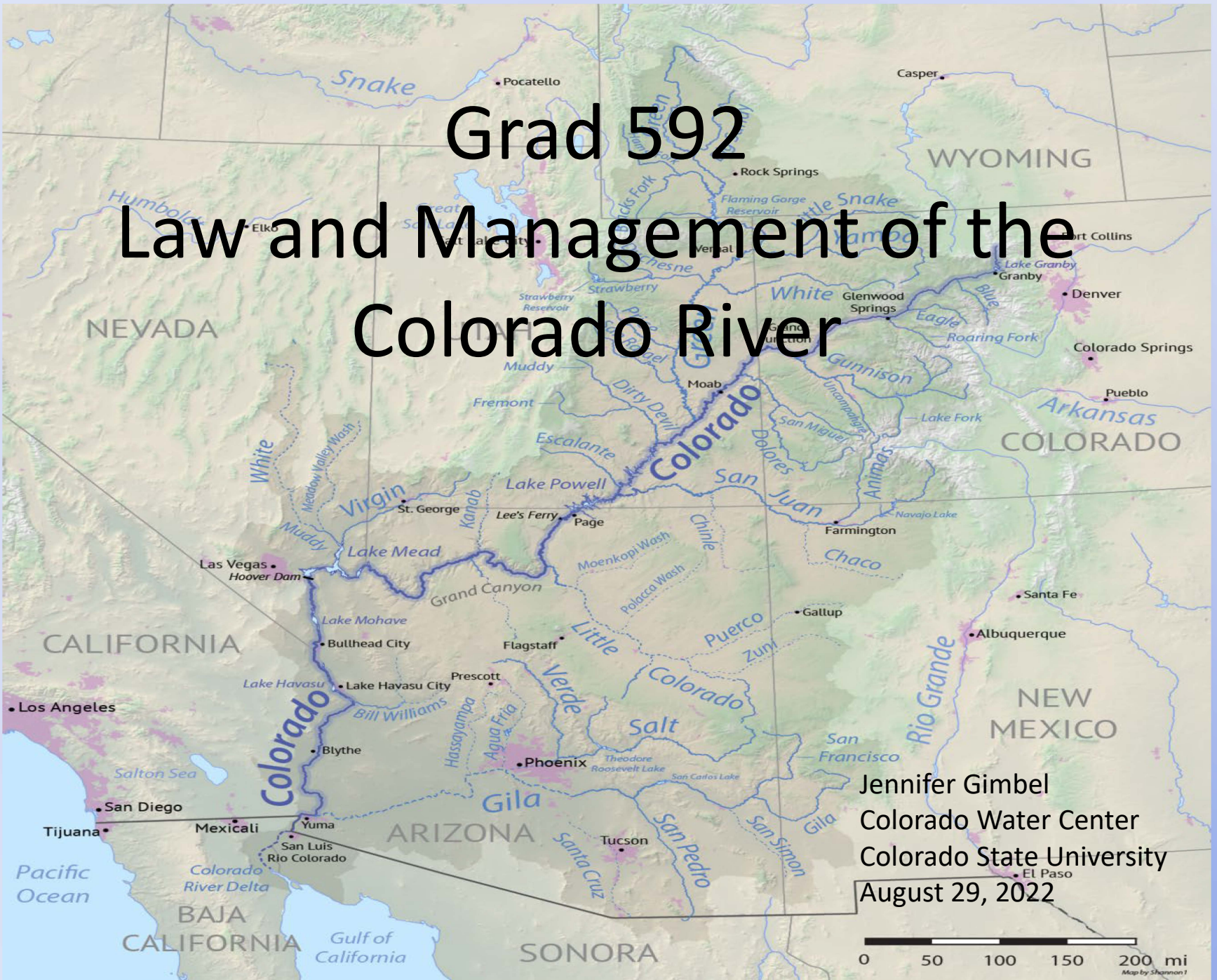


# Grad 592 Law and Management of the Colorado River



Jennifer Gimbel  
Colorado Water Center  
Colorado State University  
August 29, 2022

