



Department of Transportation

Coastal Risk and Hazards Commission

(RSA 483E)

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Kevin Nyhan

Administrator, Bureau of Environment

Ann Scholz, PE

Assistant Research Engineer, Bureau of Materials and Research

Presentation Outline

Participation and response to RSA 483-A

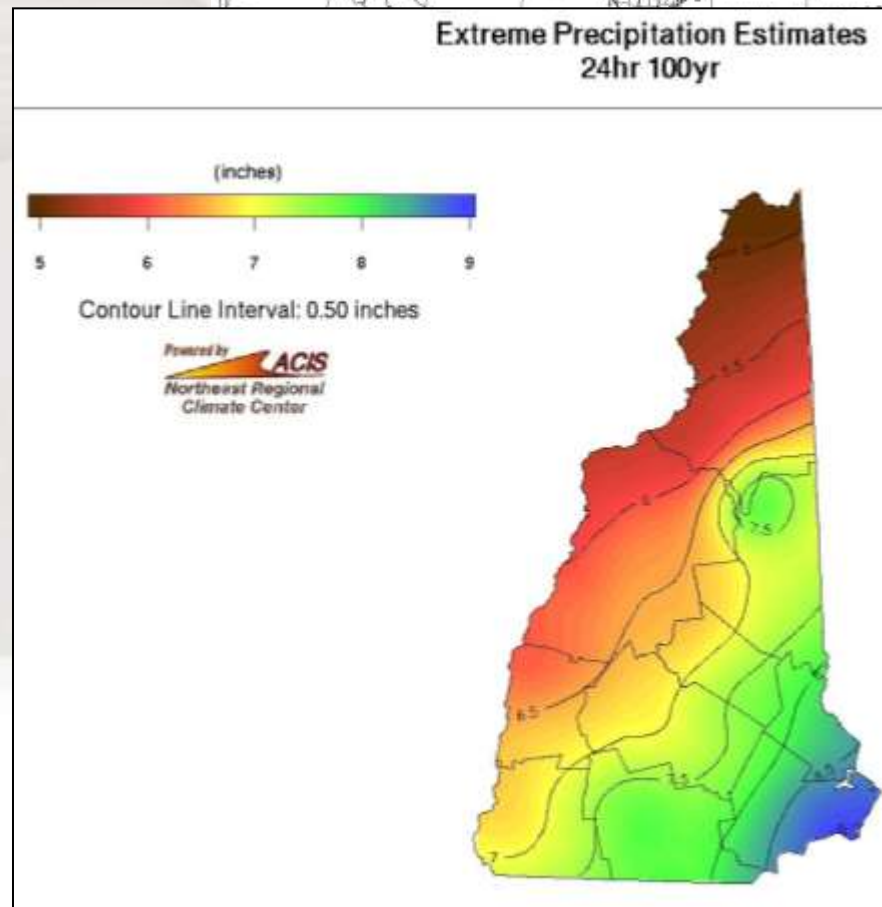
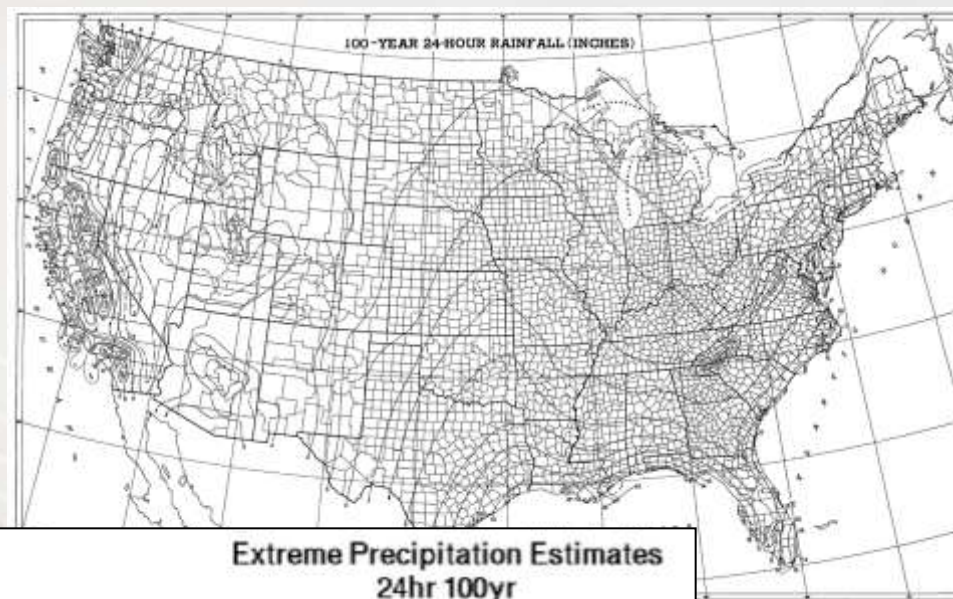
Existing policies and gaps

