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INSIGHT

Responding to Drought in the Colorado River Basin

Updated June 16, 2025

The Colorado River Basin covers more than 246,000 square miles in seven U.S. states and Mexico. Basin waters are governed by multiple documents, known collectively as the *Law of the River*. The Colorado River Compact of 1922 established the framework to apportion water supplies between the river's Upper and Lower Basins, with each basin allocated 7.5 million acre-feet (MAF) annually. The compact requires the Upper Basin to release certain waters to the Lower Basin and Mexico (**Figure 1**). The Bureau of Reclamation (Reclamation) plays a prominent role in basin water management due to the many federally authorized projects in the basin.

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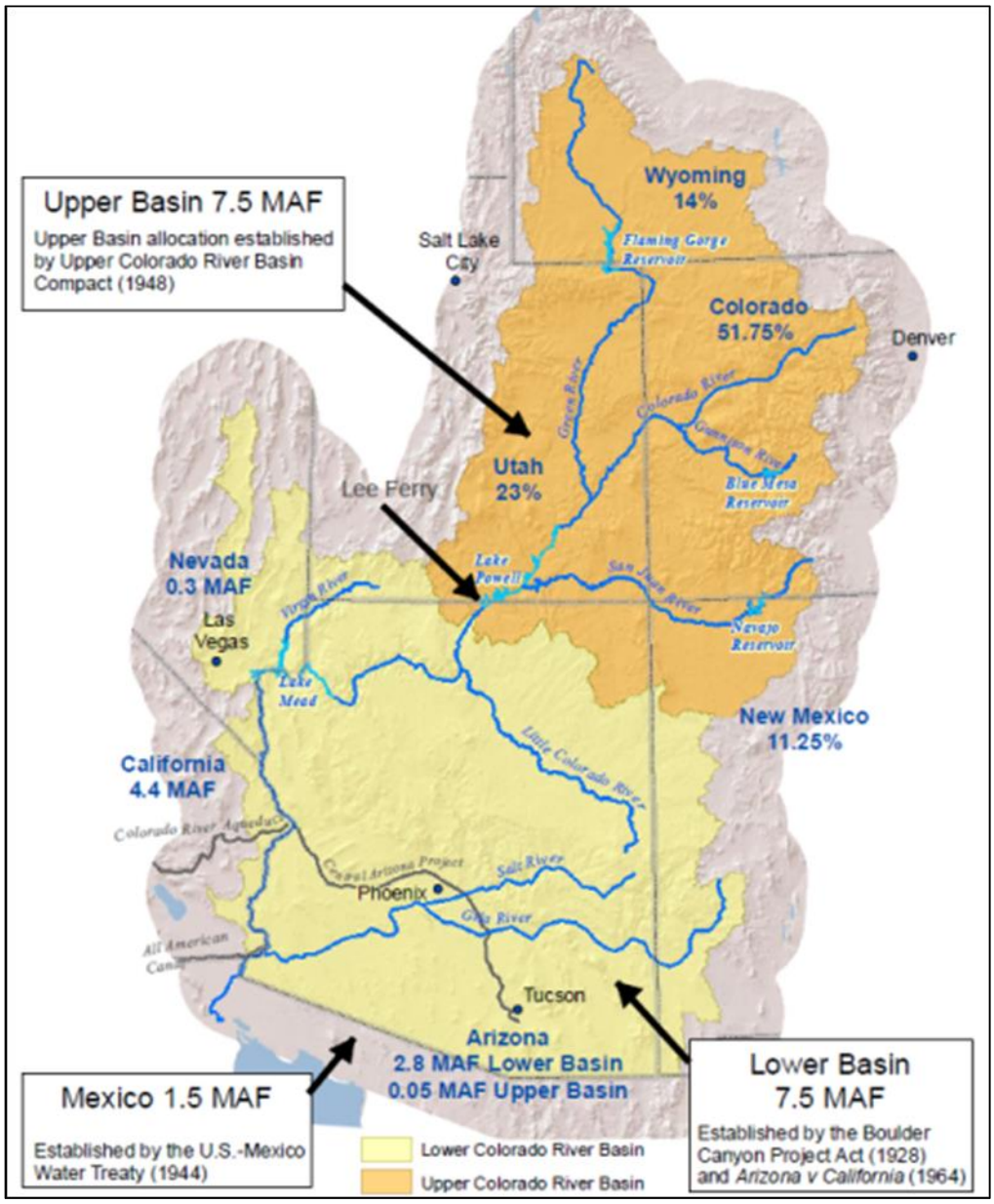
IN11982

