

The Colorado River: Sharing a Limited Resource

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SOUTHERN NEVADA WATER AUTHORITY

CO RIVER 101

- 1,450 miles from the Rocky Mountains to the Gulf of California
- Prior to its vast system of dams, reservoirs and aqueducts, the system was subject to catastrophic flooding
- The basin has been inhabited for at least 8,000 years
- Mid-19th century explorations helped chart the river's course
- Recognized as the most controlled and litigated river in the world

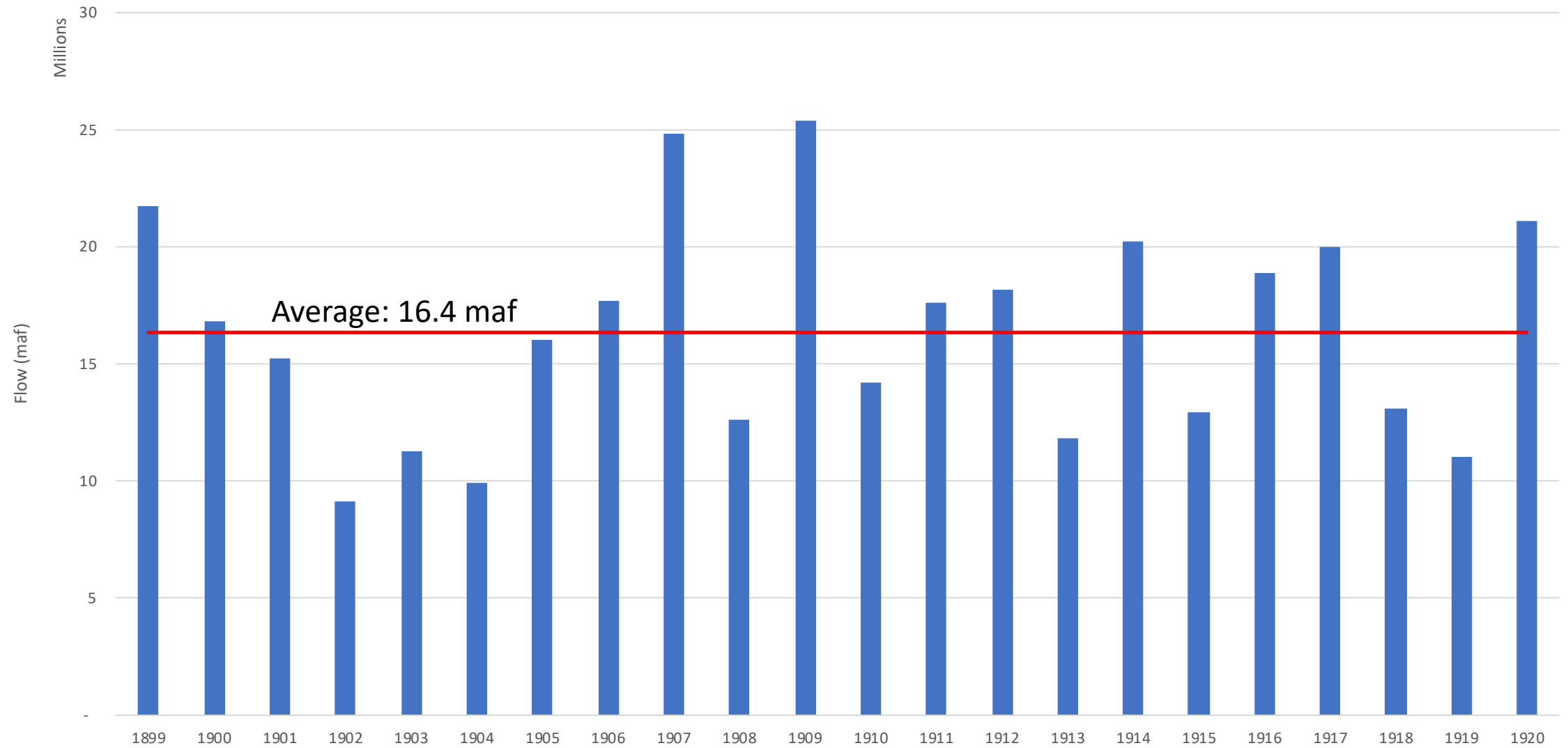


THE LAW OF THE RIVER



The numerous compacts, federal laws, court decisions and decrees, contracts and regulatory guidelines that manage and operate the Colorado River.

Colorado River at Lee's Ferry, 1899-1920



ISSUES LEADING TO COMPACT NEGOTIATION



**Imperial Valley's
increasing agricultural
demands**



**Upper Basin states needed
to secure future supplies**



**Los Angeles was rapidly
growing; water demands
were increasing**

ISSUES LEADING TO COMPACT NEGOTIATION

Prior Appropriation?

If left to the Courts, the Upper Basin states were at risk of getting very little water.

COLORADO RIVER COMPACT

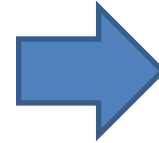
1921

Congress authorizes the Basin States to enter into an interstate compact for the equitable division and apportionment of Colorado River water supplies.



1922

The Colorado River Compact is signed in Santa Fe, NM, by representatives of the seven Basin States.



1923

The Colorado River Compact is ratified by six of the seven states.
(Arizona missing)

COLORADO RIVER COMPACT



- Outlines purpose of Compact; divides Colorado River into two basins
- Defines the Compact's terms (Lee Ferry, Upper Basin, Lower Basin, domestic use, Colorado River System)
- Apportions 7.5 million AFY to each basin; recognizes Mexico as a user, Upper Basin states must supply 75 MAF over a 10-year period and cannot withhold deliveries
- Prioritizes domestic, agricultural and power uses over river navigation and agricultural and domestic uses over power uses
- Provisions within the Compact cannot interfere with existing agreements with Indian Tribes
- Protects "Present Perfected Rights"

COLORADO RIVER COMPACT



PINCH POINT #1

Article III(d):

The States of the Upper Division will not cause the flow of the river at Lee Ferry to be depleted below an aggregate of 75,000,000 acre-feet for any period of ten consecutive years reckoned in continuing progressive series beginning with the first day of October next succeeding the ratification of this compact.

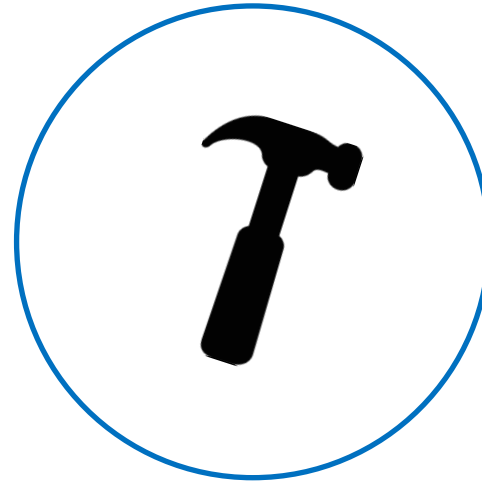
COLORADO RIVER COMPACT

OUTCOMES



BALANCE

Balanced Lower Basin's increasing demands with need to preserve future resources for Upper Basin



FACILITY **CONSTRUCTION**

Enabled storage construction in Lower Basin

COLORADO RIVER COMPACT

THE COMPACT DID NOT ADDRESS:

- Allocations among the states
- Mexico's allocation amount
- Tribal or other Federal Reserved Rights

COLORADO RIVER COMPACT

Because the Compact did not allocate waters among the states, disagreements existed among the Lower Basin states as to how their allocation should be split:

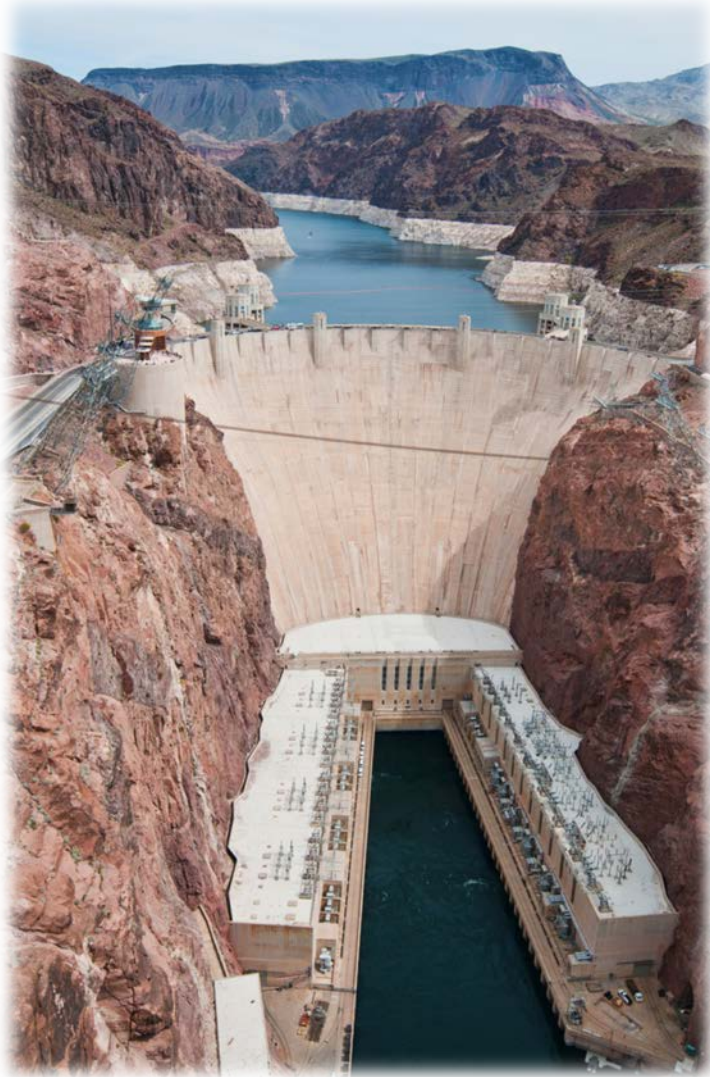


- Wanted resources to provide stable supply of water for the Imperial Valley
- Needed new supply for rapidly growing Los Angeles



