FROM TIDES TO STORMS: PREPARING FOR NEW HAMPSHIRE'S FUTURE COAST

Assessing Risk and Vulnerability of Coastal Communities to Sea Level Rise and Storm Surge

Seabrook - Hampton Falls – Hampton - North Hampton – Rye - New Castle - Portsmouth

Rockingham Planning Commission – with support from the NH Coastal Adaptation Workgroup – will work closely with coastal communities over the next 2 years to evaluate their risk and vulnerability to flooding from sea level rise and storm surge, and identify practical approaches to protecting municipal and private assets, public safety and natural resources.

Increased flooding has the potential to place coastal populations at risk, threaten infrastructure, intensify coastal hazards and ultimately damage homes, businesses, public infrastructure, recreation areas, public space, coastal wetlands and salt marsh.

PROJECT COMPONENTS

The project will provide the following products to coastal NH communities:

- **Maps and Data**
  Detailed maps, risk and impact analyses, mitigation strategies, and recommendations for municipal Hazard Mitigation Plans.
- **Informational Materials**
  Informational outreach materials and tools to help plan future actions and inform public and private investments.
- **Coastal Vulnerability Assessment**
  A regional-scale vulnerability assessment report and map set for NH coastal communities.
- **Town-specific Vulnerability Assessment Summary**
  A report for each community summarizing the impacts of climate change on land, natural resources and infrastructure based on projections of future of sea level rise and storm surge.

FEMA

This project is funded by New Hampshire Homeland Security and Emergency Management (HSEM) through a Pre-Disaster Mitigation Grant from the Federal Emergency Management Agency (FEMA).

ROCKINGHAM PLANNING COMMISSION

New Hampshire coastal municipalities are confronted by land use and hazard management concerns that include extreme weather events, storm surges, flooding, coastal erosion, and damage to key coastal habitats. These issues are only intensified by recent increases in the frequency and intensity of extreme storm events and increases in sea level.

How will the vulnerability assessment benefit my community?

The project is intended to assist coastal NH communities to take actions to prepare for increase flood risk, including:

- **Enhance preparedness and raise community awareness of future flood risks.**
- **Identify cost-effective measures to protect and adapt to changing conditions.**
- **Improve resiliency of infrastructure, buildings and investments.**
- **Protect life, property and local economies**
- **Protect services that natural systems provide**
- **Preserve unique community character**

Overview of the Project Elements and Proposed Timeline

Through Fall 2015, Rockingham Planning Commission staff will meet with towns to discuss the goals of the project, collect local data, identify local priorities and issues of concerns, and prepare detailed maps, risk and impact analyses, mitigation strategies, and recommendations for their Hazard Mitigation Plans.

November 6, 2013	**Kick-off Meeting with coastal communities and regional stakeholders**
March-May 2014	**Presentations introduce and discuss draft results of the coastal vulnerability assessment to coastal communities and regional stakeholders.**
June 2014	**Presentation of the final coastal vulnerability assessment report and maps to coastal communities and regional stakeholders .**
Fall 2014 – Fall 2015	**Meetings to evaluate assessment results and maps with Emergency Management Director, Town Administrator/Manager, Elected Officials, Staff, Planning Board and Conservation Commission in each town. Preparation of climate change chapters for town Hazard Mitigation Plans.**
Fall 2015	**Final informational meeting to present the results of the Coastal Assessment and Hazard Mitigation Planning project to community and regional stakeholders**

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ROCKINGHAM PLANNING COMMISSION

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New Hampshire's Climate: PAST AND FUTURE CHANGES

Earth's climate has varied throughout time and it will continue to change. However, according to a 2011 research report from the University of New Hampshire, the rate of change has increased over the last four decades, with New England getting warmer and wetter.

TEMPERATURES

WHAT HAVE WE SEEN SINCE 1970?

- Annual and seasonal temperatures have warmed by almost 2°F
- Lake ice-out dates are occurring earlier

WHAT CAN WE EXPECT?

- Warmer winters: 25-50 fewer days per year below 32°F
- Hotter summers: 30-70 days per year above 90°F (compared to about 10 per year during the period 1970-1999)

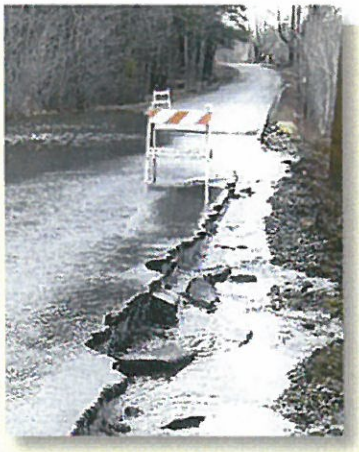
SEA-LEVEL RISE

WHAT HAVE WE SEEN SINCE 1970?

- Sea level in Portsmouth has risen almost six inches since 1926

WHAT CAN WE EXPECT?

