



# **GRAD 592 – Colorado State University Policy for the Lower Basin**

October 31, 2022

**Brenda Burman**

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**YOUR WATER. YOUR FUTURE.**

# Brenda Burman

## CAREER PATH

- UA College of Law
- Wyoming State Supreme Court, Clerk
- Private Practice, Water & Energy Law
- U.S. Senate, Water and Energy Lawyer
- U.S. Department of the Interior Deputy Commissioner
- The Nature Conservancy, Senior Water Policy Advisor
- Metropolitan Water District of Southern California, Special Projects Manager
- Salt River Project, Director of Water Strategy
- U.S. Bureau of Reclamation, Commissioner
- Central Arizona Project, Executive Strategy Advisor



# Colorado River Basin Map

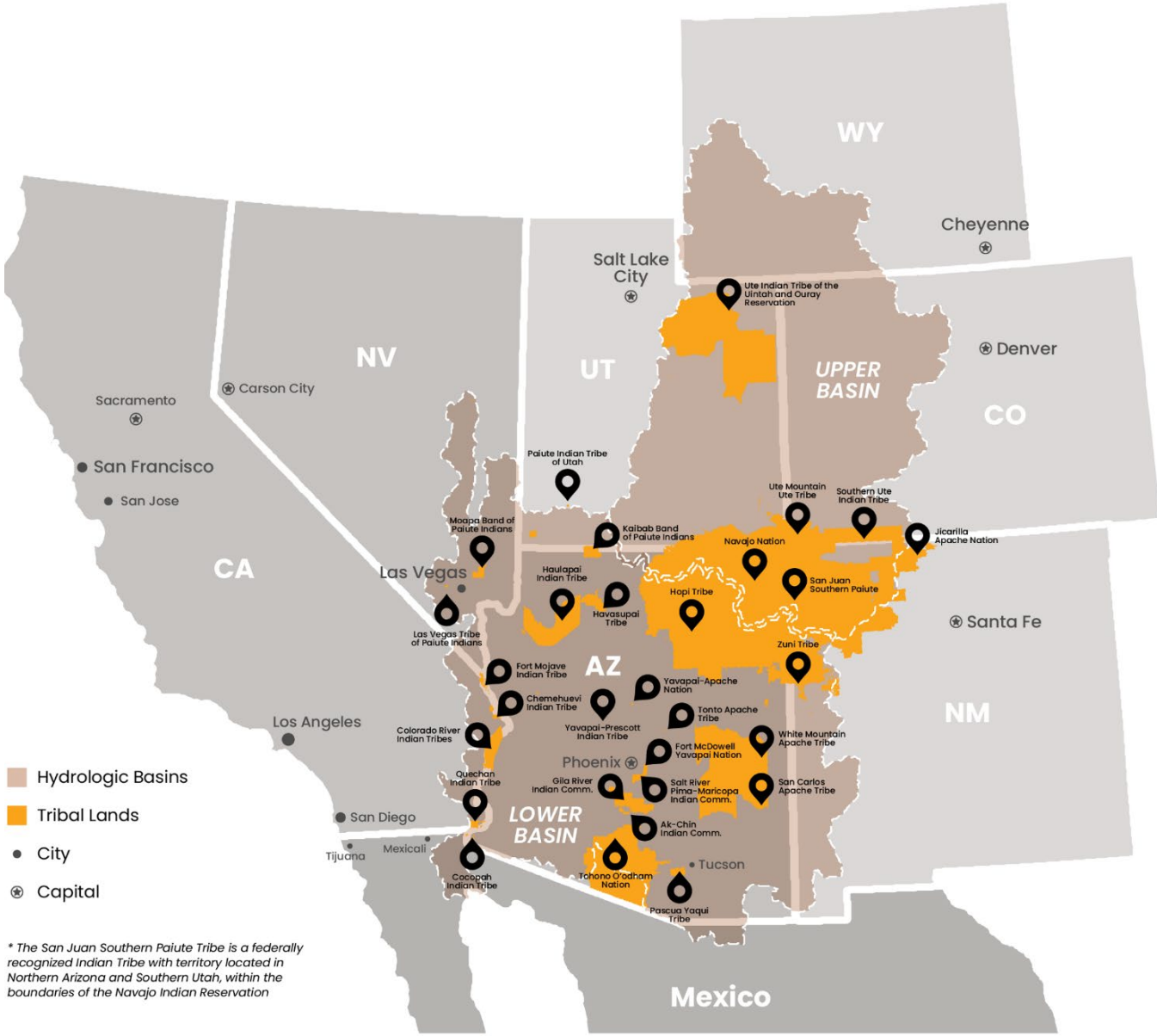
- Supplies water to 40 million people
- Provides water to Salt Lake City, Las Vegas, Phoenix, Los Angeles, San Diego, and the front range
- Includes 30 Tribes
- Irrigates ~5 million acres of farmland
- Includes 60 million acre-feet of storage capacity
- Generates clean hydropower for the Western power grid
- Supports National Parks, wildlife refuges, recreation areas and monuments



# Colorado River Basin



# Tribes in the Colorado River Basin



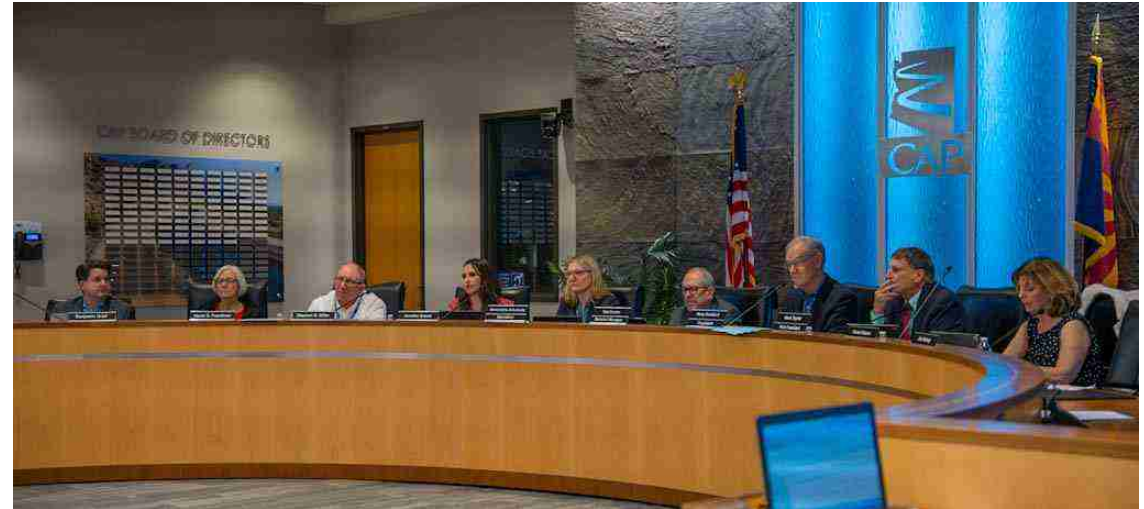
# Central Arizona Project

- 336-mile aqueduct stretches from Lake Havasu to Tucson
- Deliveries began in 1985
- Construction complete in 1993
- Serves 3 counties and more than 5 million people
- Nearly 50% of CAP water contracted to 12 Tribes



