

Colorado River Basin

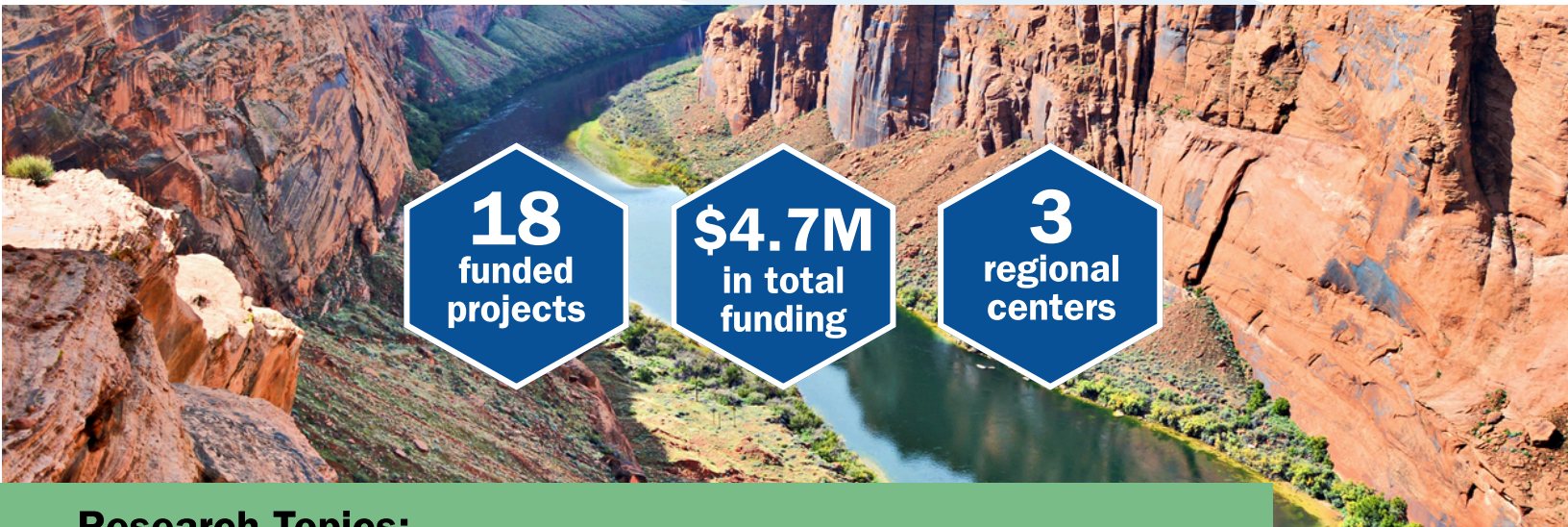


U.S. Geological Survey Climate Adaptation Science Centers

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Flowing 1,450 miles through seven states and 30 Tribal Nations, the Colorado River is known as the lifeline of the Southwest. The river delivers water to 40 million people, irrigates approximately five million acres of farmland, supports a trillion-dollar economy, and supplies hydroelectric power to millions. Its drainage basin stretches across 250,000 square miles of diverse ecosystems, providing habitat for thousands of plant and wildlife species. However, increasing temperatures have altered the amount and timing of annual snowmelt and streamflow, exacerbating drought conditions and diminishing reservoir storage levels. Over time, less water becomes readily available for the communities, ecosystems, and economies that rely on the river's consistent flow.

For over a decade, the **Climate Adaptation Science Centers** (CASCs) have engaged with resource managers along the expansive river system to address this growing threat. CASC-supported researchers model historic and future climate conditions, forecast fish population changes, and co-develop riparian adaptation strategies with federal, Tribal, state, and local partners from across the river basin. **Learn more:** usgs.gov/casc/coriver



18
funded
projects

\$4.7M
in total
funding

3
regional
centers

Research Topics:



Developing Tools of the Trade

By combining community science, participatory mapping, and storytelling, researchers help document the impacts of drying climates on river communities and develop tools that support future management.



Aquatic Life in a Regulated River

CASC researchers are providing timely, science-based strategies that outline the benefits and trade-offs of different reservoir operations and their impacts on the river's ecology, particularly on its aquatic inhabitants.



Managing Risk and Hazards

CASC scientists are providing usable information to guide long-term ecological stewardship and adaptation to wildfires, drought, and other hazards in this critically water-stressed region.



Forecasting Flow on the Colorado

To support proactive water planning and management, CASC scientists are working to understand and anticipate how changes in climate may influence water levels across the basin.

Science Across the Colorado River Basin: Project Spotlights

Science-based tools tailored to local conditions and needs

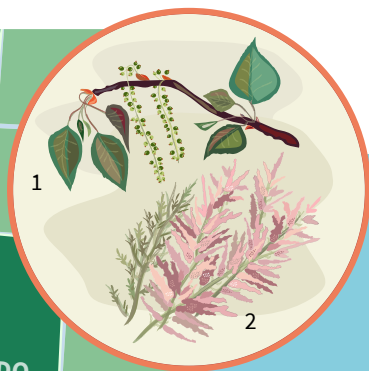
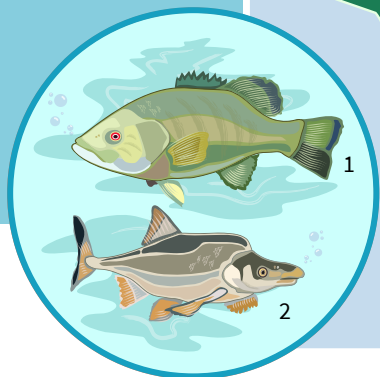
In the San Juan and Gunnison River Basins, scientists collaborated with land managers and local communities to [identify adaptation strategies](#) around drought, fire, and invasive species to help prepare for and respond to the impacts of a changing climate.

Science supports riparian restoration

Researchers working with the San Carlos Apache Tribe are [mapping and monitoring non-native tamarisk](#) across the Upper Gila River watershed. Drought has caused tamarisk stress, increasing the risk of wildfire and threatening critical habitat.



Smallmouth bass, (*Micropterus dolomieu*) (1) and humpback chub, (*Gila cypha*) (2)



Frémont's cottonwood (*Populus fremontii*) (1), a tree native to the watershed, and non-native tamarisk (*Tamarix ramosissima*) (2)

Artistic depiction of the Colorado River Basin (not to scale)

Balancing water supply with ecosystem health

USGS researchers are investigating how [future allocation and reservoir storage decisions could affect native fish populations](#), including the impacts of invasive smallmouth bass on rare and federally listed species such as the humpback chub.

Understanding the influence of spring and summer rains

While most research in the Colorado River Basin focuses on winter snowpack and runoff, CASC researchers are hoping to fill a critical knowledge gap by [examining how spring and summer rains](#) shape water availability and landscape conditions.

About the CASCs

The CASCs deliver science to help fish, wildlife, water, land, and people adapt to a changing climate. Comprised of nine regional centers and one national center, the CASCs address on-the-ground resource management challenges across the country through a public-private partnership model. Learn more: usgs.gov/casc

