Tools for managing forested landscapes with climate change in mind

Danielle Shannon
dshannon@mtu.edu
Northern Institute of Applied Climate Science

www.ForestAdaptation.org

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United States Department of Agriculture
Northern Forests Climate Hub
The Northern Institute of Applied Climate Science (NIACS) develops synthesis products, fosters communication, pursues science, and provides technical assistance in climate change adaptation and carbon management.

Multi-institutional collaborative chartered by USDA Forest Service, universities, non-profit organizations, and a tribal commission.
Acknowledging Barriers

Climate change science is not being used
- Mismatches in scale & scope of science
- Science often doesn’t reflect the needs of managers

Managers feel overwhelmed and isolated
- Managers faced with huge volume of research
- Individual attempts at adaptation are not communicated
  - Climate change can be an intimidating topic

There’s not a shared understanding of “success”
- Best practices haven’t been established
- One-size-fits-all prescriptions are non-starters
We create practical tools you can use!

**Vulnerability Assessment for Forested Ecosystems in New England and N. NY**

**Tree projections & Adaptation tools**

**Video presentations**

**Real stories of people making climate-informed decisions**

ForestAdaptation.org/new-england
Forests are a key component of a “healthy” watershed

- Regulate streamflow
- Purify regional air quality
  - Reduce erosion
- Maintain clean water supplies
  - Sequester carbon

... and more!

Barten 2008, Center for Watershed Protection
Climate change presents many challenges...

- Forests and ecosystems are changing and will continue to change due to a changing climate.
- We are experiencing the impacts of climate change – now!
- Climate change impacts are exacerbating underlying issues and worsening current challenges.
- One-sized-fits-all answers to these problems are insufficient.

Watersheds are not static – changes to one component of the ecosystem may affect another

**Loss of trees effects:**
- Flood control
- Soil retention
- Nutrient uptake
- Clean water
Climate change is a threat multiplier

...may make systems more susceptible to existing or new stressors.

- Chronic stress
- Disturbances
- Invasive species
- Insect pests
- Forest diseases

Janowiak, 2014. Image: Bartlett Tree Experts
Adaptation is the adjustment of systems in preparation or in response to climate change.

Adaptation actions are designed to specifically address climate change impacts and vulnerabilities in order to meet goals and objectives.
**Adaptation** is the adjustment of systems in preparation or in response to climate change.

Ecosystem-based adaptation activities that build on sustainable management, conservation, and restoration.
Adaptation is the adjustment of systems in preparation or in response to climate change.

- What do you value?
- How much risk are you willing to tolerate?
Identifying Adaptation Actions

Charting a path forward

**RESISTANCE**
- Improve defenses of forest against change and disturbance
- Maintain relatively unchanged conditions

**RESILIENCE**
- Accommodate some degree of change
- Return to prior reference condition following disturbance

**TRANSITION**
- Intentionally facilitate change
- Enable ecosystem to respond to changing and new conditions

*Reduce impacts/maintain current conditions

*Forward-looking/promote change

The process: Adaptation Workbook

- Decision-support framework to develop customized climate adaptation plans.
- Flexible 5-step workbook designed for a variety of landowners with diverse goals.
- Works at project level.
- Centers around manager’s expertise, and judgement.
- Creates clear rationale for actions by connecting them to broader adaptation ideas.
- Does not make recommendations.

Includes:
- Adaptation workbook.
- Adaptation strategies for different resource areas (menus).

Download at: www.fs.usda.gov/research/treesearch/52760 or use online at www.AdaptationWorkbook.org
Adaptation Workbook: Decision-support tool

A workbook process provides “structured flexibility”

1. DEFINE, management objectives.
2. ASSESS climate impacts and vulnerabilities.
3. EVALUATE management objectives given vulnerabilities.
4. IDENTIFY adaptation approaches and tactics.
5. MONITOR and evaluate effectiveness actions.

Menu of Adaptation Strategies & Approaches

Download at: www.fs.usda.gov/research/treesearch/52760 or use online at www.AdaptationWorkbook.org
Adaptation Demonstrations

Real-world examples of climate-informed forest management.

More than 500 projects have used the **Adaptation Workbook** to consider climate change and identify adaptation actions.

More than 170 are described online.

**Adaptation case studies:** [www.forestadaptation.org/demos](http://www.forestadaptation.org/demos)
Let’s add some dots to the map!
Thank you!

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