the final building site. There are three such manufacturers in New Hampshire and many more across the country and in Canada. All structures designated for installation in the State of New Hampshire must bear a label certifying it meets the building and life safety codes of the state and the local jurisdiction where the structure is assembled. The section certifies all the manufacturers and also the third party inspection agencies who act on behalf of the division in conducting the in-plant inspections.

Bureau of Administration

The Bureau of Administration provides the clerical support for the entire division. A large portion of this support includes operating the numerous licensing programs for all other bureaus. These include the gas fitting licenses, plumbing licenses, pyrotechnic licenses, lightning rod installer's licenses, fire protection equipment technician licenses, modular housing certifications, and more.

The bureau is responsible for document management and storage for all other bureaus. This involves the proper archiving and storage of all reports, communications and other files.

This bureau is also responsible for the overall management of the division's many budgeting, purchasing, inventory control, receiving, accounts receivable, and accounts payable programs.

Post-Disaster Mitigation Policies and Funding Capabilities

1. Hazard Mitigation Grant Program

This program, which has been active for ten years in the State, receives its funding pursuant to a Notice of Interest as is submitted by the Governor's Authorized Representative (or GAR, i.e. the Director of HSEM) to the FEMA Regional Director within 60 days of the date of a Presidentially Declared Disaster. The amount of funding that may be awarded to the State/Grantee under the Hazard Mitigation Grant Program, HMGP, may not exceed

15% of (over and above) the overall funds that are awarded to the State pursuant to the Disaster. In accordance with 44 CFR Subpart M. Section 106.404, within 15 days of the Disaster Declaration, an Inter-Agency Hazard Mitigation Team is convened consisting of members of various Federal, State, County, Local and Private Agencies with an interest in Disaster Recovery and Mitigation. From this meeting, an Inter-Agency Hazard Mitigation Team Report is produced which evaluates the event and stipulates the State's desired Mitigation initiatives (See Goals and Objectives following page 172 of this Plan Summary). Hazard mitigation by definition is any sustained action taken to reduce or eliminate long term risk to people and property from natural hazards and their effects. There are two specific funding sources for hazard mitigation, Hazard Mitigation Annual (HMA) Program and the Hazard Mitigation Grant Program (HMGP). FEMA provides guidance for local and state governments; this guidance can be found at <http://www.fema.gov/media-library/assets/documents/33634?id=7851>. Many of the approved projects are related to drainage improvements, property acquisitions, and property elevations.

The HMGP is derived from a presidentially declared disaster. NH HSEM is currently working thirteen active Hazard Mitigation programs. The hazard mitigation grant program is funded by receiving 15% of the total monies paid out within the public assistance program. The Hazard Mitigation Grant program is a State wide competitive program. Once applications are approved as an eligible project by the State Hazard Mitigation Officer (SHMO) they are then processed by the State Hazard Mitigation Committee scores the most eligible projects. The highest scoring projects are sent to FEMA for their formal approval and review. Many NH communities take this opportunity because of the 75/25 cost share. FY 2013 the State of NH on behalf of FEMA provided \$2,136,389.71 in mitigation funds back to the communities.

ELIGIBLE HMGP PROJECTS

- Structural hazard control or protection projects
- Construction activities that will result in protection from hazards
- Retrofitting of facilities
- Certain property acquisitions or relocations
- Development of State and local mitigation standards
- Development of comprehensive hazard mitigation programs with implementation as an essential component
- Development or improvement of warning Systems

Upon the Governor's authorized Representative's receipt of the notice of an award of such funding by the FEMA Regional Director, the State Hazard Mitigation Officer (SHMO) publishes a Notice of Interest (NOI) to all NH communities, State Agencies and others announcing the availability of HMGP funding. The SHMO solicits applications for grants from these communities, State agencies and other qualifying applicants.

The NH Mitigation Grant Administrative Plan (2013) calls for the State Hazard Mitigation Team to review all HMGP applications. The Team is comprised of individuals from various State Agencies. This Plan, and the Inter-Agency Hazard Mitigation Team Reports, are utilized as guides by the State Hazard Mitigation Team in its review and prioritization of all applicant's proposed mitigation initiatives in accordance with 44 CFR Section 206.434 (i.e. with respect to eligibility criteria such as effectiveness, practicality, benefit/cost ratio, environmental soundness, the State's priorities etc.).

2. Public Assistance and Hazard Mitigation

Once a presidential disaster is declared, assistance is provided to aid communities within the declared counties through the public assistance program. Communities are provided financial reimbursement at a 75/25 percent match to help alleviate some of the costs that were associated with the incident. Additional assistance is provided to local officials to help mitigate identified hazards to allow communities to bring their infrastructure back to pre-disaster condition as well as provide them with invaluable information to mitigate that infrastructure from future damages. This creates high resiliency and sustainability in communities. This is an integral process that involves local, state, and federal officials.

Hazard Mitigation, as per Section 406 of the Stafford Act is a funding source for cost-effective measures that would reduce or eliminate the threat of future damage to a facility damaged during the disaster. The measures must apply only to the damaged elements of a facility rather than to other, undamaged parts of the facility or to the entire system. For example, if flooding inundates a sanitary sewer and blocks the manholes with sediment, mitigation to prevent the blockage of the damaged manholes in a future event may be considered eligible. However, work to improve undamaged manholes using the same method would not be eligible, even though the manholes are part of the same system.

Section 406 mitigation measures are considered part of the total eligible cost of repair, restoration, reconstruction, or replacement of a facility. Individuals who conduct mitigation measures under Section 406 are limited to only permanent work. The applicant cannot apply mitigation funding to alternate or improvement projects if those projects involve a new replacement facility. Upgrades required to meet applicable codes and standards are not “mitigation measures” because such measures are part of eligible restoration work.

3. New Hampshire Mutual Aid for Public Works

The goal of New Hampshire Mutual Aid for Public Works is to facilitate quick response to public works emergencies by creating an intercommunity cooperative. The program creates a network of communities that will assist one another during emergency situations. This is done through the creation of partnering agreements and fashioning a protocol for requesting and receiving mutual aid. The program provides for the compilation of a list of resources available from participating communities. The resources list is a time saver because it enables participants to contact communities directly that may have the resources required to assist with emergencies at hand.

The Mutual Aid Program for Public Works has a board consisting of nine people with four ex-officio members. Membership includes: 4 members of the New Hampshire Road Agents Association, 2 members of the New Hampshire Public Works and Municipal Engineers, 1 member of the New Hampshire Municipal Management Association, 1 member of the New Hampshire Association of Fire Chiefs, and 1 member of the New Hampshire Association of Chiefs of Police. The ex-officio members include: the Commissioner of the New Hampshire Department of Transportation, or designee, the Director of the New Hampshire Homeland Security and Emergency Management, or designee, the Director of the University of New Hampshire Technology Transfer Center,

or designee, and the Executive Director of the New Hampshire Municipal Association, or designee.

The New Hampshire Technology Transfer Center is responsible for the training aspect of the program. The Center has the resources of two full-time staff members along with two part-time people. It is located at the University of NH and has access to the resources of the University of New Hampshire. The program also has the full support of the New Hampshire Road Agents Association, New Hampshire Homeland Security and Emergency Management along with the New Hampshire Municipal Association which is fiscally responsible for the program.

4. Disaster Relief Funding (DRF)

From this appropriation, supplementary assistance is provided to individuals and State and local governments in the event of a presidentially declared emergency or major disaster. This declaration allows the federal government to support sheltering activities, help clear impacted roads and provide needed commodities such as water, emergency generators for shelters and other public safety institutions, and other assistance to the state and local communities in responding to the immediate impact of the incident or event.

5. Community Development Block Grant (CDBG)

These Federal funds are provided through the U.S. Department of Housing and Urban Development (HUD) and are administered by the CDBG Program of the Community Development Finance Authority.

The specific CDBG funds designated for Hazard Mitigation purposes are made available to address “unmet needs” pursuant to a given Disaster Declaration to States which request them and forward a proposed list of expenditures. For these funds, project selection guidance is provided by HSEM and CDFA administers the grant pursuant to Declaration DR-1144-NH. \$557,000.00 was made available to the State. The Town of Salem applied for and has been designated to receive these funds toward the acquisition of a 19 unit mobile home park that lies in the floodplain and floods regularly. The Town of Conway applied for and has been designated to receive these funds toward the acquisition of 12 homes that lie in the floodplain and were damaged during Tropical Storm Irene.

Current Hazard Mitigation Programs and Funding Capabilities

1. HSEM Field Representatives

Homeland Security and Emergency Management Field Representatives are currently trained in all five mission areas of Emergency Management including; Prevention, Mitigation, Protection Preparedness, Response and Recovery. Field Representatives participate in hazard mitigation training as well as the development of local hazard mitigation plans. The Field Representative are assigned to assist communities with development of Emergency Operations Plans, Hazard Mitigation Plans, applying for mitigation funding, conducting exercises and training, as well as providing overall support to their respective communities in the field of emergency management.

In addition, each field representative acts as a liaison to the following state departments to facilitate communication and coordination of emergency management services: Department of Transportation (NHDOT); Health and Human Services (HHS); Department of Corrections, Department of Education, Fish & Game, and the Public Utilities Commission.

2. Regional Planning Commissions

Homeland Security and Emergency Management (HSEM) has the Local Mitigation Planning initiative with the nine (9) Regional Planning Commissions. The Regional Planning Commissions (RPC) provide technical assistance with community planning to local jurisdictions. These include Hazard Mitigation Plans, Floodplain Ordinances and Emergency Operation Plans. As planning agencies that provide assistance to the majority of communities in the State, the RPC's are a vital conduit to promoting the concept and importance of hazard mitigation planning. New Hampshire Homeland Security and Emergency Management understand the RPC's close relationship with many communities in their planning area. The State of New Hampshire allocates Pre-Disaster Mitigation (PDM) funding for the RPCs to work with communities to develop local hazard mitigation plans. Since the 2010 Mitigation Plan HSEM has provided funding to produce over 100 local hazard mitigation plan updates.

3. Department of Safety

The Department of Safety and Homeland Security and Emergency Management maintains a website with information on natural hazards, technological hazards, Citizens Corp, emergency preparedness and specific information for local officials and emergency management directors.