- Wanted project to bring Colorado River water to central AZ
- Fearful of California taking disproportionate share

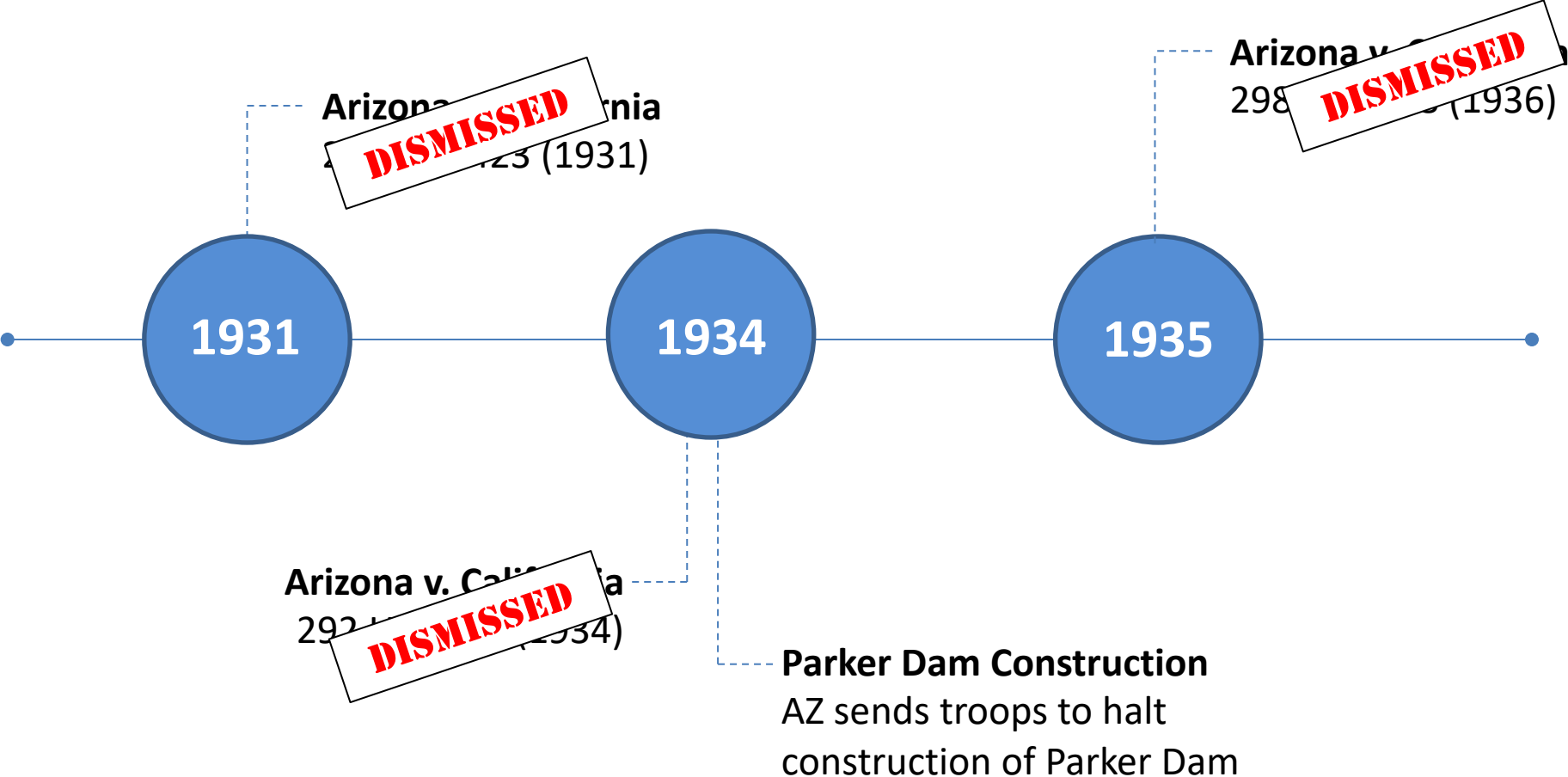
BOULDER CANYON PROJECT ACT (1928)



- **First (and only) legislative allocation of interstate waters**
- **Apportions Colorado River water among Lower Basin States**
 - California: 4.4 MAFY
 - Arizona: 2.8 MAFY
 - Nevada: 300,000 AFY
- **Authorized construction of Hoover Dam**
- **Gave AZ exclusive rights to Gila River and its tributaries within the state**
- **Required CA and AZ to determine how to meet Mexico's delivery requirements**
- **Prioritized dam uses: River regulation and flood control, THEN irrigation and domestic uses, and FINALLY power generation**

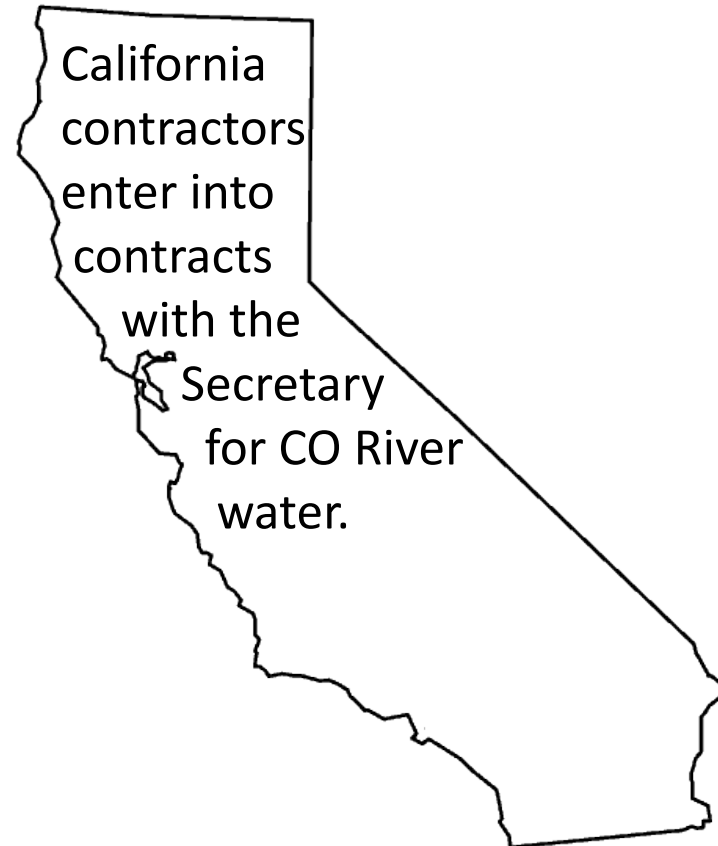
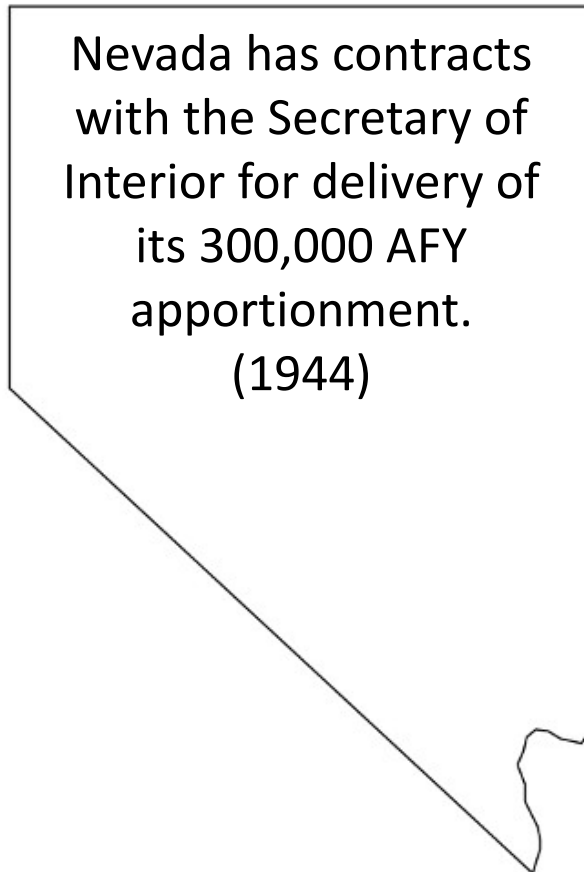
ARIZONA V. CALIFORNIA

UNHAPPY NEIGHBORS



ARIZONA V. CALIFORNIA

MEANWHILE, IN THE LOWER BASIN...

