



# Responding to Drought in the Colorado River Basin: Federal and State Efforts

Updated May 23, 2023

The Colorado River Basin (**Figure 1**) covers more than 246,000 square miles in seven U.S. states and Mexico. Basin waters are managed and governed by multiple laws, court decisions, and other documents known collectively as the *Law of the River*. The [Colorado River Compact of 1922](#) established a framework to apportion water supplies between the river's Upper and Lower Basins (divided at Lee Ferry, AZ). Each basin was allocated 7.5 million acre-feet (MAF) annually under the compact; an additional 1.5 MAF in annual flows was made available to Mexico under a [1944 treaty](#). The Bureau of Reclamation (Reclamation) and the Department of the Interior (DOI) play a prominent role in [basin water management](#) due to the many federally authorized projects in the basin. This Insight discusses the hydrological status of the basin, as well as recent agreements and proposals to address the basin's long-term water supply issues.

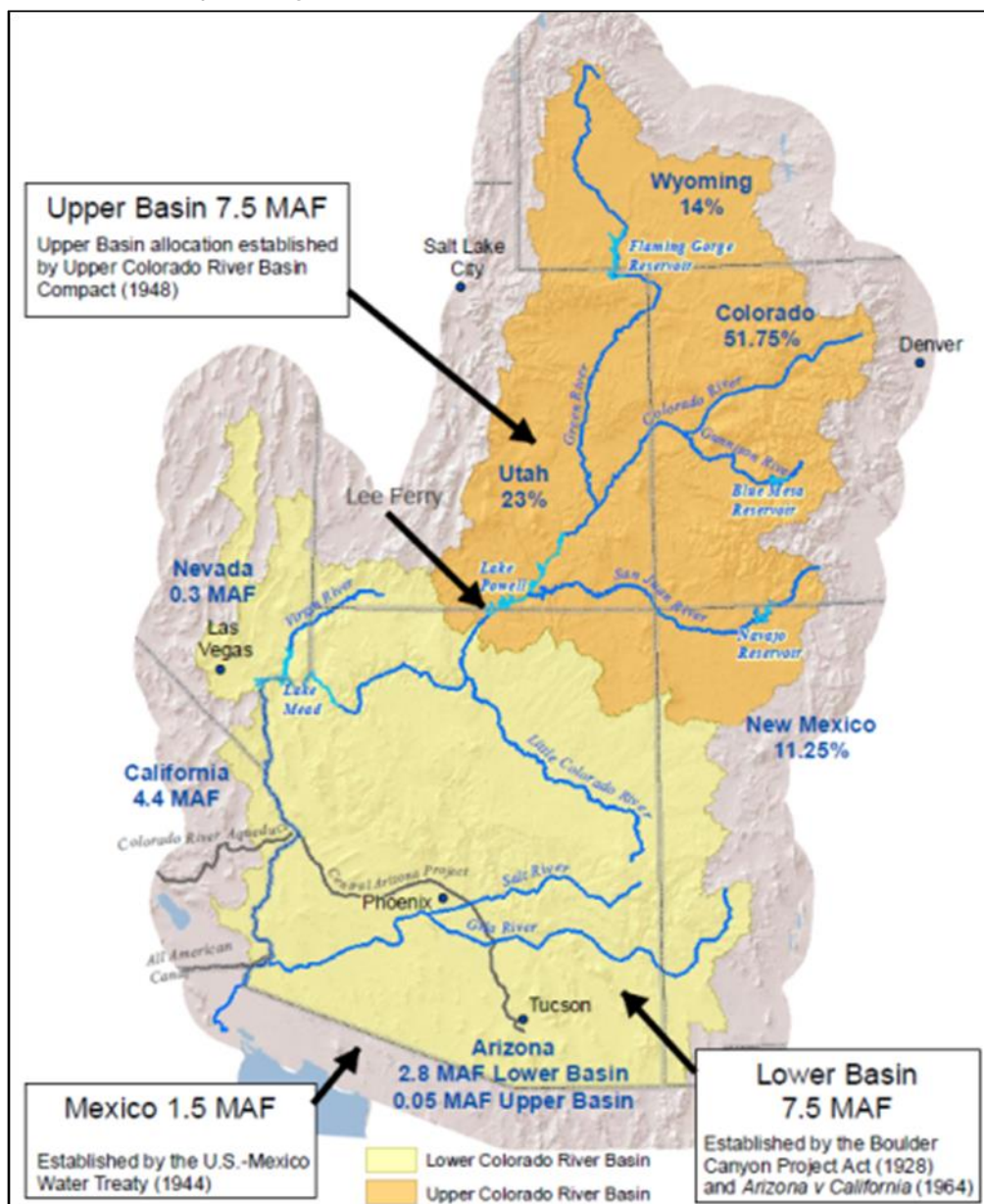
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### Figure 1. Colorado River Basin Allocations