# CAWCD Governance

- CAWCD is governed by a 15-member Board of Directors
- Each board member is elected from CAP's three-county service area and serves a staggered, unpaid six-year term:
  - 10 from Maricopa
  - 4 from Pima
  - 1 from Pinal





# ECONOMIC IMPACT OF COLORADO RIVER WATER DELIVERED BY CAP TO ARIZONA FACT SHEET

**\$2  
TRILLION**

The Colorado River water **CENTRAL ARIZONA PROJECT (CAP)** delivers has supported Arizona's gross state product (GSP) with \$2 trillion in economic benefits since water deliveries began. The GSP represents the dollar value of all goods and services produced in the region and is a measurement of the economic output of a state. This economic impact supports 22 sectors of the Arizona economy related to gross state product and job-years of employment.

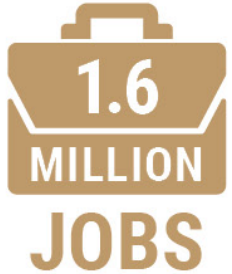
## IN RECENT YEARS

Colorado River water delivered by CAP has supported an economic benefit exceeding

**\$100 BILLION PER YEAR**



**ARIZONA'S GROSS STATE PRODUCT**



CAP's supply of water to its customers in **2017** is estimated at annual employment of nearly **1.6 MILLION JOBS.**

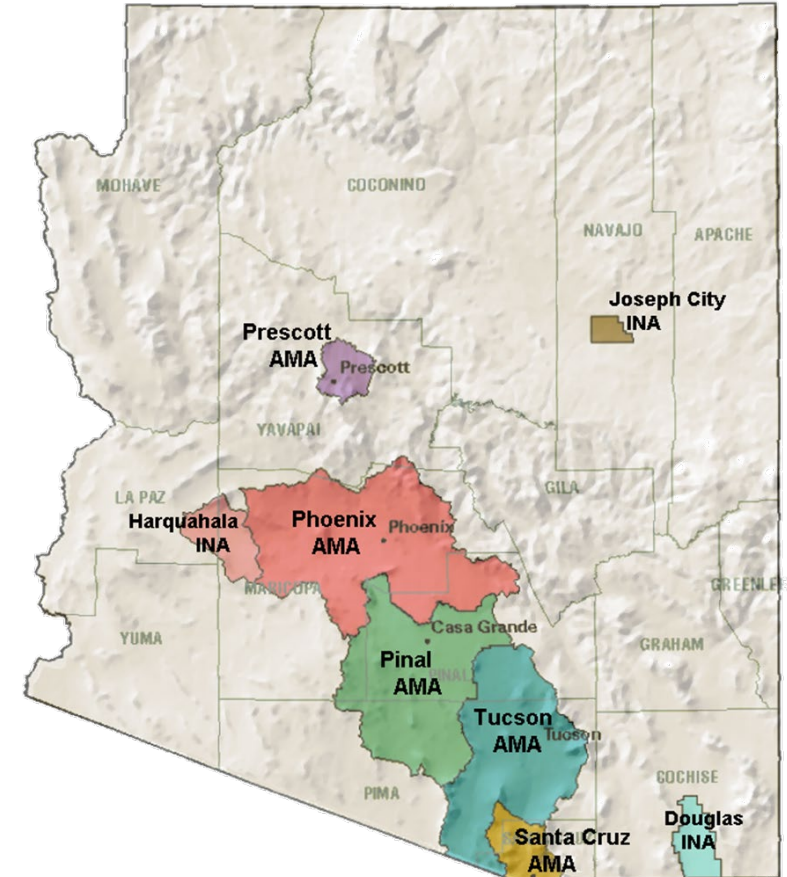


# 1980 Groundwater Management Act

Created Arizona Department of Water Resources and five active management areas

Goals of the Groundwater Code:

- Limit groundwater mining, preserving groundwater as a backup supply in times of shortage
- Grandfathered-in existing groundwater users; gave them specific volumetric rights to limit pumping
- Mandated conservation requirements
- Required new growth to rely on renewable water supplies



# What is CAGRD?

- Created in the mid-1990s to help water providers and landowners comply with Arizona's 1980 Groundwater Management Act
- CAGRD plays an important role in Central Arizona's groundwater management by replenishing groundwater pumped by its members