- Sea level will continue to rise an additional two to six feet by 2100
- Increased extent of coastal flooding and storm surge



RAIN AND SNOWFALL

WHAT HAVE WE SEEN SINCE 1970?

- Annual precipitation has increased 5-20%
- The frequency and magnitude of extreme precipitation events has increased.

WHAT CAN WE EXPECT?

- Less snow and more rain
- More frequent and severe flooding
- More precipitation (annual average will increase by 12-17%) and more extreme precipitation events.

CLIMATE ON THE MOVE

Changing Summers in New Hampshire

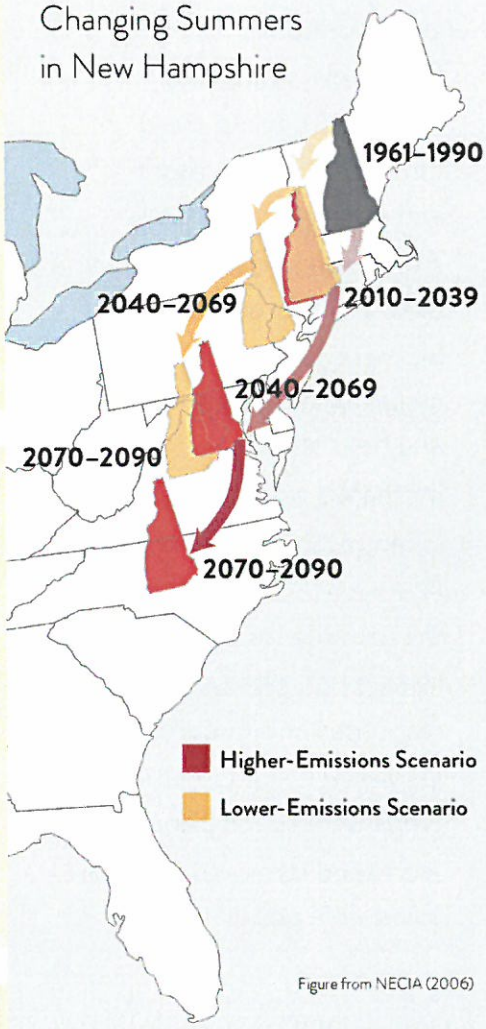


Figure from NECIA (2006)

Yellow arrows track what summers are projected to feel like under a lower emissions scenario, while red arrows track projections for a higher emissions scenario. For example, under the higher emission scenario, by late this century residents of New Hampshire would experience a summer climate more like what occurs today in North Carolina.

How could projected changes in climate affect the places where we live, work, and play?

Seacoast community members provided the following responses to this question during a recent workshop on the past, present, and future climate of coastal New Hampshire.

Their ideas fell into three major categories:


Satellite image of coastal New Hampshire.

OUR COMMUNITIES

- Reduced heating and increased cooling costs
- Greater stress on routine and emergency services
- Expansion in diseases from ticks and mosquitos
- Increased summer heat resulting in discomfort and heat stroke
- Increased ozone pollution
- Changes in tourism economy
- Property loss leading to tax revenue loss
- Impacts on coastal historical resources and culture
- Increased need for community preparedness and planning
- Increased stress on the most vulnerable populations

OUR NATURAL PLACES

- Species loss and change
- Increased invasive species and insects
- Changes in agriculture, such as longer growing seasons and increases in weeds and pests
- Changes to rivers and aquatic habitats
- Changes in migration and ecological patterns
- Loss of pollinators
- Changes in wildlife habitat
- Forest impacts, such as loss of maple syrup and change in tree species

OUR WATER

- Changes to seasonal recreation
- Greater flooding
- Damages to infrastructure
- Risks to drinking water supply
- Greater drought and fire risk
- Changes in groundwater flow to wetlands and rivers
- Less frozen conditions resulting in greater groundwater recharge

Learn more about New Hampshire's changing climate

These reports describe trends of the past century and likely changes in New Hampshire's climate over the next century. They can help residents and communities plan and prepare for changing climate conditions.

Climate Change in the Piscataqua/ Great Bay Region: Past, Present, and Future (2011).

Scan QR code or go to **carbonsolutionsne.org/resources/reports/pdf/greatbayreport_online.pdf**

Trends in Extreme Precipitation Events for the Northeastern United States, 1948-2007. (2010) **carbonsolutionsne.org/resources/ne_climate_reports/pdf/2010_NortheastExtremePrecip.pdf**

Climate Change in the US Northeast. A Report of the Northeast Climate Impacts Assessment (NECIA) (2006) **northeastclimateimpacts.org**

Key resources for community members and journalists on climate adaptation in coastal New Hampshire are available through the NH Coastal Adaptation Workgroup (email **Steve.Miller@wildlife.nh.gov**), **nh.stormsmart.org** and **nh-journalists.stormsmart.org.**