

PREPARING FOR CLIMATE CHANGE IN DOVER

GAINING INSIGHTS AND CHARTING A COURSE

Dover Workshop #1 – Project Kick-off
Tuesday October 21, 2014 | 6:00-8:30pm
McConnell Center (café), 61 Locust Street, Dover, NH

AGENDA

- 5:30 **Refreshments and Register**
- 6:00 ***Climate Change in the Great Bay/Piscataqua Region: Past, Present, and Future***
Cameron Wake, PhD, University of New Hampshire
- 6:25 **Question & Answer**
Cameron Wake
- 6:40 **Project Team and Project Overview**
Amanda Stone, UNH Cooperative Extension
- 6:50 **Overview of How Other NH Coastal Communities are Preparing for Climate Change**
Chris Keeley, NH Sea Grant and UNH Cooperative Extension
- 7:10 **Climate Café Activity Introduction**
- 7:20 **Climate Café Activity**
Participants will work in small groups with a facilitator and notetaker to explore two questions. Participants will focus on one topic at a time (people, infrastructure, or natural resources). Facilitators will rotate to ensure each group gets to work on each topic.
- Given the trends in increased frequency of storms, inland and coastal flooding, and sea-level rise, how might these impacts affect (people, infrastructure or natural resources) in Dover?
 - What actions could Dover take to address these issues?
- 8:10 **Report Out and Sticky Dot Prioritization**
A spokesperson from each group will briefly summarize the input on their topic. Flip charts will be posted on the wall. Participants will each place three sticky dots on what they feel are priority issues for **Dover** to address.
- 8:30 **Adjourn**

Join us for the next workshop!
Monday November 17 6:00-8:00pm
McConnell Center café

This project is led by a local steering committee including members of Dover boards and commissions, City staff, and volunteers. There is no cost to the community for participating. This project is funded by a federal grant from the National Oceanic and Atmospheric Administration awarded to the NH Dept. of Environmental Services and administered through the NH Coastal Program. This program is managed by UNH Cooperative Extension and NH Sea Grant.

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How might sea-level rise, storm surge, and changes in temperature and rainfall affect the City of Dover? Join fellow residents in a series of informative workshops in Fall & Winter 2014 to explore these questions and identify specific actions to prepare for climate change in Dover.

The Situation:

- New Hampshire's coastal communities have experienced numerous flooding events, increased frequency and intensity of storms, impacts from storm surge and as a result, costly repairs.
- The changes in climate over the past several decades are already having a significant impact on New Hampshire's coastal watershed, and will continue to impact ecosystems and society in a range of ways. Prompt action to plan for climate change will help towns to reduce risks to people, infrastructure, and natural resources.
- **In 2012-2014, Dover engaged residents throughout the community** in role-play simulations to explore the challenge of planning for climate change.
- For more information about our local climate, refer to the attached information sheet: *New Hampshire's Climate: Past and Future Changes*

Project Purpose and Goals:

The purpose of this project is to provide Dover with information and tools to better understand how climate change may impact the community. The goals of the project are to:

- Conduct workshops to facilitate discussion and raise awareness about climate change.
- Identify priority issues and/or actions the towns may want to consider to address changes in climate.
- Help Dover to start working on steps to implement actions.

Community leaders and residents will learn about inland and coastal flooding, sea level rise, storm surge, changes in temperature and precipitation, and other impacts of climate change. They will gain experience with new tools for understanding coastal hazards including the NH Coastal Viewer (an online resource for viewing local hazards, currently under development).

At the conclusion of the project, community members and City leaders will have developed an Action Plan to address the impacts of climate change in Dover.

This project is funded by a federal grant from the National Oceanic & Atmospheric Administration awarded to the New Hampshire Coastal Program, managed by staff from the University of New Hampshire Cooperative Extension and NH Sea Grant, and carried out with a local steering committee. There is no cost to the City for participating.



University of New Hampshire
Cooperative Extension

What are other Coastal New Hampshire Towns Doing to Prepare for Climate Change?

Dover's "Role Play Simulations for Climate Change Planning" (2012-2014) <http://necap.mit.edu>

- Used role-play simulations with over 125 residents to stimulate dialogue and action on planning for the impacts of climate change, in partnership with the Great Bay National Estuarine Research Reserve and Massachusetts Institute of Technology.