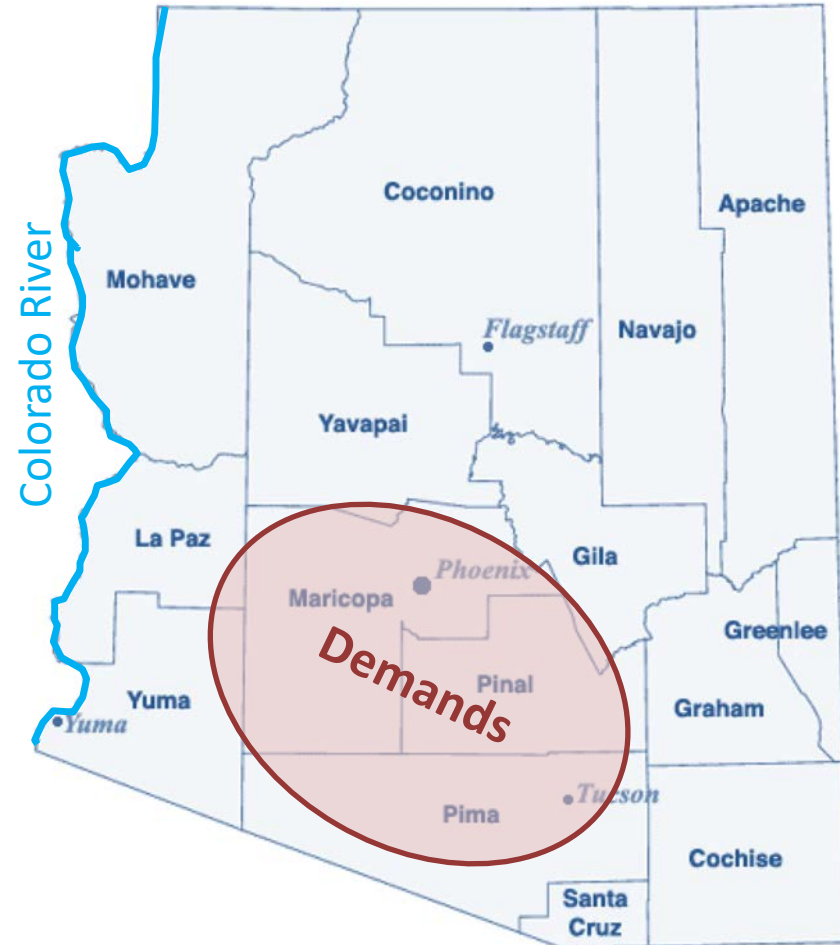


ARIZONA V. CALIFORNIA

Arizona still had no means to convey its water rights.

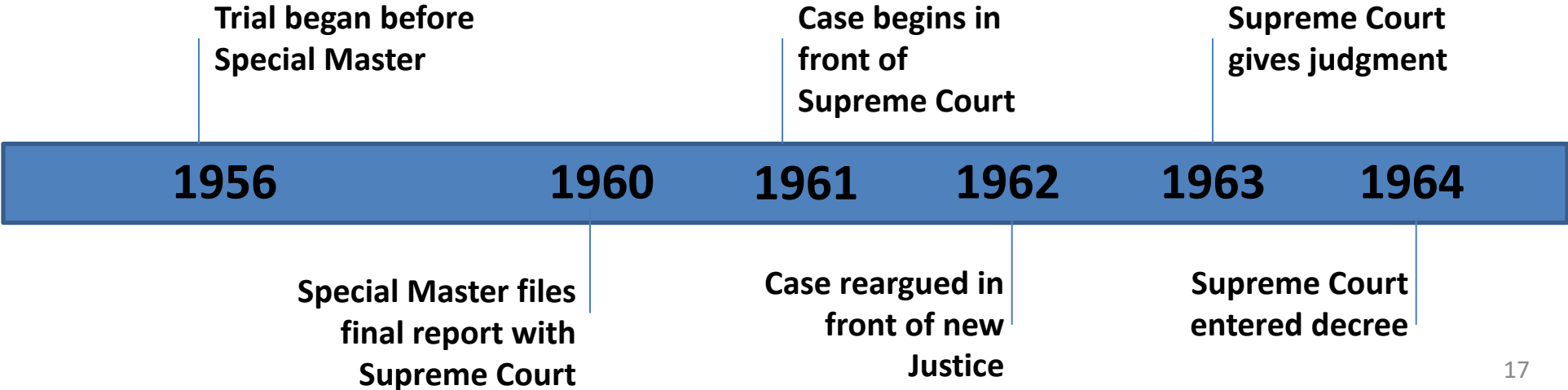
In 1947, Arizona sought legislation to authorize construction of the Central Arizona Project.

California opposed.



ARIZONA V. CALIFORNIA

It was twenty-six years after Arizona made its first attempt to obtain adjudication of its Colorado River water rights that trial began.



ARIZONA V. CALIFORNIA

Supreme Court of the United States, 1963.

373 U.S. 546, 83 S.Ct. 1468, 10 L.Ed.2d 542, decree entered. 376 U.S. 340, 84 S.Ct. 755, 11 L.Ed.2d 757

Opinion of the Court:

- **The Lower Basin States failed to make a compact that allocated waters among themselves**
- **The Secretary's contracts with the States effected an apportionment of the waters of the mainstream, which were the only waters to be apportioned under the Act**
- **Held that in the event of shortage, the burden must be borne by each state in proportion to their share**

ARIZONA V. CALIFORNIA

Supreme Court of the United States, 1963.

[373 U.S. 546, 83 S.Ct. 1468, 10 L.Ed.2d 542, decree entered.](#) [376 U.S. 340, 84 S.Ct. 755, 11 L.Ed.2d 757](#)

Opinion of the Court:

- **It is not the Court's responsibility to equitably apportion the waters of the Colorado River, but instead create a system to allocate the waters.**
- **It was the intention of the Boulder Canyon Project Act to apportion Lower Basin allocations**
- **The Secretary of Interior's discretion is not confined by the law of prior appropriation or by present perfected rights**
- **Rejected California's contention that each state's share of water in shortage be determined by equitable apportionment or prior appropriation.**

ARIZONA V. CALIFORNIA

In reaction to the Supreme Court's opinion, California announced that it will oppose authorization of the Central Arizona Project.

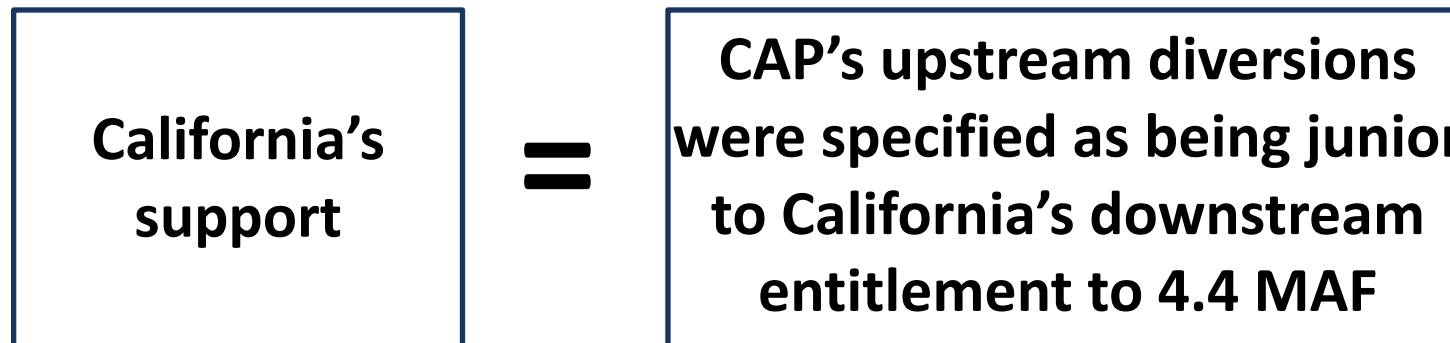


ARIZONA V. CALIFORNIA

The Central Arizona Project

Arizona recognized that it needed California's support in order for Congress to approve the Central Arizona Project.

A deal was struck:



ARIZONA V. CALIFORNIA

PINCH POINT #2

California Priority over Arizona?

II. The United States, its officers, attorneys, agents and employees be and they are hereby severally enjoined:

(B) From releasing water controlled by the United States for irrigation and domestic use in the States of Arizona, California, and Nevada, except as follows:

(2) If sufficient mainstream water is available for release, as determined by the Secretary of the Interior, to satisfy annual consumptive use in the aforesaid States in excess of 7,500,000 acre-feet, such excess consumptive use is surplus, and 50% thereof shall be apportioned for use in Arizona and 50% for use in California; provided, however, that if the United States so contracts with Nevada, then 46% of such surplus shall be apportioned for use in Arizona and 4% for use in Nevada;

(6) If, in any one year, water apportioned for consumptive use in a State will not be consumed in that State, whether for the reason that delivery contracts for the full amount of the State's apportionment are not in effect or that users cannot apply all of such water to beneficial uses, or for any other reason, nothing in this decree shall be construed as prohibiting the Secretary of the Interior from releasing such apportioned but unused water during such year for consumptive use in the other States. No rights to the recurrent use of such water shall accrue by reason of the use thereof;

MEXICAN WATER TREATY (1944)

Treaty on the Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande

Guarantees Mexico 1.5 MAF from Colorado River in normal water supply year

In the event of a surplus, Mexico is entitled to an additional 200,000 acre-feet

In the case of *extraordinary drought*, delivery of water to Mexico will be reduced in a way that is proportionate to U.S. reductions.