Department's Assessment of Vulnerability

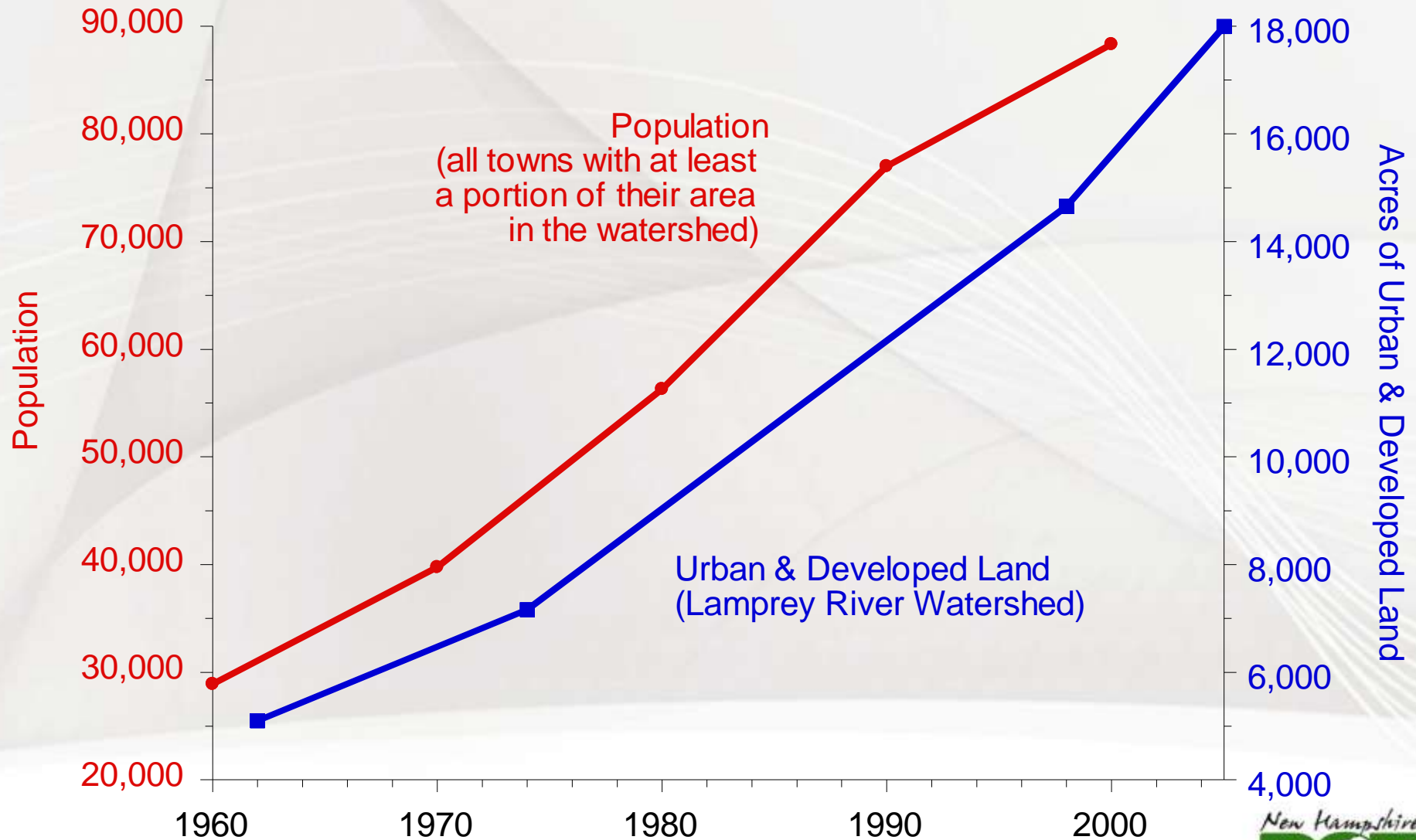
Identified actions needed from RSA 483-A

