



## Meeting the Southwest's Climate Challenges

Working with the region's stakeholders to cope with the nation's most persistent and severe drought.

Building capacity with tribal communities to meet their growing climate challenges.

Collaborating with land and wildlife managers to increase resilience of forests in the face of worsening wildfire and tree death.

Partnering with water, fish, and ecosystem managers to understand and deal with shrinking snowpack and declining river flows.

Preparing wetland and other coastal managers for recurring and accelerated flooding.



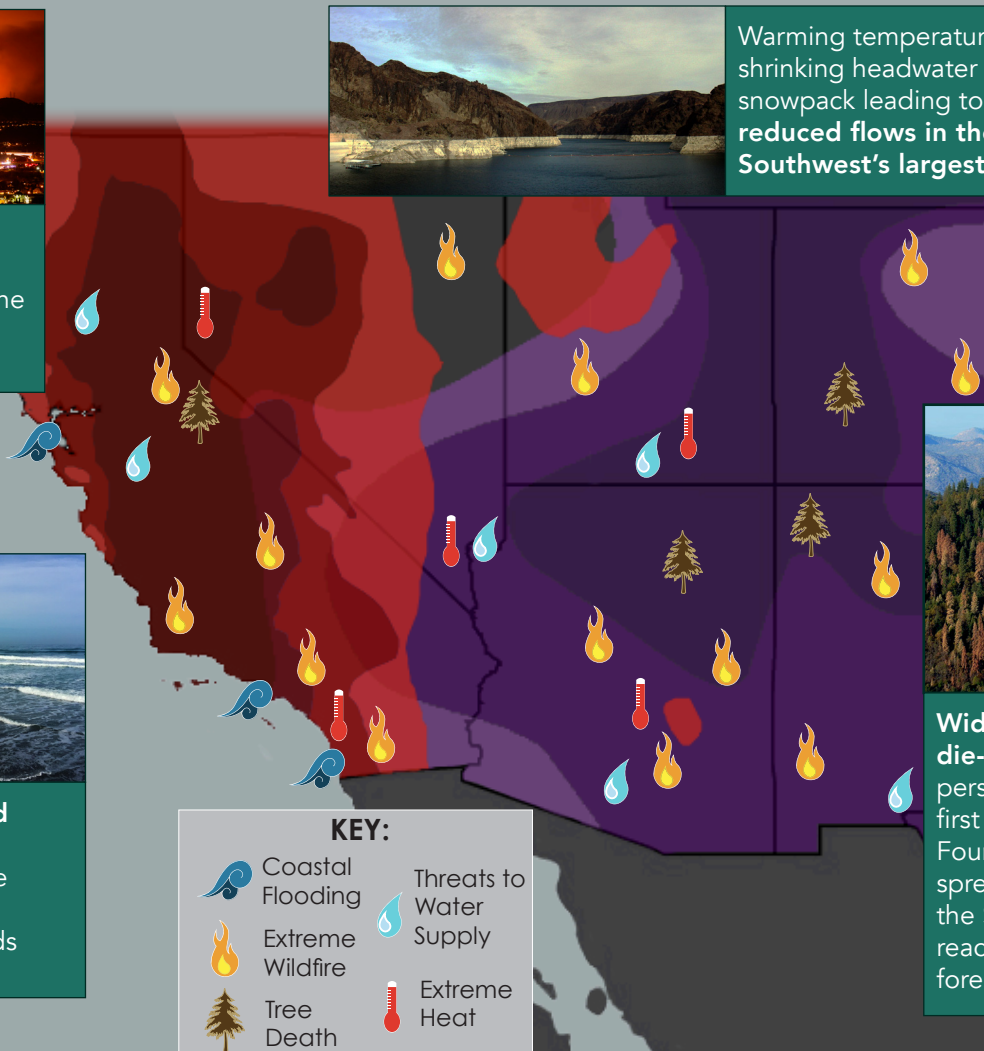
Unprecedented **large and severe wildfires** are on the rise across the Southwest, most recently in California.



