



Colorado River Basin

Basin Overview

Today, nearly 40 million people in the seven Colorado River Basin States—Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming—rely on the Colorado River and its tributaries for some, if not all, of their municipal needs. These same sources irrigate nearly 4.5 million acres of land in the Colorado River Basin (Basin) and the adjacent areas that receive Colorado River water, generating billions of dollars a year in agricultural and economic benefits. Within the Basin, 29 federally recognized Tribes consider the Colorado River and its tributaries an essential physical, economic, and cultural resource.

The Colorado River and its tributaries provide habitat for a wide range of species, including several that are federally endangered. These rivers flow through seven National Wildlife Refuges and 11 National Park Service units that provide a range of recreational opportunities and add significant benefits to the regional economy. Hydropower facilities in the Basin can supply more than 4,200 megawatts of vitally important electrical power to assist in meeting the power needs of Western States, reducing the use of fossil fuels. In addition, the Colorado River is vital to the country of Mexico.

Future Changes in Climate and Hydrology

Temperature

The period since 2000 has been about 2°F (degrees Fahrenheit) warmer than the 20th century average and is likely warmer than at any time in the past 2,000 years.

Snowpack and Runoff

Decreases in spring snowpack in many parts of the Upper Basin, as well as decreases in annual Colorado River flows at Lees Ferry, Arizona, have occurred in recent decades. While the timing of peak spring runoff is not as important as the runoff quantity to overall Basin water system outcomes due to the large system storage capacity, some water uses can be sensitive to runoff timing.

Droughts

The period since 2000 has been unusually drought-prone, but several paleodroughts prior to record keeping beginning in 1900 were more severe and sustained than the worst-case droughts since 1900. These “megadroughts” could recur in the future due to natural

climate variability alone, but the risk of their recurrence is increased by the recent trend in warming temperatures.



Lake Powell created by Glen Canyon Dam in Arizona

Water Management Impacts

Several studies have evaluated the impacts from the potential changes to temperature, precipitation, snowpack, and runoff on water deliveries, hydropower, and reservoir operations. Below are some of the potential impacts for the Basin:

- Current projections for hydropower generation at Hoover Dam indicate that there is a relatively high probability of a 0.5 percent to 2.5 percent reduction in hydropower generation from year to year over the next 5 years.
- Reclamation's Lower Colorado Basin Region conducted the Salt and Verde River Reservoir System Reservoir Operations Pilot Study to understand the implications of projected future hydrologic conditions to operations. This study confirmed that the Salt River Project can address any future shortfalls through conservation and the existing system design.

Adaptation Strategies

Through various planning efforts, Reclamation, the Basin States, and Basin stakeholders have come to recognize that no single action or approach will be sufficient to resolve future projected supply and demand imbalances. Strategies are being developed and actions taken to ensure the sustainability of current and future water supplies. Examples of some of the activities occurring throughout the Basin in which Reclamation is involved are described below.

Drought Contingency Plans

The Department of the Interior and Reclamation worked collaboratively with partners to develop consensus-based drought contingency plans in both the Upper and Lower Basins. When coupled with the Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations of Lake Powell and Lake Mead (2007 Interim Guidelines) and Minute 323 to the 1944 United States-Mexico Water Treaty, the drought contingency plans executed on May 20, 2019, will ensure a greater likelihood of sustainable operation of the Colorado River System until new operational guidelines can be developed by 2026.

Partnerships

Because of the complexities in the management and operations of the Colorado River System, Reclamation actively and continually partners with a wide variety of entities when engaging in activities and implementing programs to help mitigate the impact of the ongoing drought, and to address future water management challenges. Example activities with tremendous collaboration, coordination, and compromise by all include the 2019 Drought Contingency Plans, Tribal Water Study, Minute 323, and the Glen Canyon Dam Adaptive Management Work Group.

Next Steps

There is broad interest from Federal, State, and local governments; Tribes; agricultural users; municipal water suppliers; electrical power users; and conservation and recreation groups in ensuring the sustainability of the Colorado River. The future promises to continue to bring many complex challenges. These include mitigating the impacts of ongoing drought and a changing climate, operating and maintaining aging infrastructure, continuing to improve operational efficiencies, planning and developing new and more reliable water supplies, implementing existing and new water conservation strategies, and ensuring stewardship of environmental and cultural resources.

Reclamation recognizes that partnering to facilitate cross-program coordination and information exchanges is an important strategy that can allow such programs to work together and focus resources to address Basinwide challenges. Reclamation will continue to support and facilitate ongoing research critical to furthering the understanding of the Colorado River System. These efforts often include collaborations with the National Center for Atmospheric Research, the Colorado Basin River Forecast Center, and recognized Colorado River experts and researchers.

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