Precipitation

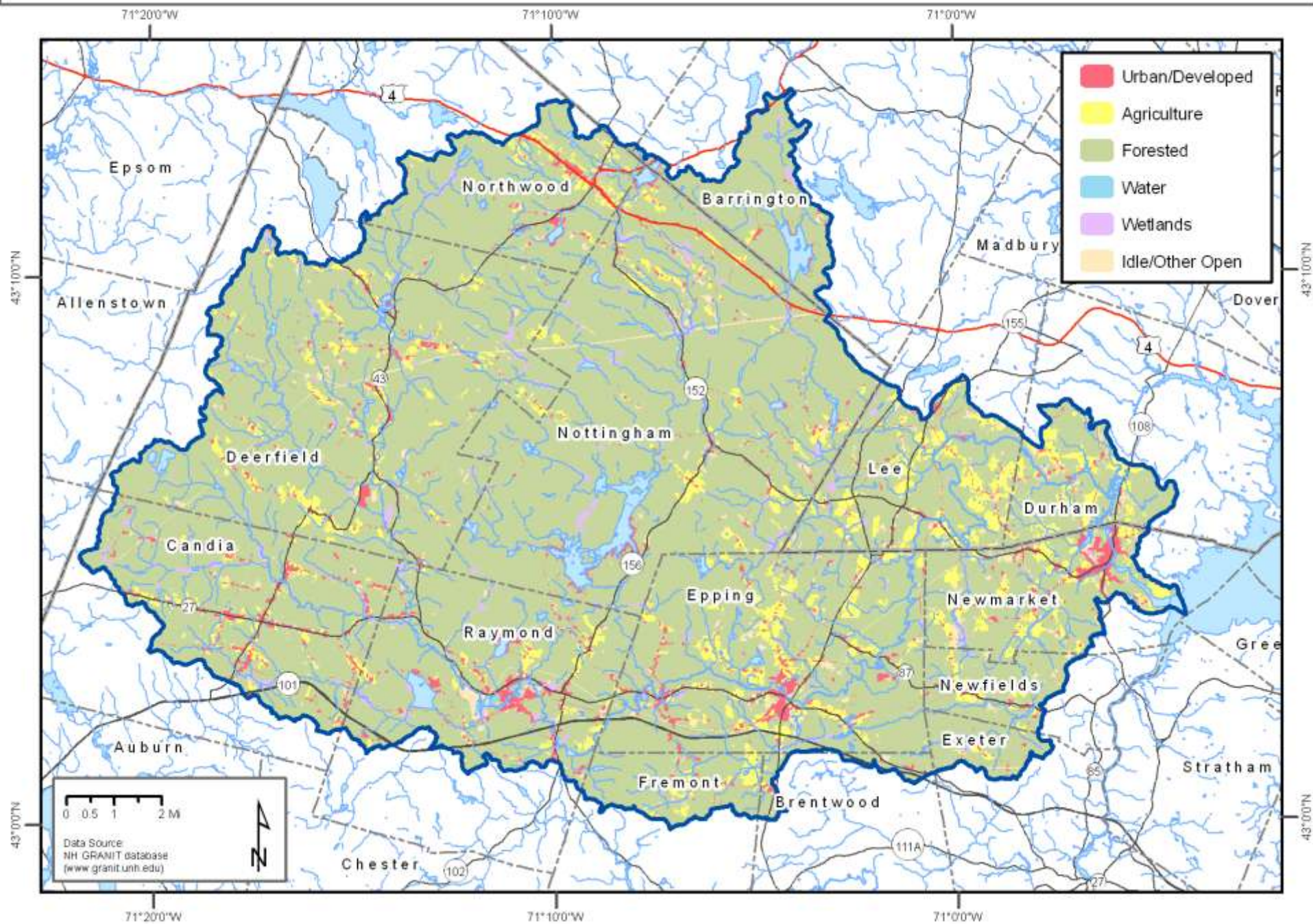
- TP-40 Rainfall Frequency Atlas of the United States
- Northeast Regional Climate Center (NRCC) Atlas
 - NHDES adopted and NHDOT conformed
- USGS StreamStats
- USGS Peak Streamflow