(Upper Basin allocations in percentages of overall allocation, Lower Basin allocations in million acre-feet [MAF])



**Source:** Figure by the Congressional Research Service, using data from U.S. Geological Survey ESRI Data & Maps, 2017, Central Arizona Project, and ESRI World Shaded Relief Map.

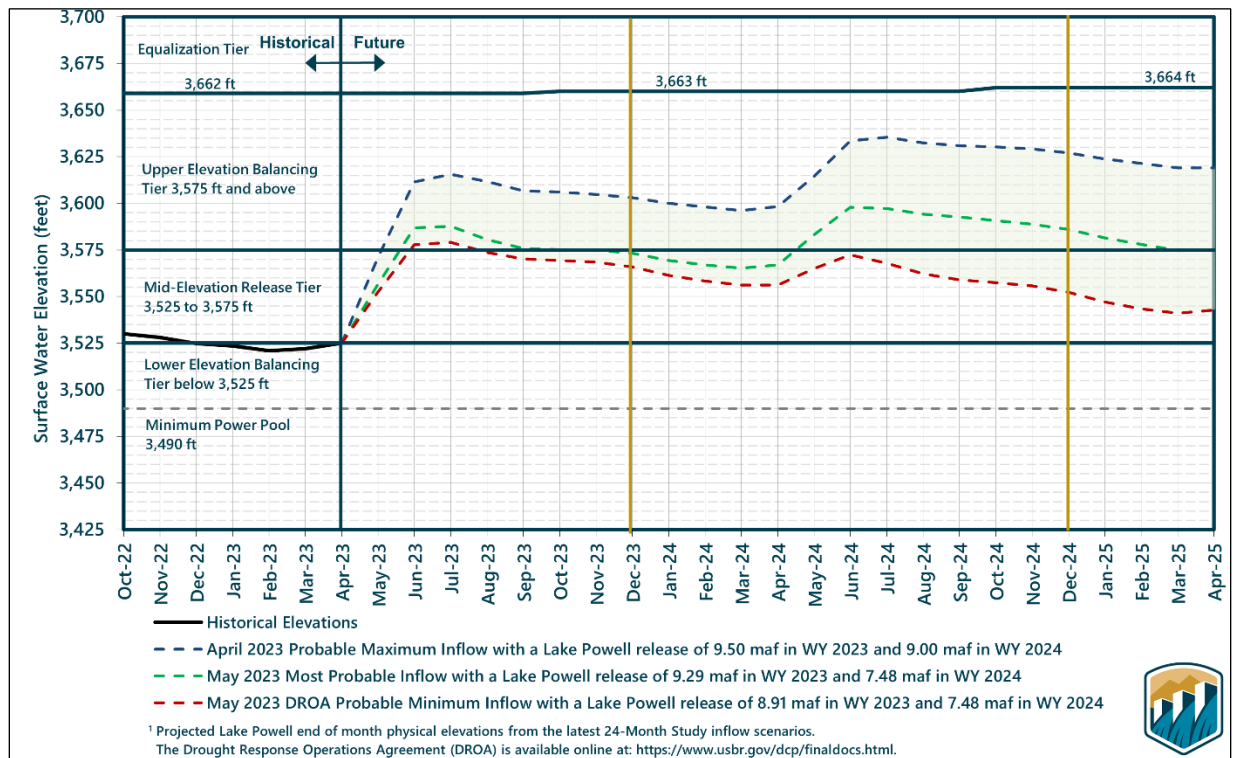
**Notes:** 7.5 MAF in Upper Basin allocations assumes full allocations under the Colorado River Compact. Due to uncertainty about how much water would remain after meeting obligations to the Lower Basin and Mexico, most Upper Basin Compact apportionments are in terms of percentage of the overall Upper Basin allocation.

