

# The EPA on Climate Change

New Hampshire Joint  
Water and Watershed Conference

Presented by:  
Ray Sirois  
Senior Associate

**WRIGHT-PIERCE**   
Engineering a Better Environment



## Climate Change - Science

[Contact Us](#)   **Search:**    All EPA    This Area     
You are here: [EPA Home](#) » [Climate Change](#) » [Science](#) » State of

Climate Change Home

## State of Knowledge

[What's Known](#) | [What's Very Likely](#) | [What's Not Certain](#)

## National Water Program Strategy ▶ Response to Climate Change



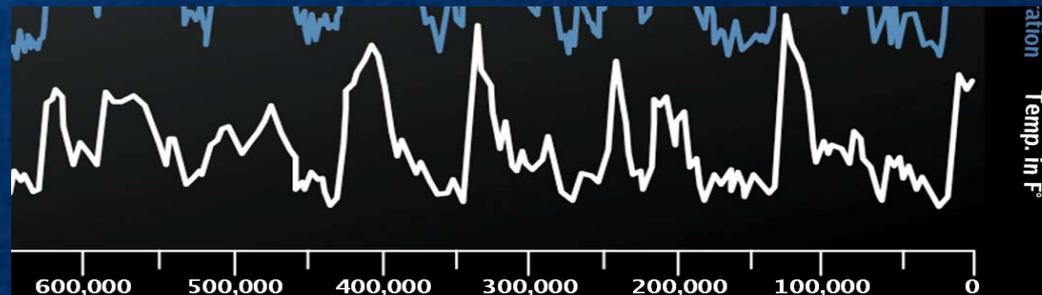
- Human activities change the composition of the atmosphere
- e.g. Increased CO<sub>2</sub> and other greenhouse gasses from the combustion of fossil fuels
- +1.0 to 1.7 F past century avg worldwide
- GHG-es stay for decades, So
- It is certain they will continue to increase
- GHG-es tend to warm the planet

# What is Very Likely

- Most of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations" (IPCC, 2007).
- In the coming decades, scientists anticipate that as atmospheric concentrations of greenhouse gases continue to rise, average global temperatures and sea levels will continue to rise as a result and precipitation patterns will change.

# State of Knowledge **What's Not Certain**

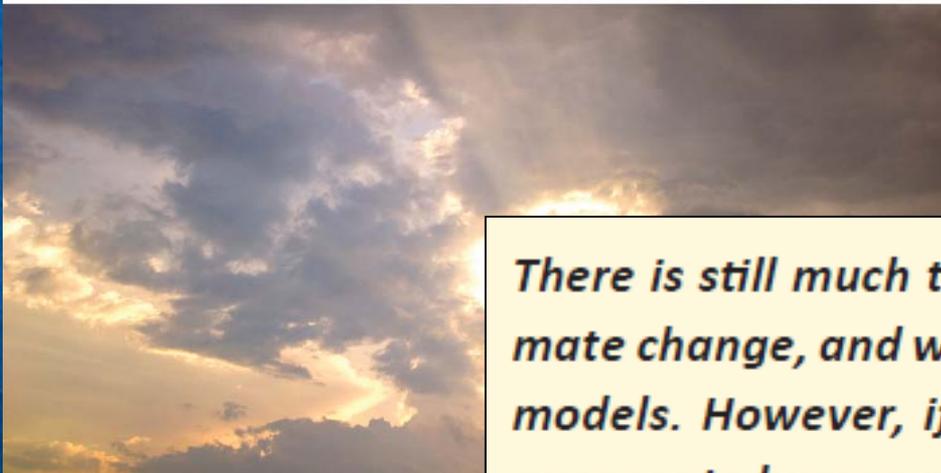
- **Future Emissions** - Which scenario will be operative?
- Predicting resulting changes within a narrow range
- Impacts of changing humidity and cloud cover, future pollutants, changing land use
- Causes of “Abrupt Climate Change”



# The New Hampshire Climate Action Plan

A Plan for New Hampshire's Energy, Environmental  
and Economic Development Future