# Arizona's Water Supply

**36%**

COLORADO RIVER

**18%**

IN-STATE RIVERS



**5%**

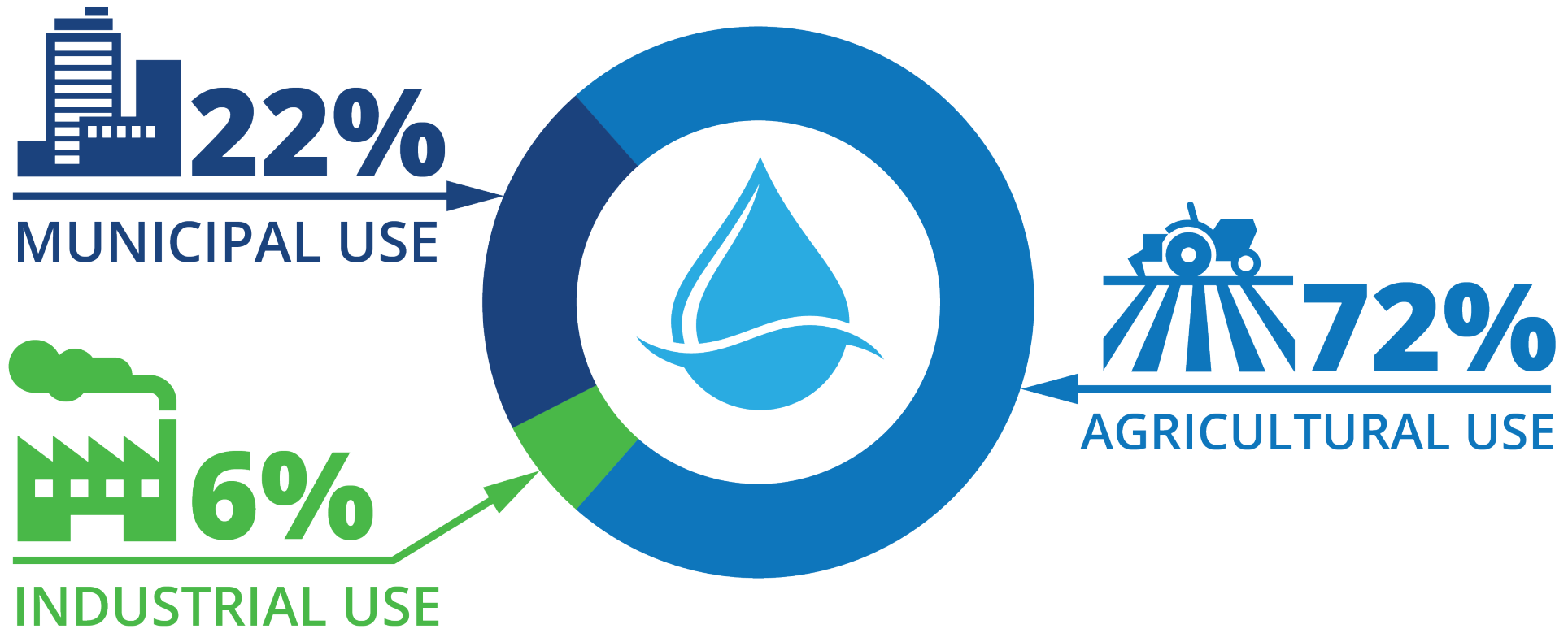
RECLAIMED WATER

**41%**

GROUNDWATER

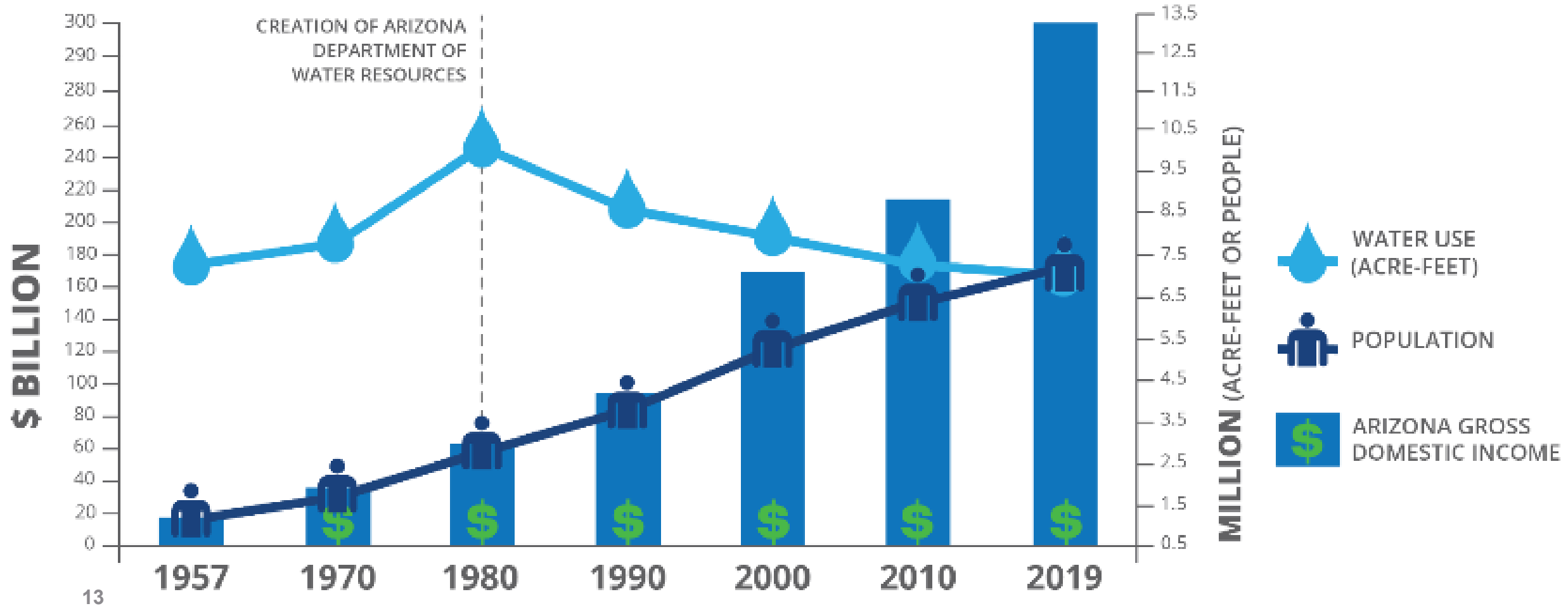
Source: ADWR, 2020

# Arizona Water Use by Sector



# ARIZONA'S WATER MANAGEMENT SUCCESS

## ARIZONA WATER USE, POPULATION AND ECONOMIC GROWTH (1957 - 2019)



# Drought-Ravaged States Face Another Round of Water Cuts

Bloomberg · Economy News · 2022-08-16 19:18

# Water cutbacks 'to avoid a collapse' of Colorado

PUBLISHED WED, AUG 17 2022·11:23 AM EDT | UPDATED WED, AUG 17 2022·12:52 PM EDT

CNN US Crime + Justice Energy + Environment More

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# New water cuts coming for Southwest as Colorado River falls into Tier 2 shortage



