



United States  
Department of Agriculture

# Forest Threat Facts

## Climate and Severe Weather

### Climate Variability, Climate Change, and Severe Weather

The impacts of climate variability, climate change, and severe weather can make forests more vulnerable to other stresses including wildfire, invasive plants, diseases, and insect pests. These interacting threats to forest health can reduce biodiversity (the variety of species) and forest productivity, often resulting in costly environmental, economic, and social consequences.

#### Climate vs. Weather

**Weather** describes daily conditions that can change rapidly. Severe weather refers to extreme short-term weather events, such as hurricanes, floods, tornadoes, droughts, and ice storms.



**Climate** represents typical or average weather patterns established over a long period of time. Short-term changes in weather patterns, or the occurrence of multiple severe weather events, are known as **climate variability**. **Climate change** refers to long-term changes in weather patterns, which may take years or decades to identify.



Researchers with the USDA Forest Service **Eastern Forest Environmental Threat Assessment Center** are investigating, developing, and implementing strategies for sustaining long-term forest productivity and health during changing climates and weather-related events. Key projects include:

#### Climate hub provides science-based land management support

As the impacts of climate variability and severe weather increase risks to forests, farms, and ranches, land managers need information and tools to maintain successful operations through times of change and uncertainty. The Eastern Threat Center is hosting the USDA Southeast Regional Climate Hub (SERCH) to connect a network of researchers and specialists in a variety of organizations who understand these needs. A joint effort of the Forest Service, Agricultural Research Service, and Natural Resources Conservation Service, SERCH and its partners provide education and outreach services that deliver relevant technical support to local and regional land managers throughout the southeastern United States.



## Quick 'state-of-the-science' reports aid forest management and planning

Natural resource managers and planners must be able to effectively and efficiently evaluate an ever-growing body of climate research to assess, manage, and monitor forests. The Template for Assessing Climate Change Impacts and Management Options (TACCIMO) is a web-based application that simplifies this process to connect land managers and planners with climate change science they can trust. TACCIMO offers several tools that enable users to review climate change forecasts, consider relevant literature-based science, and generate customized reports to aid decision making with long-term forest sustainability in mind.



## Water planning tool helps find balance between forest and human water use

Water availability is a key determinant of forest productivity, but forest water use must be balanced with human needs for water in homes, agriculture, energy, and industry. The Water Supply Stress Index (WaSSI) model is a web-based tool that can help natural resource managers and planners evaluate balances and tradeoffs related to water availability. WaSSI predicts how changes in climate, human population, and land cover may impact water availability and forest productivity at the watershed level and can be applied locally, regionally, and even internationally. Researchers are applying WaSSI in a variety of research projects, including a study of the effects of wildfire and forest fuel reduction treatments on water quantity across U.S. landscapes.

## Comprehensive website offers land managers training and tools

The Climate Change Resource Center (CCRC) website ([www.fs.fed.us/ccrc](http://www.fs.fed.us/ccrc)) aims to empower land managers to address climate change impacts. The CCRC provides an online portal to credible, science-based, and relevant information and tools concerning climate change and ecosystem management options. The Eastern Threat Center is among the partnering Forest Service research organizations contributing content and input to the CCRC's ongoing development.

## Monthly virtual meetings provide the latest news and updates

The Eastern Threat Center hosts First Friday All Climate Change Talks (FFACCTs), monthly information sharing forums featuring presentations about research activities focused on climate change impacts to eastern forest ecosystems. Forest Service scientists, managers, and partners also provide updates about climate change issues at the Station, Regional, and National levels. These virtual meetings are open to participants internal and external to the Forest Service, including forest researchers, managers, policy makers, and partners.



## For more information:

Visit [www.forestthreats.org](http://www.forestthreats.org) to learn more about the Eastern Threat Center's climate research and other projects.

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