

Dual Indicator Operations at Lake Powell and Lake Mead

COOPERATIVE
CONSERVATION
ALTERNATIVE

Stabilize Storage and Avoid Crisis Management

The Colorado River Basin faces pressing and evolving challenges to its ecosystems and the diverse community of sovereigns and stakeholders who call it home. The Cooperative Conservation Alternative proposes **Dual Indicator Operations** to help advance our shared priorities.



Photo 1. Lake Mead at critically low elevations with “bathtub” rings. Credit: Colleen Miniuk-Sperry

COOPERATIVE CONSERVATION PRIORITIES

- **Stabilize storage** and avoid crisis management
- **Ensure mitigation and stewardship** is part of operations
- **Incentivize conservation** and operational flexibility
- **Maintain Cienega, Delta flows** and River connections
- **Call for parallel resilience** building processes

Lakes Powell and Mead are currently operated to withstand drought cycles based on:

- *An overly optimistic estimate of future hydrology*
- *Limited forecasts/modeling that do not account for climate trends*
- *A goal of limiting shortages and avoiding curtailment of water users*

This has led to “mining” of storage, which puts the predictability of supplies at risk as reservoir releases are only reduced after significant declines in water levels or critical reservoir infrastructure is at risk.



*Cooperative Conservation emphasizes a shift in reservoir management to better **stabilize storage and move away from crisis management** toward adaptively responding to challenges posed by climate change and hydrologic variability.*

Dual Indicator Operations are used to determine Lakes Powell and Mead’s annual releases to help:

- *Respond to a variety of reasonable hydrologic futures*
- *Proactively balance demands for water as the system changes*
- *Ensure relatively predictable water releases in an uncertain future*
- *Provide a needed storage buffer against year-to-year variation in hydrology, helping to avoid the sacrifice of environmental priorities and human needs.*

What it is: Dual Indicator Operations are an approach predicated on two primary indicators - combined storage and climate response trend(s).

The **combined storage indicator** looks at the current storage status at key reservoirs. For Lake Powell operations, it looks at storage within Lake Powell as well as the other Colorado River Storage Project Initial Units - Flaming Gorge, Blue Mesa, and Navajo Reservoirs (CRSP IU). For Lake Mead operations, it looks at CRSP IU storage and Lake Mead, Lake Mohave, and Lake Havasu (Total System Storage). This view of combined storage reveals a holistic understanding of the system's health beyond the isolated levels of the main reservoirs, alleviating past oversights where reservoir elevation triggers have proven unreliable and contentious.

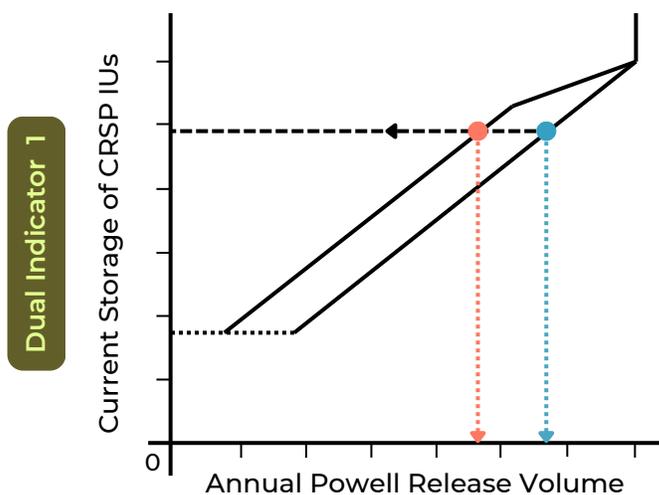
The **climate response indicator** is a **proactive element** to reservoir operations that considers near-term, observed influences on hydrology to anticipate likely future Colorado River water supply conditions. The influences applied would not be mere forecasting. They would be based on reliable criteria and ideally agreed to by consensus.

How it works: Dual Indicator Operations would first set Lake Powell releases and Lake Mead deliveries based on CRSP IU storage and Total System Storage, respectively. The climate response trend would then be used to adjust Lake Powell releases or delivery reduction volumes from Lake Mead to account for climate influences.

Dual Indicator Operations focus on storage and climate response trends embodies a significant evolution in water management, aiming to balance human and ecological needs while navigating the uncertainties of climate change and hydrological variability. It enables a dynamic and responsive management strategy that can adjust to current conditions and reliable trends to offer a more sustainable approach to reservoir management.

Figure 1. (Below) In Dual Indicators Operations, annual Powell release volumes are based on (1) CRSP IU and (2) a climate response trend and, annual Mead delivery reduction volumes are based on (1) Total System Storage and (2) a climate response trend.

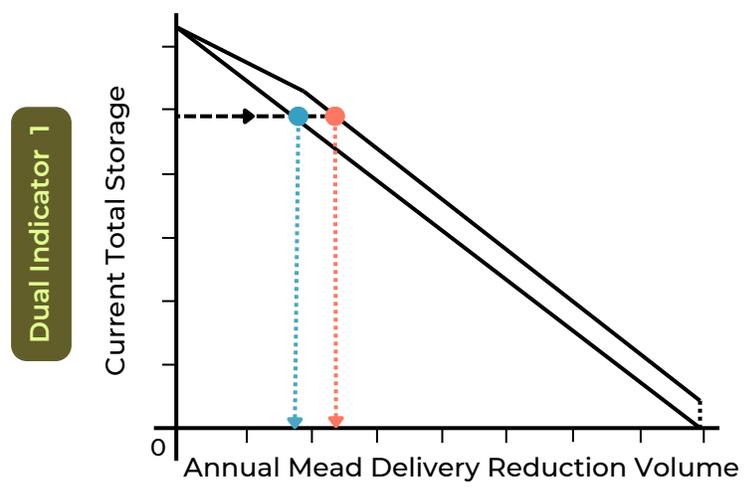
Lake Powell Release Volume



Dual Indicator 1

Lake Powell release volume based on current storage of CRSP IUs (indicator 1) and observed climate response trend (indicator 2)

Lake Mead Delivery Reduction Volume



Dual Indicator 1

Lake Mead delivery reduction volume based on current total storage (indicator 1) and observed climate response trend (indicator 2)

Dual Indicator 2 **Climate Response Trend** ● No Adjustment ● Adjustment