4. Department of Transportation

The New Hampshire Department of Transportation (NH DOT) maintains numerous programs that could be considered as pre-disaster programs, but actually cover post-disaster and response activities. The following is an overview of DOTs programs:

- *State Aid Bridge Program for Communities* (RSA 234) provides 80/20 funding for the construction or reconstruction of structures on Class IV and Class V highways as well as municipally-maintained bridges on Class II highways.
- *Highway Block Grant Aid Funds* (RSA 235:23 & :25) come from a portion of the total road toll and motor vehicle registration fees collected by the State and given to municipalities for the purpose of constructing, reconstructing, or maintaining Class IV and V highways.
- *Contribution to Damage Losses* (RSA 235:34) is available to any municipality which suffers damage to its highways through a disaster which is estimated to exceed one-eighth (1/8) of one percent (1%) of its assessed valuation providing the Commissioner of Transportation is notified and requested to investigate the damage.
- *Inspection of Bridges* (RSA 234:21-:25) on all Class IV and V highways and municipally-maintained bridges on Class II highways is required on a two-year basis. Municipalities must keep records of the inspections. These inspections are a requisite

for Bridge Aid. The Department will inspect all municipal bridges every two years provided that sufficient qualified personnel are available to make these inspections.

- Culvert Inspection Program includes inspection of state owned culverts by the NH DOT.
- Incident Management Plan for Little Bay Bridge in Dover, NH provides for the emergency response procedures in the event of an emergency or disaster event on the bridge.
- DOT provides weekly inspections on three bridges in Portsmouth, which is the largest port in New Hampshire.

Information received from the Department of Transportation Performance -2011 states The Department of Transportation has established a bridge Red List that includes all federal and NH definition bridges with one or more major structural elements in poor condition or worse. The Red List also includes bridges that require weight limit postings. Currently there are 2,138 state owned bridges and 148 (6.9%) are on the Red List. The number of bridges on the Red List is a good indication as to how the Department is doing at addressing its bridges that are in the poorest condition. Since 2003, the Department has used a Bridge Priority List to prioritize work on the State's worst bridges. By doing this, the Department is able to anticipate required bridgework and to focus on the commitment to reduce the number of Red List bridges. Currently there are 79 of these bridges in the 10-year plan with an expected cost of \$684,390,000. Additionally there are 16 other bridges that need to be added to the 10-year plan at \$31,250,000 for a total of \$715,640,000 or \$71,564,000 annually. Currently the Department expends approximately \$35,000,000 annually towards the bridge capital program. The Department currently dedicates \$8M a year towards bridge preservation activities. In addition to the capital program the Department's Bureau of Bridge Maintenance also has a big impact on both removing bridges from the Red List and preserving existing bridges to prevent them from being added to the list. It's expected that the number of bridges added to the Red List will remain stable, adding about 20 bridges per year and increasing slightly over time. Additionally, if all factors remain the same, it is anticipated that the number of bridges removed from the list will remain the same at about 18 per year in the future. This difference will lead to an increased number of bridges placed on the Red List as time goes forward. The Department's current strategy is to continue to focus on rehabilitating and/or replacing Red List bridges and to efficiently preserve the remaining non-Red List bridges.

5. State Emergency Operations Plan

Homeland Security and Emergency Management developed comprehensive Emergency Operations Plan (EOP). The State EOP was developed in accordance with standards of the National Response Framework (NRF), the National Incident Management System (NIMS), and other related guidelines and regulations. Although this is neither a pre- nor post-disaster activity, it does ensure an efficient response to a disaster, thus minimizing the impact and recovery of a disaster.

6. Hazard Mitigation Resource Profiles

As an element of the development of this Plan, the State Hazard Mitigation Officer (SHMO) created a Hazard Mitigation Resource Profile Outline and circulated it to representatives of various Federal, State and private agencies that contribute to Hazard Mitigation Planning and/or the execution of Hazard Mitigation Measures throughout the State. These resource profiles can be found in Appendix B.

The State Hazard Mitigation Planning Team reviewed the 2010 plan protection matrix specific to their area(s) of expertise, and viewed the matrix as being stable and still vital to the State of NH. Any changes that have been made to the matrix will be reflected in blue, or red if it has been deleted. Many of the SHMPC members were also a vital part of the Threat Hazard Identification and Risk Assessment (THIRA) and the State Preparedness Report (SPR). Please see Table 5.3 on the following pages for the Existing Protection Matrix.

EXISTING PROTECTION MATRIX			
Existing Protection	Responsibility/Oversight	Effectiveness (Poor, Average, Good)	Recommendations for Improvement / Comments
Pre-Disaster Capabilities			
Legislation	State Legislature	Good	None
Executive Order 96-4	Governor of New Hampshire	Good	None
Emergency Management Planning Grant (EMPG)	Dept. of Safety - Homeland Security and Emergency Management	Good	Relies on annual funding from FEMA
Pre-Disaster Mitigation (PDM)	Dept. of Safety - Homeland Security and Emergency Management	Good	Competitive grant program – not guaranteed every year
Hazard Mitigation Assistance Program	Dept. of Safety - Homeland Security and Emergency Management	Good	Competitive grant program – not guaranteed every year
Comprehensive Emergency Management Planning for Schools (CEMPS)	Dept. of Safety - Homeland Security and Emergency Management	Good	Relies on funding through EMPG
Hurricane Tracking Chart	Dept. of Safety - Homeland Security and Emergency Management	Good	Maintain annual updates
Family Preparedness	Dept. of Safety - Homeland Security and Emergency Management	Good	Continue annual training
State Building Code	New Hampshire State Building Code Review Board	Good	Newly revised and updated to include natural hazards.
Emergency Alert System	State Emergency Communications Committee (SECC) and Dept. of Safety Homeland Security and Emergency Management	Good	Maintain annual public information announcements
Non Commercial Service Announcements	Dept. of Safety - Homeland Security and Emergency Management	Good	Continue announcements on natural & human caused hazards
New England Seismic Network (NESN)	USGS, Boston College & Massachusetts Institute of Technology	Good	Support as needed
National Warning System (NAWAS)	Dept. of Safety - Homeland Security and Emergency Management & NH State Police	Good	Maintain service

Table 5.3

Existing Protection	Responsibility/Oversight	Effectiveness (Poor, Average, Good)	Recommendations for Improvement / Comments
Post-Disaster Capabilities			
National Flood Insurance Program (NFIP)	Office of Energy and Planning	Good	Continue training for private entities & communities
Community Rating System (CRS)	Local Communities, Office of Energy and Planning	Avg.	Identify communities that would most benefit and recruit them into the CRS
Dam Safety Program	Department of Environmental Services	Good	None
Hazard Mitigation Grant Program (HMGP)	Dept. of Safety - Homeland Security and Emergency Management	Good	A very effective program for post-disaster mitigation initiatives.
Public Assistance	Dept. of Safety - Homeland Security and Emergency Management	Good	Available only after a Presidentially declared disaster
NH Public Works for Mutual Aid	UNH Technology Transfer Center	Good	The first statewide program in the US.
Disaster Relief Initiative (DRI)	Dept. of Safety - Bureau of Emergency Management	Good	Available only after a Presidentially declared disaster
Community Development Block Grants (CDBG)	Community Development Finance Authority	Good	Available to address “unmet needs” pursuant to a Disaster Declaration

Table 5.3 Cont.

Existing Protection	Responsibility/Oversight	Effectiveness (Poor, Average, Good)	Recommendations for Improvement / Comments
Current Capabilities			
Field Representatives	Dept. of Safety - Homeland Security and Emergency Management	Good	Continue training in field of mitigation and mitigation planning
Regional Planning Commissions (RPCs)	RPCs and Homeland Security and Emergency Management	Good	Continue funding for development of Hazard Mitigation Plans
Website	Dept. of Safety & Homeland Security and Emergency Management	Good	Review other states and consider improvements to NH HSEM website
Transportation Programs	Department of Transportation	Good	Various programs that rely on Federal and State funds.
Emergency Operations Plan	Dept. of Safety - Homeland Security and Emergency Management	Good	Recently updated to include National Incident Management System format
Hazard Mitigation Resource Profiles	Dept. of Safety - Homeland Security and Emergency Management	Good	Update profiles with update of State Hazard Mitigation Plan

Table 5.3 Cont.

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Chapter VI.

Coordination of Local Mitigation Planning

Local Capability Assessment

Homeland Security and Emergency Management has been actively working with Regional Planning Commissions, contracted planners and local communities to develop local mitigation plans and identify cost-effective mitigation measures. The State has adopted NH Revised Statutes Annotated - RSA 674:2, which states that a Master Plan adopted under this statute may include a “natural hazards section which documents the physical characteristics, severity, frequency, and extent of any potential natural hazards to the community. It should identify those elements of the built environment at risk from natural hazards as well as extent of current and future vulnerability that may result from current zoning and development policies.”

Summary of Local Capability Assessment

Local Hazard Mitigation Plans that are submitted to Homeland Security and Emergency Management include their own individual local capability assessments. These local assessments contain a review of the effectiveness of each community’s programs by the local hazard mitigation committees. Homeland Security and Emergency Management provides technical assistance and recommendations for improving a given community’s programs, but the local government policies, programs, and the implementation of their hazard mitigation plans is the responsibility of the local government. Local towns and cities, however, are not required by law to implement the State’s recommendations.

The matrix below provides an overview of programs and regulations for most of the communities in New Hampshire. The overall effectiveness of these programs is assessed at the local level in the Local Hazard Mitigation Plan. HSEM has reviewed the local plans and has determined that these common actions in local hazard mitigation plans are reflected in the matrix below and has determined that all of these programs are adequate to excellent in quality with no changes needed. The individual assessment by the local plans identify whether or not they need improvement. If a problem is identified HSEM will provide technical assistance to those individual communities.

Emergency Operation Plan	Aquifer Protection District
Building Code	Shoreland Protection Program
Floodplain Ordinance	Hazardous Materials Plan/Team
Elevation Certificates	Public Education Programs
Community Rating System	Master Plan
Emergency Warning System	Wetland Conservation District
Subdivision Regulations	Capital Improvement Program
Site Plan Regulations	Emergency Back-up Power
Road Design Standards	Mitigation Grants
Bridge Design Standards	Fluvial Erosion Hazard Zoning
Bridge Maintenance Program	Ordinance
Storm Drain/Culvert Maint.	