When federal and state governments originally approved the Colorado River Compact, it was [assumed](#) that river flows would average 16.4 MAF per year. [Actual annual flows](#) from 1906 to 2022 were approximately 14.6 MAF, and have dropped to 12.1 MAF per year since the basin's drought began in 2000. Some [studies](#) have projected that these conditions will continue.

The *structural deficit* between basin water supplies and demand has depleted storage in the basin's two largest reservoirs—Lake Powell in the Upper Basin and Lake Mead in the Lower Basin—and threatens urban and agricultural water supplies for millions in the Southwest. Reclamation makes operational decisions for basin reservoirs in monthly [24-month studies](#), which project operational conditions for upcoming years ([Figure 2](#), [Figure 3](#)).

**Figure 2. Lake Powell Storage Elevations and Projections**

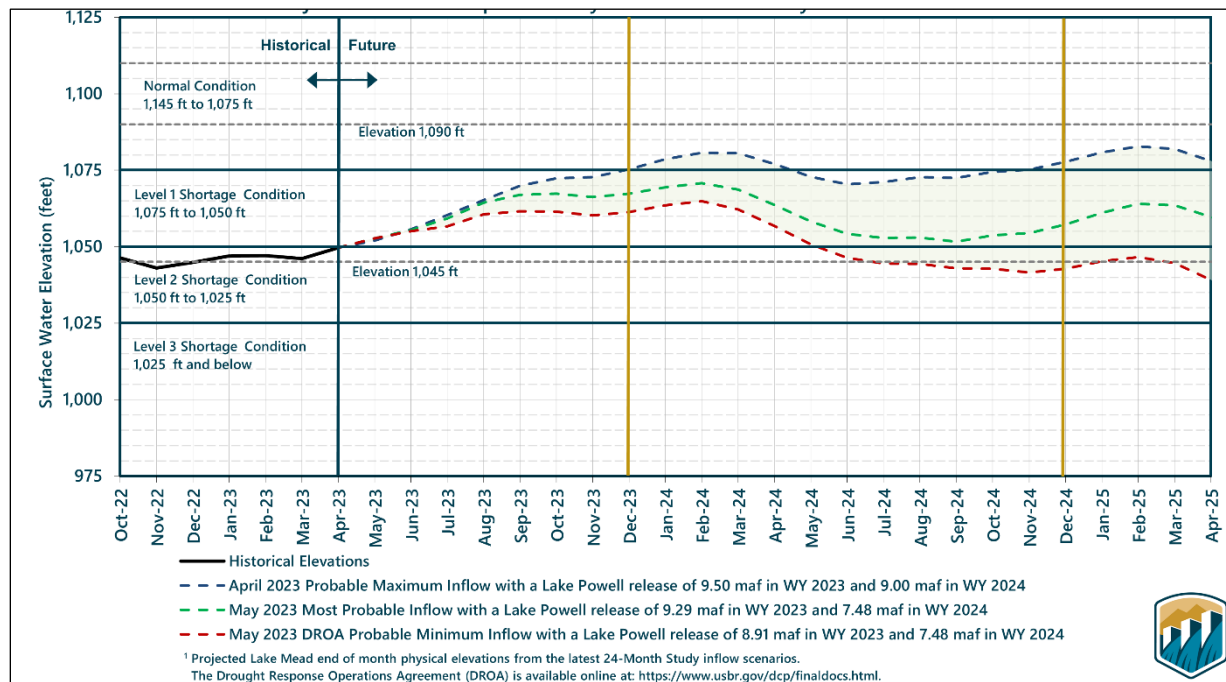
April/May 2023 24-Month Study Inflow Scenarios



