

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



USGS
science for a changing world



ADDRESSING MANAGEMENT CHALLENGES: SOUTHWEST REGION



KEY CHALLENGES

- ▶ Larger & more severe wildfires
- ▶ Increasing water demands in a region with limited supply
- ▶ Broad-scale forest mortality & die-off

DROUGHT WORK

- ▶ Identifying the consequences of “hotter drought” on people & ecosystems
- ▶ Building resilience & reducing vulnerability of water resources, forests, & wildlife

CONTACT US

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Learn more about these projects:
usgs.gov/casc/ecodrought

DROUGHT IN THE SOUTHWEST: AT A GLANCE

- ▶ Since 1999, the Southwest has been experiencing the **longest and hottest drought on record** for the U.S.
- ▶ **Trees are dying** as drought promotes larger wildfires and bark beetle outbreaks - a key example of the ecological impacts of drought.
- ▶ Without an increase in precipitation, projected increases in temperature suggest that the **odds of a multi-decadal megadrought in the Southwest could increase six-fold**.

CHANGING WATER SUPPLY

OUR SCIENCE: Found that warming temperatures—not just reduced precipitation—have impacted the Colorado River’s water flow. Less snow is accumulating and snowpack is melting earlier, reducing flow.

IMPACT: Enhances **streamflow forecasts** and addresses a critical gap consistently raised by water managers—what are the conditions that lead to reduced flow in the Colorado River basin?

“This work is extremely timely and important to my district. The drought we experienced from 2000-2013 was a critical shock to the system. It’s essential that we understand the relationship between rising regional temperature and streamflows if we’re going to be prepared for future droughts.”

-Eric Kuhn, General Manager, Colorado River District



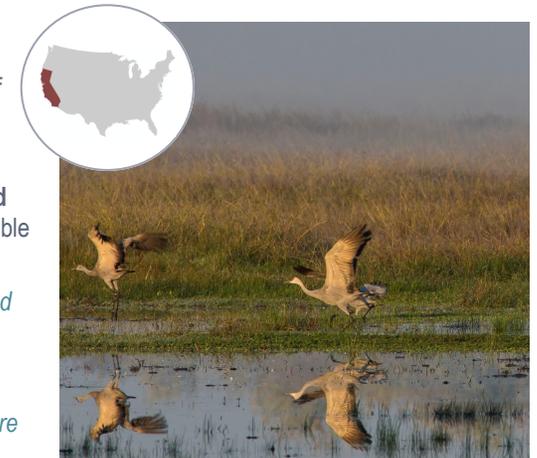
Learn more: <https://go.usa.gov/xQhHe>

WATER-TRACKING TOOL FOR WETLANDS

OUR SCIENCE: Developed a water-tracking tool to visualize the extent of wetlands in California’s Central Valley, which provide critical habitat to waterfowl, and used the tool to identify the impacts of recent drought.

IMPACT: Help land managers coordinate the timing and use of limited water resources during drought to ensure that water and habitat is available to meet the diverse needs of humans and wildlife.

“This project provided key information about the timing and extent of wetland and ricefield flooding during the recent historic drought in California. This information was essential for refining the spatial habitat objectives in our Implementation Plan, and developing conservation strategies to ensure our Joint Venture partners are providing food resources for migratory birds where they need it most.” -Mike Dunphy, Central Valley Joint Venture Coordinator



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