## Overview: *A Call to Action*

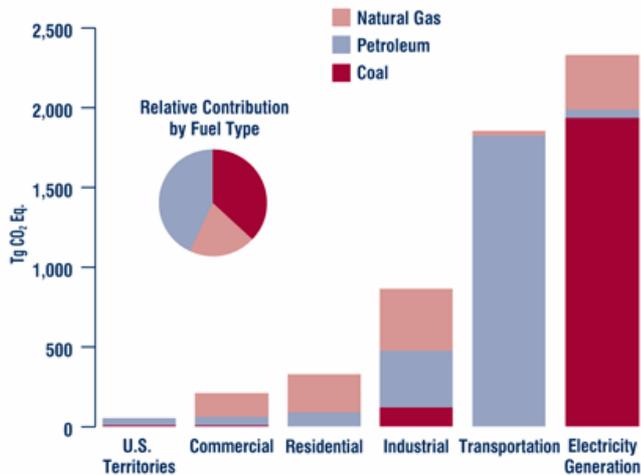


**New Hampshire  
Climate Action Plan**  
March 2009

*There is still much to learn about the mechanics of climate change, and work continues on improving climate models. However, if we fail to take action, the consequences to human populations are potentially severe. If we are wrong about the causes, but we take the actions that have been recommended, man and the environment will certainly be no worse off and arguably better off than under a business-as-usual scenario.*

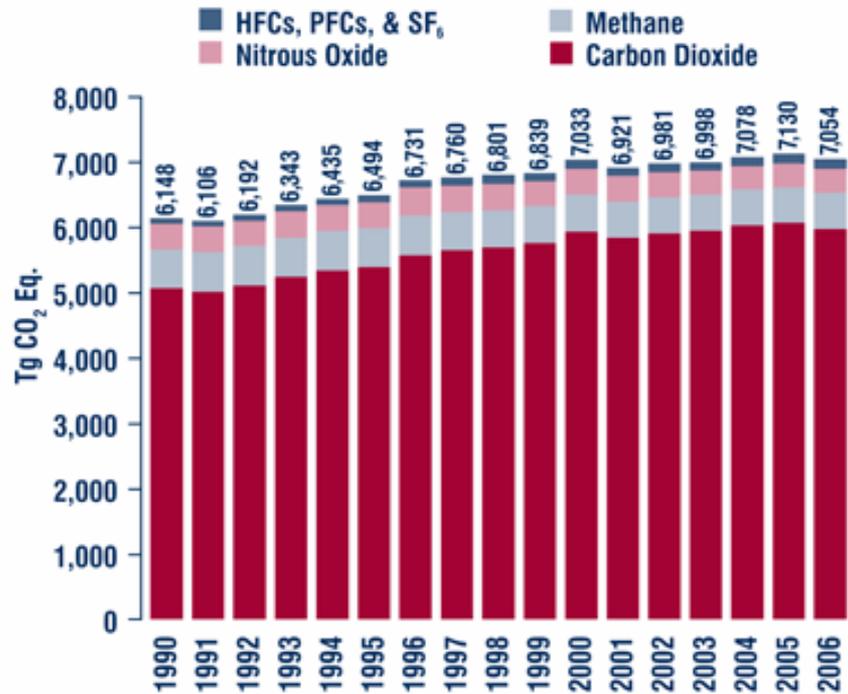
# EPA: Our GHG Emissions

2006 CO<sub>2</sub> Emissions from Fossil Fuel Combustion by Sector and Fuel Type



Note: Electricity generation also includes emissions of less than 0.5 Tg CO<sub>2</sub> Eq. from geothermal-based electricity generation.

U.S. Greenhouse Gas Emissions by Gas



Reference: Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2006, USEPA #430-R-08-005

Region/State	lbs/kWh
(US DOE on electricity mix)	
New England	0.98
Connecticut	0.94
Maine	0.85
Massachusetts	1.28
New Hampshire	0.68
Rhode Island	1.05
Vermont	0.03

United States **1.34**

# GW or CC?

- “Climate Change” is the preferred term
- More than just warming of air & water
- Increased storm intensity
- Precipitation changes: amounts / location
- Sea level rise
- Changes in ocean characteristics

# Water Impacts of CC

- Warmer water holds less DO making hypoxia & algae blooms more likely.
- More extreme water-related events, water quality, runoff, erosion, pathogens
- Availability of drinking water
- Waterbody boundary movement / displacement
- Changing aquatic biology
- Collective Impacts on coastal areas