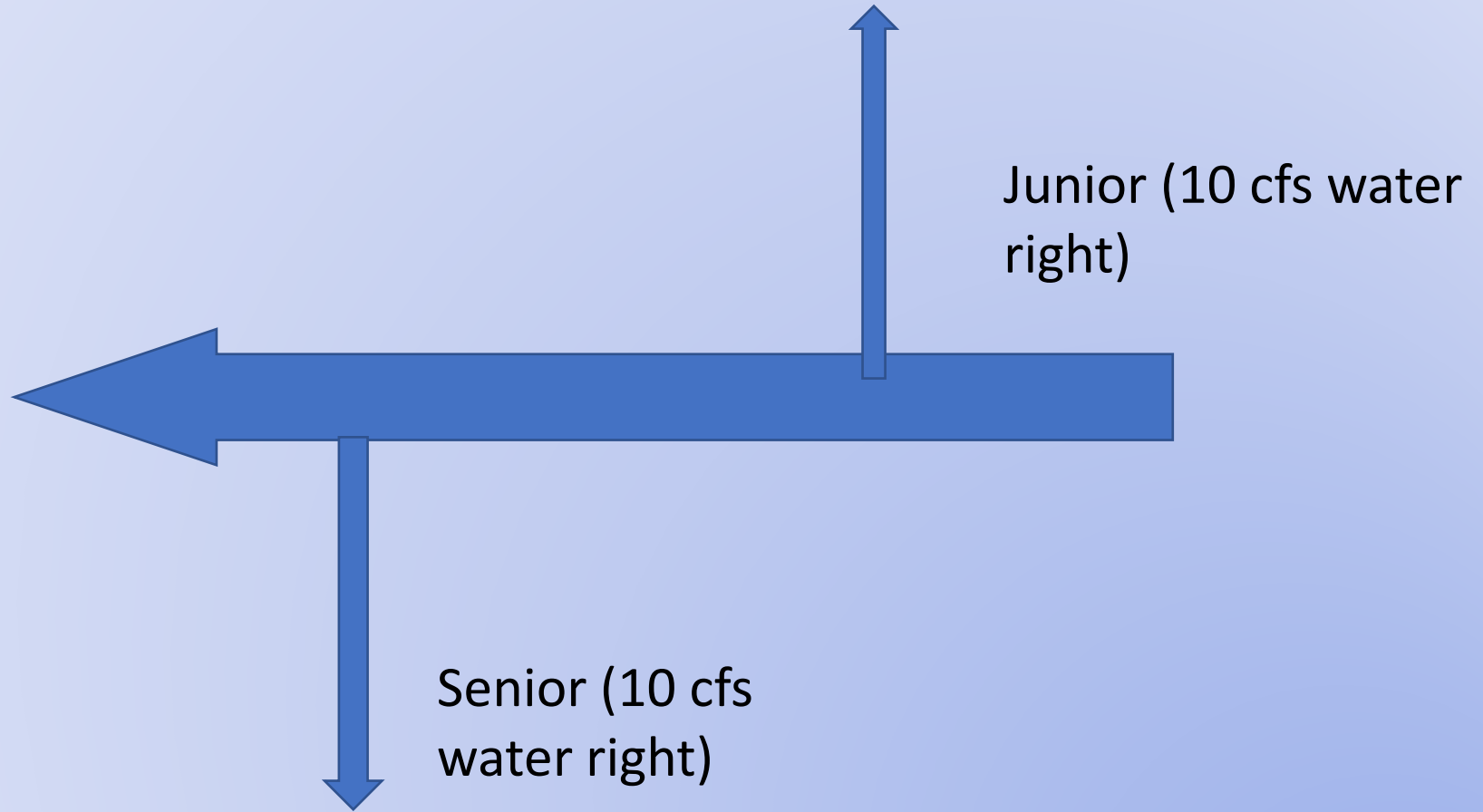
# Prior Appropriation Doctrine

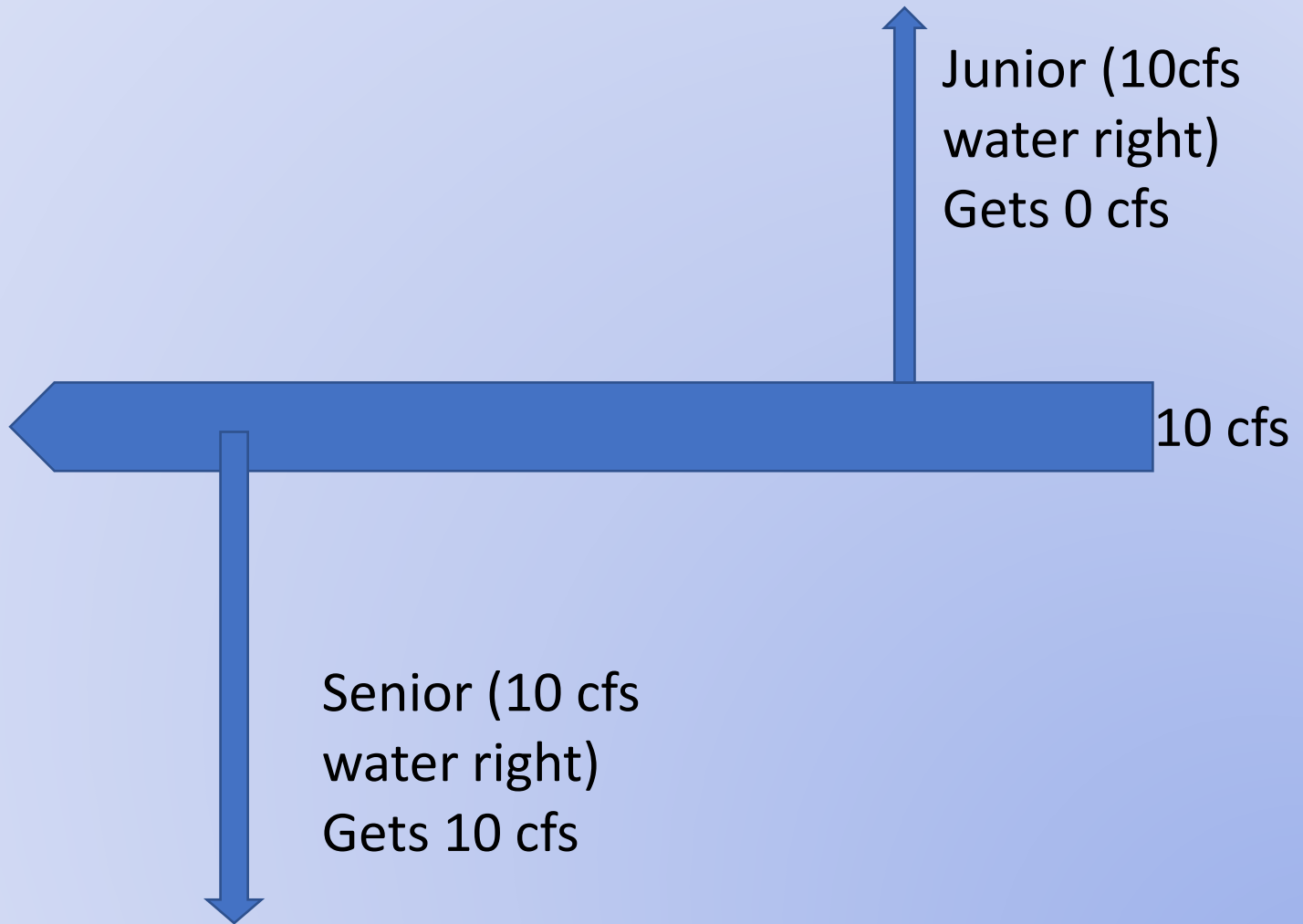
- Earliest appropriators have the **highest priority**; “First in time, first in right.”
- Water must be put to **beneficial use** without waste or speculation.
- **Remote uses** and **transfers** allowed.
- Right of use can be **forfeited by non-use**.