Figure 1. Colorado River Basin Allocations

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



Source: CRS, using data from U.S. Geological Survey ESRI Data & Maps, 2017, Central Arizona Project, and ESRI World Shaded Relief Map.

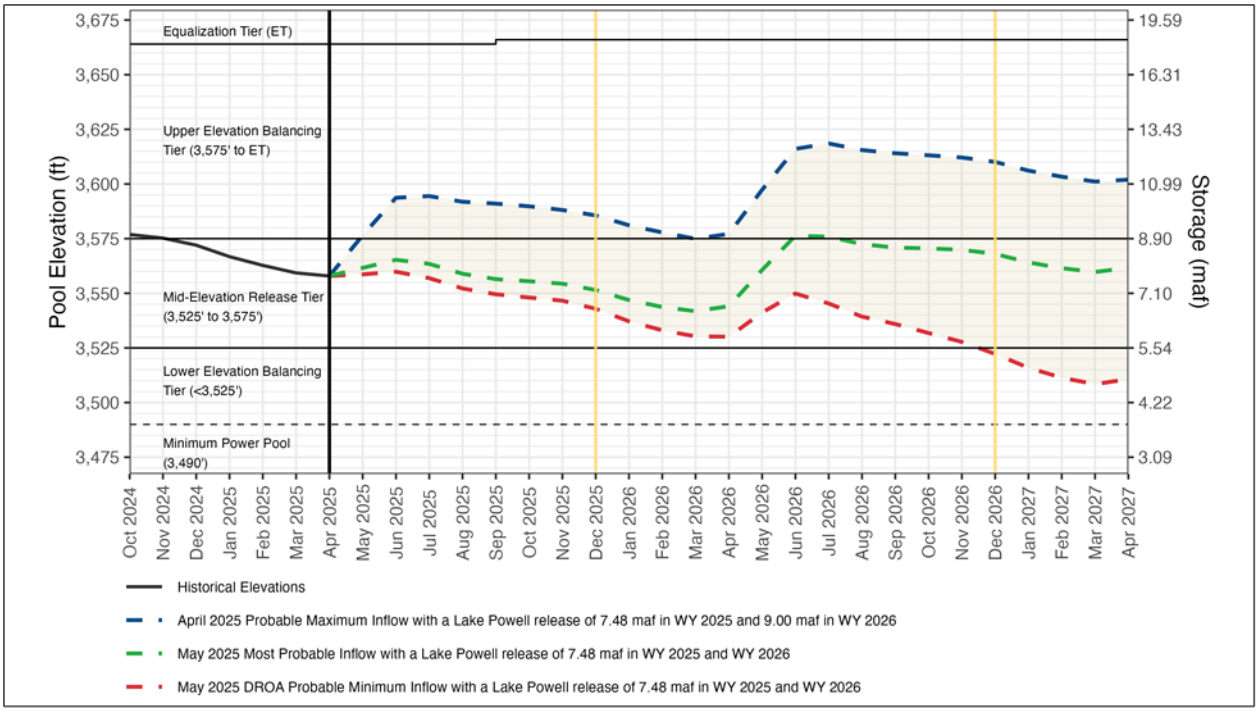
Notes: 7.5 MAF in Upper Basin allocations assumes full allocations under the Colorado River Compact. Due to uncertainty about how much water would remain after meeting obligations to the Lower Basin and Mexico, most Upper Basin compact apportionments are in terms of percentages.

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 2024 were approximately 14.6 MAF and have averaged significantly less (12.4 MAF per year) since 2000. Several studies have projected lower annual runoff volumes in the future.