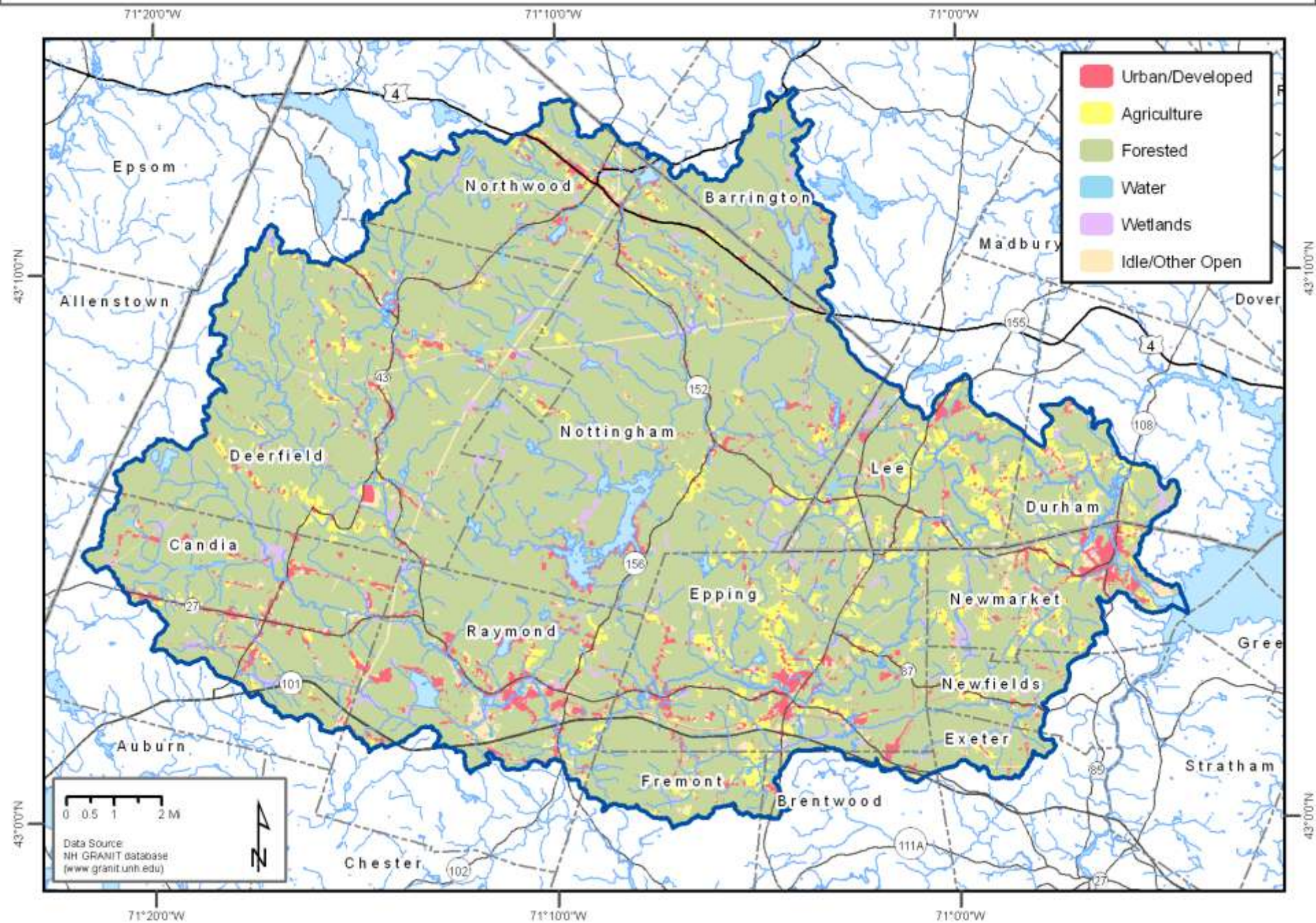
5 Decades of Population Growth and Development