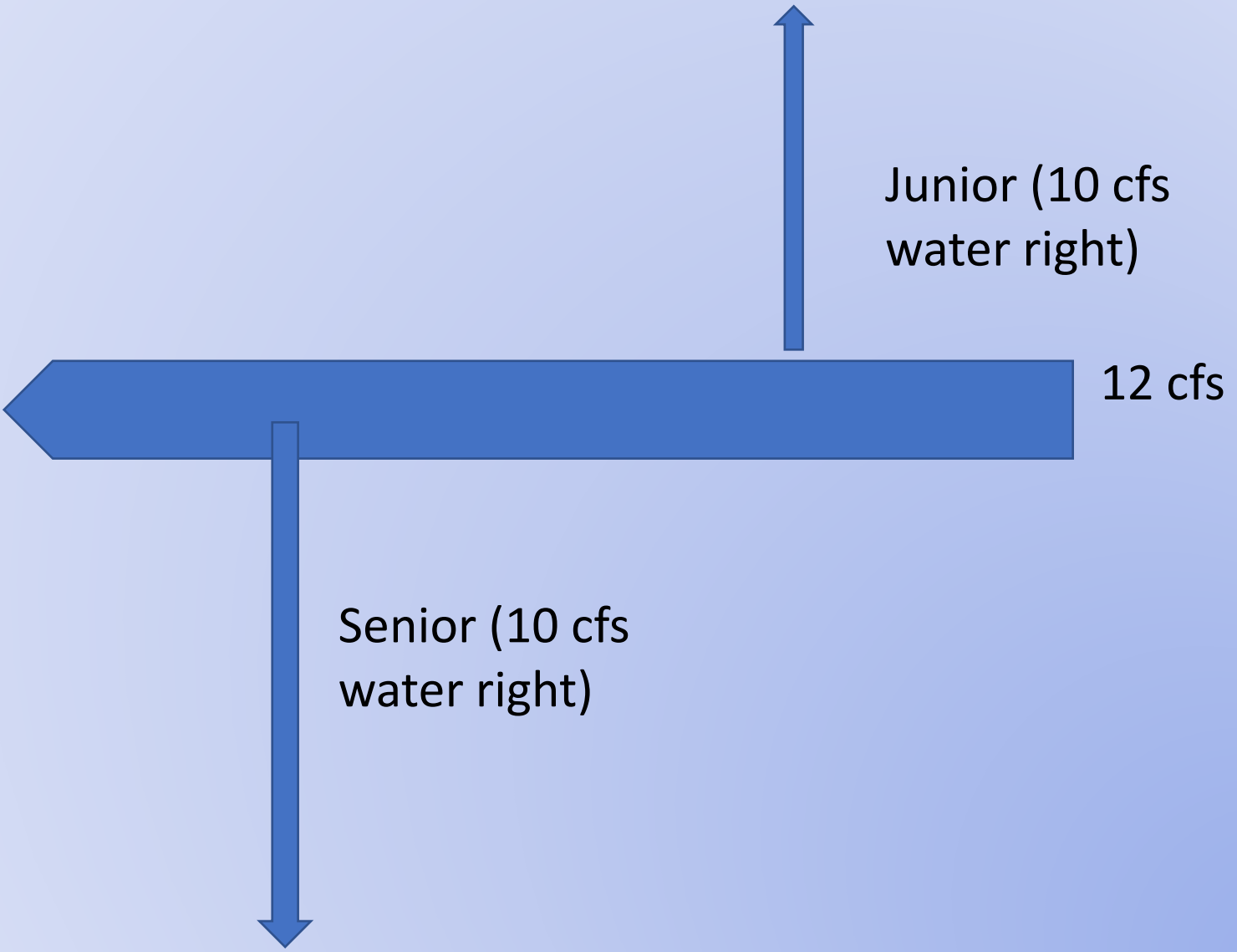


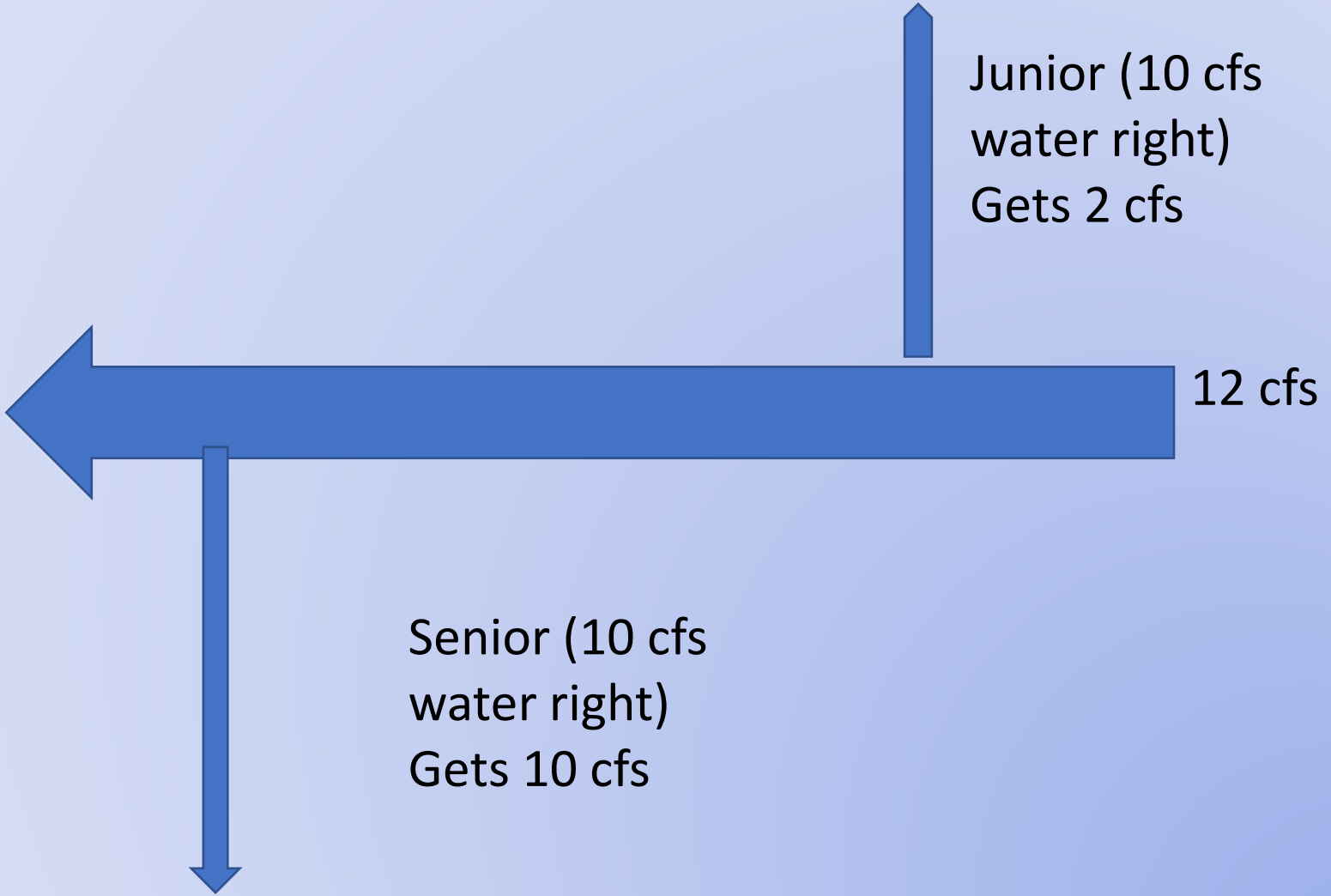


# Water Administration Examples



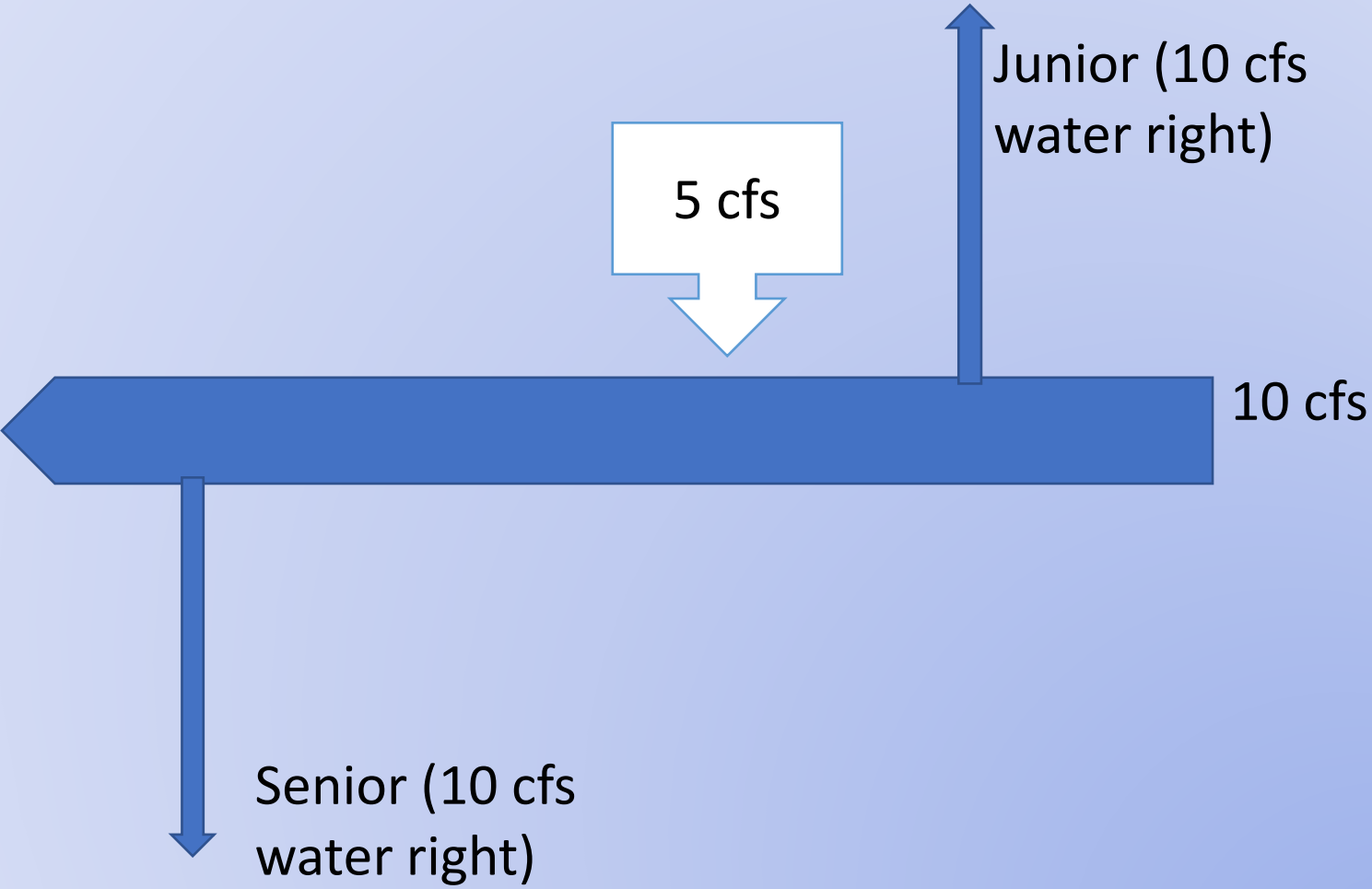


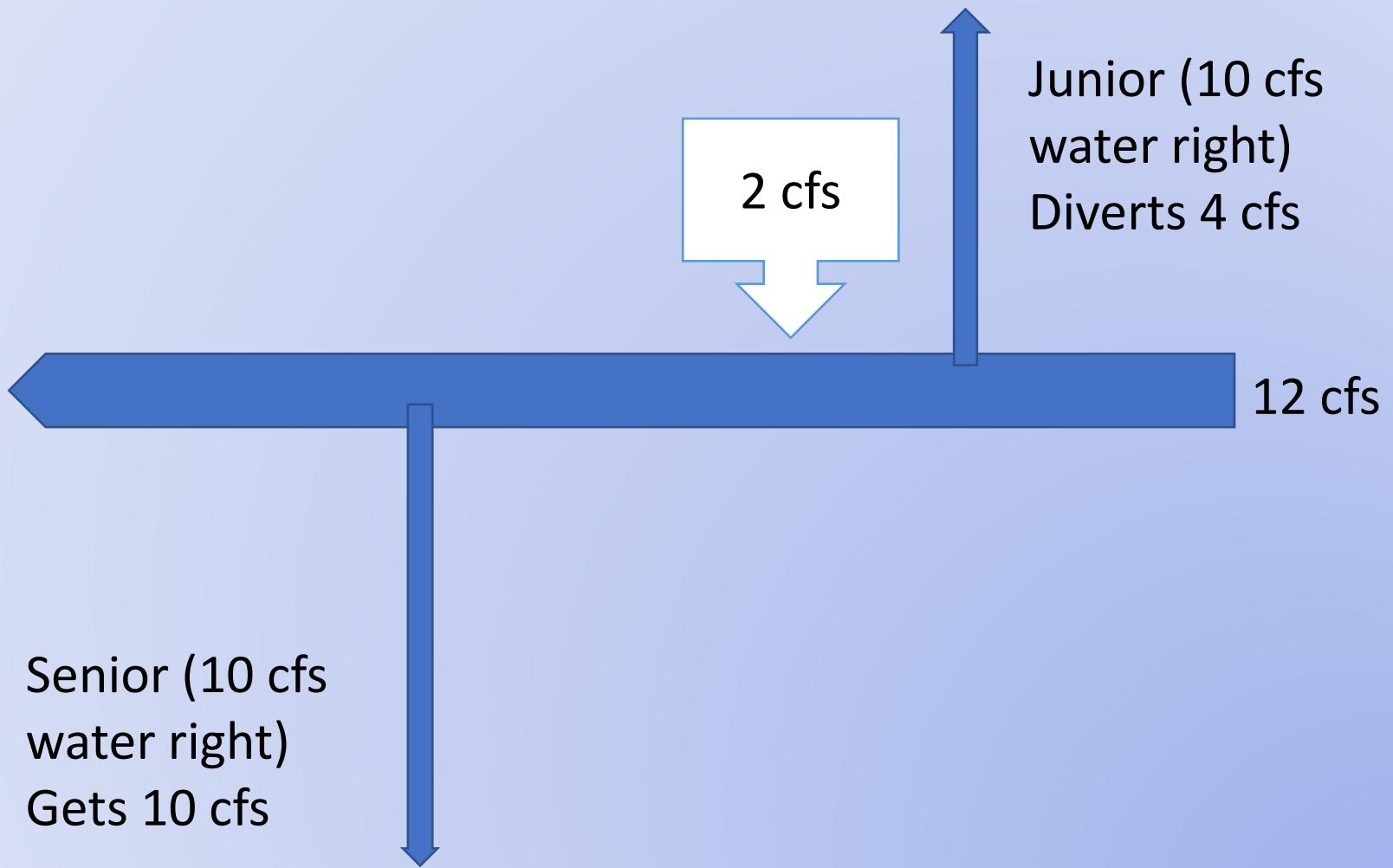






# Return Flows





# Law of the River

- Colorado River Compact, 1922
- Boulder Canyon Project Act of 1928
- California Seven Party Agreement
- Mexican Water Treaty, 1944
- Upper Colorado River Basin Compact, 1948
- Colorado River Storage Protection Act of 1956
- Arizona v. California, 1964
- Colorado River Basin Project Act of 1968
- Long Range Operating Criteria, 1970
- Interim Surplus Criteria, 2002
- Interim Guidelines for LB Shortages and Coordinated Operations for Lake Powell and Lake Mead, 2007
- Drought Contingency Plans 2019