By **Ella Nilsen** and **Rachel Ramirez**, CNN

Updated 10:47 PM ET, Tue August 16, 2022

ve Lake Mead, Lake

# Western states hit with more cuts to Colorado River water

By SAM METZ, SUMAN NAISHADHAM and KATHLEEN RONAYNE August 16, 2022

# Water Shortages Rise As Water Cuts

# The Southwest is running out of fresh water. Could the ocean provide a cure?

By Alex Hager/KUNC

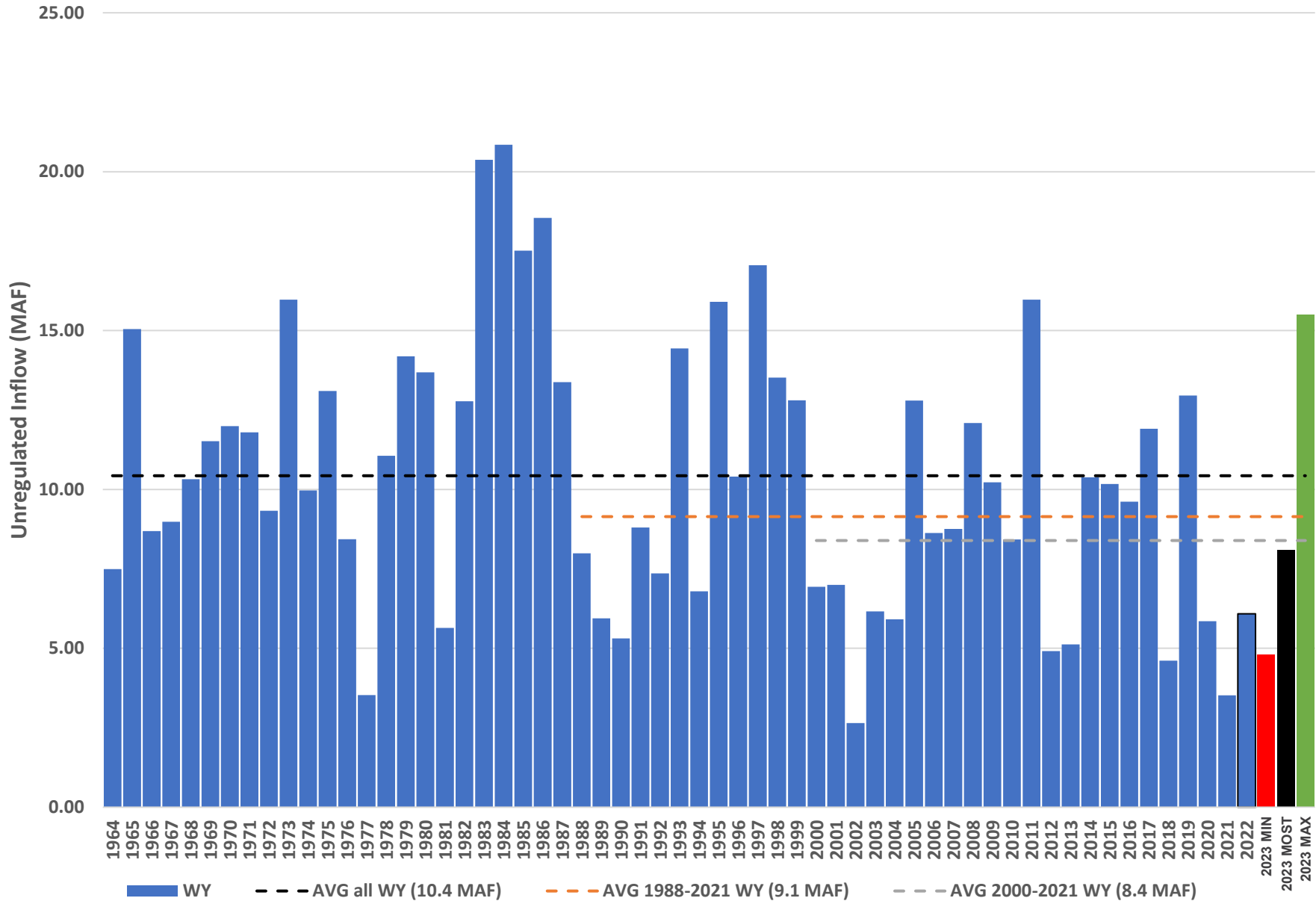
Published: Tuesday, August 16, 2022 - 12:24pm

Updated: Tuesday, August 16, 2022 - 1:42pm

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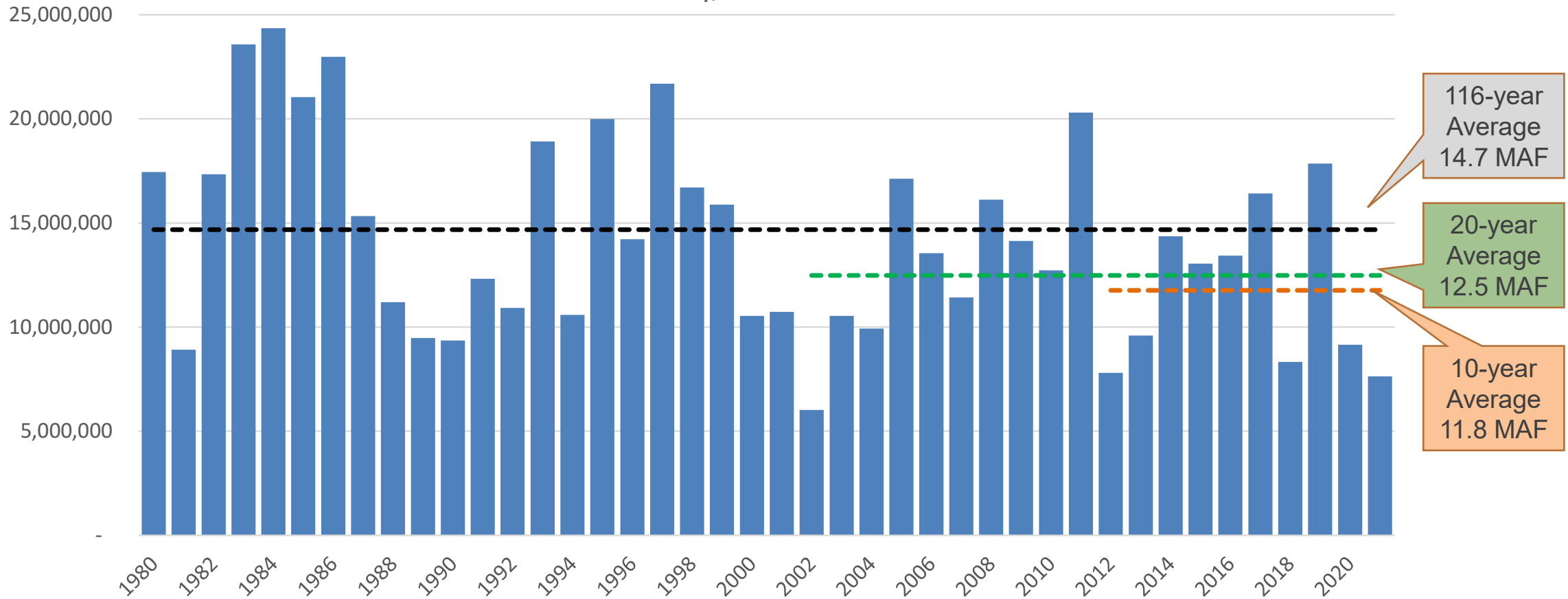
# Unregulated Inflow to Lake Powell by Water Year (1964-2021)