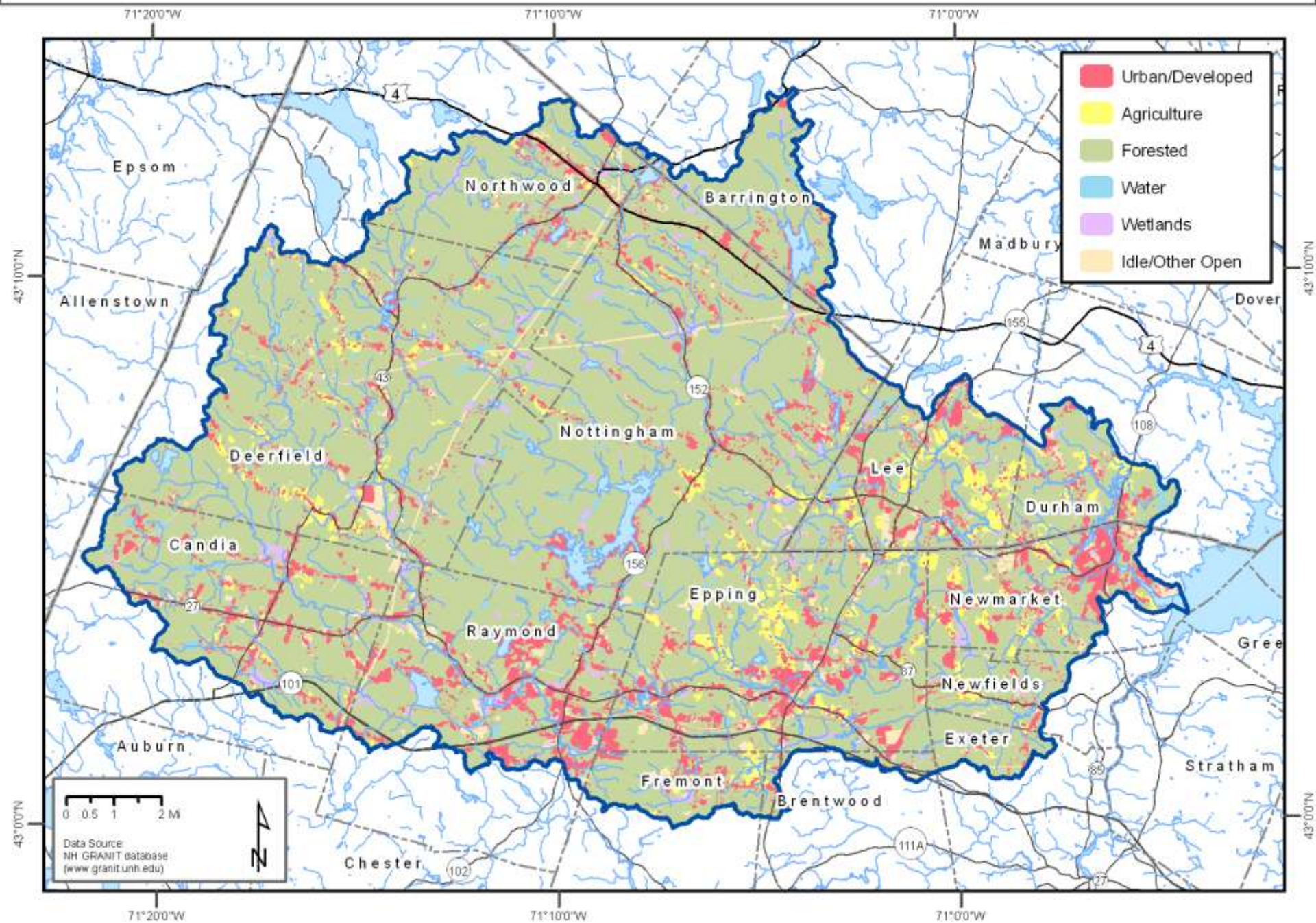
Lamprey River Watershed Generalized Land Use - 1962