# Colorado River Compact, 1922



# 1945 International Water Treaty

- Between U.S. and Mexico on Rio Grande, Tijuana and Colorado Rivers.
- U.S. required to deliver a certain 1.5 maf/year to Mexico.
- Created the International Boundary and Water Commission

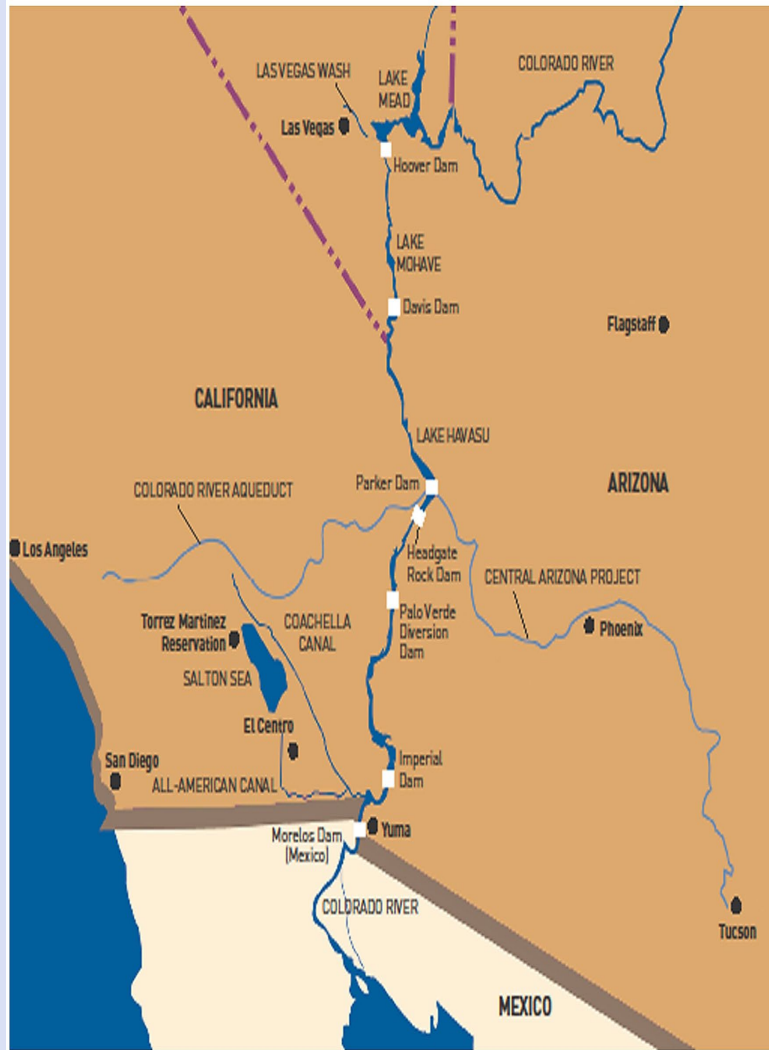


# Upper Colorado River Compact, 1948

- % Apportionments to CO, NM, UT, WY & 50,000 AF/yr to AZ
- Process for curtailment of use to comply with Colorado River Compact
- Established Upper Colorado River Commission

