



SECOND ANNUAL REPORT

New Hampshire Coastal Risk and Hazards Commission

December 2014



COASTAL RISK AND HAZARDS COMMISSION
(RSA 483E)

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December 19, 2014

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New Hampshire Coastal Risks and Hazards Commission (RSA 483-E)

**APPOINTED MEMBERS AND ALTERNATES
as of November 1, 2014**

Member	Representing
Dr. Mimi Becker	Town of Exeter
Steve Bird	City of Dover
Rep. David Borden	Town of New Castle
David Caron	NH Municipal Association
Patrick Carroll	Town of Rollinsford
Robert Cormier	Homebuilders and Remodelers Assoc. of NH
Edna Feighner	NH Division of Historical Resources
Jennifer Gilbert	New Hampshire Office of Energy and Planning
James Houle	Town of Durham
Peter Kinner	Town of Greenland
Jonathan Kipp	NH Public Risk Management Exchange (Primex)
Dr. Paul Kirshen	University of New Hampshire
Shep Kroner	Town of North Hampton
Paul Melanson	Town of Hampton Falls
Steve Miller	City of Portsmouth
Tom Morgan	Town of Newington, NH
Rep. Christopher Muns	House of Representatives
Theodore Kupper	Bureau of Public Works Design & Construction (NH Dept. of Administrative Services)
Kevin Nyhan	NH Department of Transportation - Bureau of Environment
Michael O'Sullivan	Town of Madbury
Jonathan Pennock	New Hampshire SeaGrant Program
Kyle Pimental	Strafford Regional Planning Commission
Vicki Quiram	NH Department of Environmental Services
Rep. Frederick Rice	New Hampshire House of Representatives
John Rice	Seacoast Board of Realtors
Cory Riley	New Hampshire Fish and Game Department
Cliff Sinnott	Rockingham Planning Commission
Raymond Smith	Town of Seabrook
Sabrina Stanwood	NH Department of Resources and Economic Development (DRED) – Division of Forests and Lands
Roger Stephenson	Town of Stratham
Sen. Nancy Stiles	New Hampshire Senate
Sen. David Watters	New Hampshire Senate
Phil Winslow	Town of Rye
Gail Wolek	Division of Parks and Recreation - NH Department of Resources and Economic Development (DRED)
David Wood	Town of Hampton
Michael Woodworth	Town of Newfields
VACANT	Town of Newmarket
Brian Fitzgerald	ALTERNATE: Town of Rye
Sherry Godlewski	ALTERNATE: NH Department of Environmental Services
Mary Kate Ryan	ALTERNATE: NH Division of Historical Resources
Ann Scholz	ALTERNATE: NH Department of Transportation
Richard Huber	ALTERNATE: Town of Exeter

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COASTAL RISK AND HAZARDS COMMISSION (RSA 483E)

1.0 Background and Introduction

This document represents the second annual report to the New Hampshire Legislature on the activities and progress of the Coastal Risks and Hazards Commission. The Commission was established through the enactment of RSA 483-E (SB163, 2013) and became effective July 2nd 2013. The purpose of the Commission is to “recommend legislation, rules and other actions to prepare for projected sea level rise and other coastal watershed hazards such as storms, increased river flooding and storm water runoff, and the risks such hazards pose to municipalities and the state assets in New Hampshire.” Further, in carrying out this charge the Commission is specifically directed to “review National Oceanic and Atmospheric Administration and other scientific agency projections of coastal storm inundation, and flood risk to determine the appropriate information, data, and property risks.” The Commission will be sunset on December 1, 2016. The full text of RSA 483-E is found as Appendix A to this report.