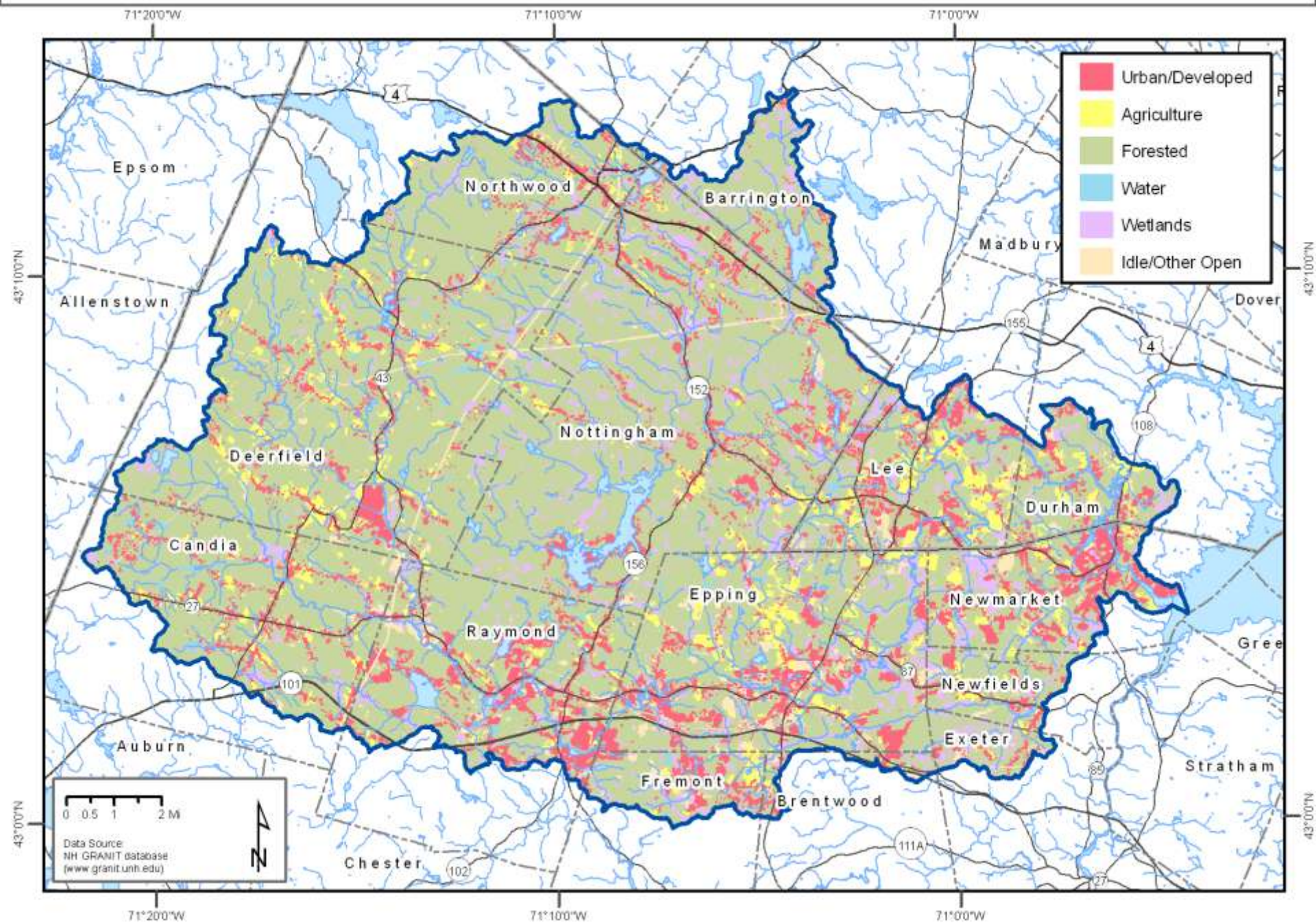
Lamprey River Watershed Generalized Land Use - 1974