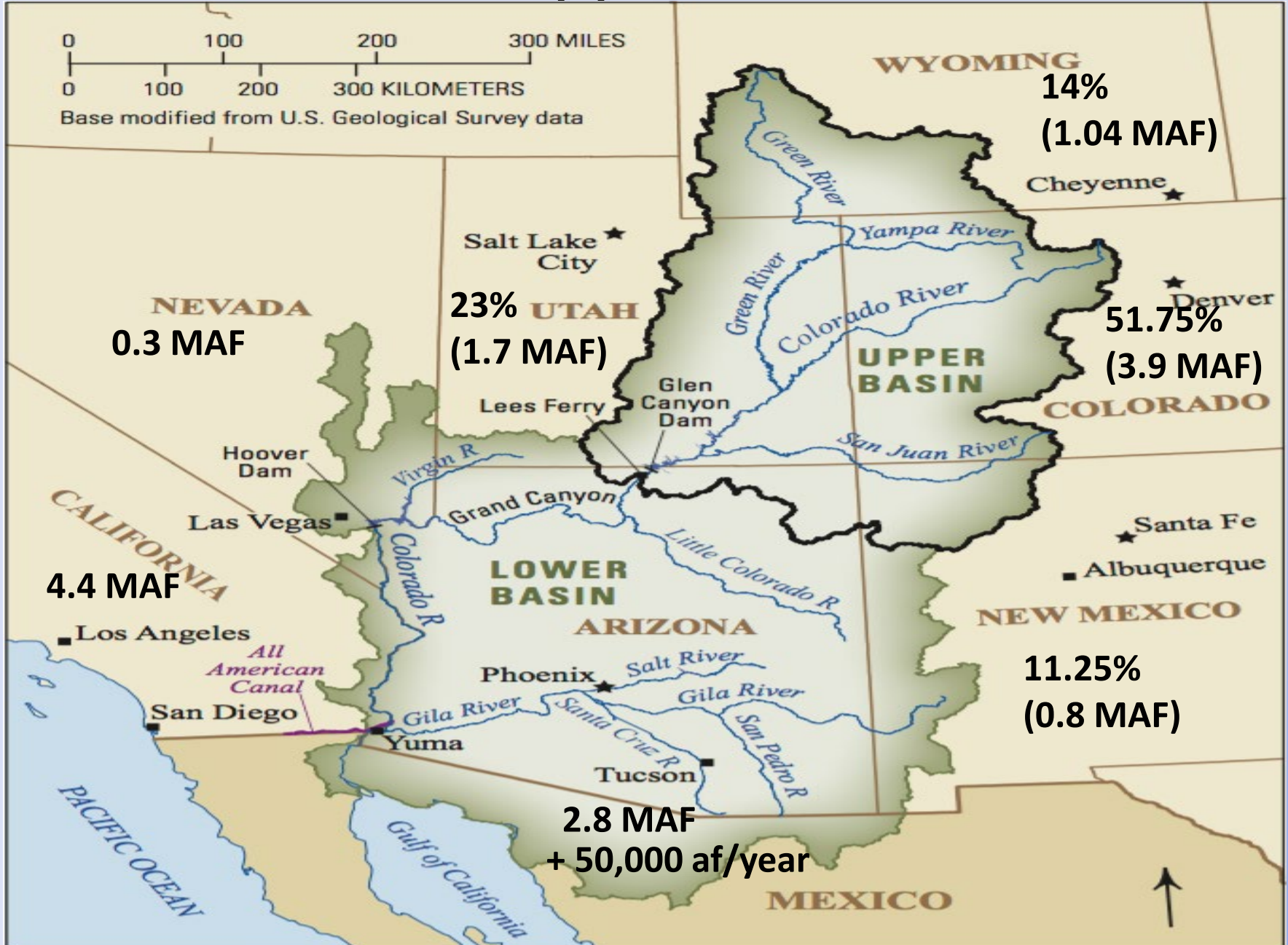


# 1928 Boulder Canyon Project Act



- Ratified CR Compact with 6 states approval
- Authorized building of Hoover Dam and All-American Canal and other features
- Congress apportioned water from Lake Mead to Lower Basin states:
  - AZ 2.8 maf
  - CA 4.4 maf
  - NV 0.3 maf

# State Apportionments

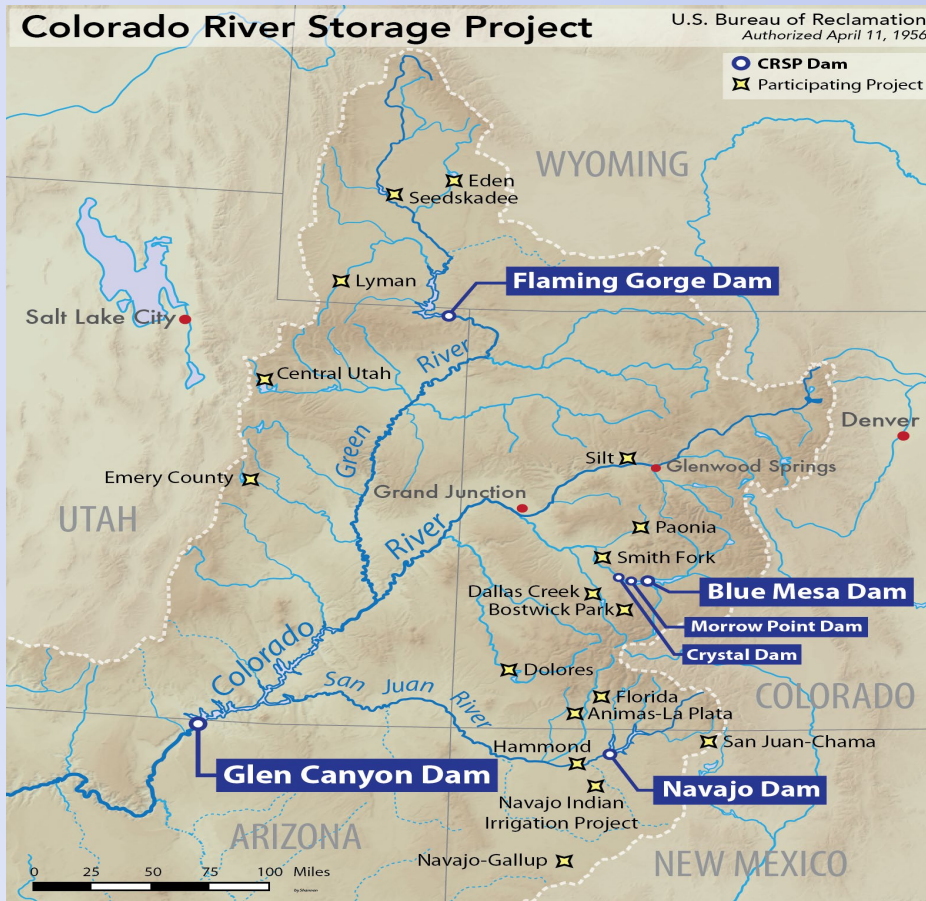


# 1934 Arizona Navy



# Colorado River Storage Protection Act of 1956

- Authorized storage projects (including Glen Canyon Dam) to assist Upper Basin to meet compact obligations



Courtesy of Bureau of Reclamation

- Established the Upper CR Basin fund from power revenues

**FIGURE 1B-A**

**Map of Federally Recognized Tribes in the Colorado River Basin**



ID	Tribe Name	ID	Tribe Name	ID	Tribe Name	ID	Tribe Name
1	Ute Indian Tribe of the Uintah and Ouray Reservation	9	Havasupai Tribe	15	Chemehuevi Indian Tribe	23	Salt River Pima-Maricopa Indian Community
2	Southern Ute Indian Tribe	10	Hualapai Indian Tribe	16	Colorado River Indian Tribes	24	Gila River Indian Community
3	Ute Mountain Ute Tribe	11	Shivwits Band of Paiute Indian Tribe	17	Yavapai-Apache Nation	25	Ak-Chin Indian Community
4	Jicarilla Apache Nation	12	Moapa Band of Paiute Indians	18	Yavapai-Prescott Indian Tribe	26	Quechan Indian Tribe
5	Navajo Nation	13	Las Vegas Tribe of Paiute Indians	19	Tonto Apache Tribe	27	Cocopah Indian Tribe
6	Zuni Tribe	14	Fort Mojave Indian Tribe	20	White Mountain Apache Tribe	28	Tohono O'odham Nation
7	Hopi Tribe			21	San Carlos Apache Tribe	29	Pascua Yaqui Tribe
8	Kaibab Band of Paiute Indians			22	Fort McDowell Yavapai Nation		



# Arizona v. California

- United States Supreme Court original jurisdiction case decided in 1964
- Determined Congressional apportionments for Lower Basin states
- Determined federally reserved water rights for five tribes – water to come from home state's apportionment
- Determined Secretary to charge consumptive use to Lower Basin states at the point of delivery (at the headgate)
- Distributed surplus water: 50% CA, 46% AZ, 4% NV