2.0 Coastal Risk and Hazards Commission Established

The organizational meeting of the Commission was called by Representative Christopher Muns (District Rockingham 21 - Hampton), the first named House Member as appointed by the Speaker of the House. The meeting was held in the Legislative Office Building occurred on Friday, August 16 2013 and attended by 24 of the 31 Commission members appointed as of that date by their appointing authorities. At that meeting Cliff Sinnott, member representing the Rockingham Planning Commission, was elected as chairperson and David Wood, member representing Hampton, was elected as clerk. An initial meeting schedule was established which called for the Commission to meet approximately monthly, primarily in locations in the Seacoast. All meeting notices, agenda and minutes are posted in the Legislative Calendar and are open to the public and on the CRHC web page (part of the NH Stormsmart Coast website) found here: <http://nhcrhc.stormsmart.org>

3.0 Commission Membership

RSA 483-E (Appendix A) establishes the Commission consisting of 37 members. As of the date of this report 36 of 37 members have been appointed. A Roster of current Commission members is included as Appendix B. The Commission determined at its organization meeting that members could designate alternates to serve in their absence and to date five members have designated alternates, who are designated as such on the roster.

4.0 Commission Meetings

Since submission of the first interim report (November 2013) the full Commission has met nine times. The subject matter of these meetings has been primarily focused on fact finding regarding coastal risks and hazards, as well as on planning and organizing the work of the Commission. The agenda and minutes of each of the meetings are compiled in Appendix C to this report. The dates, locations, and major topics covered at these meetings are shown in the accompanying table.

With regard to fact finding, reports were requested and received from all state agency representatives of the CRHC and from other members representing statewide interests, to determine (1) whether and how their organizations are responding to the increase coastal flooding risks and (2) what changes they will need in enabling law or other public policy to respond more effectively. In addition, in mid-year, the Commission received and adopted the report of the Science Advisory Panel which provides the basis for the Commission’s assumptions about future conditions with respect to sea level rise and storm intensity that will be used to assess vulnerability and necessary responses.

Organizational work included developing a multiyear plan and strategy to complete the Commission’s work and creating a structure of working groups to assist with specific tasks. Commission members were unsuccessful in two attempts to obtain technical and grant assistance on behalf of the Commission that would have supplemented the volunteer efforts of members but will continue to pursue such assistance focused on producing the Commission draft and final reports. In the meantime, the Commission is well supported by the commitment of many of its members who are contributing significant amounts of time and effort.

**Coastal Risks and Hazards Commission Meetings
November 2013 - December 2014**

DATE	LOCATION	TOPIC(S) / ACTIONS
November 15, 2013 10:00 AM	Exeter Public Library	-Member Agency Reports on Responses for Climate Change and Coastal Flooding risk: <ul style="list-style-type: none"> • NH Dept of Environmental Services • NH Dept. of Transportation • NH Fish and Game Establish Science Advisory Panel
January 17, 2014 10:00 AM	Urban Forestry Center, Portsmouth	-Continued Member Agency Reports on Responses for Climate Change and Coastal Flooding risk: <ul style="list-style-type: none"> • Division of Parks and Recreation (DRED) • Division of Forests and Lands (DRED) • Division of Historic Resources (NHDCR) • Office of Energy and Planning (NHOEP) -Georgetown Climate Center Technical Assistance Opportunity
February 21, 2014	Hampton Seashell Pavillion	--postponed due to winter storm—
March 21, 2014 10:00AM	Hampton Seashell Pavillion	-NHOEP member report on National Flood Insurance Program and Biggart-Watters Act -NHDES Report of Flood Insurance Commission Study -Strategic Planning for Commission
April 18, 2014 10:00 AM	Dover City Hall	-New England Climate Adaptation Project – Dover Report -New Coastal Flood Insurance Maps (RiskMap) -Member Report (PRIMEX): Role of Insurance Industry in managing risks from natural hazards -3 rd NH Climate Summit summary
May 16, 2014	Newington Town Hall	-Member Report (NH Homebuilders): the

DATE	LOCATION	TOPIC(S) / ACTIONS
10:00 AM		Homebuilder perspective on future coastal risks -Draft FIRM Map release -Science and Technical Advisory Panel update -Discussion / planning for CRHC workgroups
June 20, 2014 10:00 AM	Brown's Lobster Pound, Seabrook	-Science Advisory Panel – presentation of Draft Report -Continued discussion re: Working Groups -Presentation (UNH Jackson Lab) on salt marsh responses to sea level rise, -Continued discussion / planning for CRHC workgroups
July 18, 2014 10:00 AM	Portsmouth Pubic Library	-Science Advisory Panel Final Report – Adopted as Guidance document -NH Coastal Program Report: Comparing other states' responses to sea level rise risk -Initial discussion of CRHC public outreach & communications -Authorization and formation of 3 Work Groups to study vulnerability and recommendations: Coastal Communities, Inland/Great Bay Communities; State Agency/Legislature
August 15, 2014 10:00 AM	NHDES Portsmouth Regional Office, Pease Tradeport	-Release of Science Advisory Panel - Working Group Kickoff/Organizational Meetings
December 19, 2014 10:00 AM	NHDES Portsmouth Regional Office, Pease Tradeport	-Working Group progress reports -Annual Report to Legislature -Shoreline Conference summary -New York and Maryland State Reports

