Climate Change Adaptation in New England

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Science at Work
for a
Sustainable World

Manomet Overview

- Manomet is a non-profit based in Massachusetts, and our work takes us all over the hemisphere
- We are committed to building science-based, cooperative solutions to environmental problems.
- Our focus areas include--
  - preparing America for climate change,
  - creating a sustainable relationship between our economy and the natural world,
  - restoring and maintaining shorebird populations in the western hemisphere, and
  - reconnecting humans to nature.

Manomet Climate Change Adaptation Project

- Working at a set of sites in Massachusetts and Maine
- Assessment of ecosystem service impacts of climate change
- Development of climate change adaptation plans at both the landowner scale and the landscape scale

Landscape Scale Sites

- Three landscape scale sites:
  - Taunton River Watershed in Massachusetts
  - Sebago Lake Watershed in Maine
  - Sagadahoc County in Maine

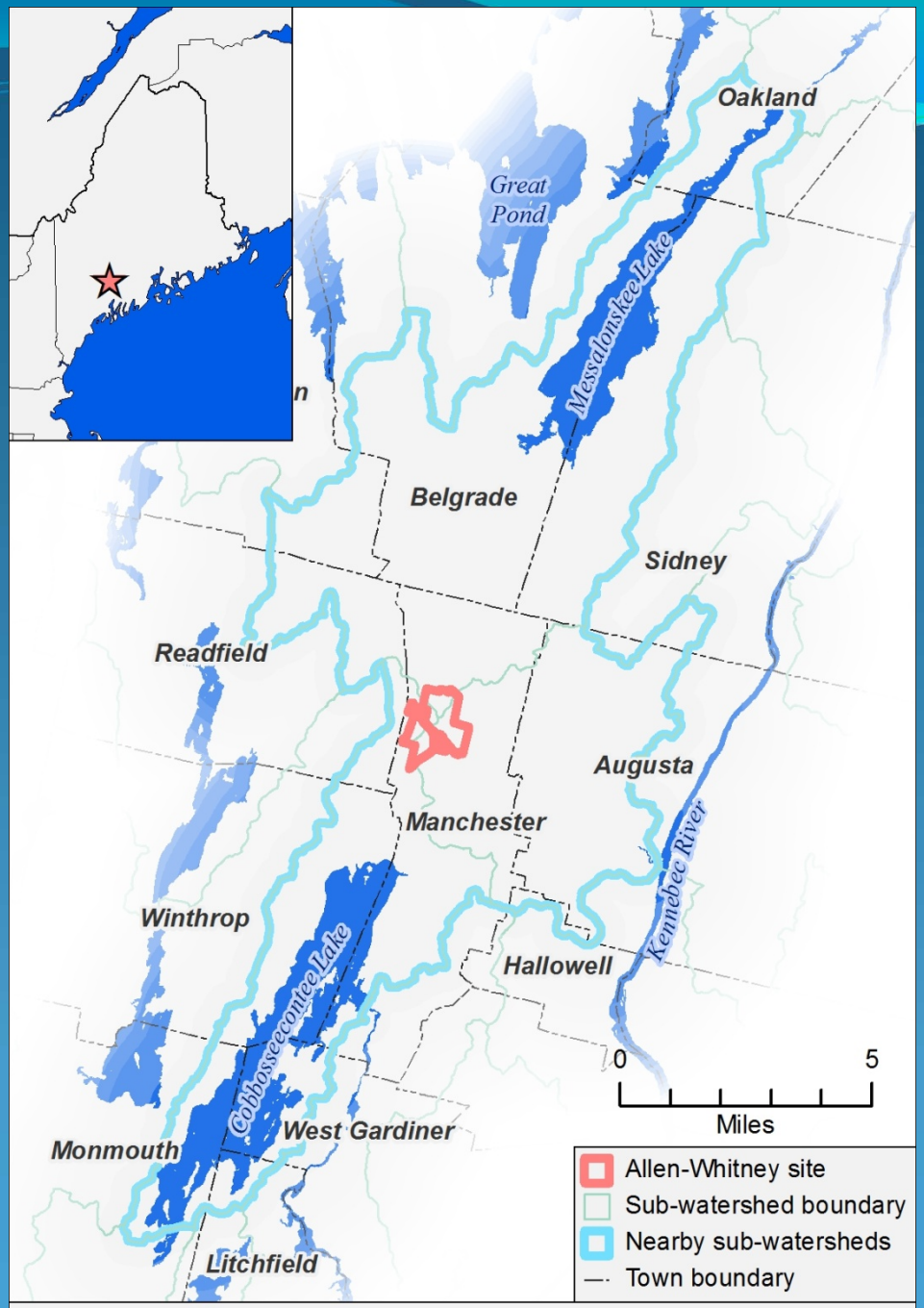
Landowner Scale Sites

- Landowner sites include forestry, agriculture, conservation lands and residential development sectors
- Massachusetts sites: Century Bog, River Run residential development and Tidmarsh Farms
- Maine sites: Allen Whitney Forest, a private woodlot, a cattle farm and an apple orchard

Allen Whitney Forest Overview