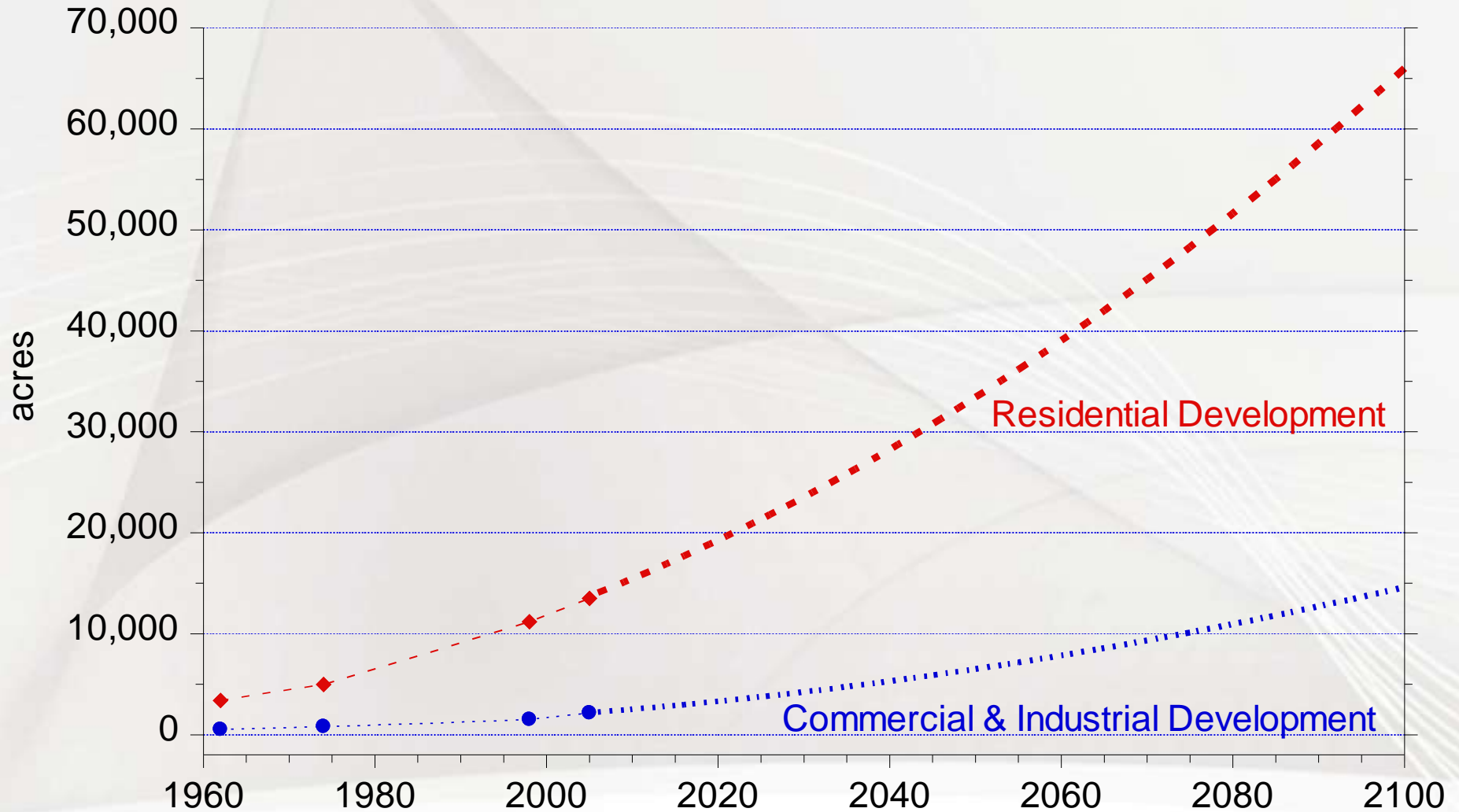
Lamprey River Watershed Generalized Land Use - 1998