Current Protection, Program or Activity	Responsibility	Effectiveness	Recommendations For Improvements/Comments
Emergency Operation Plan	Local Jurisdiction/EMD	Good	None
Building Code	Local Jurisdiction	Good	None
Floodplain Ordinance	Local Jurisdiction/Selectboard	Good	None
Elevation Certificates	Local Jurisdiction/Planning Board	Good	None
Community Rating System	Local Jurisdiction/Selectboard	Good	None
Emergency Warning System	Local Jurisdiction/Selectboard	Good	None
Subdivision Regulations	Local Jurisdiction/Planning Board	Good	None
Site Plan Regulations	Local Jurisdiction/Planning Board	Good	None
Road Design Standards	Local Jurisdiction/EMD	Good	None
Bridge Design Standards	Local Jurisdiction/EMD	Good	None
Bridge Maintenance Program	Local Jurisdiction/EMD	Good	None
Storm Drain/Culvert Maintenance	Local Jurisdiction/EMD/Road Agent	Good	None
Aquifer Protection District	Local Jurisdiction/EMD	Good	None
Shoreland Protection Program	Local Jurisdiction/Selectboard	Good	None
Haz. Materials Plan/Team	Local Jurisdiction/Fire Chief	Good	None
Public Education Programs	Local Jurisdiction/School Board	Good	None
Master Plan	Local Jurisdiction/Selectboard	Good	None
Wetland Conservation District	Local Jurisdiction/	Good	None
Capital Improvement Program	Local Jurisdiction/Selectboard	Good	None
Emergency Back up Power	Local Jurisdiction/EMD	Good	None
Mitigation Grants	Local Jurisdiction/EMD	Good	None
Fluvial Erosion Hazard Zoning	Local Jurisdiction/EMD	Good	None

Table 6.1

State Assistance for Local Plan Development

Homeland Security and Emergency Management (HSEM), Planning Section, provides technical assistance to Regional Planning Commissions, contracted planners and local communities that request support in the development of their Local Hazard Mitigation Plans. HSEM staff distributes the Local Mitigation Plan Review Guide (October 1, 2011) document both in paper and digital format, and mitigation planning documents offered through the Federal Emergency Management Agency (FEMA). However, HSEM has largely relied upon the nine Regional Planning Commissions (RPCs) as well as the contracted planners to facilitate and develop hazard mitigation plans for local communities. Many communities in New Hampshire are all volunteer do not have the staff and resources available to develop a plan. The RPC's and contracted planners have been trained over the years by HSEM and FEMA and have developed the experience and expertise to assist in the development of local Plans.

The State Hazard Mitigation Officer, the State Hazard Mitigation Planner, NH HSEM Field Representatives, the NFIP Coordinator, Regional Planning Commissions and contracted planners work with local governments by providing the following:

- Model zoning ordinances
- Local hazard mitigation planning guidance and assistance
- Local mitigation planning workshops
- Sharing examples of good mitigation planning methods and products that have been approved by FEMA
- Assistance in the identification of cost-effective and environmentally sound mitigation projects
- Natural hazard, demographic and economic data for communities to use in their local plans
- Vulnerability assessment and loss estimation modeling data, as well as benefit-cost analysis guidance
- Workshops on Mitigation Project Identification & Development

Funding for planning assistance is provided by grants from FEMA. These include annual planning grants through the Flood Mitigation Assistance (FMA) program, Emergency Management Performance Grants (EMPG) and the Pre Disaster Mitigation (PDM) grants. The RPC planning initiative mentioned above is funded completely by the PDM grant program. Since 2010 over one hundred communities have received a formal approval from FEMA for their Hazard Mitigation plan, and over ninety-five communities are adopting their plans or are in the process of updating their plans. All of these were funded through a combination of the aforementioned grant programs. Please see table 6.2 on following page for funding sources.

Summary of Funding Sources for Local Mitigation			
Funding Source	Program Description	Eligible Projects	Responsible Agency
Emergency Management Performance Grant (EMPG)	Federal grants to assist State, local, territorial, and tribal governments in preparing for all hazards.	Funding assistance to update all-hazards Emergency Operations Plans, assist with local emer. management capabilities, and serve as the foundation for first responder activities.	Homeland Security and Emergency Management (HSEM)
Pre-Disaster Mitigation Grant (PDM)	Federal grants to assist State, local, territorial, and tribal governments in mitigating natural hazards through cost effective measures.	Drainage improvements, planning initiatives, acquisitions and elevations	HSEM
Flood Mitigation Assistance Grant (FMA)	Implementing measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the NFIP.	Soil stabilization, dry flood-proofing, acquisitions and elevations	HSEM
Hazard Mitigation Grant Program	Structural Mitigation Projects due to a Presidential Disaster Declaration.	Drainage improvements, planning initiatives, acquisitions and elevations	HSEM
FEMA Supplemental Funding	Funding assistance to State and Locals to assist financially for eligible projects	Clearance, removal, and/or disposal of storm-generated debris such as trees, sand, gravel, building materials, wreckage, vehicles and personal property.	HSEM
Citizen Corp	To support the formation of state and local Citizen Corps Councils to help drive local citizen participation by coordinating Citizen Corps programs.	Education, training and volunteer services to help prepare for the response to threats natural and human caused.	HSEM
School Emergency Response and Crisis Management Plan Discretionary Grant Program	To provide school districts with funds to strengthen and improve current school crisis plans in preparation for emergencies including potential terrorist attacks.	Emergency response and crisis plan writing and updating.	Department of Education

Community Development Block Grant (CDBG)	Provides annual grants on a formula basis to entitled cities, urban counties and states to develop viable urban communities by providing decent housing and a suitable living environment, and by expanding economic opportunities, principally for low- and moderate-income persons	Improvements for Public Infrastructure and Housing. Property Acquisitions	Housing and Urban Development (HUD)
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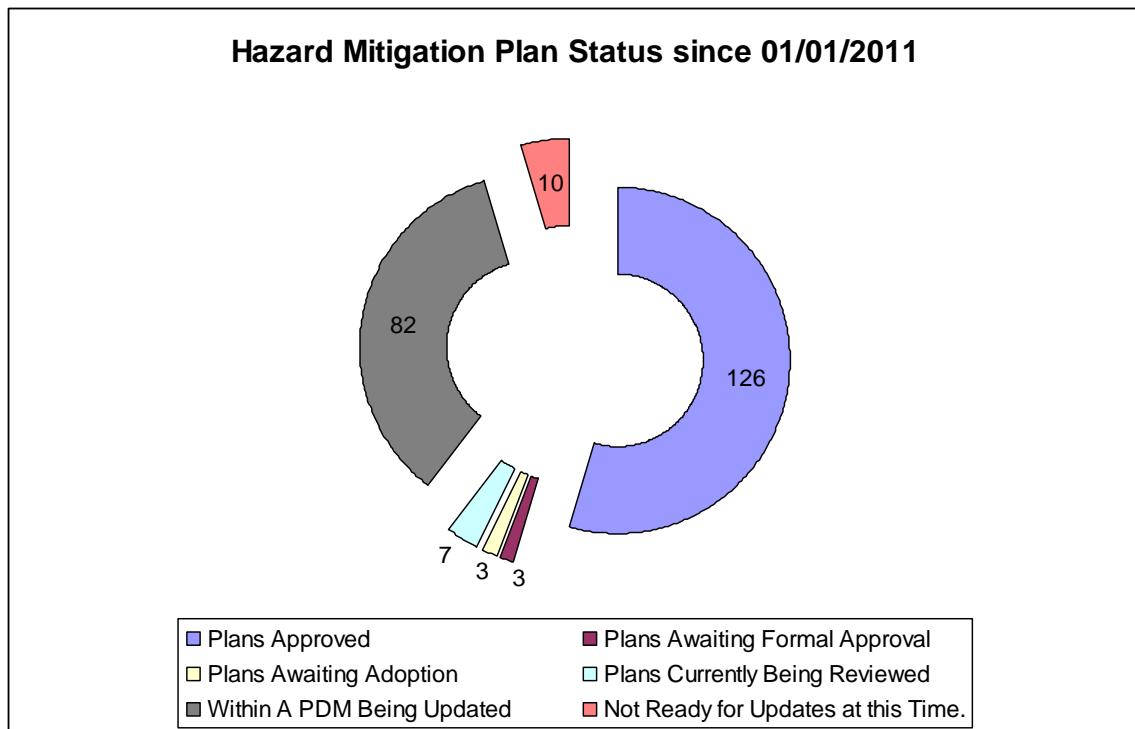
Table 6.2

Review Process of Local Plans and Projects

Plan Review

All plans completed by the Regional Planning Commissions (RPCs) and other independent consultants, regardless of funding sources, are submitted to HSEM. The State Hazard Mitigation Officer (SHMO) reviews each plan using the Local Hazard Mitigation Plan Review Guide effective 10/01/2011 developed by FEMA. This review is completed within 30 days then sent to FEMA Region 1 for review. FEMA has 45 days to review, if FEMA has comments on a Plan, they send their comments to HSEM and the community. Once revisions are made and approved by FEMA upon receipt of FEMA's Approvable Pending Adoption (APA) the community will formally adopt the Plan and the final adopted plan will be forwarded to NH HSEM and FEMA for the formal approval from FEMA. The official approval letter and date of the approved plan is sent to NH HSEM, RPC/contracted planner, and community official. All formal approved plans are kept at NH HSEM.

As HSEM staff reviews local Hazard Mitigation Plans, information that is applicable to a regional or State level of planning will be collected and available within 60 days for inclusion to future revisions of the State Hazard Mitigation Plan. Likewise, sections of the State Plan are posted on the HSEM website for local communities, Regional Planning Commissions, contracted planners and the general public to incorporate into their Local Hazard Mitigation Plans. Currently the State of New Hampshire has 231 plans that are currently within some form of review, approval or adoption/implementation (see chart below). Three communities have opted to not participate in writing a local hazard mitigation plan.



Project Review

The SHMO is responsible for project management and record keeping, including project files that contain all correspondence, applications, vouchers, reports, receipts, and related documentation. HSEM support staff will assist in the preparation of the state/local grant agreement, all correspondence and project files. Quarterly progress reports will be submitted to FEMA by the SHMO based on the reports provided by the Applicant's Agent. A final report will also be required from each applicant, and closeout documents will be submitted to FEMA by the SHMO.

Mitigation Project Closeout procedures required by the communities include the following:

- A. The sub-grantee shall submit closeout information in the form of a final report on work done, expenditures, and other costs.
- B. Project closeout will be noted in the project files.
- C. Final payment shall be made along with a closeout letter.

Prioritization of Local Planning & Projects

Mitigation Planning is a high priority for the Homeland Security and Emergency Management (HSEM). The RPC's or contracted planners complete the majority of mitigation plans within the State and select communities based on population, hazard risk, and a community's interest and involvement in mitigation. HSEM also provides direct technical assistance to communities that develop plans on their own.

