Basin Report: Sacramento and San Joaquin Rivers

The Sacramento and San Joaquin Basin includes two major watersheds – the Sacramento River on the north and the San Joaquin River on the south – plus the Tulare Lake Basin. The combined watersheds extend nearly 500 miles from northwest to southeast and range approximately from 60 to 100 miles wide. These rivers play a key role in California`s powerful economy, providing water for six of the top 10 agricultural counties in the nation's leading farm state. They provide water to farms, homes and industry in California`s Central Valley as well as major urban centers in the San Francisco Bay Area. To protect these critical resources, Reclamation must continually evaluate the risks and impacts from a changing climate and identify appropriate adaptation and mitigation strategies utilizing the best available science in conjunction with stakeholders.

Future Changes in Climate and Hydrology

Reclamation's 2011 SECURE Water Act Report identifies climate challenges the Sacramento and San Joaquin River Basins could likely face:

- Temperature is projected to increase by roughly 5-6 °F during the 21st century, with precipitation slightly increasing in the northern Central Valley and slightly decreasing in the southern Central Valley. The projections also suggest annual precipitation in the Sacramento and San Joaquin River Basins will remain quite variable over the next century with a slight increase of 0.6% over the Sacramento River Basin and a decrease of from 4.2 to 5.3% over the San Joaquin River Basin by 2050.
- The basin's annual runoff is projected to increase very slightly during the first half of the 21st century and slightly decline in the latter half of the century.
- Mean annual runoff is projected to increase as much as 2.5% in the Sacramento River Basin and decrease by 8.7% in the San Joaquin River Basin by 2050.
- Moisture falling as rain instead of snow at lower elevations will increase wintertime runoff and decrease summertime runoff.

Future Impacts for Water and Environmental Resources

These historical and projected climate changes have potential impacts for the basin:

- Due to early snowmelt and relatively higher winter rains from warmer conditions, the system's ability to provide effective flood protection will be reduced.
- Warmer conditions might result in increased fishery stress, reduced salmon habitat, increased water demands for instream ecosystems and increased invasive species infestations.
- Climate change-related surface water decreases are likely to significantly increase future groundwater demands.

Adequate and safe water supplies are fundamental to the health, economy and ecology of the United States and global climate change poses a significant challenge to the protection of these resources. Reclamation is taking a leading role in assessing risks to Western U.S. water resources and is dedicated to mitigate risks to ensure long-term water resource sustainability through its WaterSMART Program. To this end, an Interim Federal Action Plan was developed in 2009 and described actions by six federal agencies to deal with California's Bay-Delta and water supply management; these include support for the completion of the California Bay Delta Conservation Plan and aligning federal, State and local water conservation and recycling efforts.

Where opportunities exist, Reclamation has begun adaptation actions in response to climate stresses as well as land use, population growth, invasive species and others. These activities include extending water supplies, water conservation, hydropower production, planning for future operations and supporting rural water development. For example, the Bay Delta Conservation Plan is addressing long-term ecosystem restoration and water management in the Bay-Delta, utilizing potential changes in climate to both determine how the system would respond without action as well as how potential future strategies would perform. Further, the Department of the Interior High Priority Goal for Climate includes activities of the Landscape Conservation Cooperatives and Climate Science Centers, assessing vulnerabilities to the natural and cultural resources management by the Department and activities to adapt to the stresses of climate change.

This fact sheet contains partial information from the SECURE Water Act Section 9503(c) - Reclamation Climate Change and Water 2011, Section 7 - Basin Report: Sacramento and San Joaquin. The full report may be read online at www.usbr.gov/climate.