MEXICAN WATER TREATY (1944)

PINCH POINT #3

Article 10(b)

Of the waters of the Colorado River, from any and all sources, there are allotted to Mexico:

Any other quantities arriving at the Mexican points of diversion, with the understanding that in any year in which, as determined by the United States Section, there exists a surplus of waters of the Colorado River in excess of the amount necessary to supply uses in the United States and the guaranteed quantity of 1,5000,000 acre feet (1,850,234,000 cubic meters) annually to Mexico, the United States undertakes to deliver to Mexico, in the manner set out in Article 15 of this Treaty, additional waters of the Colorado River system to provide a total quantity not to exceed 1,700,000 acre-feet (2,096,931,000 cubic meters) a year. Mexico shall acquire no right beyond that provided by this subparagraph by the use of the waters of the Colorado River system, for any purpose whatsoever, in excess of 1,5000,000 acre-feet (1,850,234,000 cubic meters) annually.

In the event of extraordinary drought or serious accident to the irrigation system in the United States, thereby making it difficult for the United States to deliver the guaranteed quantity of 1,5000,000 acre-feet (1,850,234,000 cubic meters) a year, the water allotted to Mexico under subparagraph (a) of this Article will be reduced in the same proportion as consumptive uses in the United States are reduced.

UPPER COLORADO RIVER COMPACT



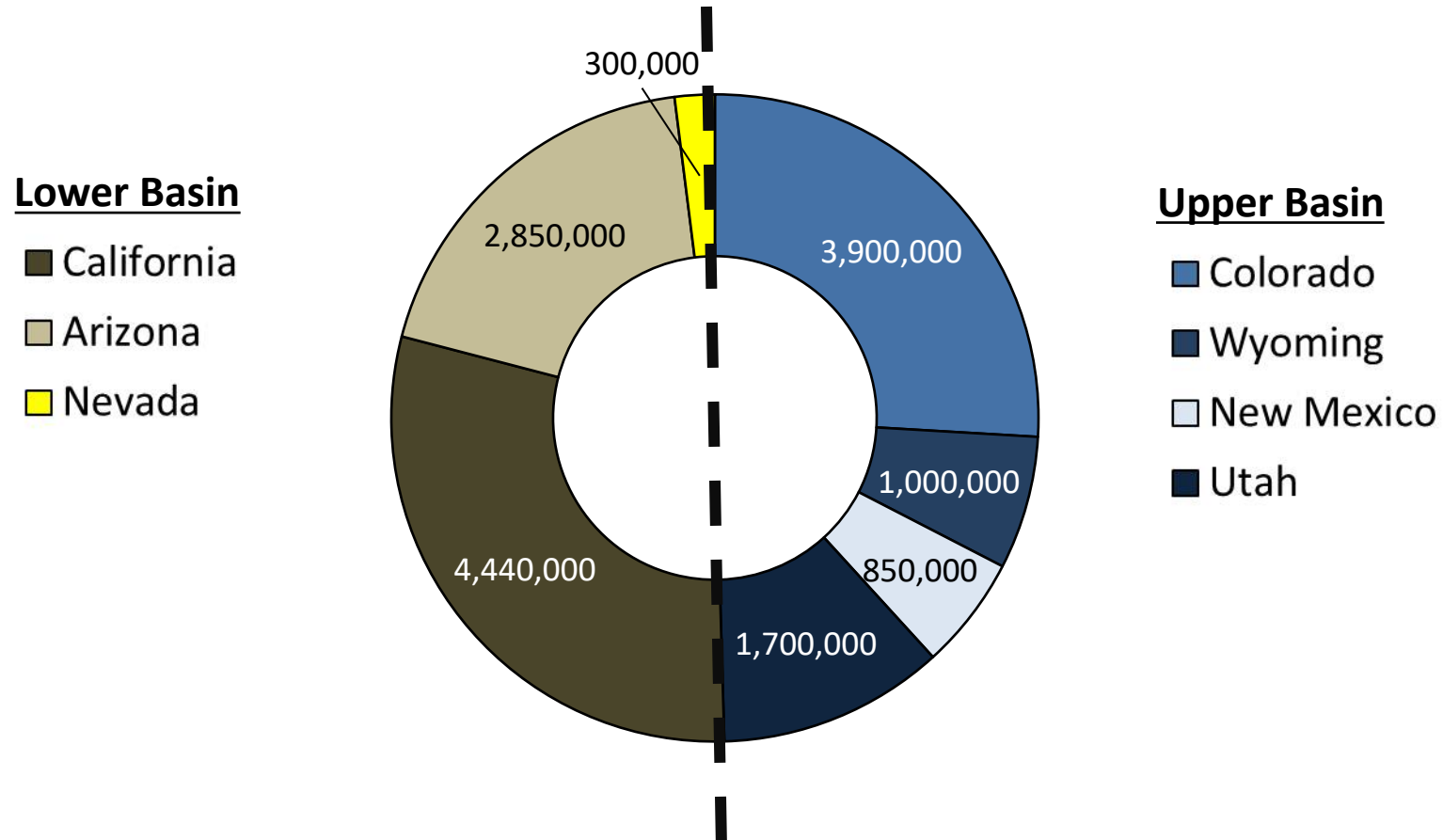
Lake Powell, Utah

Upper Colorado River Compact (1948)

- Created Upper Colorado River Commission
- Apportioned the Upper Basin's 7.5 million acre-feet allocation

COLORADO RIVER ALLOCATIONS

Ultimately, allocations were divided based on existing demands (largely agricultural) and projected growth of demands.



COLORADO RIVER BASIN STORAGE PROJECT ACT (1956)



Glen Canyon Dam
Lake Powell, AZ

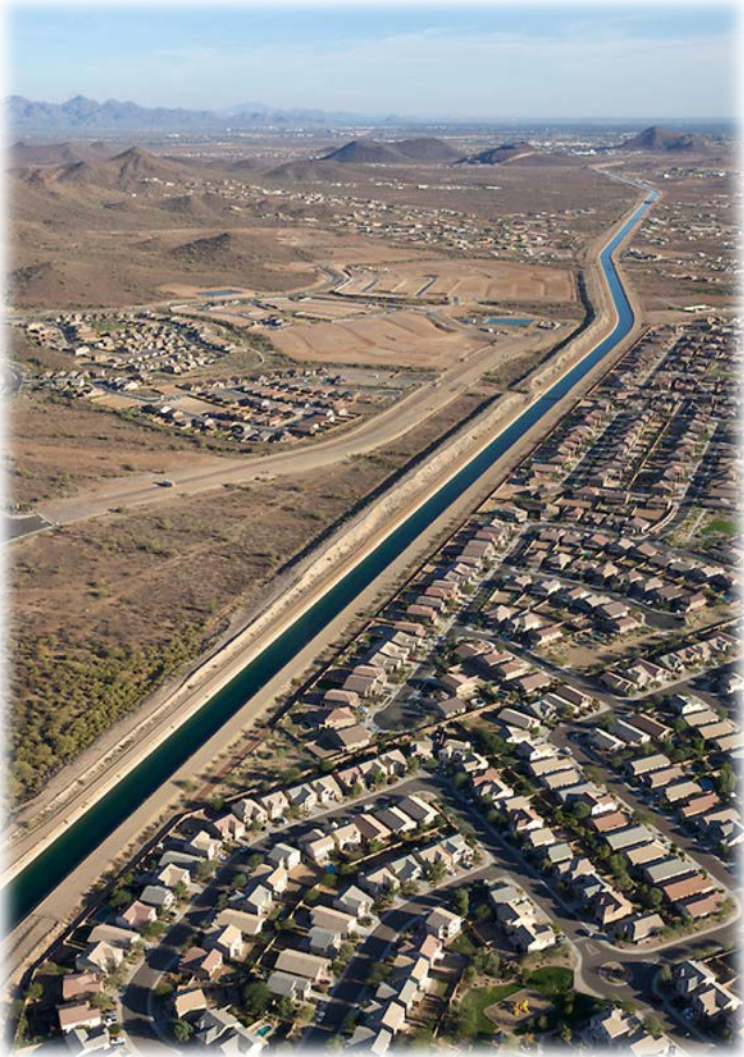


Flaming Gorge
Flaming Gorge Reservoir, WY



Navajo Dam
Navajo Reservoir, NM

COLORADO RIVER BASIN PROJECT ACT (1968)



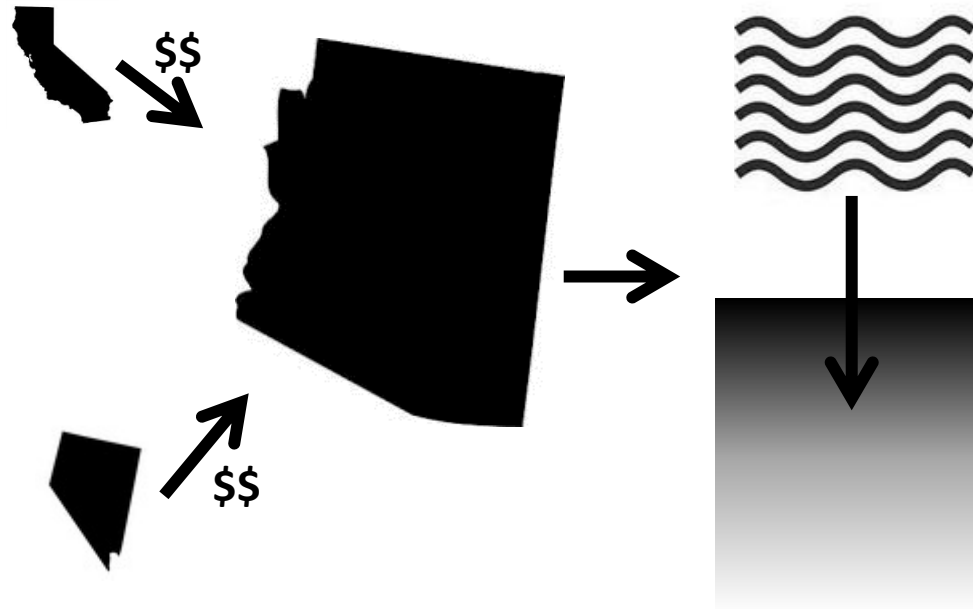
Central Arizona Project

- Authorized construction of a number of projects in the basins, including the Central Arizona Project
- Long-range operating criteria
- Apportionment of shortages
- Salinity
- Augmentation

