

ECOLOGICAL DROUGHT MANAGEMENT CHALLENGES

Understanding drought impacts to fish, wildlife, their habitats, & people

NATIONAL & REGIONAL CLIMATE ADAPTATION SCIENCE CENTERS

ALASKA

- Larger, more frequent wildfires
- Less snowpack & earlier melt
- Rapidly warming winters & springs

NORTHWEST

- More frequent wildfires
- Less snowpack & earlier melt
- Warmer winters & hotter summers

NORTH CENTRAL

- Competing water demands
- More rain, less snow
- Diverse seasonal warming trends across the region

GREAT LAKES

- Competing water demands
- Changing river flows & lake levels
- Impacts to forests & timber production

NORTHEAST

- More rain, less snow
- More intense short-term droughts
- Rich biodiversity at risk



ECOLOGICAL DROUGHT IS:

Drought that impacts fish, wildlife, their habitats, & people



HOW OUR WORK IS DIFFERENT

- ▶ Drought can change ecosystems, with implications for human communities
- ▶ But these **ecological impacts of drought** are not typically examined
- ▶ We are identifying how drought impacts ecosystems to **support adaptation planning**

Learn more: casc.usgs.gov/science/ecological-drought

- More severe wildfires
- Invasive species are spreading
- Rich biodiversity at risk

PACIFIC ISLANDS

- Larger & more severe wildfires
- Competing water needs
- Forests are dying

SOUTHWEST

- Competing water demands
- Rapid drought development
- More extreme & expensive drought & flood cycle

SOUTH CENTRAL

- Competing water demands
- Changing water flows
- Rich biodiversity at risk

SOUTHEAST



ADDRESSING MANAGEMENT CHALLENGES: SOUTHEAST REGION



KEY CHALLENGES

- ▶ Rapid population growth = competing demands for water
- ▶ Shifting precipitation is leading to changing river flows
- ▶ Rich biodiversity at risk

DROUGHT WORK

- ▶ Improve understanding of climate variability
- ▶ Identify vulnerability of ecosystems to changing conditions
- ▶ Work with managers to minimize drought impacts

CONTACT US

Southeast CASC

globalchange.ncsu.edu/secsc/
casc.usgs.gov/centers/southeast

Learn more about these projects:
casc.usgs.gov/science/ecological-drought

DROUGHT IN THE SOUTHEAST: AT A GLANCE

- ▶  Rainfall in the Southeast is becoming more variable, with summers becoming drier and falls wetter. Dry years are becoming drier, and droughts are becoming more frequent.
- ▶  The region has experienced **3 record-breaking droughts in the last 15 years**. The 2016 drought helped fuel catastrophic wildfires in the Great Smoky Mountains, home to the country's most visited national park.

PREDICTING THE RISK OF "THE BIG ONE"

OUR SCIENCE: Improved predictions of the risk of catastrophic wildfires in Georgia, by identifying which weather conditions resulted in extreme wildfires in the past. Found that if summers get hotter in the future, the risk of extreme wildfires will increase substantially.

IMPACT: Informs adaptive management planning by helping resource managers understand how the risk of catastrophic fires might change over time. This is **critical information for the restoration of longleaf pine**, an important ecosystem in the region that requires periodic burning. Managers of these and other ecosystems seek information on how prescribed burning fits into long-term wildfire-risk management plans.

USERS: Southeastern LCCs: South Atlantic, Appalachian, Peninsular Florida, Gulf Coastal Plains & Ozarks, Gulf Coast Prairie • Longleaf Alliance



Learn more: <https://go.usa.gov/xQhHN>

ECOSYSTEMS AT RISK

OUR SCIENCE: Assessed the vulnerability of 19 ecosystems in the Southeast & Caribbean to changing conditions - including changes in hydrology, drought, and wildfire. Identified knowledge gaps and key strategies to increase the adaptive capacity of these ecosystems and decrease their vulnerability to changing conditions.

IMPACT: Informs the management actions of local conservation practitioners working to protect these ecosystems, and supports decision-makers in prioritizing ecosystems to target with adaptive management.

"This work is a great benefit to the USDA Caribbean Climate Hub, to the Caribbean LCC, and to partners working to conserve species and habitats in the U.S. Caribbean, contributing to regionally integrated planning."

-William Gould, U.S. Forest Service International Institute of Tropical Forestry



Learn more: <https://go.usa.gov/xQhH8>