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# Colorado River Flow

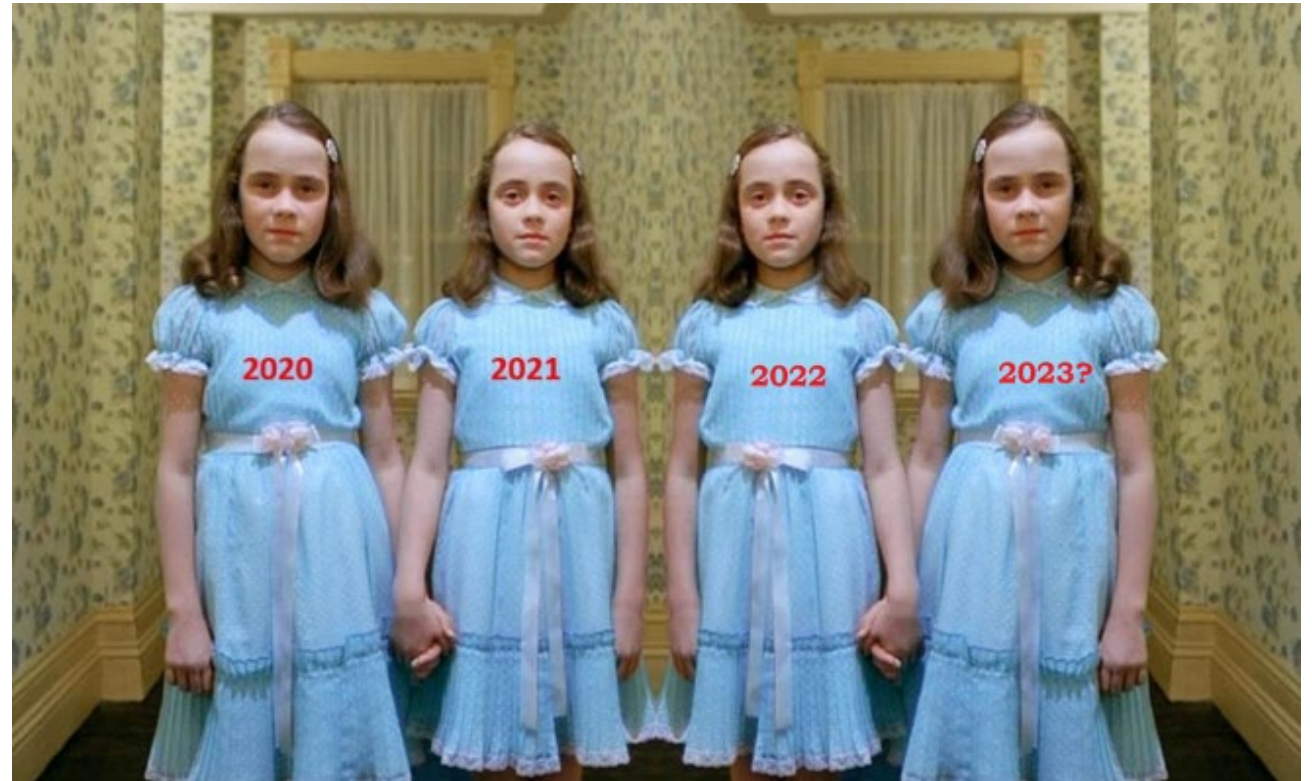
Natural Flow At Lee Ferry, Calendar Year 1980--2021



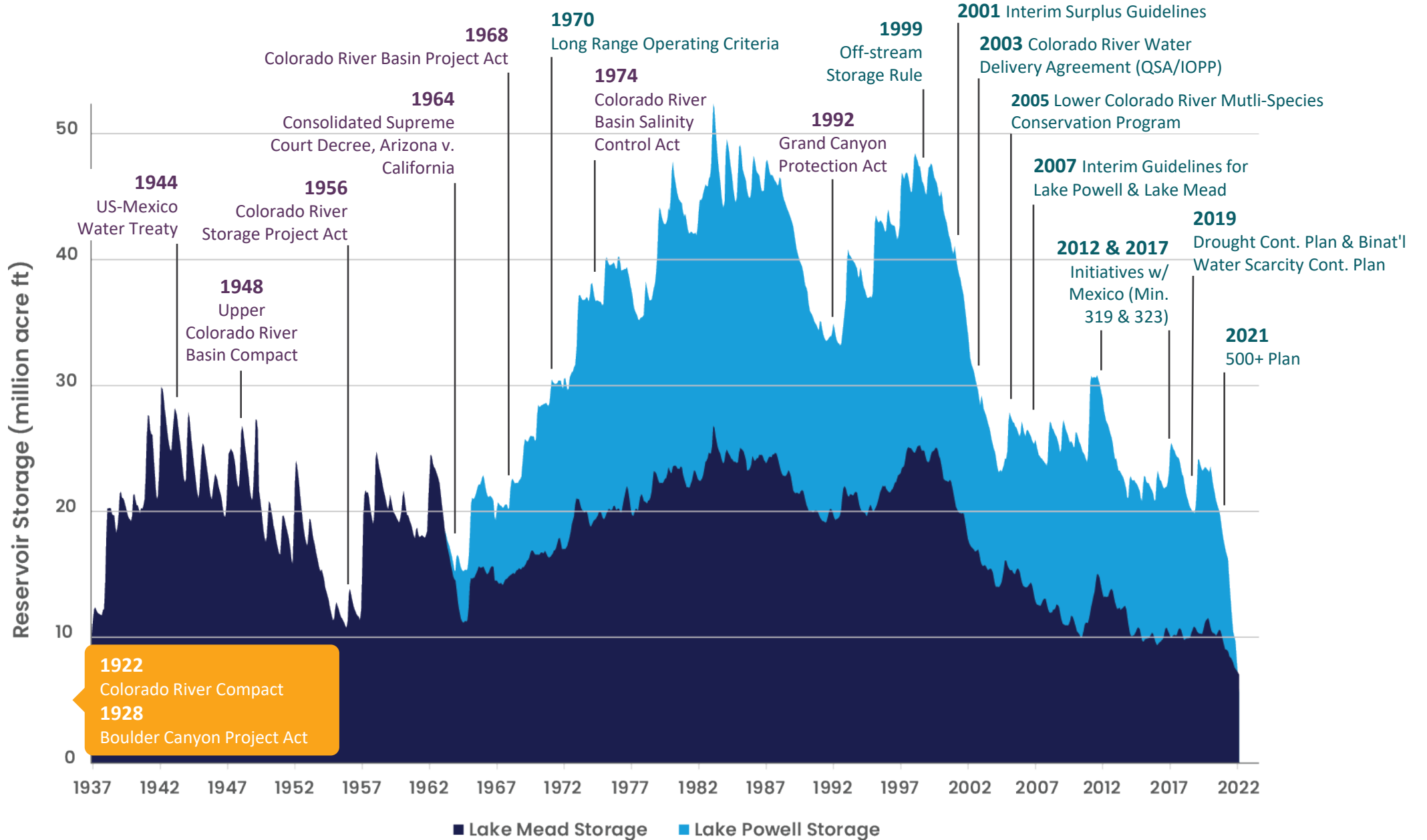
# Recent Hydrology

Snowpack vs. Runoff (% of average)

	Snowpack	Runoff
2020	105%	56%
2021	86%	37%
2022	90%	63%
2023	?	?