Sept 2008

National Water Program Strategy  
Response to Climate Change

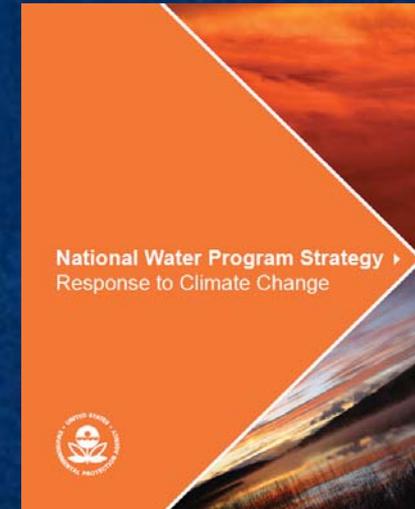


# EPA: Water Resource Impacts **Northeast**

- The Northeast states have a large, mostly urban population. The region has generally adequate water supplies, with a large number of small dams, but limited total reserve capacity. Floodplains in the region are heavily populated.
- Decreased snow cover amount and duration
- Increased variability in streamflow
- Accelerated coastal erosion, saline intrusion into coastal aquifers
- Changes in magnitude, timing of ice freeze-up/break-up, with impacts on spring flooding
- Possible elimination of bog ecosystems
- Shifts in fish species distributions, migration patterns

# 5 Goals: National Water Program Strategy Response to Climate Change

1. Mitigation – reducing GHG  
Energy efficiency & water conservation  
Carbon sequestration
2. Adaptation – warmer air & water, and extreme weather events, and sea level rise will require changes.
3. Strengthen links with climate research
4. Education for water professionals
5. Establish new capabilities and information tools to manage this in a sustained, ongoing manner



# 44 Key Actions, e.g.

- Energy performance benchmarking, energy audits, alternative energy sources, combined heat/power systems (1)
- Better address expected impacts on water supply/usage rates, I/I, leak detection (3)
- Green buildings / infrastructure practices in Stormwater permits (7)
- Develop Sequestration Regulations (8)
- Assess Contamination Potential (12)

# Key Actions (cont'd)

- Assess New Clean Water Microbial Criteria (flows, temps, salinity, habitat) (13)
- BASINS Climate Assessment Tool (21)
- Revise Nonpoint Pollution Mgmt (24)
- Adapt NPDES Permit Program Tools (25)
- Wet Weather Impacts (26)
- Animal Feeding Operations (27)
- Clarify SRF policy for cc Adaptation (30)
- Section 404 Regulatory Framework (32)

# Section 404(b)(1) Clean Water Act

- The National Water Program will work with the Corp of Engineers to ensure effective implementation of the Clean Water Act...
- Consider the effects of CC...  
explore the need for additional guidance on avoiding or minimizing impacts,
- Defining “significant degradation”, “unacceptable adverse impact”, & “implementing compensatory mitigation”

# Water Resources

- Altering infrastructure or institutional arrangements
- Changing demand or reducing risk
- Improving water use efficiency, planning for alternative water sources (such as treated wastewater or desalinated seawater), and making changes to water allocation
- Conserving soil moisture through mulching and other means
- Protecting coastal freshwater resources from saltwater intrusion

# Coastal Areas

- Developing county-scale maps depicting which areas will require shore protection (e.g. dikes, bulkheads, beaches) and which areas will be allowed to adapt naturally
- Promoting shore protection techniques that do not destroy all habitat
- Identifying land use measures to ensure that wetlands migrate as sea level rises in some areas
- Engaging state and local governments in defining responses to sea level rise
- Improving early warning systems and flood hazard mapping for storms
- Protecting water supplies from contamination by saltwater

# Agriculture & Forestry

- Altering the timing of planting dates to adapt to changing growing conditions
- Altering cropping mix and forest species that are better suited to the changing climatic conditions
- Breeding new plant species and crops that are more tolerant to changed climate condition
- Promoting fire suppression practices in the event of increased fire risk due to temperature increases
- Controlling insect outbreaks

# Other key areas for adaptation

- Public health
- Ecosystems & wildlife
- Energy

The Intergovernmental Panel on Climate Change (IPCC) defines adaptation as the "adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities"