The imbalance between water supplies and demand has depleted storage in the basin's two largest reservoirs—Lake Powell and Lake Mead—and threatens water supplies for millions in the Southwest. Storage at both reservoirs is at some of the lowest levels on record. Reclamation makes operational decisions for basin reservoirs based on 24-month studies, which project operational conditions for upcoming years (**Figure 2**, **Figure 3**).

Figure 2. Lake Powell Storage Elevations and Projections

(April/May 2025 24-month study inflow scenarios)

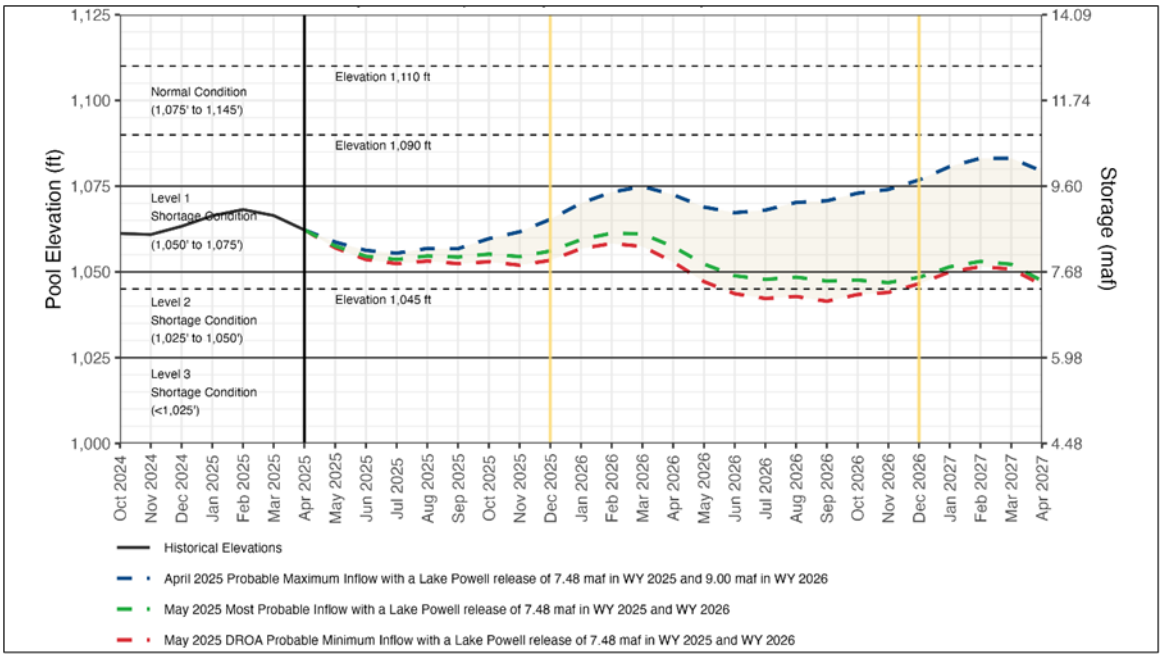


Source: Bureau of Reclamation, 24-Month Study Projections, https://www.usbr.gov/lc/region/g4000/riverops/24ms-projections.html.

Notes: DROA = Drought Response Operations Agreement; maf = million acre-feet; WY = water year.

Figure 3. Lake Mead Storage Elevations and Projections

(April/May 2025 24-month study inflow scenarios)



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

Notes: DROA = Drought Response Operations Agreement; maf = million acre-feet; WY = water year.

Mitigating Drought in the Colorado River Basin

Previous efforts to improve the basin's water supply outlook resulted in agreements in 2003, 2007, and 2019. The agreements, which generally built on one another, among other things reduced Lower Basin deliveries based on operational "tiers" for Lake Mead, authorized additional water conservation efforts, and implemented a framework to coordinate Upper Basin operations and protect hydropower generation at Glen Canyon Dam.

Despite these efforts, water supplies have continued to decrease. Pursuant to the agreements, since 2020 Reclamation has curtailed water deliveries to Arizona and Nevada based on annual hydrologic conditions tied to Lake Mead elevations (**Table 1**) and implemented operational changes to move water into Lake Powell in 2021 and 2022. While storage levels have generally stabilized, there remains widespread concern about the basin's long-term water supply outlook.