**Source:** Bureau of Reclamation, 24-Month Study Projections, <https://www.usbr.gov/lc/region/g4000/riverops/24ms-projections.html>.

**Note:** WY = water year (the 12-month period from October through September).

**Figure 3. Lake Mead Storage Elevations and Projections**  
April/May 2023 24-Month Study Inflow Scenarios



**Source:** Bureau of Reclamation, 24-Month Study Projections, <https://www.usbr.gov/lc/region/g4000/riverops/24ms-projections.html>.

**Note:** DROA = Drought Response Operations Agreement

## Mitigating Drought in the Colorado River Basin

Previous efforts to improve the basin's water supply outlook included agreements in 2003, 2007, and 2019 (approved by Congress in P.L. 116-14). These agreements reduced Lower Basin deliveries based on Lake Mead storage levels, authorized additional water conservation efforts, and implemented a framework to coordinate Upper Basin operations to prevent losing hydropower generation at Glen Canyon Dam, among other things.

Despite these efforts, storage levels at both reservoirs have continued to fall, with Reclamation instituting Lower Basin delivery curtailments for Arizona and Nevada in 2021 and 2022. In the Upper Basin, Lake Powell fell below 3,525 feet in March 2022 for the first time since the late 1960s. To alleviate the potential for lost hydropower generation at Glen Canyon Dam at lower storage volumes, Reclamation made operational changes on Upper Basin reservoirs in 2021 and 2022. In 2023, Reclamation has upgraded its projected elevations for both reservoirs based on improved hydrology, but there remain widespread concerns about the basin's long-term water supplies.

At a June 14, 2022, congressional hearing, Reclamation announced that states needed to conserve an additional 2 MAF to 4 MAF in 2023 and 2024 to protect storage volumes. Reclamation noted that if the target was not met with voluntary commitments, it was prepared to act unilaterally. No major commitments were announced in response to the June request, and Reclamation did not implement new unilateral delivery curtailments. Instead, in October 2022 Reclamation announced its intent to study revised operational guidelines for 2023 and 2024. In response to a request for comments on these revisions, separate proposals were submitted to the federal government by California and the six other basin states.

On April 11, 2023, Reclamation released its [draft modeling](#) for two action alternatives under this process. Both alternatives would impose equal amounts of new Lower Basin delivery reductions (0.020-2.900 MAF per year in water years 2024-2026, depending on Lake Mead elevations and the year). The primary difference between the two alternatives is the approach for apportioning reductions among contractors. One alternative would apportion reductions based on water rights priority, whereas the other would use existing federal authorities to impose the same percentage-based delivery reductions on all Lower Basin users.

On May 22, 2023, DOI [announced](#) a consensus-based proposal in which Lower Basin states will conserve a total of 3 MAF prior to 2026, with 2.3 MAF of these cuts compensated by the federal government via \$4.0 billion in previously appropriated funds in [P.L. 117-169](#) (popularly known as the Inflation Reduction Act). DOI stated that it will temporarily withdraw its analysis of the other alternatives so it can focus on analyzing the new proposal, with a goal of finalizing a plan by the end of the year.

Major questions for Congress associated with this plan include how it will affect long-term basin water supplies, how state-level commitments will be met if contractors with senior water rights are unwilling to participate in voluntary actions, and whether any needed future delivery curtailments will continue to require ongoing federal funding commitments similar to the level expected to be provided with IRA funds.

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