Prioritization of mitigation projects typically fall under the Hazard Mitigation Grant Program (HMGP). All PDM project applications submitted to the State, will also be reviewed under the following HMGP requirements:

1. Project Review Process:

- The State Hazard Mitigation Officer (SHMO) will review all applications for completeness and to ensure they meet State and Federal eligibility criteria.
- A Cost Benefit Analysis will be conducted on all projects submitted utilizing FEMA BCA software.
- The Hazard Mitigation Grant Review Committee will review and make funding recommendations on the applications. This is to be based on communities with the highest risk and the greatest pressures caused by development.
- The SHMO will provide the Director of HSEM, in prioritized order; those grant applications recommended for FEMA approval by the Mitigation Grant Review Committee.
- The Director of HSEM will forward applications to FEMA for funding approval.

2. Project Ranking Process and Criteria:

The Mitigation Grant Review Committee will rank all eligible projects. Ranking will include consideration based on meeting the following:

- a. Objectives and criteria within the State Hazard Mitigation Plan
- b. Federal and State criteria as outlined earlier in this document
- c. 44 CFR Section 206.435 (b)
- d. Membership in the National Flood Insurance Program
- e. FEMA-approved Hazard Mitigation Plan
- f. Communities with the highest level of risk
- g. Repetitive Loss Property
- h. Communities feeling the highest pressures caused by development
- i. Available funding

Applicants will be formally notified of the results of the Committee's ranking and reviewing process, and of their recommended or non-recommended status by the SHMO. Applicants not being recommended for funding may appeal the Committee's decision under specific criteria.

3. Selection of Projects:

The SHMO will submit to the Director of HSEM those projects that have been reviewed and ranked by the Mitigation Grant Review Committee, and are recommended for submission to FEMA for final approval and funding.

Applicants will be notified by the Director's office if the application has been approved for forwarding to FEMA.

Integration of Local Projects

The State of New Hampshire is currently working with the University of New Hampshire Granite program to assist in gathering local Hazard Mitigation project information statewide. The intention is to develop an interactive GIS map of completed projects. The information on the map will include project scope of work, funding program, project cost and before and after mitigation pictures. This map will be included in this section of the state plan and on the HSEM Website for public use.

This project is in the planning phase and should be introduced in the 2016 edition of the State Plan.

Integration of Local Plan Risk Assessments

The State of New Hampshire Hazard Mitigation Planning Committee has reviewed and analyzed the risk assessment portion of various local hazard mitigation plans for the THIRA/SPR and used this information to help develop risk assessments into County specific hazards, this information can be found in Appendix C.

Chapter VII.

Mitigation Measures and Action Plan

Introduction

The mitigation projects identified in this chapter were initially compiled by the State Hazard Mitigation Officer (SHMO). They were reviewed by the State Hazard Mitigation Planning Committee (SHMPC) to ensure if they are still valid, what changes should occur or what needs to be deleted or deferred. For each Goal identified, the SHMPC identified objectives and projects to achieve that goal. NH HSEM provides support to other state agencies, which together provides a collaborative work environment.

Goals Identified

The SHMO, in coordination with the SHMPC, developed the following list of Mitigation Goals for the State of New Hampshire. These goals are broad and represent what the State would like to achieve in the long-term. They are intended to guide the development and implementation of mitigation measures. Due to the short turn around for updates of State Hazard Mitigation plans, many of the funding sources and projects have not changed since the 2010 Plan. This will be reviewed again for the 2016 update.

The goals are organized on a functional basis, as opposed to being grouped by hazards. The thought behind this decision is that many mitigation measures address multi-hazards. However, as identified in Chapter 2-Hazard Analysis, Flooding and Winter Weather-related hazards occur most frequently in New Hampshire. Consequently, the mitigation projects identified in this Chapter are based on their implementation in the highest risk areas. HSEM sets a high priority for projects implemented in the highest impact areas.

The SHMPC reviewed all of the mitigation actions from the 2010 plan and many of the actions are still current. Due to the short turn around with the timeframe of the plan updates some of the items have been modified to better suit the goal and objectives. There are some changes which are all noted as completed, deleted, or deferred. All goals, objectives and actions in this document are those specific to the mitigation strategies of the State of New Hampshire which are designed as a guide for local planning efforts, but do not reflect goals or actions identified in local mitigation plans. All actions have been prioritized through the STAPLEE (Social, Technical, Administrative, Political, Legal, Economical, and Environmental) process which can be found in Appendix A.

Local communities continue to develop their specific mitigation projects based on the goals, objectives and actions identified in the State Hazard Mitigation Plan. When there is an open application period, many communities review their hazard mitigation strategy for eligible mitigation projects, and ultimately many of the projects are approved.

Hazard Mitigation Goals Of the State of New Hampshire

The overall Goals of the State, with respect to Hazard Mitigation, are to provide guidance in the selection of hazard mitigation activities throughout the state. The State Hazard Mitigation Plan Committee reviewed the list and decided that they were still productive, made some slight variations and will review changes for the next update. A complete list of the Goals, Objectives and Activities can be found in the “*Mitigation Measures and Action Plan*” on the following pages.

- Ensure the protection of the general population, citizens and guests of the State of New Hampshire, before during and after a hazard.
- Protect existing properties and structures through mitigation activities.
- Provide resources to residents of New Hampshire to become more resilient to hazards that impact the State’s Critical Support Services, Critical Facilities, Infrastructure, Economy, Environment, Historical & Cultural Treasures and Private Property.
- Support the Presidential Policy Directive (PPD-8) through prevention, mitigation, preparedness, response and recovery actions in all New Hampshire communities
- Work regionally to identify, introduce and implement cost effective Hazard Mitigation measures in order to accomplish the State’s Goals.
- Develop and implement programs to promote hazard mitigation to protect infrastructure throughout the State to reduce the State’s liability with respect to natural and Human-caused hazards generally.
- To address the challenges posed by climate change as they pertain to increasing risks in the State’s infrastructure and natural environment.

Goal #1- To improve upon the protection of the general population, citizens, and guest of the State of New Hampshire, from all natural and human caused hazards.

Objective A: Protect the public from natural & Human-caused hazards by dissemination of information with respect to the relative risk of individual hazards.

Actions	
1.	Sustain the Emergency Alert System as necessary. (<i>Funded by HSEM through annual FEMA Grants</i>) This will continue to be an action and will be reviewed again for the 2016 update.
2.	NH HSEM will continue to sustain the CEMPS initiative through the Emergency Management Planning Grant Program. (<i>Funded by HSEM through annual FEMA Grants</i>) This will continue to be an action and will be reviewed again for the 2016 update.
3.	Support the development of information dissemination opportunities with broadcast and cablecast media during times of potential hazard conditions as a support agency This will continue to be an action and will be reviewed again for the 2016 update.
4.	Establish integration between the NH State Fire Marshal's Office and HSEM for the dissemination of critical information This will continue to be an action and will be reviewed again for the 2016 update.
5.	Development of a tips line for the reporting of homeland security concerns This will continue to be an action and will be reviewed again for the 2016 update.
6.	Sustain the dissemination of emergency information through the statewide 211 system and the Ready NH website This will continue to be an action and will be reviewed again for the 2016 update.
7.	Maintain the statewide Reverse 911 system for the dissemination of hazardous situations and emergency events. This will continue to be an action and will be reviewed again for the 2016 update.

Objective B: Develop and distribute public awareness materials to New Hampshire communities going to Hazard awareness, Preparedness and Hazard Mitigation.

Actions	
1.	Using materials such as the NESEC video, <i>New England's Next Earthquake</i> and the publication from the State of Maine Emergency Management Office, <i>When Rivers Rise</i> as models; the State will develop public information materials for distribution to appropriate State Agencies, Regional Planning Commissions, communities and interested parties This will continue to be an action and will be reviewed again for the 2016 update.
2.	The State will review and develop (as necessary) Public Service Announcements to alert interested parties as to the existence and availability of these products and publish such material to the worldwide web as resources allow. (<i>Funded by HSEM through annual FEMA Grants</i>) This will continue to be an action and will be reviewed again for

	the 2016 update.
3.	The SHMO will continue to work with the HSEM Field Representatives to make direct outreach to the State's EMDs and other community officials with Hazard Mitigation workshops. This will continue to be an action and will be reviewed again for the 2016 update.
4.	Encourage the development of local Flood Reduction Programs. This will continue to be an action and will be reviewed again for the 2016 update.
5.	Publish such relevant material to the HSEM and Ready NH websites as it may relate to Preparedness, Mitigation, Response and Recovery. (<i>Funded by HSEM through annual FEMA Grants</i>) This will continue to be an action and will be reviewed again for the 2016 update.
6.	Using materials supplied by NFPA and others, the state will utilize and develop public information materials for distribution to appropriate State Agencies, Regional Planning Committees and Local Planning Committees This will continue to be an action and will be reviewed again for the 2016 update.
7.	The NHSFMO will review and develop (as necessary) Public Service Announcements to alert interested parties to the existence of Fire and Hazardous Materials risks. This will continue to be an action and will be reviewed again for the 2016 update.

Objective C: Support the NH DES-Coastal Program in the mitigation of flood hazards in the State's Coastal Zone

Actions	
1.	Provide necessary support to the NHDES-Coastal Program in its Flood Hazard Mitigation activities and in the preservation of the State's marine and adjacent environments This will continue to be an action and will be reviewed again for the 2016 update.
2.	Support the New Hampshire Department of Resources and Economic Development in the implementation of the State's Forest Fire Plan and other plans and authorities toward the development of cost effective wild land fire hazard mitigation measures This will continue to be an action and will be reviewed again for the 2016 update.
3.	Support the completion of the seacoast evacuation Plan -complete

Objective D: Improve the awareness and safety of the State's population related to Hurricane related flooding from excessive rainfall and/or Storm Surge.

Actions	
1.	Sustain the Hurricane Tracking Chart Program and related initiatives to help raise the awareness in the general population of the State's Vulnerability to significant hurricane events. (<i>Funded by HSEM through annual FEMA Grants</i>) This will continue to be an action and will be reviewed again for the 2016 update.

Objective E: Develop and support the creation and maintenance of state and local Hazard Mitigation Plans.