**OFFSTREAM STORAGE OF COLORADO RIVER WATER
AND DEVELOPMENT AND RELEASE OF
INTENTIONALLY CREATED UNUSED
APPORTIONMENT IN THE LOWER DIVISION STATES
(1999)**

**Enabled interstate water banking in the Lower Basin
Rooted in Article II(B)(6)**

ARIZONA GROUNDWATER BANKS



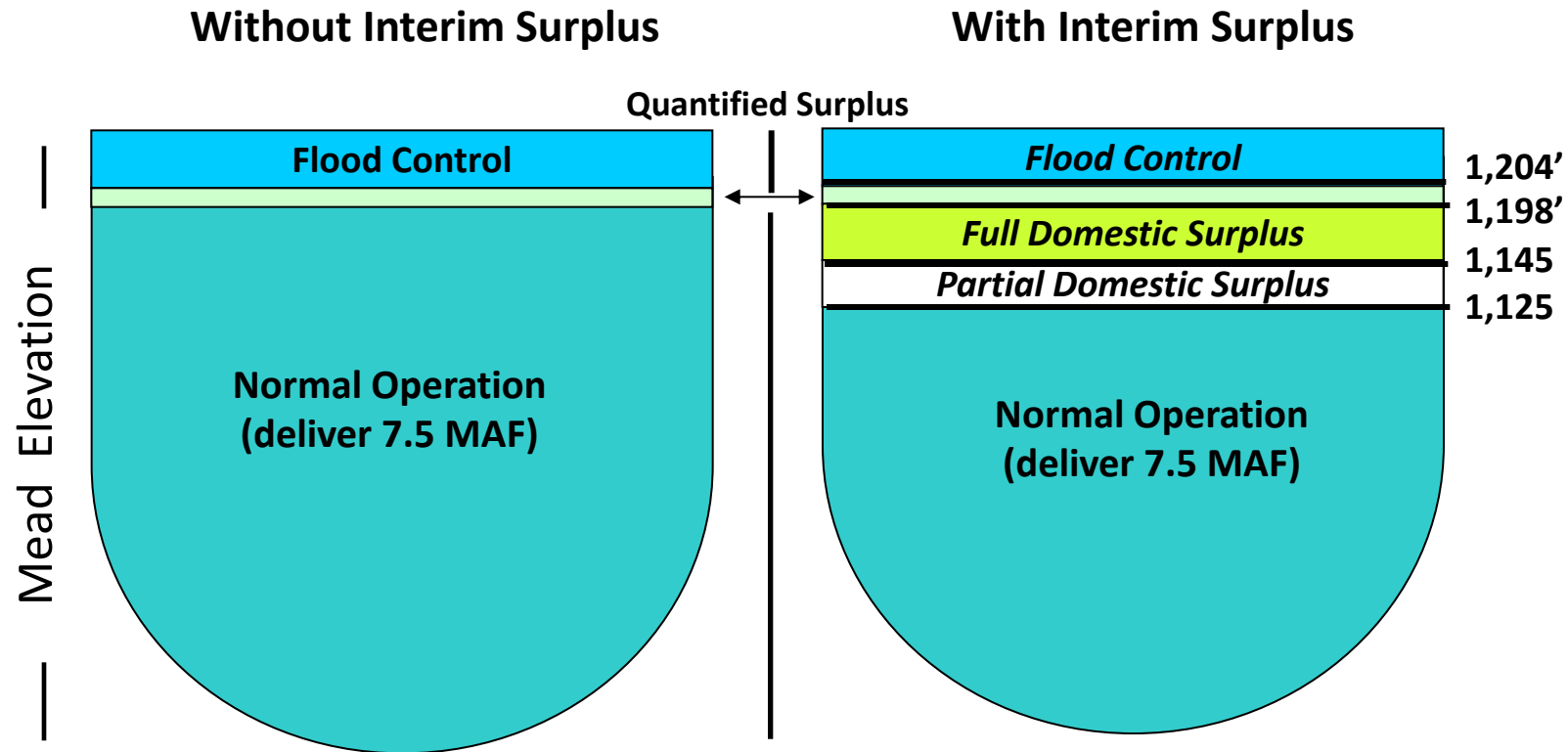
INTERIM SURPLUS GUIDELINES (2001)



Lake Mead, 1999

- **Developed following a period of high-flow years in the system**
- **Outlined a framework to allow Lower Basin States share surplus Colorado River water**
- **Provided time for California to reduce Colorado River use to its 4.4 million AFY allocation**

INTERIM SURPLUS GUIDELINES



INTERIM SURPLUS GUIDELINES

Following adoption of the Interim Surplus Guidelines, drought significantly reduced storage levels in Lakes Powell and Mead.



Jan. 2000 Elevation: 1,214 ft.



Dec. 2003 Elevation: 1,139 ft.

2004 – 2005 TIMELINE

At that time, significant disagreements between the Upper and Lower Basins, as well as among the Lower Basin states included:

**2005 Annual Operating Plan disagreement
(2004 hydrology)**

**Article II.B.2 of the Decree in AZ v. CA (50/46/4)
(Wheeling)**

Quantity and timing of shortage

Secretary Norton May 2005 Letter

INTERIM GUIDELINES

In 2005, the Basin States began evaluating options for reservoir operations and shortage criteria.

- **Drought remained a looming threat to system management**
- **The Secretary of the Interior initiated the development of an EIS in response to the drought**
- **The states spent more than two years developing a proposal with support from the Bureau of Reclamation**

INTERIM GUIDELINES

The Interim Guidelines addressed a number of ongoing basin concerns:

- **Coordinated operations of the system's two largest reservoirs: Lake Powell and Lake Mead**
- **Shortage conditions**
- **The expiration of Interim Surplus Guidelines**
- **A framework for a new type of surplus (II.B.2)**

INTERIM GUIDELINES

Coordinated Operations of Lake Powell and Lake Mead:

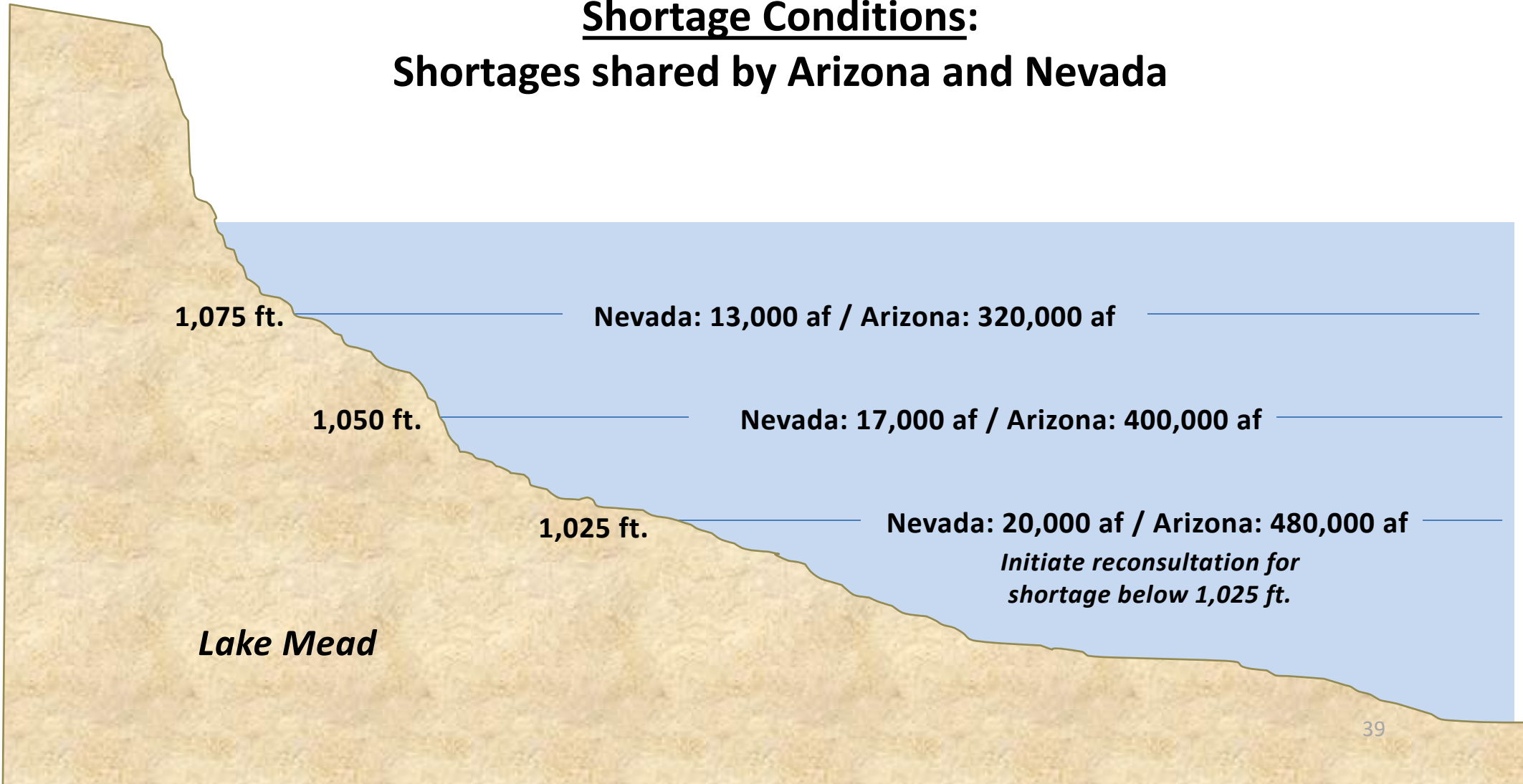
- **Previously, Lakes Powell and Mead were operated largely independently - Lake Powell released an established amount of water regardless of Lake Mead's elevations**
- **The guidelines optimizes operations of Lakes Powell and Mead, allowing the maximum utilization of each reservoir**