5.0 Committees and Workgroups

- Steering Committee: At its second meeting on September 10, 2013, the Commission voted to establish an ad hoc Steering Committee which presently consists of 11 Commission members or their alternates. The function of this Committee is to plan the Commission meetings to plan and oversee the ongoing work of the Commission and to develop proposals for consideration by the Commission.
- Science and Technical Advisory Panel: In November of 2013 the full Commission voted to establish a Science and Technical Advisory to the Commission and appointed Dr. Paul Kirshen, University of New Hampshire representative to the Commission, to head up the panel and to choose qualified members from both within the Commission membership as well as outside the Commission who are scientists and/or qualified experts in the field of climate science or related disciplines. (See Section 7 below for additional explanation.)
- Workgroups: Based on a recommendation from the Steering Committee, the Commission at its July 2014 meeting established, by separate votes, three geographically focused Workgroups to divide the effort of researching issues and developing preliminary recommendations for the Commission to consider as it develops its main report. Membership on the workgroups was limited to Commission

members, with several members serving on more than one Workgroup. The Workgroups are defined as follows.

Coastal Communities Workgroup: focused on risks, vulnerabilities and recommendations applicable to the seven ocean fronting communities (Seabrook, Hampton Falls, Hampton, North Hampton, Rye, New Castle, Portsmouth).

Inland/Great Bay Communities Workgroup: focused on risks, vulnerabilities recommendations applicable to the ten inland communities that face or have tidal rivers connected to the Great Bay Estuary (Durham, Dover, Exeter, Greenland, Madbury, Newfields, Newington, Newmarket, Rollinsford and Stratham).

State Authorities and Legislative Workgroup: focused on risks, vulnerabilities and recommendations applicable to all communities as well as state agencies. This workgroup is also charged to considers state law, regulations, agency rules, policies and enabling authority that may have a bearing on implementing recommendations and actions at both the state and local levels.

The Workgroups began their work in the September of 2014 and are expected to be finished in the Spring of 2015.

6.0 Strategic Plan and Timeline

One of the Commission's first activities following organization was to develop a strategy and work plan for accomplishing its charge. The Steering Committee lead this activity and secured the pro bono services of John Gilbert, Chair of the Governor's Waters Sustainability Commission to lead two strategic planning sessions. The end result was a mission statement, a definition of the scope of work for the commission, and a general workplan of task and timeline. These are summarized as follows

- **Mission Statement:** The mission statement is drawn directly from SB163, the legislation that established the commission but provides additional specificity and emphasis based on our understanding of the desired outcome: *The purpose of the Coastal Risk and Hazards Commission is to develop sound guidance and recommendations for the state and municipalities regarding prudent and necessary changes to laws, regulations, plans, standards, and other actions that should be taken to prepare for anticipated sea level rise and increased future risks from coastal flooding, stormwater and related hazards.*
- **Scope of Work:** It was agreed that the end product of the Commission's work would be one or more reports containing findings, guidance and recommendations directed at three audiences: the legislature, state agencies, and municipalities. It was understood that to complete this task we would need to develop assumptions about future conditions pertaining to sea level rise, storm intensity and flooding and how they will impact coastal communities with respect to their economy, the physical infrastructure and the environment. It was further recognized that with no financial resources the Commission would rely heavily on existing data and reports, as well studies that are presently underway, including but not limited to:
 - Sea level rise scenario mapping for 2050 & 2100 (UNH/GRANIT/AECOM/Rockingham Planning Commission) based on the Science Advisory Panel's findings.
 - Vulnerability assessments to coastal flooding, with SLR and storm surge (NHSEM/RPC Vulnerability Study)
 - Changes in precipitation (Wake Climate Change report)
 - Impacts to wetlands and fisheries (NHF&G SLAMM model)
 - LiDAR based high resolution topography of coastal areas.