# Colorado River Basin Project Act of 1968



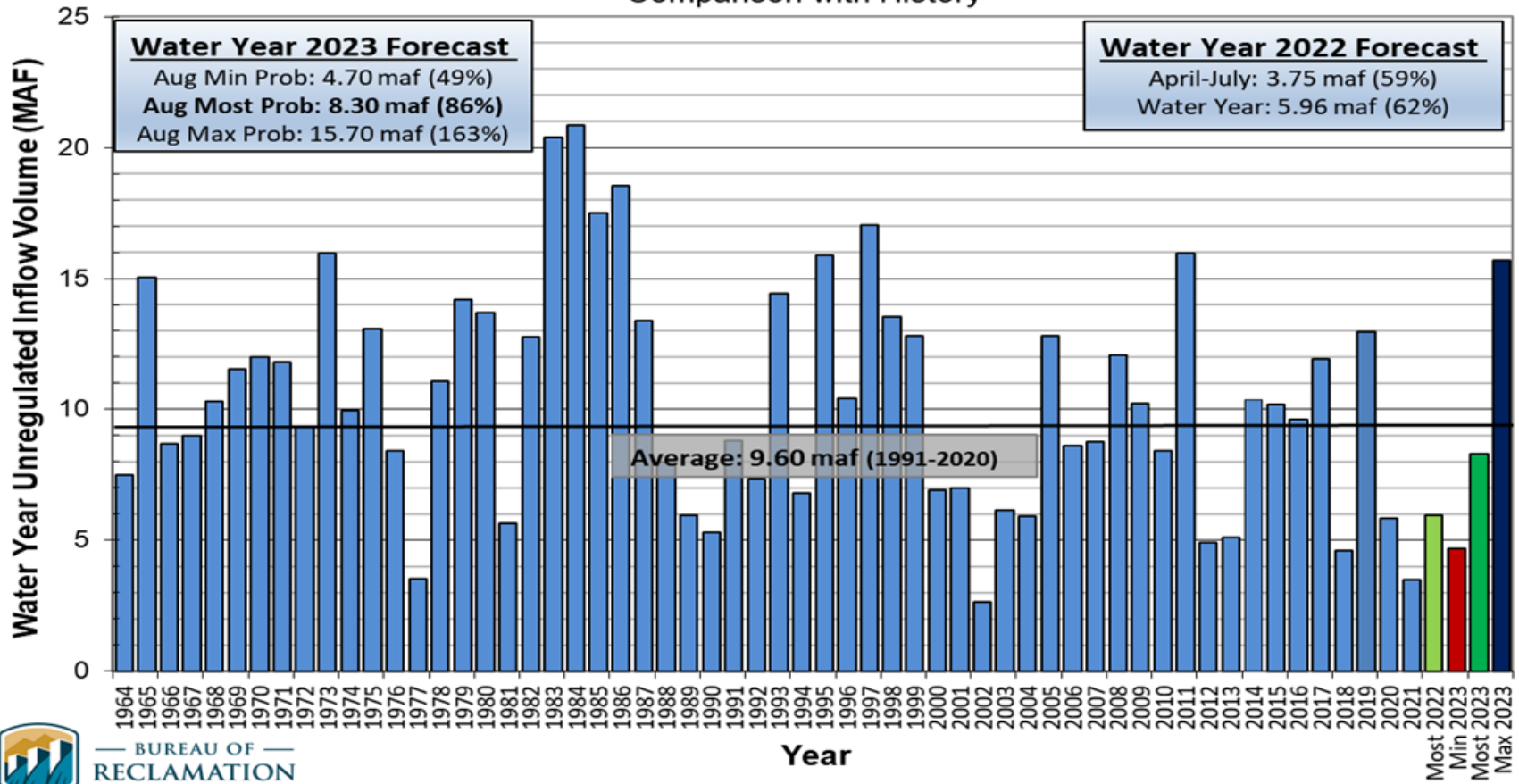
- Authorized Central Arizona Project
- Water supply junior to CA compact rights
- Coordinated operation of federal storage projects (602 (a) storage)
- Directs Sec. of Interior to create a yearly consumptive uses and losses report on state-by-state basis
- Requires Sec. to develop “Long Range Operating Criteria LROC) for the CR reservoir system

# Central Arizona Project



# Drought

**Lake Powell Unregulated Inflow**  
**Water Year 2022 and 2023 Forecast** *(issued August 2)*  
 Comparison with History



# 2007 Interim Guidelines

- Interim implementation of amended LROC expires in 2025
- Sets criteria for shortages in the LB (California sees no shortages, Arizona takes biggest hit)
- Creates a mechanism for a LB water bank (intentionally created surplus).
- Coordinating criteria for operations between Lake Powell and Lake Mead (protects UB from a LB call).



— BUREAU OF —  
RECLAMATION

## Review of the Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead

Upper and Lower Colorado Basin Regions



U.S. Department of the Interior

December 2020

# Balancing Tiers

Lake Powell			Lake Mead		
Elevation (feet)	Operation According to the Interim Guidelines	Live Storage (maf) <sup>1</sup>	Elevation (feet)	Operation According to the Interim Guidelines	Live Storage (maf) <sup>1</sup>
3,700	<b>Equalization Tier</b> Equalize, avoid spills, or release 8.23 maf	24.3	1,220	<b>Flood Control Surplus or Quantified Surplus Condition</b> Deliver > 7.5 maf	25.9
3,636-3,666 (2008-2026)	<b>Upper Elevation Balancing Tier<sup>3</sup></b> Release 8.23 maf; if Lake Mead < 1,075 feet, balance contents with a min/max release of 7.0 and 9.0 maf	15.5-19.3 (2008-2026)	1,200 (approx.) <sup>2</sup>	<b>Domestic Surplus or ICS Surplus Condition</b> Deliver > 7.5 maf	22.9 (approx.) <sup>2</sup>
3,575	<b>Mid-Elevation Release Tier</b> Release 7.48 maf; if Lake Mead < 1,025 feet, release 8.23 maf	9.5	1,145	<b>Normal or ICS Surplus Condition</b> Deliver ≥ 7.5 maf	15.9
3,525		5.9	1,075	<b>Shortage Condition</b> Deliver 7.167 <sup>4</sup> maf	9.4
3,490	<b>Lower Elevation Balancing Tier</b> Balance contents with a min/max release of 7.0 and 9.5 maf	4.0	1,050	<b>Shortage Condition</b> Deliver 7.083 <sup>5</sup> maf	7.5
3,370		0	1,025		5.8
			1,000	<b>Shortage Condition</b> Deliver 7.0 <sup>6</sup> maf  Further measures may be undertaken <sup>7</sup>	4.3
			895		0

Diagram not to scale

<sup>1</sup> Acronym for million acre-feet;

<sup>2</sup> This elevation is shown as approximate as it is determined each year by considering several factors including Lake Powell and Lake Mead storage, projected Upper Basin demands, and an assumed inflow; <sup>3</sup> Subject to April adjustments which may result in a release according to the Equalization Tier;

<sup>4</sup> Of which 2.48 maf is apportioned to Arizona, 4.4 maf to California, and 0.287 maf to Nevada;

<sup>5</sup> Of which 2.40 maf is apportioned to Arizona, 4.4 maf to California, and 0.283 maf to Nevada;

<sup>6</sup> Of which 2.32 maf is apportioned to Arizona, 4.4 maf to California, and 0.280 maf to Nevada;