Table 7.1 Continued

Actions	
1.	The State will maintain its Hazard Mitigation Plan by addressing Hazard Identification, Vulnerability Assessment, Risk Analysis and assess its capabilities to mitigate the effects of such hazards. (<i>Funded by HSEM through annual FEMA Grants</i>) This will continue to be an action and will be reviewed again for the 2016 update.
2.	The State will closely support local communities, with assistance from the Regional Planning Commissions, in the creation of local and Regional Mitigation Plans. (<i>Funded by HSEM through annual FEMA Grants</i>) This will continue to be an action and will be reviewed again for the 2016 update.
Objective F: Conduct Community Assistance Visits (CAV) to advise community officials as to the merits of Hazard Mitigation Planning and the availability of resources.	
Actions	
1.	OEP NFIP staff shall regularly conduct CAV's, during which Hazard Mitigation is discussed along with NFIP issues. (<i>Funded by HSEM through annual FEMA Grants</i>) This will continue to be an action and will be reviewed again for the 2016 update.
2.	The SHMO shall address civic, professional and other groups interested in Hazard Mitigation, specifically regarding the State's initiatives and available resources. This will continue to be an action and will be reviewed again for the 2016 update.
Objective G: Support the State's Drought Mitigation Plans and initiatives.	
Actions	
1.	Sustain the New Hampshire Department of Environmental Services and Water Division in the implementation of the State's Drought Management Plan. This will continue to be an action and will be reviewed again for the 2016 update.
2.	Sustain the production and distribution of educational materials as necessary to alert the public of the risk and the appropriate preparedness and mitigation actions. This will continue to be an action and reviewed again for the 2016 plan (Funded through EMPG)
Objective H: Support NHDRED in the implementation of the State's Wildland Fire Suppression Plans and initiatives.	
Actions	
1.	Sustain the New Hampshire Department of Resources and Economic Development in the implementation of the State's Forest Fire Plan and related Plans and authorities toward the development of cost-effective Wildland Fire Hazard Mitigation measures. This will continue to be an action and will be reviewed again for the 2016 update.

Table 7.1 Continued

2.	Sustain the water resource planning initiative being implemented by RC&D to provide rural communities with water supplies available for fire suppression. This will continue to be an action and will be reviewed again for the 2016 update.
3.	Support DRED in the development and implementation of Community Wildfire Protection Plans (CWPP's) aimed at reducing the losses of resources from wildland fires This will continue to be an action and will be reviewed again for the 2016 update.
4.	Support DRED in the use of GIS data layers to map and identify the high-risk areas of the state for potential wildland fires, including the use of LANDIS, a new software model for extrapolating large amounts of data into the future to determine statistical probabilities of wildland fires. This will continue to be an action and will be reviewed again for the 2016 update.
5.	Support DRED with the establishment of Fire wise communities in those areas of the state identified as high-risk for wildland fire. This will continue to be an action and will be reviewed again for the 2016 update.

Objective I: Enhance the State's capability to monitor and anticipate potential seismic conditions and disseminate appropriate information to the public in a timely manner.

Actions

1.	Sustain the integration of existing, upgraded and new gauges in real time Weston Observatory. This will continue to be an action and will be reviewed again for the 2016 update.
2.	Sustain the enhancement of the gauging network as recommended by the USGS and NHDES-WRD. This will continue to be an action and will be reviewed again for the 2016 update.

Objective K. In coordination with the NH Association of Code Enforcement Officers, the AIA and the Society of NH Engineers, the NH Department of Safety, and other pertinent agencies, the State's Hazard Mitigation Officer will endeavor to develop Safe Rooms or Safe Areas Statewide.

Actions

1.	Provide materials to educate the public about the safest measures that should be taken outside of buildings during severe wind events. This will continue to be an action and will be reviewed again for the 2016 update.
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Objective L. Assist communities in performing cost effective Severe Wind Hazard Mitigation measures to protect private property.

Actions

1.	Support the development of local codes to include "Hurricane Clips" in roof construction and promote other cost-effective Severe Wind construction and retrofit techniques –deleted-no longer viewed as a feasible action
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Table 7.1 Continued

Goal #2: To reduce the potential impact of natural and Human caused disasters on New Hampshire's Critical Support Services, Critical Facilities and Infrastructure

Objective A: Identify, assess and catalogue the States Critical Support Services

Actions	
1.	The SHMO shall work with the HSEM Field Representatives, local EMDs and other interested regional and local entities to develop lists of public and private facilities considered "Essential" to regional and local interests during/after events. This will continue to be an action and will be reviewed again for the 2016 update.
2.	Utilizing information received from state and local agencies develop a list of critical support services and facilities. This will continue to be an action and will be reviewed again for the 2016 update.

Objective B: Develop and support Hazard Mitigation measures designed to reduce the potential impact of disasters on the State's Critical Support Services

Actions	
1.	Upon identification and submission of qualifying applications for Program funding, the SHMO shall present applications and recommendations to the State's Hazard Mitigation Team of all cost-effective Hazard Mitigation measures for consideration and prioritization. (<i>Funded by HSEM through annual FEMA Grants</i>) This will continue to be an action and will be reviewed again for the 2016 update.
2.	Assist HSEM in the design of hazard mitigation measures. This will continue to be an action and will be reviewed again for the 2016 update.

Objective C: Support the development of increased standards for such facilities as may be at risk from natural and Human-caused hazards

Actions	
1.	Assist with the retrofit of existing Waste Water Treatment Plants (WWTP) to withstand the 500 year flood event to the extent that such retrofits may be made cost effective This will continue to be an action and will be reviewed again for the 2016 update.
2.	Sustain the development of standards to locate new construction of WWTPs above the 500 year Flood level This will continue to be an action and will be reviewed again for the 2016 update.
3.	Assist Homeland Security and Emergency Management in the development of increased standards for those facilities that maybe at risk from natural and Human-caused hazard This will continue to be an action and will be reviewed again for the 2016 update.

Objective D: Develop strategies to mitigate the effects of river ice impacts on structures and related flooding.

Table 7.1 Continued

Actions	
1.	Develop river Ice Observer Training and systems to facilitate the field reports of ice conditions that will be accessible to NOAA/NWS and USACE-CRREL in real time This will continue to be an action and will be reviewed again for the 2016 update.
Objective E. Support the NH DES- Dam Bureau's Dam Safety Program	
Actions	
1.	Assist the Dam Bureau in the execution of dam safety inspections and enforcement programs as needed This will continue to be an action and will be reviewed again for the 2016 update.
2.	Assist the Dam Bureau in the cost-effective upgrade of State-owned dams for the purpose of optimizing operational controls and the mitigation of the effects of Floods. This will continue to be an action and will be reviewed again for the 2016 update.
3.	Sustain workshops in Hazard Mitigation aimed at Dam Safety and maintenance to municipal dam owners. This will continue to be an action and will be reviewed again for the 2016 update.
4.	Assist private dam owners in gaining access to funding for Hazard Mitigation when structures threaten persons or property and other means/resources are unavailable. This will continue to be an action and will be reviewed again for the 2016 update.
Objective F: Assist in the development, adoption and implementation of road standards throughout New Hampshire communities	
Actions	
1.	Sustain NHDOT and UNH - TTC - T2 Program in the development of road design construction, storm water and road drainage standards, including culvert and bridge sizing. This will continue to be an action and will be reviewed again for the 2016 update.
2.	Encourage the development of local and regional river corridor stewardship programs that address the maintenance of storm water runoff structures and systems. This will continue to be an action and will be reviewed again for the 2016 update.
3.	Consider the development of such programs above by employing the use of volunteers such as Boy/Girl Scouts, watershed groups, environmentally conscious groups, prisoners, etc. to assist in river corridor maintenance programs This will continue to be an action and will be reviewed again for the 2016 update.
Objective G: Protect the State's Road and Bridge Infrastructure against the effects of natural and Human caused hazards.	
Actions	

Table 7.1 Continued

1.	Support the Department of Transportation (NH DOT) to conduct vulnerability assessments on the 24 critical bridges throughout the state This will continue to be an action and will be reviewed again for the 2016 update.
2.	Support the NHDOT to install video surveillance at all Turnpike Toll Plazas, Welcome Centers, Rest Areas, Park-n-rides, Transit Centers, and other critical assets This will continue to be an action and will be reviewed again for the 2016 update.
3.	Support the NHDOT in the collection and distribution of accurate weather and roadway information through the use of existing Rural Weather Information Stations (RWIS) and with additional stations planned throughout the State This will continue to be an action and will be reviewed again for the 2016 update.
4.	Support the NHDOT in the identification, analysis, design solutions and construction of repeated areas of road closures for the various types of hazards This will continue to be an action and will be reviewed again for the 2016 update.
Objective H: Develop strategies to address coastal flooding and protection of infrastructure against storm surge	
Actions	
1.	Sustain the NHDES Coastal Program's participation and support of the Coastal Adaptation Workgroup to address hazard and mitigation needs relative to state and community infrastructure. CAW has been in existence for a little over two years, so the original statement can be deemed complete.
2.	Sustain the procurement and analysis of LIDAR data in coastal watersheds to better predict floodplain and coastal flooding events. This will continue to be an action and will be reviewed again for the 2016 update.
3.	Create visualization tools for communities to better understand the impacts of coastal flooding on infrastructure. This will continue to be an action and will be reviewed again for the 2016 update.
Objective I: HSEM to develop state level criteria to establish a list of critical infrastructure in accordance with the nineteen state critical infrastructure sectors	
Actions	
1.	Conduct vulnerability assessments on state critical infrastructure This will continue to be an action and will be reviewed again for the 2016 update.
2.	Maintain database of state critical infrastructure This will continue to be an action and will be reviewed again for the 2016 update.
3.	Train state and local public safety and health personnel on CIKR asset protection and assistance programs This will continue to be an action and will be reviewed again for the 2016 update.

Table 7.1 Continued

Goal #3. To improve Emergency Preparedness, Response & Recovery in all New Hampshire Communities.

Objective A : Facilitate the enhancement of State and Local Emergency Operations Planning and Preparedness and provide related training and technical assistance

Actions	
1.	Facilitate the review and development of existing Emergency Operation Plans for potential enhancement with respect to Natural and Human-caused Hazards Mitigation initiatives. (<i>Funded by HSEM through annual FEMA Grants</i>) This will continue to be an action and will be reviewed again for the 2016 update.
2.	Provide planning and related technical resources to facilitate the enhancement of Disaster Response and Recovery Plans to include Hazard Mitigation initiatives. (<i>Funded by HSEM through annual FEMA Grants</i>) This will continue to be an action and will be reviewed again for the 2016 update.
3.	Provide planning assistance and technical resources to local communities so they can plan accordingly for evacuation due to common local hazards This will continue to be an action and will be reviewed again for the 2016 update.
4.	Assist local Fire Departments, Hazardous Materials Teams, EMS providers and Law Enforcement in developing and improving the local Operations plans. This will continue to be an action and will be reviewed again for the 2016 update.
5.	Develop and train the Regional Hazardous Materials Teams within the State. This will continue to be an action and will be reviewed again for the 2016 update.
6.	Develop GIS data as it pertains to public safety and health events This will continue to be an action and will be reviewed again for the 2016 update.
7.	Share information with local and federal public and private agencies to minimize the impact from human-caused and natural disasters This will continue to be an action and will be reviewed again for the 2016 update.