# Lake Powell & Lake Mead Combined Storage



# Law of the River

**1922** – Colorado River Compact

**1928** – Boulder Canyon Project Act

**1944** – Mexican Water Treaty; AZ ratifies Compact

**1948** – Upper Colorado River Basin Compact

**1956** – Colorado River Storage Project Act

**1964** – AZ v. CA US Supreme Court Decision

**1968** – Colorado River Basin Project Act

**1970** – Coordinated Long-Range Operation of Colorado River Reservoirs

**1992** – Grand Canyon Protection Act

**2004** – Arizona Water Settlements Act

**2005** – Multi-Species Conservation Program

**2007** – Colorado River Interim Guidelines

**2017** – Minute 323 to the Mexican Water Treaty

**2019** – Drought Contingency Plan

**2021** – 500+ Plan

Citations:

[CAP - https://www.cap-az.com/about/history-of-cap/law-of-the-river/](https://www.cap-az.com/about/history-of-cap/law-of-the-river/)

[Reclamation - https://www.usbr.gov/lc/region/pao/lawofrvr.html](https://www.usbr.gov/lc/region/pao/lawofrvr.html)

# Mexican Water Treaty of 1944

Allotted 1.5 MAF of water per year to Mexico

Concept of shared risks (drought) and opportunities (surplus) provisions between Mexico and the U.S.

Recognizes binational nature of the Colorado River and need for cooperation and collaboration

Creates unique binational agency to implement the Treaty: IBWC with Mexico and U.S. sections



Notable Minutes – 242, 319, 323

# Steps to protect the river

## 2007 Guidelines

- Established common commitment for sharing water surplus and shortage
- Created opportunities to conserve water in Lake Mead, including intentionally created surplus (ICS)
- Formalized procedures for coordinated reservoir operations
- Established elevation triggers for reservoir releases and shortage declaration

## Minute 323

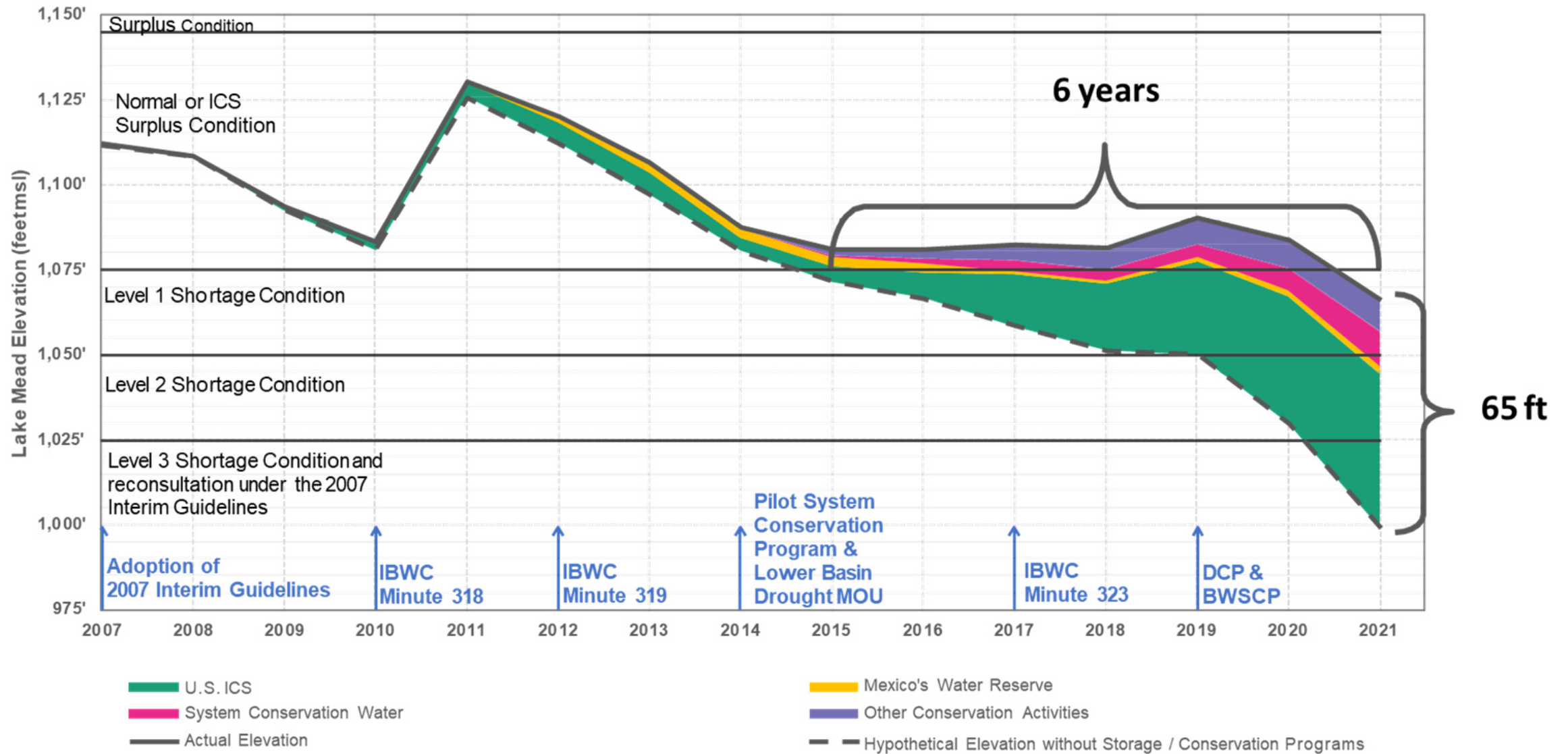
- Signed in 2017 expanding collaboration and shortage sharing between Mexico and the U.S.