- **Process:** the process for developing the report would consist of five parts:
 1. gather facts; understand the science, quantify risks
 2. receive input from stakeholders and the public
 3. assess and evaluate potential impacts
 4. develop recommendations informed by #1.-3.
 5. report to the legislature, stakeholders, and the public
- **Science Advisory Panel:** A science advisory panel would be employed to advise the Commission on the most likely future conditions, or set of plausible scenarios, on which to base our understanding of future coastal hazards.
- **Recommendations:** It was recognized that the recommendation developed by the commission will be tailored to the three “audiences”: municipalities, state agencies, the Legislature. The municipal focus will be on providing recommended assumptions about future flooding, and providing models, templates and recommended planning processes that will assist them in taking effective action and reducing risk. The state level recommendations will likely include minimum standards for the design and construction of infrastructure, policies for investment in high risk areas, enabling standards, and others.

A general timeline of the Commission’s proposed workplan is shown below. The timeline calls for a draft report to be prepared by the end of 2015 and final report before the sunset date of the Commission, December 1, 2016.

**Coastal Risks and Hazards Commission Meetings
Work Plan and Timeline**

	2014				2015				2016			
	Fact Finding				Assessment/Evaluation				Reporting & Outreach			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
CRHC Meetings	XXX	XXX	XXX	XX	XX	XX	XXX	XXX	XXX	XX	XX	XXX
Science Advisory Panel			★									
Sector Working Groups					★							
Vulnerability Assessment					★							
Other Research												
Eval. Responses/ Measures												
Devel. Recommendations												
Public Engagement												
Legislative Reports				★				★				★
Draft Report								★				
Final Report												★

7.0 Science Advisory Panel Report and Guidance

As explained above the Commission recognized early on the need to obtain the assistance of qualified scientists and other experts in climate science and with specific knowledge of New Hampshire's coast to interpret the vast amount scientific information that has been produced on climate change and predicted impacts on coastal areas. In obtain this assistance it established a Science and Technical Advisory Panel (STAP). This was done in response to three things. First, our early review of technical and scientific information, including reports from the International Panel on Climate Change (Panel 4 and 5) the National Climate Assessment, National Resource Council and several others, yielded results that were not consistent or definitive. Second, RSA 483-E specifically requires the Commission to "review National Oceanic and Atmospheric Administration and other scientific agency projections of coastal storm inundation, and flood risk to determine the appropriate information, data, and property risks." Much of this information is highly technical and is best reviewed and interpreted by individuals with a background in and understanding of climate science. Third, several members of the Commission expressed the desire to explore and factually respond to any credible counter theories refuting the likelihood of accelerated sea-level rise and storm surge risks.

The Commission requested the Chair to organize the Panel and provided the following charge to address this task:

1. Ensure the Commission is aware of and using the best available and relevant scientific and technical information to inform our recommendations;
2. Assist the Commission in interpreting and reconciling conflicting projections, scenarios and probabilities about future conditions; and
3. Review, evaluate, and respond to any major theory and supporting evidence put forward refuting the high likelihood of continued, accelerated sea-level rise and increased coastal risks and hazards.

The members on Scientific and Technical Advisory Panel included: Frederick Chormann, NH State Geologist and Director of the NH Geological Survey; Rob Flynn, Hydraulic Engineer, U.S. Geological Survey; Sherry Godlewski, NH Department of Environmental Services; Matt Huber, Department of Earth Sciences and Institute for the Study of Earth Oceans and Space, UNH; Paul Kirshen, Research Professor Department of Civil Engineering and Institute for the Study of Earth Oceans and Space, UNH (Panel Chair); Kevin Knuuti, US Army Corps of Engineers; Steve Miller, NH Fish & Game and Great Bay National Estuarine Reserve; Ann Scholz, NH Department of Transportation; Mary Stampone, Associate Professor, Dept. of Geography and NH State Climatologist; Cameron Wake, Research Associate Professor, Institute for the Study of Earth Oceans and Space and Department of Earth Sciences, UNH and Josephine A. Lamprey Professor in Climate and Sustainability, UNH Sustainability Institute; Thomas Wymuller (Retired, US NASA) .