Table 7.1 Continued

Objective B: Provide related Training and Technical Assistance.	
Actions	
1	Sponsor Disaster Response Capability training exercises for State and local officials. (<i>Funded by HSEM through annual FEMA Grants</i>) This will continue to be an action and will be reviewed again for the 2016 update.
2	Sustain Incident Stress Debriefing training workshops for responders and citizens and train debriefers to assist in post-event scenarios. This will continue to be an action and will be reviewed again for the 2016 update.
3	Provide for training in communications protocols for local and regional Emergency Responders. This will continue to be an action and will be reviewed again for the 2016 update.
4	Sustain the development of public/private partnerships in the planning for post-event recovery. This will continue to be an action and will be reviewed again for the 2016 update.
5	HSEM will support the annual All-Hazard Public and Private Sector Emergency Preparedness Conference This will continue to be an action and will be reviewed again for the 2016 update.
6	Continue to support Homeland Security Exercise Evaluation Program exercise activities for emergency response capabilities training This will continue to be an action and will be reviewed again for the 2016 update.
Objective C: Facilitate the enhancement of State and local Recovery capability through exercises.	
Actions	
1.	Assist State and local officials in developing individual and collective Recovery capability by providing resources and opportunities regarding participation in training exercises. This will continue to be an action and will be reviewed again for the 2016 update.
2.	Sustain strategies, plans and infrastructure to accommodate event debris management in an environmentally sound manner. This will continue to be an action and will be reviewed again for the 2016 update.
Objective D: Develop a Statewide Emergency Backup Power Generation for the Department of Transportation.	
Actions	
1.	Provide generators at selected state-owned fuel locations to provide fuel to emergency vehicles during an extended power outage. This will continue to be an action and will be reviewed again for the 2016 update.
2.	Provide generators for selected major intersections of state and local roads as determined by NHDOT and affected city/town staffs to provide electricity to power the traffic signal systems during an extended power outage This will continue to be an action and will be reviewed again for the 2016 update.

Table 7.1 Continued

Objective E. Expand on NH Department of Health and Human Services current capabilities to better mitigate epidemics.	
Actions	
1	Connect every NH hospital to the AHEDD system. This will continue to be an action and will be reviewed again for the 2016 update.
2	Enhance syndromic surveillance in schools This will continue to be an action and will be reviewed again for the 2016 update.
3	Develop and utilize within the Communicable Disease Control Section (CDCS) standard operating procedures for each reportable disease. This will continue to be an action and will be reviewed again for the 2016 update.
4.	Expand the use of NH Electronic Disease Surveillance System (NH EDSS) to all investigating staff members at the local and state level. This will continue to be an action and will be reviewed again for the 2016 update.
5.	Better establish protocols and procedures for NH DHHS use of the HAN system including; Define essential public health capacity for HAN, Establish 2-way communication mechanisms for use in public health emergencies, Test response of NH DHHS. This will continue to be an action and will be reviewed again for the 2016 update.
6.	Pilot a Countermeasure & Response Administration (CRA) solution for managing data in the event of a statewide response to an epidemic. This will continue to be an action and will be reviewed again for the 2016 update.
Objective F. Expand on NH Department of Health and Human Services strategies for Food Protection	
Actions	
1	Develop and maintain the Food Emergency Response Plan to allow for the preparedness, active investigation, emergency response and recovery during a food emergency response occurring in the State of NH This will continue to be an action and will be reviewed again for the 2016 update.
2	Provide ongoing technical support and information to other state agencies, local governments, the general public and the media concerning food safety issues during natural, technological or Human-caused disasters. Completed and continues to be apart of the Department of Health and Human Services strategies.
3	Investigate the need for food safety training pertinent to disaster situations for other state agencies and local governments. The Department of Homeland Security Training course, "A Coordinated Response to Food Emergencies" will be held in the fall of 2013 with pertinent State agencies, cities and towns invited to attend.
4	Develop Emergency Action Plans for Retail Establishments during emergencies and distribute to food service establishments to self-inspecting communities This document has been completed and distributed to food establishments in NH. It is also posted on the DPHS Food Protection website and will continue to be updated and

Table 7.1 Continued

	distributed as needed.
5	Expedite the response of the Food Protection Section to disaster situations. Completed with ongoing improvements-still need more information surrounding power outages with food establishments -i.e which ones have lost power, how long power has been out
6	Provide on-site inspections, when needed, to assess the affects of a disaster on the safety of the food supply. This will continue to be an action and will be reviewed again for the 2016 update.
7	Provide on-site inspections of shelters, when needed, to assess the food preparation techniques and safety of food being served. DPHS Food Inspectors will conduct inspections of shelters in our jurisdiction.
Objective G. Expand on NH Department of Health and Human Services strategies for Radiological Protection	
	Actions
1	Develop a comprehensive Radiological Emergency-Response Containment Program. This will continue to be an action and will be reviewed again for the 2016 update.
2	Develop and implement a Monitoring Point Website. This will continue to be an action and will be reviewed again for the 2016 update.

Objective H. HSEM Information and Analysis Center will Provide situational awareness to stakeholders through an integrated, multi-discipline, information sharing network that will collect, analyze and disseminate accurate and timely information in order to provide state and local leadership with actionable information to protect the citizens and the critical infrastructure of New Hampshire.	
	Actions
1	Provide public safety and health leadership with situational awareness and strategic assessments related to natural and human-caused hazard events This will continue to be an action and will be reviewed again for the 2016 update.
2	Receive and disseminate as appropriate homeland security information from federal, state and local partners This will continue to be an action and will be reviewed again for the 2016 update.
3	Determine annual information requirements and priorities This will continue to be an action and will be reviewed again for the 2016 update.

Goal #4 To reduce the potential impact of natural and Human-caused disasters on New Hampshire's Economy, Environment, Historical & Cultural Treasures and Private Property.

Table 7.1 Continued

Objective A. Establish a baseline for future Hazard Mitigation Planning with respect to the impact of natural and Human-caused hazards on the State's economy.

Actions	
1	Sustain the protocol for post-disaster data collection as to direct and indirect losses from events by type. This will continue to be an action and will be reviewed again for the 2016 update.
2	Support the inclusion of planning for economic Hazard Mitigation and recovery in local Hazard Mitigation Plans. This will continue to be an action and will be reviewed again for the 2016 update.
3	Train local fire and hazardous materials teams on the rapid deployment of remediation measures with regards to Fire and HazMat. This will continue to be an action and will be reviewed again for the 2016 update.
4	Assist in the development of Fire Mutual Aid Task Force capabilities. This will continue to be an action and will be reviewed again for the 2016 update.

Objective B. Establish a baseline for future Hazard Mitigation Planning with respect to the impact of various natural and Human-caused hazards on the State's natural environment.

Actions	
1.	Develop a strategy for mapping existing sensitive natural resources that may be impacted by the various hazard types in a GIS format that can be useful in Hazard Mitigation, project approval and for use in future DFOs. This will continue to be an action and will be reviewed again for the 2016 update.
2	Assist HSEM in the development of sensitive natural resources that may be impacted by various hazards utilizing information provided by NH Forest and Lands. This will continue to be an action and will be reviewed again for the 2016 update.

Objective C. Establish a baseline for future Hazard Mitigation Planning with respect to the impact of natural and Human-caused hazards on the State's historic and cultural treasures.

Actions	
1	Assist the State's Historic Preservation (SHPO) Officer and the NH Division of Historical Resources (NHDHR) in efforts to inventory, catalogue and assess the State's important Archeological and Historical properties (including buildings, dams, bridges etc.) This will continue to be an action due to lack of available funds and staffing and will be reviewed again for the 2016 update.

Table 7.1 Continued

2	Conduct an analysis of the impact of prior natural and Human-caused disasters on the State's Historical and Archeological properties as well as the potential for future impacts to these resources from the hazards identified in this Plan. This will continue to be an action due to lack of available funds and staffing and will be reviewed again for the 2016 update.
3	Develop a strategy for Mapping existing sensitive cultural resources as may be impacted by the various hazard types in a GIS format useful in Hazard Mitigation project approval and for use in future Disaster Field Offices. This will continue to be an action due to lack of available funds and staffing and will be reviewed again for the 2016 update.
.4	Assist NH Division of Historical Resources (NHDHR) in the recruitment and training Emergency Field Survey Teams to expedite Historical site reviews in an emergency. This will continue to be an action due to lack of available funds and staffing and will be reviewed again for the 2016 update.
5	Assist the State's Historic Preservation Officer (SHPO) and the NH Division of Historical Resources (NHDHR) in efforts to improve the fire protection of those important historical properties. This will continue to be an action due to lack of available funds and staffing and will be reviewed again for the 2016 update.
Objective D. Support the education of the general public and private property owners in regards to cost effective mitigation measures by making information and resources available to facilitate private mitigation initiatives.	
Actions	
1	Include Flood Hazard Mitigation information going to cost-effective Flood Hazard Mitigation measures for private property in Non-Commercial Service Announcements. This will continue to be an action and will be reviewed again for the 2016 update.
2	Publish and distribute information brochures going to cost effective Mitigation measures and the availability of mitigation resources. This will continue to be an action and will be reviewed again for the 2016 update.
3	Assist HSEM with the development of hazard mitigation information for Fire and Hazardous Materials incidents. This will continue to be an action and will be reviewed again for the 2016 update.
Objective E. To assist communities in performing cost effective Flood Hazard Mitigation measures to protect private property.	
Actions	
1	Assist in local planning enterprises toward the identification and prioritization of cost-effective relocation This will continue to be an action and will be reviewed again for the 2016 update. projects
2	Fund cost –effective Mitigation Projects through available federal grants and local cost share (HMGP, PDMc, FMA, RFC, SRL). This will continue to be an action and will be reviewed again for the 2016 update.