Warming temperatures are shrinking headwater snowpack leading to **reduced flows in the Southwest's largest rivers.**



**Sea-level rise and flooding** have accelerated on the California coast, impacting wetlands and more.



### KEY:



**Widespread tree die-off** due to persistent drought first occurred in the Four Corners before spreading across the Southwest, now reaching the forests of California.

Drought area for 2016 (red) overlaying 2002 (purple) highlighting the 16-year ongoing Southwestern drought — the longest in US history. Darker colors signify more extreme drought. Significant climate challenges are indicated with icons.

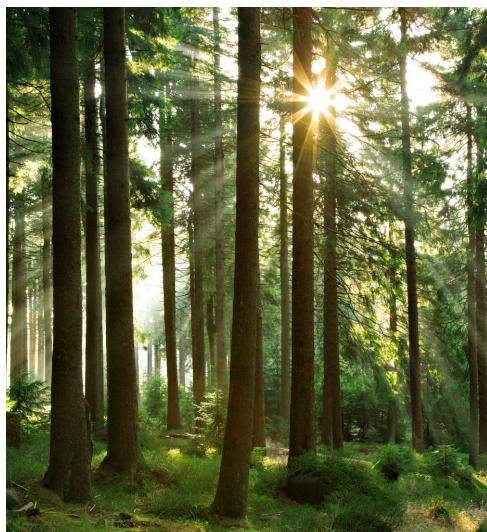
## Advancing Water Resource Management Across the Southwest with Cutting Edge Research

**Effective wetland management in the California Central Valley during extreme drought.** Ongoing SW CSC work is helping Natural Wildlife Refuges and managers make better decisions on critical water allocations for wildlife and farmers.

**California's coastal marshes are vulnerable to sea-level rise.** This will negatively affect ecosystem services such as water quality, coastal protection from storms, habitat for wildlife, and the ability to store excess carbon. SW CSC research has guided the U.S. Fish & Wildlife Service to develop more resilient coastal habitats.

**Warmer spring temperatures reduce Colorado River flow.** New SW CSC research shows that warmer spring temperatures reduce flow more than previously recognized. These results help water managers determine how future warming temperatures may influence the river's flow and the region's water supply.

**Improved modeling approaches to understand current and future changes in Colorado River Basin climate and flows.** Ongoing SW CSC work indicates that dynamically downscaled global climate projections may provide more realistic estimates of future climate than those currently used by water managers.



## Science to Increase the Resilience of Southwestern Forests

**Evaluating the vulnerability of iconic forests to extreme drought.** New SW CSC research will produce high-quality data for use in decision-support tools that forest managers can use to prioritize and implement management practices in the Southern Sierra Conservation Cooperative — a partnership of the National Park Service, the US Forest Service, the Bureau of Land Management, and the US Geological Survey.

**Prescribed fire reduces tree death from drought.** New SW CSC research shows that when prescribed fire is used to thin forests, the remaining trees are more likely to survive the stress of persistent drought.

**Increasing forest resistance to severe drought and wildfire.** Additional SW CSC work in the Sierra Nevada Mountains of California is increasing our understanding of how management practices can increase forest resilience, with utility throughout the West.

## Taking the Lead in Engaging Key Stakeholders and Tribal Communities

**Coordination and convening of federal and other climate-adaptation entities.**

The SW CSC initiated a series of discussions among regional to national climate programs, including NOAA RISAs, USDA Climate Hubs, Landscape Conservation Cooperatives (LCCs), and CSCs, to coordinate more effectively and to identify critical gaps in climate-adaptation efforts.

**Tribal Engagement Initiative.** The SW CSC collaborated with the University of Arizona's Center for Climate Adaptation Science and Solutions and the Desert LCC to organize the nation's first workshop to bring together tribes that have climate adaptation planning capacity to learn best practices. Next steps include facilitating training, grant writing, and providing other technical expertise for tribes throughout the Southwest.

**Convening Southwest Climate Summits.** The SW CSC worked with four regional LCCs, the USDA Southwest Climate Hub, the CLIMAS RISA, California state agencies, and NGOs to lead the convening of the first two Climate Summits for the region, widely attended by scientists, resource managers, and other stakeholders.

