



Sacramento-San Joaquin River Basin

Basin Overview

The Sacramento, San Joaquin, and Tulare Lake Basins are located in the Central Valley of California. The Central Valley is carpeted by vast agricultural regions and dotted with numerous population centers. There are currently more than 6.5 million acres of irrigated lands supporting a diverse range of permanent and annual agricultural crops. About 6.5 million people live in the Central Valley today, and it is the fastest growing region in California. The Central Valley regions that depend on the Sierra Nevada and Coast Range mountains for water have been facing rising demands for water from rapidly increasing populations; changes in land use; and growing urban, agricultural, and environmental demands.

Future Changes in Climate and Hydrology

Temperature

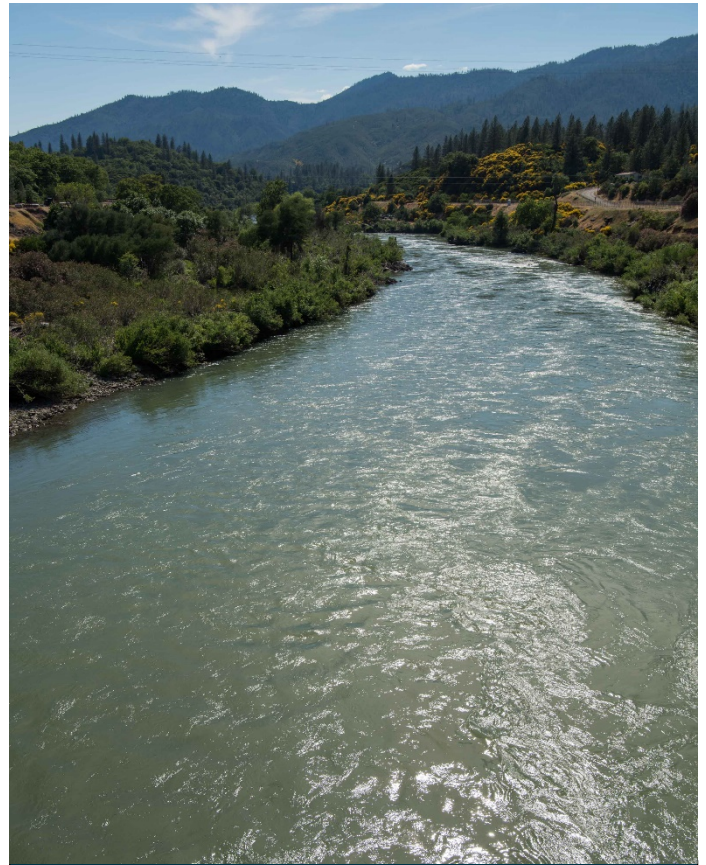
In the Central Valley, warming increases of approximately 1.8°F (degrees Fahrenheit) are projected to occur in the early 21st century with approximately 4°F of increase by mid-century. By the late 21st century, increases are projected to reach almost 6.5°F in the easternmost Sierra Nevada portions of the basin.

Precipitation

In the Sacramento Valley, San Joaquin Valley and Tulare Lake Basin, very little change in future precipitation is projected to occur throughout the 21st century. In the Sierra Nevada mountains, slight increases in precipitation are projected to occur in the early (2%), mid-century (1%) and late 21st century (2%).

Snowpack and Runoff

In the Sierra Nevada mountains, snow water equivalent is projected to decrease by about 5 percent in the higher elevations of the watershed by as early as 2025. By mid-century, a decrease in the snow water equivalent of about 10 percent is projected and by the end of the century, a decrease of up to 15 percent is projected to occur.



A view of the Sacramento River downstream of Shasta Dam

Adaptation Strategies

Water Storage Projects

Reclamation and its partners are exploring options for increased water storage in the Sacramento Valley, San Joaquin Valley, and Export Areas (CVP/SWP Delta exports). Additionally, Reclamation and its partners are studying groundwater conjunctive use management, enhanced recharge, and improved operational flexibility.

- In the Sacramento Valley, the Sites Joint Powers Authority and Reclamation are conducting a feasibility investigation to evaluate the potential for up to 1.8 million acre-feet of new off-stream water storage at the proposed Sites Reservoir.
- In the Delta, Reclamation and the Contra Costa Water District completed the Los Vaqueros Expansion Feasibility Study for Phase 2 in January 2020.
- In the San Joaquin Valley, the San Luis Low Point Improvement Project is a joint study by Reclamation in cooperation with the Santa Clara Valley Water District.
- In the Export Area, the Del Puerto Canyon Reservoir Project is a State-led project located on Del Puerto Creek in the foothills of the Coast Range Mountains, west of Patterson, California.

Innovations

Reclamation and water users in the Sacramento-San Joaquin River Basin have implemented numerous innovations to address challenges and improve water management. A few examples are presented below:

Salinity Forecast Models

Central Valley Project (CVP) operations are affected by water quality regulations both in the Delta and the upstream watersheds. In the San Joaquin River, salinity inflows to the Delta are a major concern and Reclamation is required to make releases from New Melones Reservoir to meet salinity standards established by the State Regional Water Boards and by the Environmental Protection Agency. To address these requirements, Reclamation and local partners have developed a real-time management capability and salinity forecasting in the lower San Joaquin River.

Enhancing our Understanding of Species Listed Under the Endangered Species Act

The Delta is the hub of the CVP and California State Water Project water operations. Due to prolonged drought and increasing concerns over endangered species, CVP exports to south-of-the-Delta water service and settlement contractors has become increasingly difficult to maintain. To meet these challenges, Reclamation has engaged with other Federal, State, and local stakeholders in the development of a suite of data collection and modeling tools to better understand, forecast, and respond to opportunities to export water while meeting regulatory requirements for both endangered species and California's agricultural and urban water users. Examples include:

- Directed Outflow Project
- Sacramento River Prediction and Assessment of Salmon (SacPAS)
- Central Valley Acoustic Tagging Project (CalFish Track)
- Structured Decision Making

Next Steps

The American River Basin Study and two Water Management Options Pilot Studies (Sacramento Regional Water Bank and River Arc Project) are currently in progress. In addition, the University of California Agriculture and Natural Resources and the California Department of Water Resources have formed a collaborative to update crop coefficients of major crops throughout California that require a high water demand in response to a WaterSMART Applied Science Tools Funding Opportunity.

In addition, Reclamation is collaborating with the Earth System Research Laboratories of the National Oceanic and Atmospheric Administration and the National Center for Atmospheric Research to produce historical and future climate trend estimates using state-of-the-art techniques for representing orographic (mountain) precipitation and occurrence of rain versus snow in the Sierra Nevada mountains and other Western regions.

To see the full basin report and other components of the 2021 SECURE Water Act Report, please visit:
<https://www.usbr.gov/climate/secure>