Table 1. Lower Colorado River Basin Operational Tiers, 2020-2025

Year	Operational Tier/Level	Lake Mead Elevation (Feet)
2020	Zero	1090-1075
2021	Zero	1090-1075
2022	One	1075-1050
2023	Two	1050-1045

Year	Operational Tier/Level	Lake Mead Elevation (Feet)
2024	One	1075-1050
2025 (forecast)	One	1075-1050

Source: CRS, based on Bureau of Reclamation data, 2019-2025.

Near-Term Operations

In a July 2022 hearing, Reclamation asked states to submit plans to conserve an additional 2-4 MAF between 2023 and 2026. Absent such proposals in 2022, Reclamation noticed potential unilateral operational changes to achieve this goal through a supplemental environmental impact statement (SEIS). In 2023, California and other basin states responded to Reclamation with competing water conservation proposals.

Following Reclamation's modeling of alternatives, the bureau announced a basin state consensus for near-term operations that was finalized on May 6, 2024. Under the plan, Lower Basin states added to existing Lake Mead shortage guidelines to achieve a total of 3 MAF in conservation prior to 2026 (**Figure 4**), with 2.3 MAF of these cuts compensated by the federal government via $4.0 billion in Reclamation drought response funds from the Inflation Reduction Act (P.L. 117-169).

Figure 4. Near-Term Lower Colorado River Water Delivery Cuts After 2024 SEIS

(acre-feet [af] in thousands)

Lake Mead Elevation (feet)	2007 ROD Shortages + 2019 DCP Contributions (1,000 af)				Proposed Action Modeled SEIS Conservation (1,000 af)*				Total ROD Shortages + DCP Contributions + SEIS Conservation (1,000 af)			
	AZ	NV	CA	Total	AZ	NV	CA	Total	AZ	NV	CA	Total
1,090 – >1,075	192	8	0	200	280	70	400	750	472	78	400	950
1,075 – 1,050	512	21	0	533					792	91	400	1,283
<1,050 – >1,045	592	25	0	617					872	95	400	1,367
1,045 – >1,040	640	27	200	867					920	97	600	1,617
1,040 – >1,035	640	27	250	917					920	97	650	1,667
1,035 – >1,030	640	27	300	967					920	97	700	1,717
1,030 – 1,025	640	27	350	1,017					920	97	750	1,767
<1,025	720	30	350	1,100					1,000	100	750	1,850

Source: Bureau of Reclamation, *Near-Term Colorado River Operations*, Final Supplemental Environmental Impact Statement, March 5, 2024, https://www.usbr.gov/ColoradoRiverBasin/documents/NearTermColoradoRiverOperations/20240300-Near-termColoradoRiverOperations-FinalSEIS-508.pdf.

Notes: SEIS = Supplemental Environmental Impact Statement; 2007 ROD = 2007 Record of Decision for Lower Basin Operations; DCP = 2019 Drought Contingency Plans. State commitments in 2024 SEIS may vary such that collectively a total of 3.0 MAF of SEIS conservation would occur through 2026.

Post-2026 Operations

Most existing Colorado River Basin water conservation agreements expire in 2026; thus, Reclamation is analyzing post-2026 operational alternatives for the system. In March 2024, the Upper and Lower Basins states each submitted competing "long-term" operational plans to Reclamation. The Lower Basin's plan would use total basin storage (i.e., not Lake Mead volume) to dictate water cuts, with cuts at lower

storage levels shared between the Upper and Lower Basins. The Upper Basin's plan would only cut deliveries in the Lower Basin and proposes Lake Powell water releases based in part on that lake's storage conditions (i.e., in lieu of the compact's required releases).

In November 2024, Reclamation released an initial five alternatives to be analyzed in an upcoming Draft EIS on post-2026 operations; it published more detail on these alternatives in January 2025. All action alternatives would impose new Lower Basin delivery curtailments and reduce Lake Powell releases as needed to protect Lake Powell elevations, but they differ significantly in other aspects, such as specific operational triggers and the distribution of reductions. Lower Basin states have criticized the alternatives and called on the Trump Administration to retract it and incorporate new alternatives.

Author Information

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