Hampton, Hampton Falls and Seabrook (2011 – 2013)

- Worked with NH Coastal Adaptation Workgroup to explore economic impacts of sea-level rise and storm surge to public facilities and private real estate. The models showed that between \$365 million and \$400 million of municipal and private assets in Hampton Beach will be at risk by 2050 during a 100-year flood if nothing is done to protect them and the ocean rises to 3 feet higher than it is today. Seabrook faces a loss of between \$107 million and \$115 million under the same scenario. In Hampton Falls, about \$32 million in assets would be at risk.
- After learning about different strategies to reduce these risks, stakeholders from the three towns agreed on a three-pronged approach:
 1. Preserve natural buffers (marshes, streams, forests)
 2. Protect existing high value real estate when deemed vulnerable
 3. Elevate/floodproof private homes and businesses vulnerable to flooding
- The three towns also agreed that due to shared impacts and resources, a three-town working group would be a useful approach for moving forward.
 - Following the 2011-13 project, the three towns developed the Seabrook Hamptons Estuary Alliance (SHEA). This group is currently working with NROC and the NH Coastal Adaptation Workgroup to identify priority issues and actions the town may want to consider to address changes in climate.

Portsmouth's Coastal Resiliency Initiative (2012-2013) (see attached) www.planportsmouth.com/cri

- In 2012-2013, the City of Portsmouth hired a team of consultants to examine the City's vulnerability to sea-level rise and storm surge. This report shows a summary of how the City may be impacted, and provides recommendations to reduce the risk of damage from major storms and long-term change.

Rye's "Preparing for Climate Change in Rye" (2014)

http://www.town.rye.nh.us/Pages/RyeNH_BComm/prepare/index

- Conducting workshops to facilitate discussion and raise awareness about climate change spanning discussions about the impacts, tools and strategies for responding to those impacts, and the value of salt marshes in protecting from coastal storm surge.
- Identified priority issues and/or actions the town may want to consider to address changes in climate.

Exeter's "Climate Adaptation Plan for Exeter" (2012 – 2014) www.capenh.net

- Currently working with UNH and the Great Bay Reserve to develop an adaptation plan to address sea-level rise, flooding, drainage infrastructure, and changes to water quality.

Newfields (2011-2012)

- Newfields developed an "adaptation action plan" with help from UNH Cooperative Extension and the NH Coastal Adaptation Workgroup.
- They implemented strategies for emergency preparedness and incorporated progressive stormwater management strategies into their site plan and subdivision regulations.



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)



CLIMATE ON THE MOVE

Changing Summers
 in New Hampshire

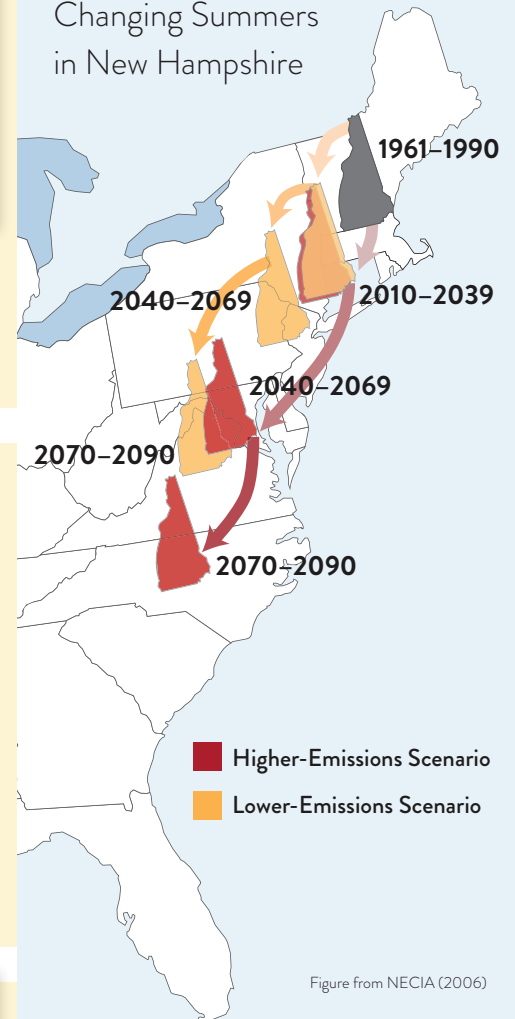


Figure from NECIA (2006)

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.

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.



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:

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

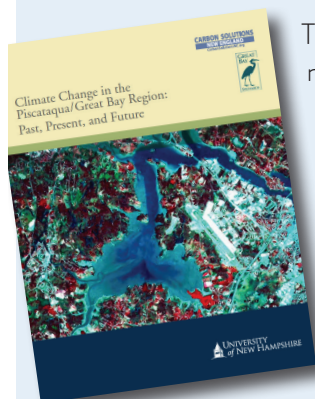
OUR WATER

- 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



Satellite image of coastal New Hampshire.

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.