Table 7.1 Continued

3	Encourage and assist communities with the mitigation of repetitive loss properties acquisition & demolition, relocation or elevation (funding through HMGP, PDMc, FMA, RFC, SRL) This will continue to be an action and will be reviewed again for the 2016 update
4	Notify all eligible applicants of available hazard mitigation project grant programs for local mitigation projects , including fund through the (HMGP, PDMc, FMA, RFC, SRL) Programs, as well as other mitigation opportunities. This will continue to be an action and will be reviewed again for the 2016 update
5	Work with Communities to implement cost effective, environmentally sound, and technically feasible mitigation projects to severe repetitive loss properties. This will continue to be an action and will be reviewed again for the 2016 update

Goal #5. To indentify, introduce and implement cost effective Hazard Mitigation measures in order to accomplish the State's Goals

Objective A. Communicate the State's Goals and Objectives statewide and assist in State, Regional and Local Hazard Mitigation Planning initiatives statewide.

Actions	
1	Produce copies of this Plan and distribute these to all members of the State Hazard Mitigation Team, State Point Of Contact's (POC's) of the relevant Lead and Support Agencies, Regional Planning Commissions and other interested private parties, to facilitate Hazard Mitigation planning and implementation. (<i>Funded by HSEM through annual FEMA Grants</i>) This will continue to be an action and will be reviewed again for the 2016 update
2	Assist HSEM in facilitating awareness and acceptance of Hazard Mitigation Planning and the propagation of responsible Hazard Mitigation initiatives. This will continue to be an action and will be reviewed again for the 2016 update

Goal #6 To reduce the State's liability with respect to natural and Human-caused hazards.

Objective A. Establish a baseline for future Hazard Mitigation Planning with respect to the impact of various natural and Human-caused hazards on the State with respect to any liability as may not have been addressed above

Actions	
1	Identify and catalogue categories of potential loss from natural hazards. This will continue to be an action and will be reviewed again for the 2016 update
2	Assist in the development of potential loss areas utilizing information provided by local, state and federal entities. This will continue to be an action and will be reviewed again for the 2016 update

Table 7.1 Continued

Objective B. Support participating communities in their Mitigation Planning initiatives as well as in project selection and execution.	
Actions	
1	OEP will facilitate the selection of one or more communities to receive an FMAP Planning Grant in FY 2008 with FMAP TA 2007 funding. Deleted OEP No longer manages the FMA grant program.
2	Assist in the development of Hazard Mitigation Plans in selected communities. (<i>Funded by NH HSEM through annual FEMA Grants</i>) This will continue to be an action and will be reviewed again for the 2016 update
3	OEP will assist communities in FMAP Project designation, initiation and completion as indicated. Deleted OEP No longer manages the FMA grant program
4	Continue to process existing applications and assist with approved projects with respect to all open Disaster related accounts. This will continue to be an action and will be reviewed again for the 2016 update
5	Continue to work with the State's Hazard Mitigation Team to select projects which are cost beneficial and address the State's Hazard Mitigation Goals and Objectives. This will continue to be an action and will be reviewed again for the 2016 update
6	Revise the HMGP Administrative Plan with Technical Assistance from FEMA. This will continue to be an action and will be reviewed again for the 2016 update
7	Disseminate information with respect to the availability of HMGP funding including the posting of public notices, posting direct mail Notices of Interest to eligible applicants and/or by conducting public information briefings as to the existence and status of HMGP funding and related grant funding requirements. This will continue to be an action and will be reviewed again for the 2016 update
Objective C. Continue to support the initiatives developed under the EMPG – Mitigation Assistance Program and develop relevant and cost beneficial planning and project initiatives as indicated.	
Actions	
1	The State will continue to support the CEMPS initiative through the EMPG Program. (<i>Funded by HSEM through annual FEMA Grants</i>) This will continue to be an action and reviewed again for the 2016 Plan.
2	The NH HSEM will continue to refine the CEMPS curriculum so as to ensure relevancy with the most current and applicable information and mitigation techniques This will continue to be an action and will be reviewed again for the 2016 update
Objective D. Continue to support the initiatives developed under the EMPG – Disaster Preparedness Improvement Grant Program (DPIG) and develop relevant and cost beneficial planning and project initiatives as indicated.	

Table 7.1 Continued

Actions	
1	The SHMO will continue to support Hazard Mitigation planning and projects statewide as are consistent with this Plan. This will continue to be an action and will be reviewed again for the 2016 update
Objective F. Provide training to other State, Regional and local personnel and the private sector which facilitates the awareness and acceptance of Hazard Mitigation and the propagation of responsible Hazard Mitigation initiatives.	
Actions	
1	OEP will provide training in Floodplain Management and the development of local policies and procedures which may facilitate responsible use of designated Floodplain areas. (<i>Funded by OEP through annual FEMA Grants</i>) This will continue to be an action and will be reviewed again for the 2016 update
2	Provide for workshops aimed at Dam Safety and maintenance. This will continue to be an action and will be reviewed again for the 2016 update
Goal #7. To address the challenges posed by climate change as they pertain to increasing risk to the State's infrastructure and natural environment.	
Objective A. Support efforts to characterize and identify risks posed by climate change especially as it relates to changing precipitation patterns, storm event frequency, and sea level rise.	
Actions	
1	Support studies which examine changing hydrology in rivers due to altered precipitation patterns and watershed development. This will continue to be an action and will be reviewed again for the 2016 update
2	Support mapping, studies and protection of natural systems (such as salt marshes) that provide natural protection against coastal flooding Deleted in order to combine into one priority action See objective B Action #4.
3	Utilize and/or establish base information that is provided by an agency that studies sea level rise in the region, striving for consistent use of information and models that are used within the New England region. This is important for keeping information constant, reliable and enables the Town to set benchmarks for implementation as well as tracking progress. This will continue to be an action and will be reviewed again for the 2016 update
4	Thoroughly research and analyze existing information on coastal hazards, statutory authorities and plan strategies and synthesize the findings in a report. This will continue to be an action and will be reviewed again for the 2016 update
5	Evaluate the impacts of salt water intrusion into all aquifers that support the local and regional population. This will continue to be an action and will be reviewed again for the 2016 update

Table 7.1 Continued

6	Also see Goal VI, Goal VII, – establish a uniform regional baseline in Hazard Mitigation Planning for existing and potential future climate change and sea level rise. This will continue to be an action and will be reviewed again for the 2016 update
Objective B. Support strategies for adaptation to climate change.	
Actions	
4	Support NHDES Coastal Program and other organizations' efforts to develop adaptation strategies Deleted in order to combine into one priority action See objective B Action #4.
2-1	Disseminate results of climate change studies for the purpose of better floodplain planning and changing infrastructure standards (ie. Recommendations on culvert sizing and storm water volumes). This will continue to be an action and will be reviewed again for the 2016 update.
3-2	Increase funding and resources for land acquisition, conservation planning, land management programs, and land stewardship in areas at risk of loss or degradation due to sea level rise. This will continue to be an action and will be reviewed again for the 2016 update.
43	Create a web-based data and information portal about coastal hazards including visualization tools (such as browser-based maps providing access to hazards information). Deleted in order to combine into one priority action See objective B Action #4.
4	Support NHDES Coastal Program and other organizations' efforts to develop adaptation strategies. This will include creating a web-based data and information portal about coastal hazards including visualization tools (such as browser-based maps providing access to hazards information), and developing mapping, studies and protection of natural systems (such as salt marshes) that provide natural protection against coastal flooding.
Objective C. Encourage coastal communities to incorporate mitigation planning in master plans, zoning, land use and resource regulations and other planning studies and initiatives that address the existing and potential future threats related to climate change and sea level rise.	
Actions	
1	Establish a comprehensive planning and zoning policy such as development setbacks and limits on density and infrastructure in coastal and transitional zones to consider vulnerability to sea level rise and saltwater intrusion This will continue to be an action and will be reviewed again for the 2016 update.
2	See Goal II, Objective B and Goal III, Objective B, Action 1 Establish new street grade and building first floor elevation requirements that exceed current Town, State,

Table 7.1 Continued

	and FEMA standards. This will continue to be an action and will be reviewed again for the 2016 update.
3	Incorporate projections of sea level rise in current and future capital infrastructure projects. Assessments should assume a 1.5 feet sea level rise for the year 2010 and at least a 2 to 5 feet sea level rise for the year 2100.
4	Define a protected or transition zone between existing and projected hazard areas and developed areas and prohibit incompatible land uses that would place these lands in the transition zone at risk of threat or degradation. This will continue to be an action and will be reviewed again for the 2016 update.

Table 7.1 Continued

State of New Hampshire Mitigation Action Plan

Project	Responsibility/Oversight	Estimated Cost	Funding/Support	Chapter 2 Timeframe	Weather Action
Support DES in Fluvial Studies of NH Watersheds to gain the best scientific data on reducing the effects of flooding in NH communities while maintaining environmentally sound solutions. This action is a continued action and will be until all watershed communities have been completed.	DES / HSEM	450K	HMGP 5% / EMPG & PDMC	2013-2016	Yes
Support the completion of the Seacoast Evacuation Plan-Completed and implementation of plan is forthcoming. Will be available for the 2016 update.	HSEM	Developing Contract	Homeland Security	1 Year	Yes
Support the installation of regionally and locally significant staff gauges and other such monitoring equipment as determined to be necessary by local EMDs, Road Agents, etc. This action is a continued action and will be continued to be monitored.	USGS / HSEM	\$75 per site	EMPG/HMGP	2013-2016	Yes
Support the New Hampshire Department of Resources and Economic Development in the implementation of the State's Forest Fire Plan and related Plans and authorities toward the development of cost effective Wildland Fire Hazard Mitigation measures. This action is a continued action and will be continued to be monitored.	DRED/HSEM	Planning Phase being developed	Firewise and PDMc	2013-2016	No

Table 7.2

Mitigation Action Plan Continued

Project	Responsibility/Oversight	Estimated Cost	Funding/Support	Chapter 3 T imeframe	Weather Action
Support the procurement and analysis of LIDAR data in coastal watersheds to better predict floodplain and coastal flooding events. Completed and implementation is forthcoming.	HSEM / DES	100K	HMA grants	2013-2015	Yes
NEW- Develop adaptation strategies. To include creating a web based data and information portal about coastal hazards including visualization tools and developing mapping, studies and protection of natural systems that provide natural protection against coastal flooding.	NH DES/ NHF & G/UNH Sea Grant & GRANIT/ Clean Air Cool Planet	200K	HMA Grants	2013-2016	Yes
The State will closely support local communities, with assistance from the Regional Planning Commissions, in the creation of local and Regional Multi-Mitigation Plans. This action is a continued action and will be continued to be monitored.	HSEM	\$7,500+/plan	PDM	2013-2016	No
Support the integration of existing, upgraded and new gauges in real time Weston Observatory. This action has been removed due to lack of funding. Will be reviewed at 2016 update.	Weston/HSEM	\$25,000/Site \$15,000 annual fee	Private Sourcee	2013-2016	No

