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

PACIFIC ISLANDS

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

SOUTHWEST

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

SOUTH CENTRAL

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

SOUTHEAST

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

ECOLOGICAL DROUGHT IS:

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

HOW OUR WORK IS DIFFERENT

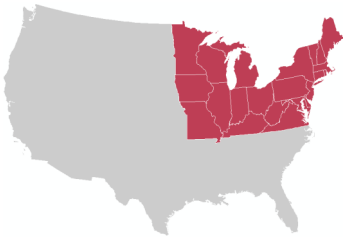
- Drought can change ecosystems, with **implications for human communities**
- But these **ecological impacts of drought** are not typically examined
- We are identifying how drought impacts ecosystems to **support adaptation planning**

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

Symbols courtesy of the Integration and Application Network, University of Maryland Center for Environmental Science (ian.umces.edu/symbols/)

USGS science for a changing world

ADDRESSING MANAGEMENT CHALLENGES: NORTHEAST REGION



KEY CHALLENGES

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

DROUGHT WORK

- ▶ Incorporating early drought detection & adaptation measures for water and natural resource managers
- ▶ Determining effective strategies for responding to water shortages
- ▶ Identifying changes in streamflow and temperature

CONTACT US

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Learn more about these projects:

https://casc.usgs.gov/science/ecological-drought

DROUGHT IN THE NORTHEAST REGION: AT A GLANCE

Northeastern ecosystems depend on abundant and predictable water supplies. Shorter, warmer winters and drier summers punctuated by intense rainfall are expected in the future, with more precipitation falling as rain than snow. These change stress forests, plants, and wildlife.

Drought can weaken trees and make them more vulnerable to pests, such as the invasive emerald ash borer and southern pine beetle.

EARLY DROUGHT DETECTION TOOL

OUR SCIENCE: Scientists are incorporating information on streamflow forecasts and other key indicators of drought into a tool that predicts and classifies drought severity in the greater Susquehanna River Basin.

IMPACT: To date, this research has informed the City of Baltimore Bureau of Water and Wastewater on the most effective way to respond to water shortages. Scientists worked closely with Baltimore's water resources staff to tailor water supply models and respond to the city's climate-driven decision needs.

USERS: Cities of Boston, New York, Providence, Philadelphia, Baltimore ● Susquehanna River Basin Commission

Learn more: https://bit.ly/2Ktyo5C

'SLOWING THE FLOW': DROUGHT & FLOOD RESILIENCE

OUR SCIENCE: Scientists are examining whether a "slow the flow" approach can decrease vulnerability to droughts and floods. The approach aims to increase natural water storage through activities such as floodplain reconnection, beaver management, and restoring stream channels.

IMPACT: This is being tested in the Connecticut and Ipswich River basins, as well as Lake Michigan and interior Wisconsin tributaries. Supports managers in both regions identify effective strategies for drought and flood resilience, as climate conditions change.

USERS: USFWS ● USFS ● Menominee Nation ● State management agencies ● The Nature Conservancy ● Trout Unlimited ● USACE ● EPA ● Regional water planning commissions

Learn more: https://bit.ly/2JJRLDb