Outside Reviewers of the STAP Report included: Robert Kopp (Rutgers University), Stephen Gill (US NOAA), and Kerry Emanuel (Massachusetts Institute of Technology)

The STAP Report, titled "*Sea-level Rise, Storm Surges, and Extreme Precipitation in Coastal New Hampshire: Analysis of Past and Projected Future Trends*" summarizes the large volume of published scientific research pertaining to climate change and how it will affect coastal flood hazards in coastal New Hampshire. Specifically, the report outlines plausible sea level rise scenarios for coastal New Hampshire to the end of the century based on scenarios provided in the most current National Climate Assessment and also suggests assumptions that should be used in planning for storm surge and extreme precipitation. The Panel's report also includes advice on the planning parameters that the Commission should use in framing its recommendations. As stated, the conclusions reached by the Panel regarding future coastal flood hazards are consistent with the Third U.S. National Climate Assessment completed in 2013-2014.

According to the science panel’s report, global sea levels have been rising at a moderate rate for decades and are expected to continue to rise at accelerating rates well beyond the end of the 21st century. The report presents plausible results that sea level will rise between 0.6 and 2 feet by 2050 along New Hampshire’s coast, and between 1.6 and 6.6 feet by 2100 from 1992 conditions (see accompanying table). The report recommends that for coastal locations where there is very low tolerance for risk in protecting new or reconstructed infrastructure, existing coastal settlements, existing infrastructure, or ecosystems that the assumption of sea level rise in the range of 1.3 to 2.0 feet be used for the year 2050 and 3.9 to 6.6 feet be used for 2100.

Time Period*	“Intermediate Low	“Intermediate High”	“Highest”
2050	0.6 ft.	1.3 ft.	2.0 ft.
2100	1.6 ft.	3.9 ft.	6.6 ft.

*using mean sea level in 1992 as a reference (Parris et al., 2012)

Table ES.1. [From STAP Report, July 2014] Sea-Level Rise Scenarios (in feet) Provided by the National Climate Assessment (Parris et al., 2012).

The commission voted unanimously at its July 18, 2014 meeting to adopt the report as guidance for its subsequent work. It will be used by the Commission as it fulfills its statutory responsibilities to recommend legislation, rules, and other actions to prepare for projected sea level rise and other coastal watershed flood hazards and the risks such hazards pose to municipalities and state assets in New Hampshire.

An Executive Summary and FAQ produced as part of the STAP work in found in Appendix F. The full report can be accessed from the Commission’s website at: <http://nhcrhc.stormsmart.org/legislative-reports/>

8.0 Public Outreach

To date, the Commission formal outreach to the public has consisted of a limited number of press releases, presentations at conferences and publically notices meetings as well as the publication of the STAP Report. It is the intention of the Commission to begin significant public outreach during and after the active development of the draft report. More targeted outreach has been occurring through the CHRC membership which is highly representative of a cross section of stakeholders. Members have been encouraged to maintain two way communication between the community or organization they represent and the Commission.

The Commission has been highly transparent in its activities and information sharing though a web presence on the New Hampshire Stormsmart Coast website, managed by staff of the NH Coastal Program (NHDES). The website provides easy access to Commission, Steering Committee and Workgroup meeting agendas and minutes, gathered research materials, and any final reports that are produced.

Examples of the website content and of the most recent conference presentation which summarizes the status of the Commission are found in Appendix D. and Appendix E. respectively.

9.0 Anticipated Activities and Focus in 2015

The Commission’s focus in 2015 will be completing its fact-finding phase (assessments of risk exposure, review of vulnerability assessments now underway, and research into policies and responses considered in other coastal

states, regions and municipalities.) Based on the completed work of the Scientific and Technical Advisory Panel we anticipate using vulnerability assessments being conducted by other organizations to assess risks, make findings and formulate recommendations for an initial draft report expected by the end of 2015. Once the draft report is completed we will seek input on its content from the public stakeholders, included those organizations represented on the Commission.

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