- 700 acre parcel in Manchester, ME
- Owned by New England Forestry Foundation
- Mix of hardwoods
  - (sugar maple, beech, ash, red oak)
- And softwoods
  - (white pine, hemlock, and spruce-fir)


New England
Forestry Foundation
Welcomes you to the
Allen-Whitney Memorial Forest
We manage this demonstration forest for:
• Forest products
• Wildlife habitat
• Biological diversity
• Non-motorized recreation
www.NewEnglandForestry.org
MOST RECENT
HARVEST
2005



Location of the Allen-Whitney site and the surrounding sub-watersheds in southern Maine.

Allen Whitney
Adaptation Recommendations

- Maintain species, structural, and age class diversity
- Conduct low-impact and sustainable timber harvests
- Maintain and increase red oak and white pine on site
- Be aware of, and plan for, threats facing hemlock stands

Allen Whitney
Adaptation Recommendations

- Minimize negative impacts of disturbance events
- Create a low-impact recreational trail system
- Conduct deer population management
- Be aware of the need for cross-sector and interagency adaptation planning at landscape, state, and regional scales

Allen Whitney
Management Response

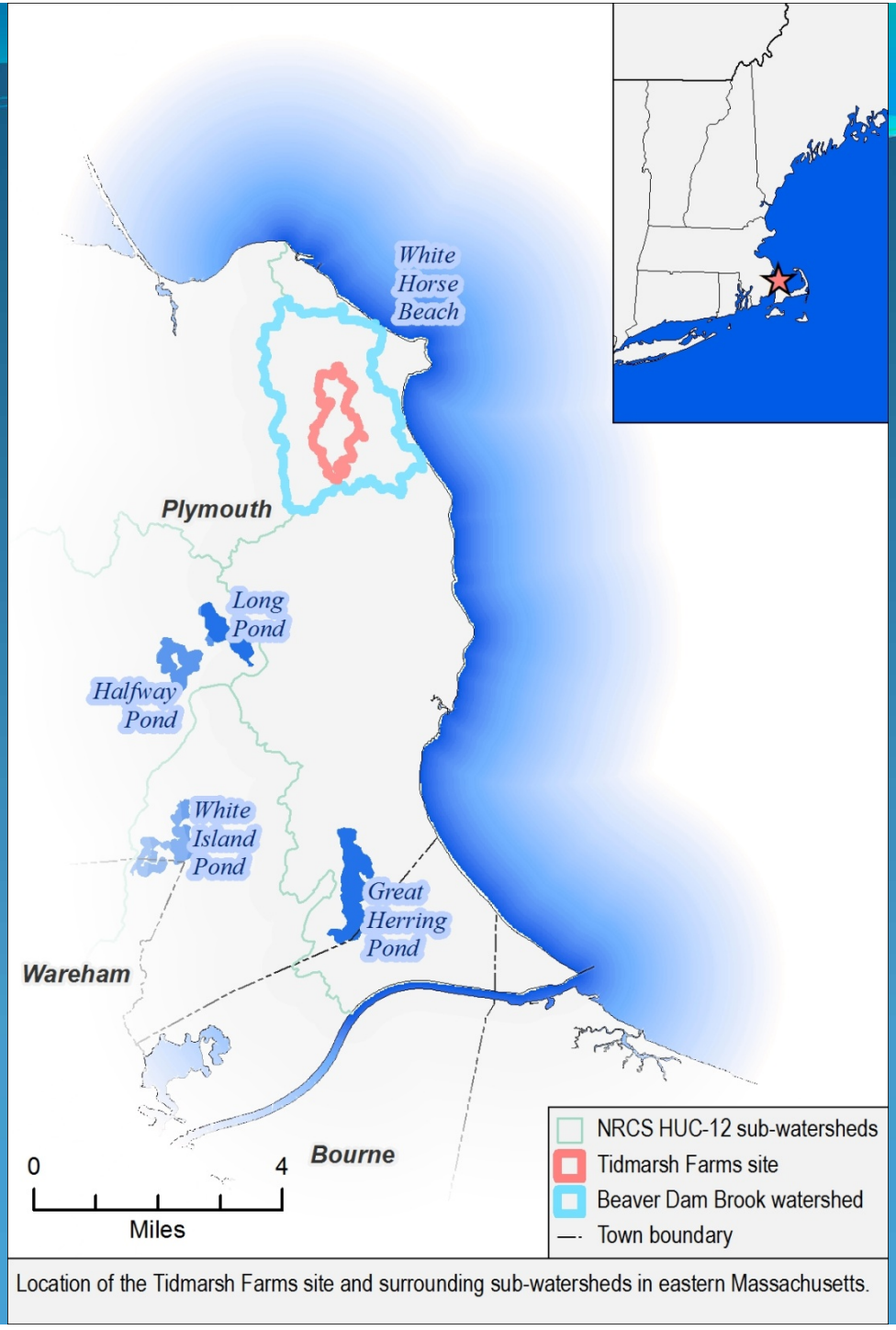
- NEFF is now collecting data on invasive plant species
- Monitoring the health of hemlock and ash trees, which are vulnerable to invasive pests
- A timber harvest occurred in 2013 and foresters made efforts to create conditions that favor well-adapted species