Table 7.2 Continued

Mitigation Action Plan Continued

Project	Responsibility/Oversight	Estimated Cost	Funding/Support	Timeframe	Weather Action
Identify ideal NOAA Weather transmitter locations and alternates that will provide at least 90% signal reception to the State. This action is a continued action and will be continued to be monitored.	NH DOT	\$70,000/site +\$35/mo. Fees	DOT General Funds	2013-2016	Yes
NEW-Provide for workshops in Hazard Mitigation aimed at Dam Safety and maintenance to municipal dam owners.	DES	\$2,000 Workshop	Dam Registration Fees	2013-2016	Yes
Organize and train Road Agents, EMDs and “Skywarn” etc. volunteers in affected areas in ice monitoring activities that will enhance the NH-CRREL database. This action is a continued action and will be continued to be monitored.	CRREL/HSEM	\$1,500/ Workshop	State Hazard Mitigation Funds	2013-2016	Yes
Provide funding, and facilitate the review of existing local Emergency Operation Plans for potential enhancement with respect to Natural and Manmade Hazards Mitigation initiatives. This action is a continued action and will be continued to be monitored.	HSEM	\$2,500- \$5,000/plan	EMPG	2013-2016	No

Table 7.2 Continued

Mitigation Action Plan Continued

Project	Responsibility/Oversight	Estimated Cost	Funding/Support	Timeframe	Weather Action
Develop a strategy for mapping existing sensitive natural resources as may be impacted by the various hazard types in a GIS format useful in Hazard Mitigation, project approval and for use in future DFOs. This action is a continued action and will be continued to be monitored.	HSEM/grnit/911	Admn. Costs	Personnel Support/ Administrative Budget	2013-2016	No
Assist the State's Historic Preservation (SHPO) Officer and the NH Division of Historical Resources (NHDHR) in efforts to inventory, catalogue and assess the State's Archeological and Historical treasures (including buildings, dams, bridges, etc.). This action is a continued action and will be continued to be monitored.	NHDHR/HSEM	Varies per project	EMPG/NHDR	2013-2016	No
Continue to work with the State's Hazard Mitigation Team to select projects which are cost beneficial and address the State's Hazard Mitigation Goals and Objectives. This action is a continued action and will be continued to be monitored.	HSEM/State Hazard Mitigation Committee	Admn.	EMPG	2013-2016	No
Provide for training in Floodplain Management and the development of local policies and procedures which may facilitate responsible use of designated floodplain areas. This action is a continued action and will be continued to be monitored.	OEP/RPCs	\$3,000/yr	CAP/NFIP	2013-2016	Yes

Table 7.2 Continued

Mitigation Action Plan Continued

Project	Responsibility/Oversight	Estimated Cost	Funding/Support	Timeframe	Weather Action
NEW-GIS layer digitizing all known area surveys (project area, historic district area, town-wide area, and National Register district), needs to be done.	NHDHR	350K-500K	HMA Grants/Staff	2016	No
NEW-State-wide assessment of deficiencies in survey data (done by town, but phase by county if necessary).	NHDHR	350K-500K	NHDHR Interns/FEMA	2016	No
NEW-Upgrade hardware/software to digitize all remaining records, either locational data or full records.	NHDHR	350K-500K	NHDHR Interns	2016	No

HSEM Staff Projects

The following is a list of mitigation activities that should be incorporated in the next update of the Plan, as time and funds allow

Complete building type to the <i>Inventory of State-Owned Critical Facilities</i> table in Chapter IV. This action is a continued action and will be continued to be monitored.	HSEM – SHMO	Admn.	HSEM Staff	2013-2016	No
NEW-Complete assessment of mitigation funds currently being utilized within the State.	HSEM – SHMO	Admn.	HSEM Staff	2013-2016	No
Collect more hazard specific data, on a county wide basis for Landslide, Downburst, Lightning and Winter Weather. Completed	HSEM – SHMO	Admn.	HSEM Staff		
Incorporate identification, risk assessment and mitigating of Human Caused Hazards in future updates of this Plan. Completed	HSEM – SHMO	Admn.	HSEM Staff		

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Chapter VIII.

Plan Implementation and Maintenance

Implementation and Monitoring

The SHMPC determined that the process for monitoring, evaluating, and updating the 2013 State Hazard Mitigation Plan was efficient and met the necessary criteria for the involved agencies. The Committee will review the process prior to the 2016 update and make appropriate changes based on national criteria at that time.

The implementation of the Plan shall continue to be an ongoing effort on the part of the HSEM Director, The SHMPC, and the SHMO. The SHMO shall be responsible for annual Plan maintenance as well as reporting suggested changes/additions to the SHMPC and the HSEM Director as appropriate and needed to ensure continuity with the Plan. Such reports will be incorporate into the Hazard Mitigation Team's agenda and conveyed to the HSEM Director.

The Plan shall be reviewed and evaluated after each declared/non-declared event, or at a minimum on an annual basis. The Plan will be updated formally every three years. The review will detail any adjustments that need to be made to the Plan to illustrate changes from across the State, such as updated maps or changes in priorities from within the State's mitigation strategy. At a minimum, the criteria for review will be the 'January 2008 Standard State Hazard Mitigation Plan Review Crosswalk' provided by FEMA Region I. The process for the annual review of the Plan is the responsibility of the SHMO and the SHMPC with all plan contributors being included either in group or individual meetings to ensure consistency and continuity. These meetings are recorded and open to the public; any recommendations derived from the meetings will be evaluated and forwarded by the SHMO to the State's Hazard Mitigation Team for consideration and comment. The SHMO will ensure the general public is notified of the review process and are invited to comment on the Plan.

More specifically, the State Hazard Mitigation Team will:

- Review the Hazard Analysis, Chapter II, to reflect new historical information on natural or human-caused hazards.
- Review the Risk Assessment, Chapter IV, to incorporate new data collected on State and local critical facilities, infrastructure, and population
- Review the Capability Assessment, Chapter V, to integrate new programs, policies, initiatives, and funding capabilities at the local, State and Federal level
- Incorporate a summary of the development of local mitigation plans in the Coordination of Local Mitigation Planning, Chapter VI

- Examine the progress and effectiveness of mitigation projects completed. Determine whether or not they meet the goals of the State's Mitigation Plan, and if not, whether or not the State's mitigation strategy should be modified.

Recommendations for Plan amendment from the SHMPC and the general public shall be forwarded to the HSEM Director for consideration and Plan amendment approval.

Any Section of the 409 Plan, which is recommended for amendment by the HSEM Director shall be forwarded to the FEMA Regional Office Hazard Mitigation Division staff for review and final adoption in accordance with 44 CFR, Subpart M.

Plan Maintenance

The SHMO and the SHMPC shall assure maintenance of the Plan and shall consider and approve projects that are submitted for HMGP, FMA, and PDM funding in accordance with the Plan's Goals and Objectives.

The SHMO will contact the following participants via email, letters and public notices/announcements and will consider their comments for inclusion in annual updates of the Plan:

- State Hazard Mitigation **Planning** Committee ([HSEM](#), [DRED](#), [DOT](#), [DES](#), [OEP](#), [SHPO](#))
- One or more representatives [from each](#) of the nine Regional Planning Commissions
- Representatives of local jurisdictions
- Private/Non-profit organizations as identified in Chapter I—Planning Methodology
- Members of the general public

Continuing Relevancy of Goals and Objectives

The SHMO and the SHMPC shall continually monitor the relevancy of the Plan's stated Goals and Objectives. They will take this step when considering any and all mitigation measures.

Effectiveness of Mitigation Strategies and Measures.

The SHMO and the SHMPC shall work cooperatively to identify and evaluate the effectiveness of all existing Hazard Mitigation measures, and assess and adjust the mitigation strategy accordingly.

Unless the HSEM Director and/or the SHMPC identify an adjustment as an emergency measure, adjustments requiring a modification to the State's Plan shall follow the procedure for Plan amendment. In all cases where an apparent departure from the Plan

may have been initiated, at the earliest practical opportunity, or within 30 days (whichever is less), the SHMO shall prepare and report the emergency measures and amendments undertaken, and submit the Plan amendment to FEMA for amendment approval.

Monitoring of Mitigation Activities

At the time of the 2013 Plan update, SHMPC determined that the current process for monitoring the progress of mitigation activities was efficient and worked well for all agencies involved. It was determined that no changes were necessary at that time, but the process would be reviewed again prior to the 2016 Plan update. Many of the action items were not able to be completed due to the short turn around between the 2010 Plan and the 2013 Plan. Those actions that have been determined to be a continuous action will be reviewed for incorporation in the 2016 Plan update.

Any HMGP, FMA, PDM, RFC, and SRL-funded projects will include the closeout procedures as identified in the Mitigation Grant Administrative Plan 2013, in Appendix C. The SHMO will monitor all HMGP, FMA, PDM, RFC and SRL project closeouts. At a minimum, the following will occur for project closeouts:

- a. The sub-grantee shall submit closeout information in the form of a final report on work done, expenditures, and other costs.
- b. Project closeouts will be noted in the project files.
- c. Final payments shall be made along with a closeout letter.

State agencies that are identified in the Mitigation Action Plan, or are contributing to any of the mitigation measures identified in Chapter VII, will submit brief progress reports on an annual basis. The SHMO will utilize the FEMA cost benefit software and follow the cost benefit analysis for project funding, monitoring and closeout requirements as identified in the Mitigation Grant Administrative Plan (Appendix C). The SHMO will track progress of actions and projects identified in the State Hazard Mitigation Plan by meeting and maintaining contact with members of the SHMPC.

Future Enhancement

The SHMPC will review the need for improvements for the 2016 Plan, such as HAZUS or the possibility of hiring a consultant. Funding sources for the improvements or hiring a consultant will need to be reviewed and approved by the NH HSEM Director, as well as Governor and Executive Council. The 2013 Plan update was funded and written by NH HSEM. The SHMO and the SHMPC shall endeavor to develop appropriate and cost effective Hazard Mitigation strategies as may be consistent with the achievement of the stated FEMA and State of New Hampshire overall Goal “To substantially reduce the loss of life and damage to property” stemming from these events.

The SHMO and the SHMPC will continue to study the impact of such hazard events that impact upon the State’s citizens and guests as well as its infrastructure, critical facilities,

aviation and navigation facilities, agriculture, aquaculture, forests, ecology, economy (e.g. tourism industry, forest products, etc.), historical treasures and quality of life and endeavor to develop cost effective strategies to mitigate losses associated with these events.