



Forest Service
U.S. DEPARTMENT OF AGRICULTURE



Resources for Addressing Climate Change Through Competitive Grants and Technical Assistance

The Eastern Region State, Private, and Tribal Forestry programs work with the Northern Institute of Applied Climate Science (NIACS) and the USDA Climate Hubs to help land managers and planners identify relevant climate change impacts and adaptation actions that support land management. This document features a collection of regional resources developed by NIACS that can be used by State natural resource agencies, Tribes, landowners, and other partners to document climate and carbon considerations in projects by 1) explicitly identifying climate impacts on ecosystems; 2) selecting adaptation actions to respond to those climate impacts; and 3) integrating principles of Diversity, Equity, Inclusion, and Accessibility.

Identify Climate Change Impacts on Forests

Understanding and evaluating the climate change impacts that may affect a particular place or ecosystem are important first steps in adapting lands to climate change. Vulnerability assessments help managers understand what ecosystem components may be at risk, and this information can then inform adaptation.

- A collection of [forest vulnerability assessments](#) and synthesis products provide high-quality information about future changes in climate and anticipated effects on ecosystems. The NIACS [Climate Impact Explorer](#) provides a clickable map to explore how climate change may affect your region and ecosystems, drawing upon the key findings of these assessments.
- [Tree species lists](#) draw upon data from the Climate Change Tree Atlas, a tool produced by the USDA Forest Service Northern Research Station. This information can be used to assess stand-level risk, inform planting lists, and more. Lists are available for [assessment areas and select urban cities](#), and additional geographies (watersheds, municipalities, States, etc.) are available directly from the [Tree Atlas](#) website.

Select Adaptation Actions to Respond to Climate Impacts

After climate impacts and vulnerabilities have been identified, adaptation actions can be devised to address those impacts while helping to meet management goals. Adaptation actions address specific climate change impacts, support healthy conditions over the long term, and avoid maladaptation (the unintended consequences of an action on another forest resource). NIACS developed the Adaptation Workbook and menus of adaptation strategies to help land managers develop adaptation actions that are based on their management goals and context.

- The [Adaptation Workbook](#) (Swanston et al. 2016, *Forest Adaptation Resources: Climate change tools and approaches for land managers and Adaptation Workbook, 2nd edition*; also available as an online interactive tool: [AdaptationWorkbook.org](#)) outlines a process for incorporating climate change considerations into current management planning and activities. For urban forestry projects, the [Climate & Health Action Guide](#) integrates human health considerations into the Adaptation Workbook process and works with the [Urban Forests and Human Health Adaptation Menu](#).
- NIACS has led the development of [adaptation strategies and approaches](#) for a variety of natural resource topics, which can be used with the Adaptation Workbook. These “menus” provide topical lists of adaptation actions that help narrow down broad ideas to specific actions; land managers select appropriate actions based on their unique project location and goals. Menus are available for a variety of topics, including natural and urban forests, forest carbon management, forested watersheds, Tribal perspectives, recreation, and wildlife management.

- [Adaptation Demonstrations](#) provide real-world examples of how managers have integrated climate considerations into land management planning. Demonstrations come in all shapes and sizes, and the website allows users to explore by State, landowner type, and management topic.

Carbon Stewardship

The importance of forests in the global carbon cycle has created widespread interest among land managers to identify actions that maintain or enhance carbon stocks or sequestration rates. At the same time, the changing climate poses risks to the ability of forests to provide carbon benefits due to rising temperatures, changing seasonality of precipitation, and increases in natural disturbances such as drought, wildfire, and forest pests and pathogens. Ecosystems managed to adapt to changing conditions while remaining healthy and productive may be able to capture and store carbon more effectively over the long term, while also providing a number of other ecosystem services, such as clean air and water, biodiversity, wood products, or wildlife habitat. Practices that tend to benefit forest carbon include avoiding conversion of forests to other land uses, reforestation, minimizing forest disturbance, and increasing sequestration through enhanced forest growth. Translating these broad practices into specific actions at local scales can be facilitated by the [Forest Carbon Management Adaptation Menu](#), which can be used with the Adaptation Workbook.

Diversity, Equity, Inclusion, and Accessibility

It is important that actions taken to respond to climate change avoid disproportionate impacts on low-income, minority, Indigenous, and other disadvantaged communities, while also ensuring that the benefits of adaptation are distributed equitably. NIACS has compiled a list of [resources](#) to empower land management professionals to understand and integrate principles of diversity, equity, inclusion, and accessibility into their climate adaptation and carbon mitigation projects and activities.

Need Help?

For questions about State- or region-specific resources or for help with other climate or carbon questions, contact Patricia Leopold (patricia.leopold@usda.gov), Climate Adaptation Specialist, NIACS and USDA Forest Service Eastern Region State, Private, and Tribal Forestry.

For questions about a specific grant application or award, contact your grant monitor.

The [Forest Service Eastern Region State, Private, and Tribal Forestry](#) programs collaborate with States, Tribes, landowners, and other partners to protect, conserve, and manage forests and community trees across the 20 Northeastern and Midwestern States and the District of Columbia. Programs provide leadership, technical support, sound science, grants, and financial assistance to help ensure that the region's forests and trees continue to provide clean water, forest products, wildlife habitat, recreation, and other benefits for present and future generations.

The Northern Institute of Applied Climate Science (NIACS) is a collaborative, multi-institutional partnership led by the USDA Forest Service and comprised of Federal, forest sector, conservation, higher education, and Tribal organizations. The NIACS partnership provides integral support to the USDA Northern Forests Hub and serves to bring together partners with diverse perspectives to achieve shared goals. NIACS offers online and in-person trainings and consultations for using the resources described above; see the [Training Page](#) for more details or sign up for a [newsletter](#) here.

The USDA Climate Hubs work across the USDA and with partners to support climate-informed decisions for robust agriculture, healthy forests, and resilient communities. Regionally, the USDA Northern Forests Climate Hub develops and delivers science-based, region-specific information and technologies to help natural resource managers and woodland owners integrate climate change information into planning, decision-making, and management activities to sustain diverse benefits from forests in a changing climate. The USDA Northern Forests Climate Hub was designed to provide additional forestry-specific expertise to the Midwest and Northeast Climate Hubs