## Drought Contingency Plan

- 7 states agreements to protect the Colorado River system through reductions, contributions and conservation

## 500+ Plan

- Lower Basin states agreed to target a combined minimum of 500 KAF per year in Lake Mead to protect against elevation falling to 1020'



# Drought Contingency Plan

- Signed on April 16, 2019
- Set of agreements:
  - Upper Basin DCP involving Colorado, New Mexico, Utah, Wyoming and the US
  - Lower Basin DCP involving Arizona, California, Nevada and the US
  - Companion agreement which connects and links these to Mexico through a US-Mexico agreement



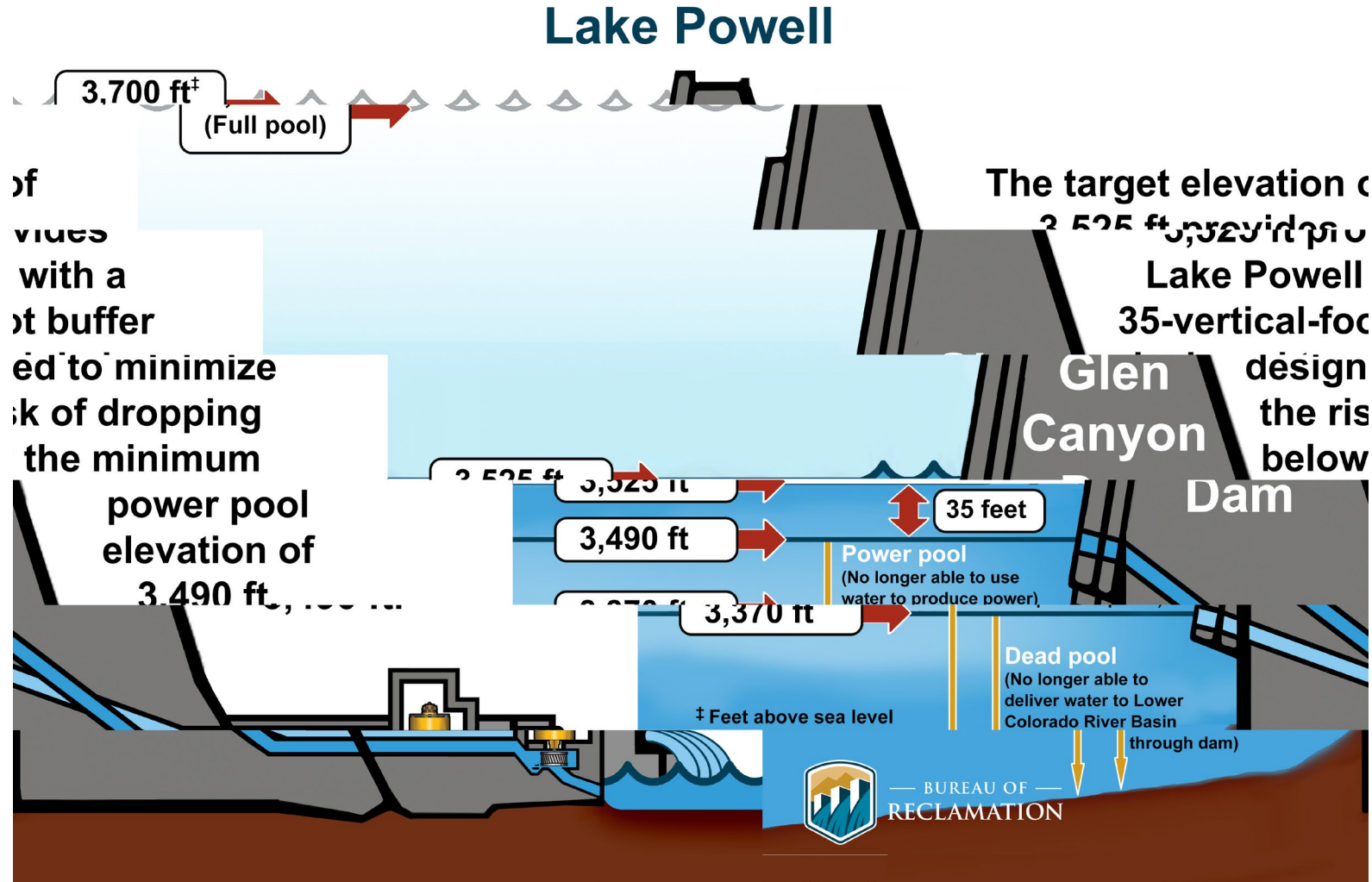
# 2007 Interim Guidelines, Minute 323, Lower Basin Drought Contingency Plan, and Binational Water Scarcity Contingency Plan Total Volumes (kaf)

Lake Mead Elevation (feet msl)		Combined Volumes by Country <i>US: (2007 Interim Guidelines Shortages + DCP Contributions)</i> <i>Mexico: (Minute 323 Delivery Reductions + Binational Water Scarcity Contingency Plan Savings)</i>					Total Combined Volumes
		<i>AZ Total</i>	<i>NV Total</i>	<i>CA Total</i>	<i>Lower Basin States Total</i>	<i>Mexico Total</i>	<i>Lower Basin States + Mexico</i>
Tier Zero	1,090 - 1,075	192	8	0	200	41	<b>241</b>
Tier 1	1,075 - 1050	512	21	0	533	80	<b>613</b>
Tier 2A	1,050 - 1,045	592	25	0	617	104	<b>721</b>
Tier 2B	1,045 - 1,040	640	27	200	867	146	<b>1,013</b>
Tier 2C	1,040 - 1,035	640	27	250	917	154	<b>1,071</b>
Tier 2D	1,035 - 1,030	640	27	300	967	162	<b>1,129</b>
Tier 2E	1,030 - 1,025	640	27	350	1,017	171	<b>1,188</b>
Tier 3	<1,025	720	30	350	1,100	275	<b>1,375</b>

← **2023 Reductions + Contributions**

The Secretary of the Interior will take affirmative actions to implement programs designed to create or conserve 100,000 acre-ft per annum or more of Colorado River System water to contribute to conservation of water supplies in Lake Mead and other Colorado River reservoirs in the lower basin. All actions taken by the United States shall be subject to applicable law, including availability of appropriations.