Allen Whitney
Management Response

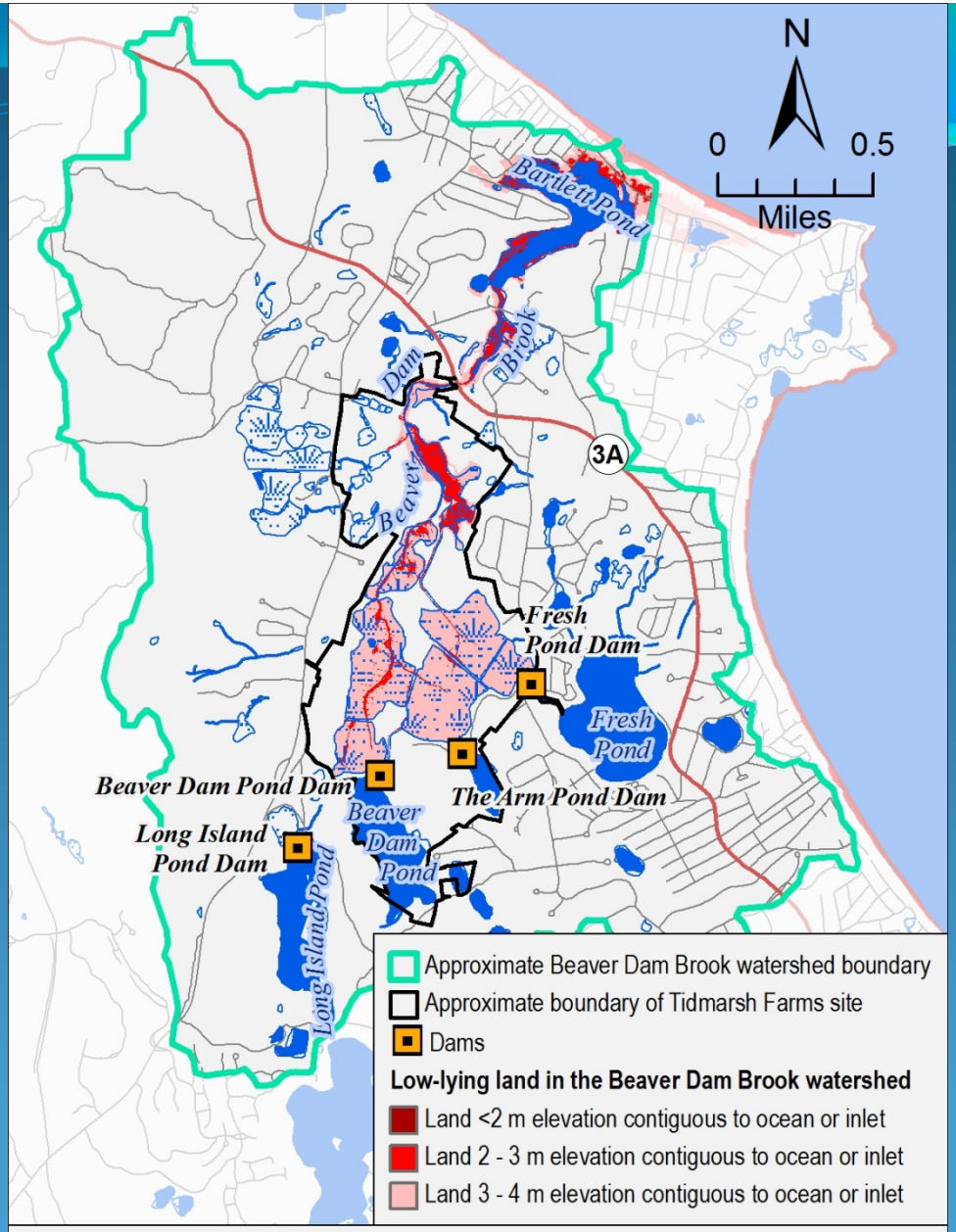
- New management techniques such as marking trees for retention and removal to create age and species diversity within stands
- Improved road networks to make stands more accessible during wetter and warmer winters

