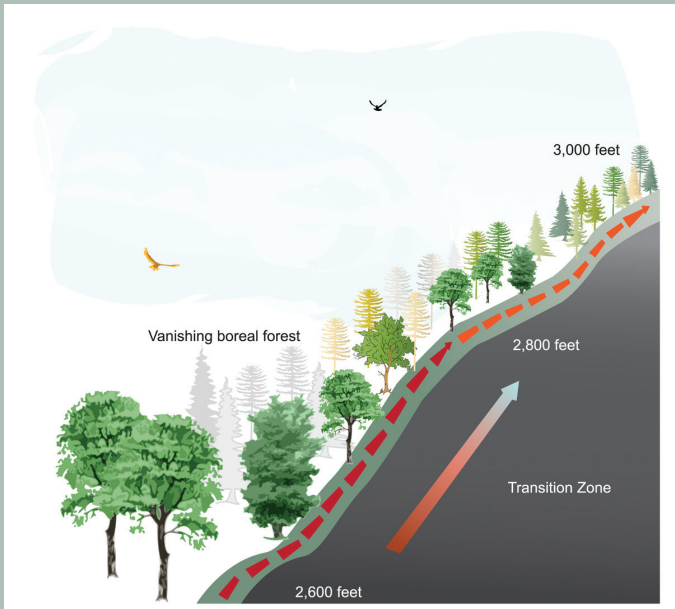
NOAA's National Climatic Data Center Sectoral Engagement Fact Sheet

FORESTS AND FOREST ECOSYSTEMS

OVERVIEW

Forests and forest ecosystems exist on both public and private lands, and range from old-growth stands to managed short-rotation pine plantations. Within these systems are refuges, sensitive habitats, national parks and forests, Nature Conservancy lands, conservation easements, and investment entities. Informed and responsible stewardship of forests and forest ecosystems is critical to the survival of many threatened and endangered species. In all geographic areas, weather and climate conditions affect forests, forest ecosystems, and forest management. Both rapid and gradual climate changes and variations can strongly impact forests and the mostly rural economies that depend on them. Having access to relevant and easily understandable weather and climate information is essential to effectively develop appropriate adaptation and mitigation strategies for future forests.

Forest Species Shift Upslope



As climate warms, hardwood trees out-compete evergreen trees that are adapted to colder conditions.

KEY STAKEHOLDERS

NOAA's National Climatic Data Center (NCDC) works with various groups, both as an information provider and as an applied research partner, to examine the effects of weather and climate on forests. This helps decision makers and planners in both private and public entities within this sector determine practical responses to climate change and weather variations. There are many different governmental and nongovernmental organizations, public and private groups, businesses, and individuals that can benefit from using pertinent climate and weather-related information. Some major groups include:

- Federal agencies such as the USDA Forest Service, the National Park Service, and the Bureau of Land Management
- Nongovernmental organizations concerned with natural resources
- State forestry agencies and forestry extension
- Federal, state, and local fire managers and emergency planners
- Forest industry, real estate investment trusts, timber investment management organizations, and nonindustrial private forest landowners

SECTOR NEEDS

Climate information is often available only as raw observations or in the form of tables, graphs, or written summaries, which may be difficult for users who are not well-versed in climate science to fully interpret. To bridge this gap, NCDC is partnering with the forests and forest ecosystems sector to translate climate data into accessible, useful, and accurate products; and to leverage NCDC's climate expertise to better understand what the information means and how it can be used most effectively.

Climate information can be used in a variety of ways. Some examples include:

- Combining temperature, precipitation, soil, and topographic information with remote sensing data to develop early warning systems for forested areas under attack from insects or diseases.
- Combining precipitation and temperature information with Forest Inventory Analysis data to examine changes in forest structure and health in relation to climate change.
- Combining historic precipitation and temperature data with long-term data from forest hydrological studies to understand and model climate change impacts on water quality and supply at local, regional, and national levels.
- Combining weather and climate data with monitoring data from experimental forests and other research sites such as flux tower networks to improve the accuracy of carbon sequestration modeling.

Photo courtesy of David McGuirk

Photo courtesy of NOAA

NCDC DATA and PRODUCTS

There are many different types of useful climate information available. Some examples include:

- A *Vegetation Index*, which is used to predict or assess vegetative characteristics such as plant leaf area, total biomass, and general health and vigor of the surface vegetation.
- The *U.S. and North American Drought Monitor*, which synthesizes multiple indices and impacts, representing a consensus of federal and academic scientists.
- The *National Integrated Drought Information System* (NIDIS), which is a Web portal-based multi-agency collaborative system that provides information about current drought conditions and impacts, and drought forecasts, planning, education, and research.
- CD-ROM/DVDs, such as the *International Station Meteorological Climate Summary*, which contains climatic data summaries from thousands of weather stations around the world, and Integrated Surface Data database, which contains climate information for about 10,000 weather stations, with some dating as far back as 1901.

Collaboration between climate scientists and the forest ecosystem community is essential in helping to build the necessary bridges that will transform climate data into information that is relevant and credible. Ongoing communication is important to ensure that the information NCDC provides is appropriate and applicable to forests and forest ecosystems sector needs. As climate changes in the years ahead and the effects become more noticeable, new information needs will emerge. NCDC will work closely with this sector, attending trade meetings and sponsoring future workshops and conferences, in order to better understand, address, and anticipate these needs.

Additional details about available NOAA products and the economic benefits of these products are provided at:
http://www.economics.noaa.gov

For further information on obtaining NCDC climate services and products related to forests and forest ecosystems please contact:

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NOAA Satellite and Information Service
National Environmental Satellite, Data, and Information Service (NESDIS)
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