

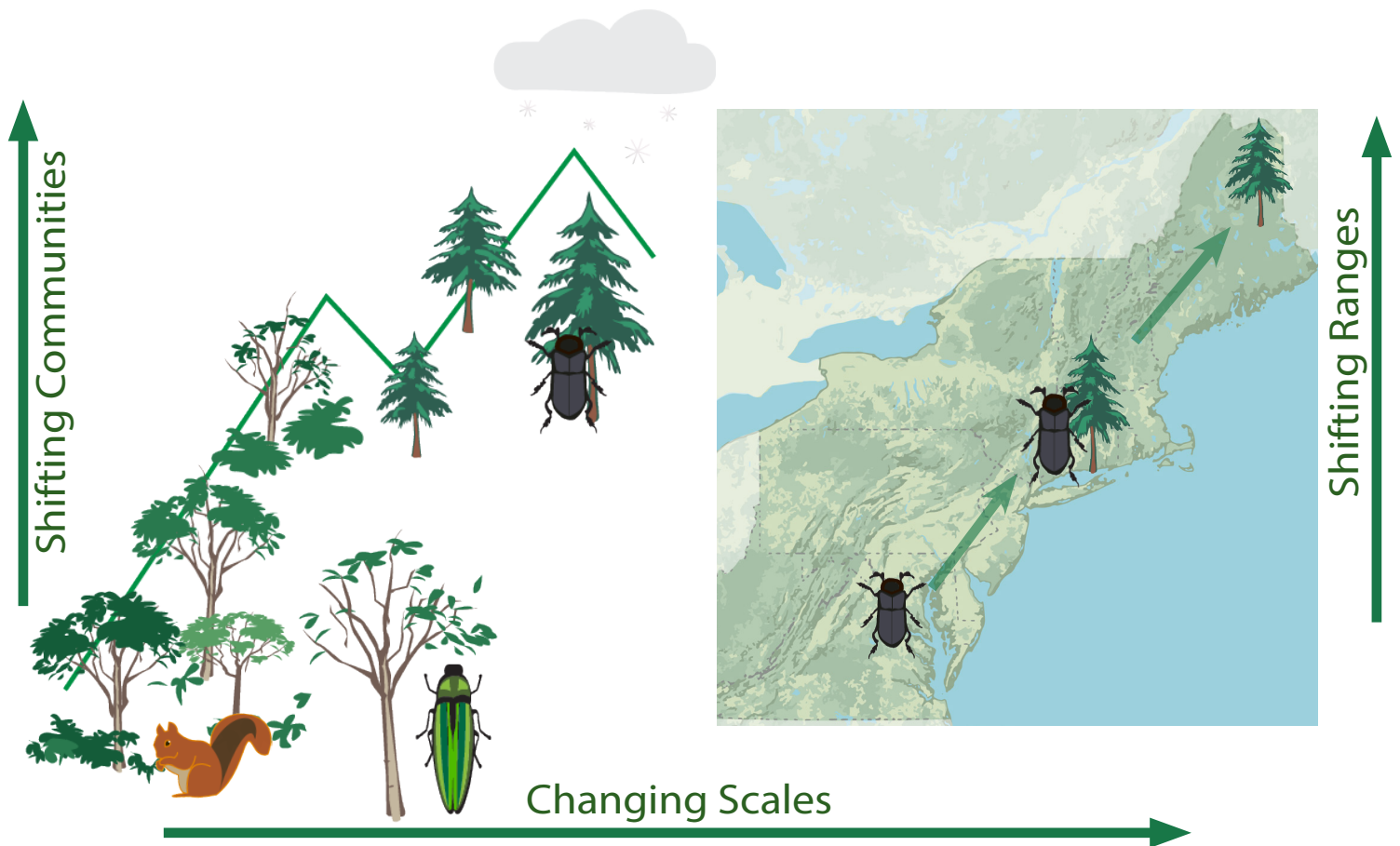
Forest Adaptation to Climate Change



NECASC

Northeast Climate Adaptation Science Center

Forests are the defining landscape characteristic of the northeastern United States and provide a vital foundation for much of the biodiversity found there. However, climate change, along with other stressors, threatens to unravel the delicate balance between the abiotic environment and the intricate ecological web that comprise forest ecosystems.



NE CASC research topics include:

- Understanding how the distribution of forest ecosystems have shifted over the recent past
- Predicting where tree species are likely to be distributed in the future given climate change
- Expanding threat of forest pests to forest ecosystems
- Climate effects on the commercial syrup production of northeastern forests
- Forest management tools to address climate change

Forests are essential for providing many life sustaining ecosystem services including oxygen production, carbon sequestration, renewable energy and building resources, flood storage, water filtration, and soil stabilization.



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Examples of forest management tools:

[Increasing Forest Resiliency for an Uncertain Future](#), a guidance report lead by Paul Catanzaro, Tony D'Amato, and Emily Silver Huff, with the goal “to provide landowners, foresters, conservation organizations, and municipal officials a framework for addressing these challenges in an integrated way that is specific to your forest and takes into consideration your individual goals, available time, and resources” using long-term data across the northeast to identify forest management strategies that are most likely to result in resistance and resilience to past and emerging forest stressors to address future global change.

Adaptation to changes in climate increases uncertainties surrounding land and sovereignty as well as revitalization of language and cultures for Tribal and Indigenous communities.

Tool in development:

Designing Wabanaki Adaptive Capacity for Climate Change, project lead Darren Ranco, University of Maine. This project is centering Indigenous Research Methods to build a regional tribal network for climate change adaptation and create a Wabanaki Climate Adaptation and Adaptive Management Workbook, based on the [Tribal Adaptation Menu](#) team from Great Lakes Indian Fish and Wildlife Commission.



Learn more about current NE CASC projects addressing forest adaptation:

Understanding how the distribution of forest ecosystems have shifted over the recent past and predicting where tree species are likely to be distributed in the future given climate change - see NE CASC spruce-fir forests handout

- *Potential elevation shifts of the border between deciduous dominated forests and montane boreal forests, determining current and historical distribution as impacted by both climate and other factors (Researchers Jane Foster and Tony D'Amato)*
- *Co-production of several large-scale forest adaptation experiments testing best adaptation practices for sustaining key habitats and priority species (Researchers Tony D'Amato, Toni Lyn Morelli, Peter Clark, Jaime Mosel, and Jess Wikle)*
- *Developing complex modeling systems to predict changes in distribution, abundance and biomass of dominant forest tree species informed by climate scenarios, management strategies, disturbance regimes and more (Researcher Frank Thompson)*

Expanding threat of forests pests to forest ecosystems - see RISCC Management Challenge: Forests Pest Risk

- *Distribution of Southern Pine Beetle, predicting temperatures that will facilitate northward expansion of its distribution (Researchers Radley Horton and Tony D'Amato)*

Understanding scale in the role of forest management - see NE CASC Mosaic Landscape handout

- *Adapting forest management efforts to prioritize carbon storage and vulnerable species conservation at different scales (Researchers Caitlin Littlefield and Tony D'Amato)*

Climate effects on the commercial syrup production of northeastern forests - see NE CASC maple syrup and climate change handout

- *Summarized the predicted effects of climate change on the maple syrup industry and have developed tools to ensure that syrup producers are informed (Researchers Kristina Stinson and Toni Lyn Morelli)*

Learn more at: necasc.umass.edu

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