Tidmarsh Farms Overview

- Tidmarsh Farms is a 577 acre property in Manomet, Massachusetts
- Occupies 10% of the Beaver Dam Brook watershed,
- Two cranberry bogs complexes,
- Comprehensive ecological restoration project is underway, which includes the stream corridor and the associated flood plain



Location of the Tidmarsh Farms site and surrounding sub-watersheds in eastern Massachusetts.



Map showing approximate areas of low elevations in and around the Tidmarsh Farms site. 1 m resolution LiDAR data acquired from MassGIS and hydrologically processed using USGS NHD. Hydrography data combined from MassGIS DEP Wetlands and USGS NHD. Road data from MassGIS MassDOT roads. Watershed boundary combined from National Elevation Dataset (USGS) and MassGIS drainage sub-basins data.

Tidmarsh Farms
Adaptation Recommendations

- Modify cranberry management practices in response to increasing threats
- Reestablish wetlands on site and maintain hydrology to maximize carbon storage in peat soils
- Minimize non-climate stressors
- Emphasize management for ecosystem function and biodiversity
- Restore open space network connections

Tidmarsh Farms
Management Response

- Dam removal to reconnect headwaters to the remainder of the watershed
- Grading of site and removal of some of the canals to both restore wetland hydrology and stream channels
- Allow existing seed bank to drive revegetation
- Reestablishment of riparian forest on adjacent uplands

Lessons Learned from Private Landowner Interaction

- Climate change is rarely a high priority for private landowners, but it is possible to successfully engage in a valuable dialog
- Ecosystem services are rarely a priority, except in those cases where services are directly tied to business viability. But again, a useful dialog is possible

Lessons Learned from Private Landowner Interaction

- Risk management approach to climate change frequently resonates with private landowners
- A simplified approach to integration of climate change issues with existing management processes is needed

Lessons Learned from Private Landowner Interaction

- Infrastructure issues (e.g., access roads, water crossings) provide an obvious intersection between climate change impacts and private land management decisions
- Long-term ecosystem change presents a more abstract and difficult set of problems

Lessons Learned from Private Landowner Interaction

- Extreme weather events present both an opportunity and an impediment for adaptation. Transitions caused by fire, flood, and wind damage will likely be one of the most important drivers of climate related change
- Public access impacts: The severe storms last winter in Massachusetts taxed the ability of public and private managers to support safe access

Lessons Learned from Private Landowner Interaction

- Capitalize on opportunities to use demonstration sites for education
  - Allen Whitney will include signage explaining the adaptation work that is underway
  - Tidmarsh Farms will include a “Living Observatory” to engage students and researchers in the restoration and adaptation work

Questions? Discussion?