# The New Hampshire Climate Action Plan

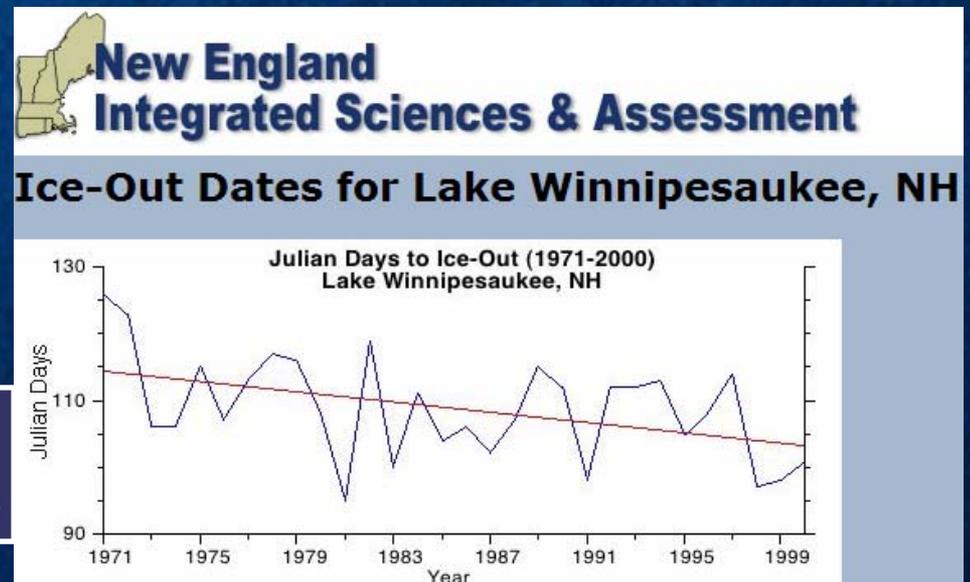
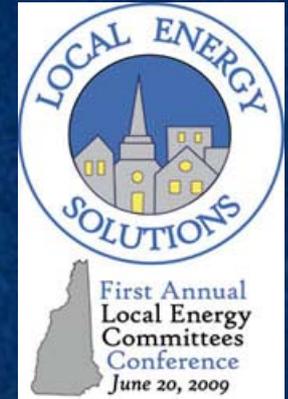
A Plan for New Hampshire's Energy, Environmental  
and Economic Development Future

Mar 09

- New Hampshire's forest lands play a critical role in maintaining the quality of life in our state.
- In 2005, forest-based manufacturing and forest-related recreation and tourism in the state contributed over \$2.3 Billion to the state economy.
- New Hampshire is currently 84 percent forested and these forest lands possess the ability to absorb and store large amounts of carbon, offsetting some of the CO<sub>2</sub> emissions resulting from human activities.

# NH leadership on climate change and applying CC science

- University of NH – Cameron Wake et.al.
- Antioch University – Michael Simpson
- Keene's CCP Committee & Rhett Lamb
- Clean Air Cool Planet – Roger Stephenson



# NH Leadership

## NOAA awards \$243,000 to prepare New Hampshire watershed for climate change and population growth

20-Oct-2009

(Portland, OR & Keene, NH) October 20, 2009 – The National Oceanic and Atmospheric Administration (NOAA) has awarded Syntectic International, LLC of Portland, Oregon; Antioch University New England of Keene, New Hampshire; the Lake Sunapee Protective Association of Sunapee, New Hampshire; and partners, \$243,000 to prepare the Lake Sunapee watershed for climate change and population growth.



## The New Hampshire Climate Action Plan

A Plan for New Hampshire's Energy, Environmental and Economic Development Future



City of Keene  
New Hampshire

home government departments services our city calendar sustainability



### in this section...

- climate change
- sustainable procurement
- keene challenge
- keene green team
- woodstove changeout
- beaver brook restoration

home > sustainability

### Climate Change

#### KEENE CITIES FOR CLIMATE PROTECTION COMMITTEE (CCP)

The [CCP Committee](#) was officially created in 2000 by the City Council. The committee's objective is to reduce greenhouse gas emissions by assisting the City to implement the adopted climate action plan, as well as to provide public education and outreach and advocate for changes in climate policy at the State level.



## New Hampshire Leadership



### House Climate Change ACES Bill

#### *New Hampshire*

Aye	NH-1	<a href="#">Shea-Porter, Carol [D]</a>
Aye	NH-2	<a href="#">Hodes, Paul [D]</a>

Senator Shaheen D-NH:

US must be a leader in climate change agreements.

Favors independence from foreign oil and reverse global warming.

Senator Gregg R-NH:

Nov 4, 2009 Signed a memo to the EPA with 3 other Republican Senators (Graham, Snowe, Collins), which highlighted the necessity of climate change legislation, and a bipartisan approach to that legislation.