INTERIM GUIDELINES

Lake Powell Elevation	Lake Powell Operational Tier	Lake Powell Active Storage
3,700 ft.		24.32 MAF
3,636-3,666 ft.	Equalization Tier <i>Equalize, avoid spills or release 8.23 MAF</i>	15.54 – 19.29 MAF
	Upper Elevation Balancing Tier <i>Release 8.23 MAF; if Lake Mead < 1,075 feet; balance contents with a min/max release of 7 and 9 MAF</i>	
3,575 ft.		9.52 MAF
3,525 ft.	Mid-Elevation Release Tier <i>Release 7.48 MAF; If Lake Mead < 1,025 ft., release 8.23 MAF</i>	5.93 MAF
	Lower Elevation Balancing Tier <i>Balance contents with a min/max release of 7.0 and 9.5 MAF</i>	
3,370 ft.		0 MAF

INTERIM GUIDELINES

Shortage Conditions: Shortages shared by Arizona and Nevada



1,075 ft.

Nevada: 13,000 af / Arizona: 320,000 af

1,050 ft.

Nevada: 17,000 af / Arizona: 400,000 af

1,025 ft.

Nevada: 20,000 af / Arizona: 480,000 af

Initiate reconsultation for shortage below 1,025 ft.

Lake Mead

INTERIM GUIDELINES

Intentionally Created Surplus:

- Solves Article II.B.2 conflict
- ICS can be created or credited to a water user through actions that conserve water and increase Lake Mead storage
- Four types of ICS:
 - Tributary Conservation
 - Imported
 - Extraordinary Conservation
 - System Efficiency

BI-NATIONAL DISCUSSIONS

Following completion of the 2007 Guidelines, bi-national discussions between the United States and Mexico occurred more frequently.

- **The countries recognized that long-term success of the Interim Guidelines depends on formal understandings between the two countries to manage environmental concerns, shortages and other trans-boundary water issues**
- **Additional opportunities for joint investments (desalination, agricultural modernization)**

BI-NATIONAL DISCUSSIONS

MINUTE 316 (2010):

Provides water for the Cienega de Santa Clara to replace losses from the Yuma Desalting Plant test run

MINUTE 317 (2010):

Established bi-national consultative council; set framework for future negotiations

MINUTE 318 (2010):

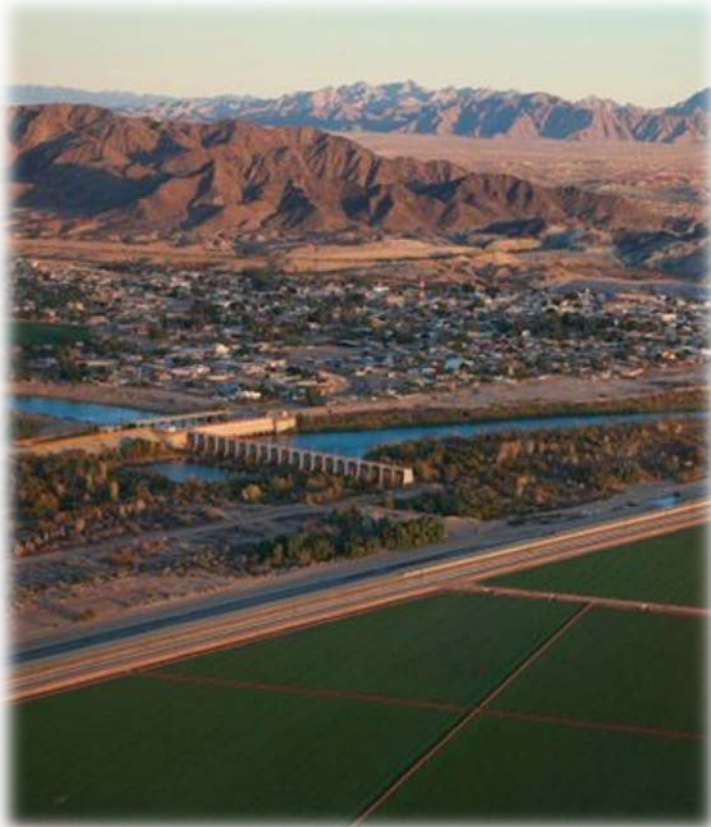
Authorized reservoir storage mechanism to allow storage of earthquake losses

BI-NATIONAL DISCUSSIONS

MINUTE 319 (2012):

- **5-year agreement (establishes framework for permanent agreement)**
- **Shared responsibility in weathering shortages and benefitting from surpluses**
- **Addresses reservoir storage and salinity concerns**
- **Acknowledges that water should flow to the Colorado River Delta ecosystem**
- **Establishes framework for future management beyond the 5-year pilot program**
- **Establishes provisions for bi-national ICS**

BI-NATIONAL DISCUSSIONS - ICS



Morelos Dam, Mexico

Pilot program entails US and Mexican investment in conservation projects that will yield environmental and water benefits for the US and Mexico

SNWA will receive 23,750 acre-feet of Binational ICS credits in Lake Mead

Environmental pulse flow occurring this week

MINUTE 323

- **Term through December 31, 2026**
- **Distribution of Flows Under High Elevation Reservoir Conditions (same as Minute 319)**
- **Distribution of Flows Under Low Elevation Reservoir Conditions (same as Minute 319)**
- **US investment in projects for the creation of Binational ICS (BICS)**
- **Water Scarcity Contingency Plan**

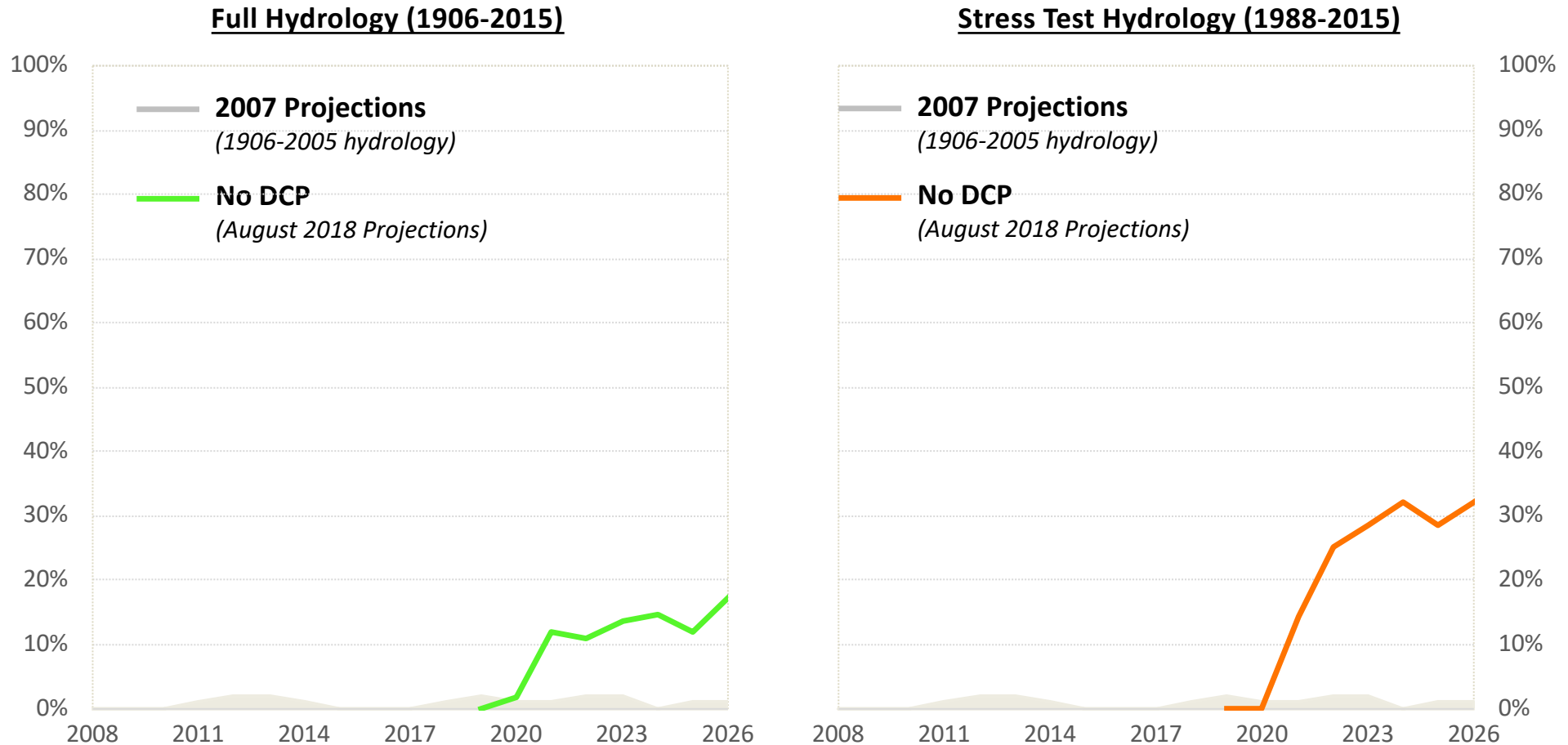
DOMESTIC AGREEMENTS

Several agreements are required to successfully implement Minute No. 323 for the full benefit of all users:

- Memorandum of Agreement on the Implementation of Minute No. 323**
- Interim Operating Agreement for Implementation of Minute No. 323**
- 2017 Contributed Funds Agreement**
- 2017 BICS Agreement**
- 2017 Binational ICS Delivery Agreement**
- Agreement Regarding Notice from the Secretary of the Interior for the Purpose of Implementing Section IV of Minute No. 323**

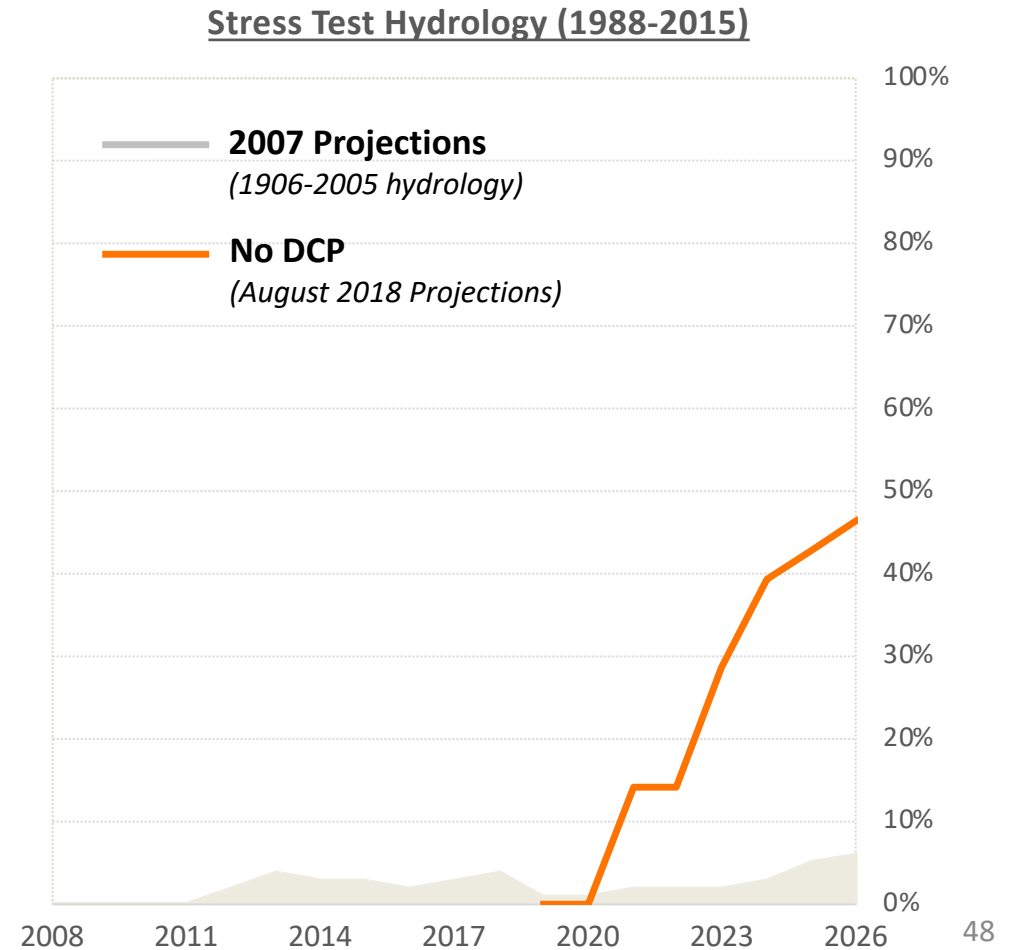
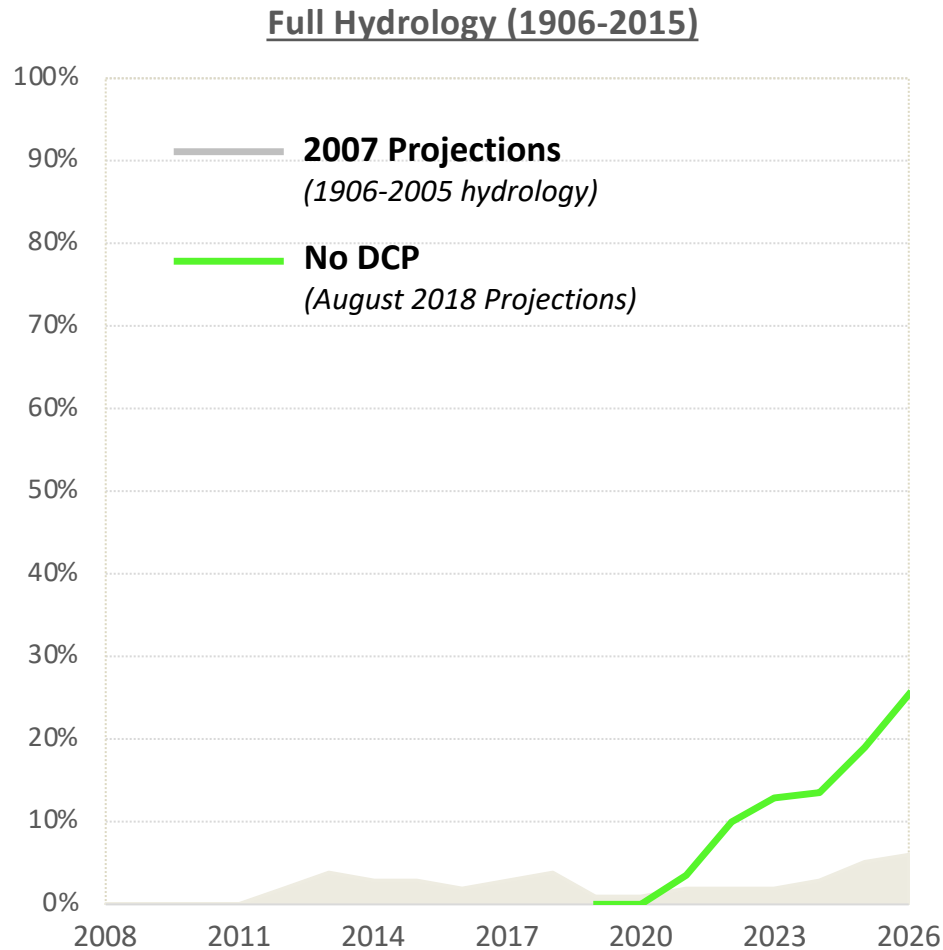
INCREASED RISK: LAKE POWELL <3,490

The risk of reaching critical elevations has substantially increased since 2007 Guidelines were implemented.



INCREASED RISK: LAKE MEAD <1,020

The risk of reaching critical elevations has substantially increased since 2007 Guidelines were implemented.



DROUGHT CONTINGENCY PLANS

The Drought Contingency Plans will reduce the risk of Colorado River reservoirs reaching critical elevations.

UPPER BASIN

GOALS:

- Reduce risk of Lake Powell reaching critically low elevations (3,490 ft. / 3,525 ft.)
- Reduce risk of involuntary curtailment within Upper Basin to maintain compliance with 1922 Compact

KEY ELEMENTS

- CRSPA initial units drought response operations
- Demand Management Storage capacity

LOWER BASIN

GOALS:

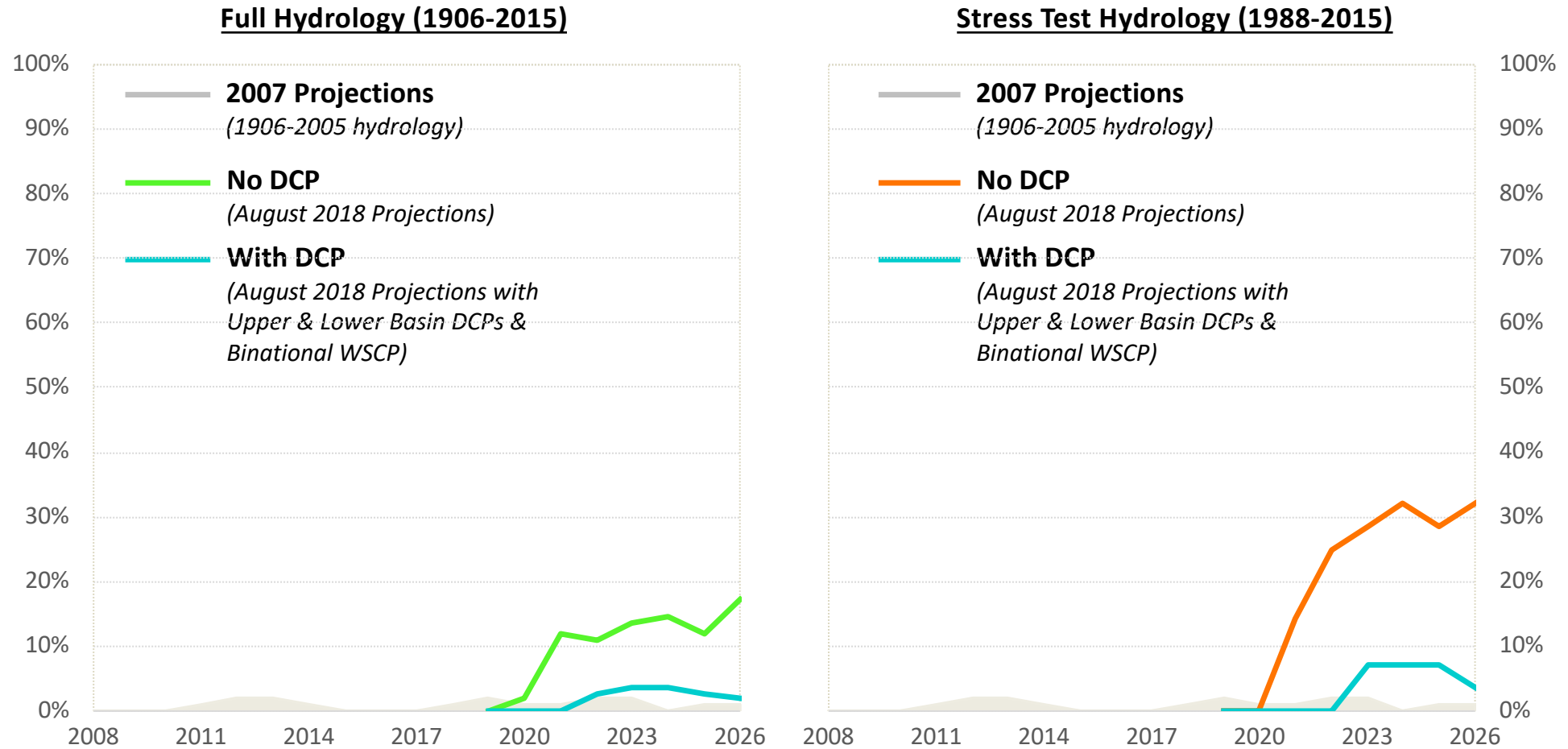
- Reduce risk of Lake Mead elevations from below 1,020 ft.

KEY ELEMENTS

- Creates water contributions
- Removes disincentives to storing water in Lake Mead
- Enhances ability to store and access water in Lake Mead

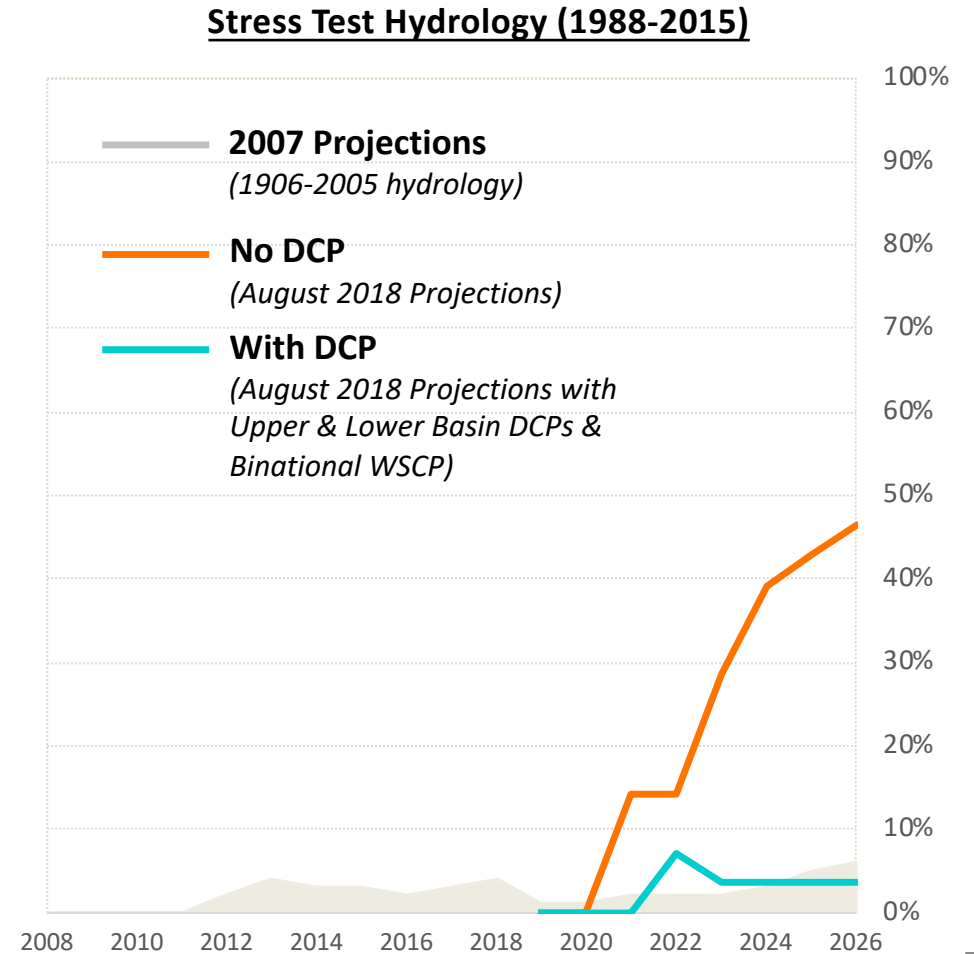
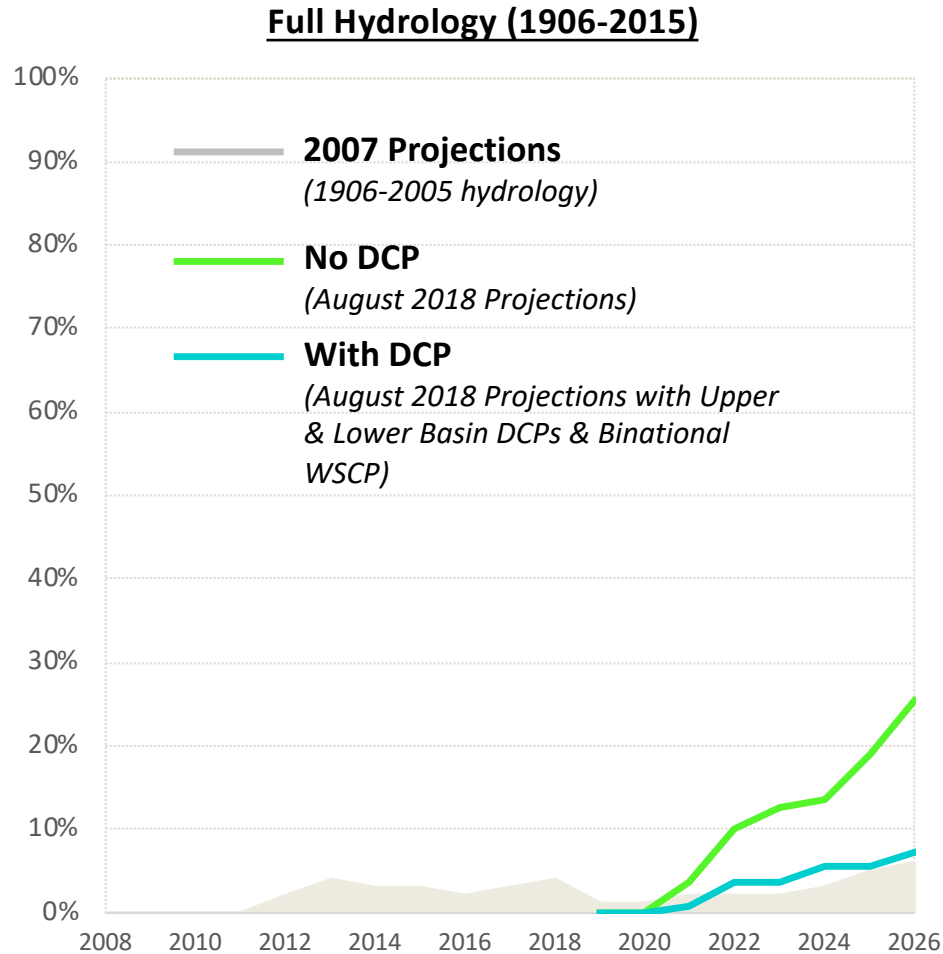
REDUCING RISK: LAKE POWELL <3,490

Modeling indicates that DCP will reduce risk.



REDUCING RISK: LAKE MEAD <1,020

Modeling indicates that DCP will reduce risk.



DCP SUMMARY

- **Reduces risk of Colorado River reservoirs reaching critical elevations**
- **Creates tools for the Upper Basin to manage Lake Powell for power and future compact requirements**
- **Includes California as a participant in protecting Lake Mead**
- **Triggers Mexico's agreement to store additional volumes of conserved water in Lake Mead**
- **Adds new levels of DCP Contributions to protect Lake Mead**
- **Creates additional incentives to store and access additional ICS, including during shortages**