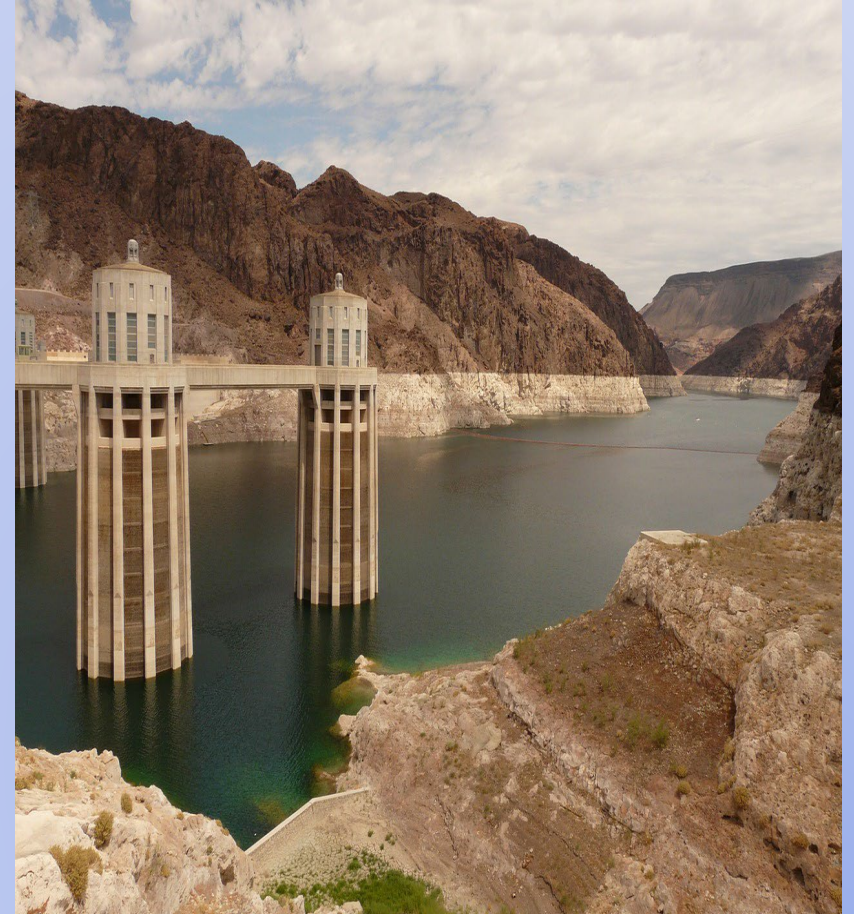
<sup>7</sup> Whenever Lake Mead is below elevation 1,025 feet, the Secretary shall consider whether hydrologic conditions together with anticipated deliveries to the Lower Division States and Mexico are likely to cause the elevation at Lake Mead to fall below 1,000 feet. Such consideration, in consultation with the Basin States, may result in the undertaking of further measures, consistent with applicable Federal law.

# Drought/ Aridification



Lake Powell

Source: Bureau of Reclamation



Lake Mead

Source: Public Domain

# 2019 Drought Contingency Plans

## Lower Basin DCP

- Increased shortage provisions
- Incentives to bank in Mead
- Recognizes need to address LB overuse



## Upper Basin DCP

- Drought Response Operations Agreement
- Demand Management Storage Agreement
- Weather modification

# Colorado River Storage Project

U.S. Bureau of Reclamation  
Authorized April 11, 1956

-  CRSP Dam
-  Participating Project





# International Cooperation



- Minute 319:
  - Mexico agrees to share in shortage;
  - U.S agrees to share in surplus;
  - International environmental projects including experimental pulse release to move water to the Lower Colorado River in Mexico.
- Minute 323:
  - Mexico agrees to further shortage;
  - Contingent on execution of L.B. drought contingency plan.

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

Lake Mead Elevation (feet msl)	2007 Interim Guidelines Shortages		Minute 323 Delivery Reductions	Total Combined Reductions	DCP Water Savings Contributions			Binational Water Scarcity Contingency Plan Savings	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
	AZ	NV	Mexico	<b>Lower Basin States + Mexico</b>	AZ	NV	CA	Mexico	AZ Total	NV Total	CA Total	Lower Basin States Total	Mexico Total	<b>Lower Basin States + Mexico</b>
1,090 - 1,075	0	0	0	0	192	8	0	41	192	8	0	200	41	241
1,075 - 1050	320	13	50	383	192	8	0	30	512	21	0	533	80	613
1,050 - 1,045	400	17	70	487	192	8	0	34	592	25	0	617	104	721
1,045 - 1,040	400	17	70	487	240	10	200	76	640	27	200	867	146	1,013
1,040 - 1,035	400	17	70	487	240	10	250	84	640	27	250	917	154	1,071
1,035 - 1,030	400	17	70	487	240	10	300	92	640	27	300	967	162	1,129
1,030 - 1,025	400	17	70	487	240	10	350	101	640	27	350	1,017	171	1,188
<1,025	480	20	125	625	240	10	350	150	720	30	350	1,100	275	1,375

# Department of the Interior Announcement

- Threat to States in June- plan to reduce deliveries by 2-4 maf
- Upper Basin response
- Lower Basin unable to agree (called feds bluff?)
- Sec. institutes shortages against AZ and NV pursuant to interim guidelines
- Commitment to conserve from major municipalities

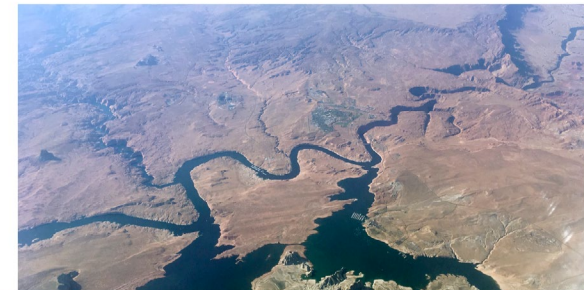


**CPR News**

COVID-19 POLITICS MONEY ARTS ENVIRONMENT SCHEDULE SUPPORT C

Colorado River states need to drastically cut down their water usage ASAP, or the federal government will step in

By Michael Elizabeth Sakas · Jun. 17, 2022, 5:32 pm



# Congress to the Rescue!

Money

to

Uphill

Flows

Water



\$4 billion of drought relief with priority to  
Colorado River

# FAQ

- What happens if UB doesn't meet 75maf/10 years?  
Can the Lower Basin put a call on the River?
- Is the Upper Basin responsible for risks from climate change?
- What is the structural deficit and how did it happen?
- Do we need to change the Compacts?
- How do the Tribes on the River figure into all this?

# Water Budget at Lake Mead

Given basic apportionments in the Lower Basin, the allotment to Mexico, and an 8.23 maf release from Lake Powell, Lake Mead storage declines

- Inflow = 9.0 maf  
(release from Powell + side inflows)
- Outflow = - 9.6 maf  
(AZ, CA, NV, and Mexico delivery  
+ downstream regulation and gains/losses)
- Mead evaporation loss = - 0.6 maf
- Balance = - 1.2 maf

Data based on long-term averages

RECLAMATION



Other Questions?