Lamprey River Watershed Generalized Land Use - 2005



Lamprey River Watershed - Build Out Rates



Resilience and Preparedness in State Government

- Support from NH Department of Environmental Services
- 6-month project
- Program Specific Action Plan and Implementation Guide

NHDOT Issues and Concerns

- Road maintenance
- Aging infrastructure
- Budgets and costs
- Emergency operations – key evacuation routes
- Storm water management



Presidentially-Declared Storm Disasters

- 2003-2012 (**10 Years**)
 - 15 Declared Disasters
 - 1 Hurricane
 - 1 Tropical Storm
 - 11 Severe Storms
 - 1 Fall Snow Storm
 - 2 Winter Storms
- 1953-2002 (**50 Years**)
 - 14 Declared Disasters

Source: FEMA.gov



Axe Handle Brook, Rochester, NH, May 2006

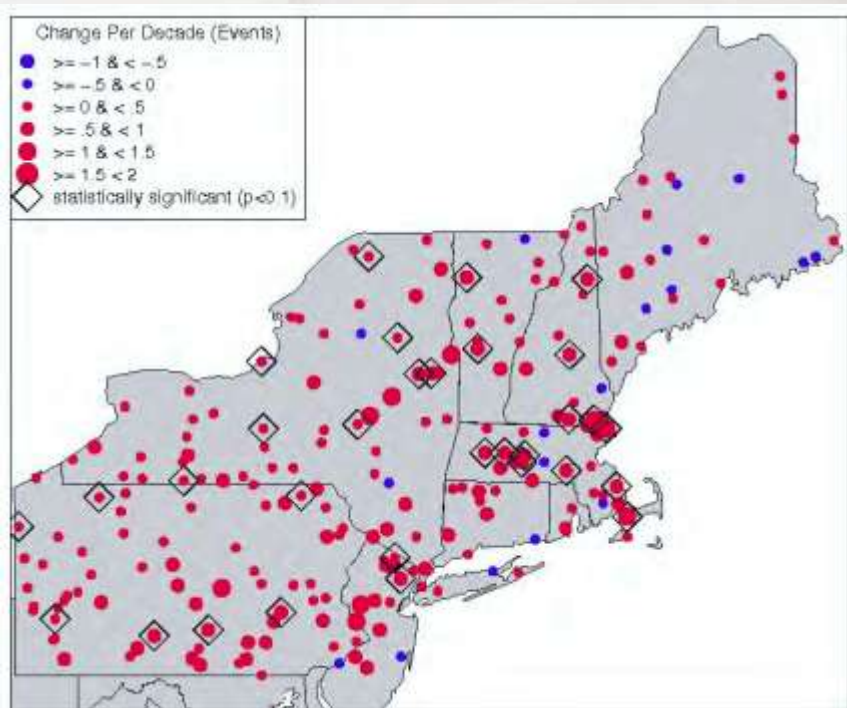


Loon Mountain, Lincoln, NH 2011

Climate Change Impacts on the Transportation Sector

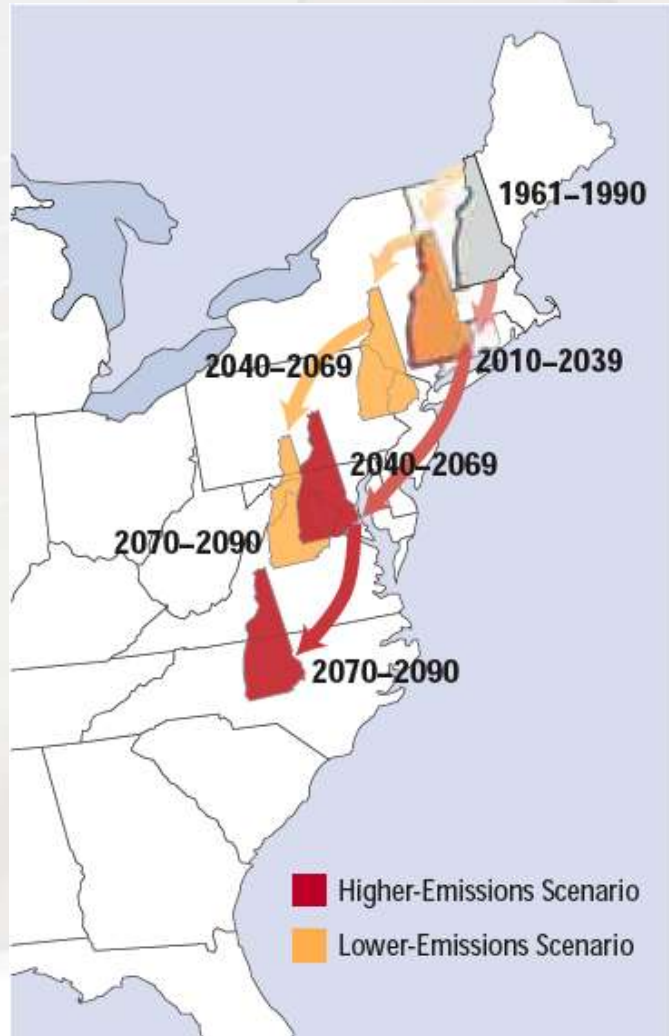
Extreme precipitation events

- Flooding risks to roads, rails, maintenance facilities, and other assets
- Tunnels and other below grade infrastructure
- Extended drought followed by extreme precipitation can destabilize vegetation along hillsides and increase the likelihood of rockfall



Spierre, S, 2010, "Trends in Extreme Precipitation Events for the Northeastern United States 1948 - 2007", Carbon Solutions New England and Clean Air-Cool Planet Report

Climate Change Impacts on the Transportation Sector



Temperature

- Increase in number of hot days and heat waves
- Changes in the freeze-thaw cycle
- Pavement integrity (e.g. softening, rutting)
- Stress on landscaping
- Length of construction season

Sources: Wake and Markham, 2005;
Wake et al., 2006; and NRC, 2008.

Climate Change Impacts on the Transportation Sector



Sea-level and coastal storm surge

- Risk of permanent or periodic inundation of coastal infrastructure
- Increased coastal erosion
- Rising groundwater levels
- Changes in salinity

RT 1A (Ocean Boulevard), Hampton, NH -
Superstorm Sandy, October 2012

Climate Change Impacts on the Transportation Sector



RT 152 along the Lamprey River
Lee, NH - March 2010

Snowmelt hydrology

- Timing and rate of spring snowmelt
- Changes from snow dominant to rain dominant
 - ✓ Imbalance in sediment transport characteristics
 - ✓ Flooding
 - ✓ Channel instability
- Transportation infrastructure alongside or crossing rivers at risk

Federal and State Guidance

TRANSPORTATION RESEARCH BOARD



Government Leadership & Action - Recommendation 1.5

“Establish a policy requiring that climate change adaptation and mitigation be considered in all planning and programmatic activities of state government agencies...A logical starting point is to incorporate consideration of climate change into all state planning and programming functions.”

Potential
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Environmental Services

Potential actions and/or changes in state laws or regulations or authority

- Legislation resulting from the Commission should guide decisions, not prescribe solutions
- Legislation protecting NHDOT design decisions to accommodate for climate change
- NHDES permitting revisions
- Review of existing legislation



Thank you