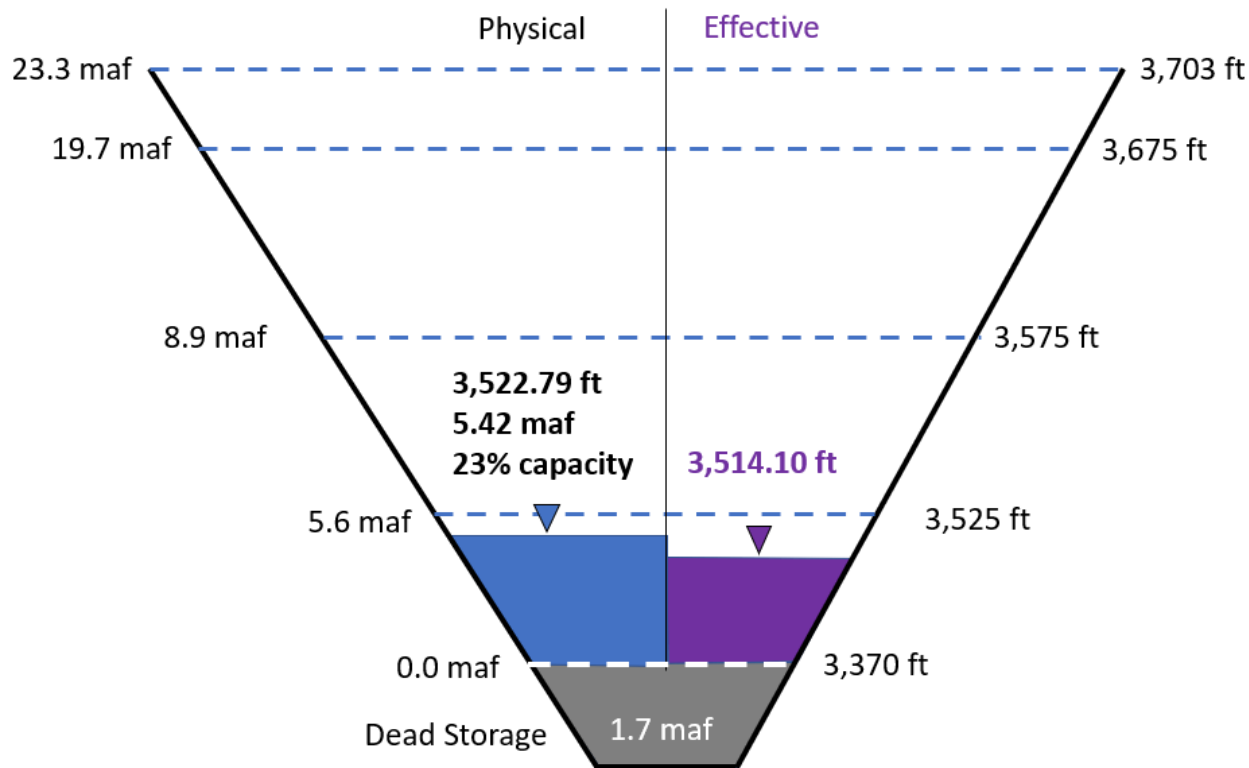
# Lake Powell – Key Elevations



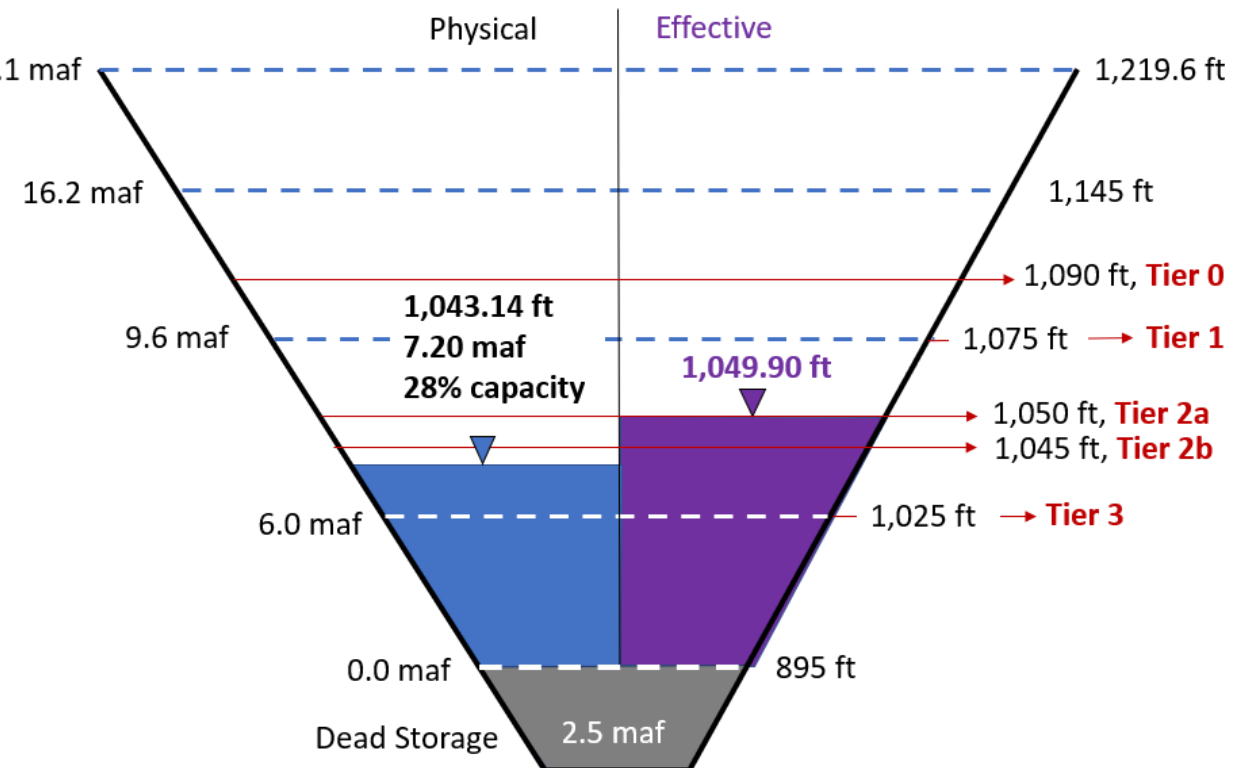
# End of Calendar Year 2022 Projections

September 2022 24-Month Study Most Probable Inflow Scenario

## Lake Powell



## Lake Mead



# What's Next?



# Long-Term Solutions

audacious

change of mindset

**durable**

broad thinking

sacrifice

more places to invest

**pain**

partnership with Mexico

litigation?

# Resources

- [U.S. Bureau of Reclamation - https://www.usbr.gov/lc/region/pao/lawofrvr.html](https://www.usbr.gov/lc/region/pao/lawofrvr.html)
- [Arizona Department of Water Resources – https://new.azwater.gov/](https://new.azwater.gov/)
- [Central Arizona Project - https://www.cap-az.com/](https://www.cap-az.com/)
- [UA Water Resources Research Center – https://wrrc.arizona.edu/](https://wrrc.arizona.edu/)



# Questions

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