

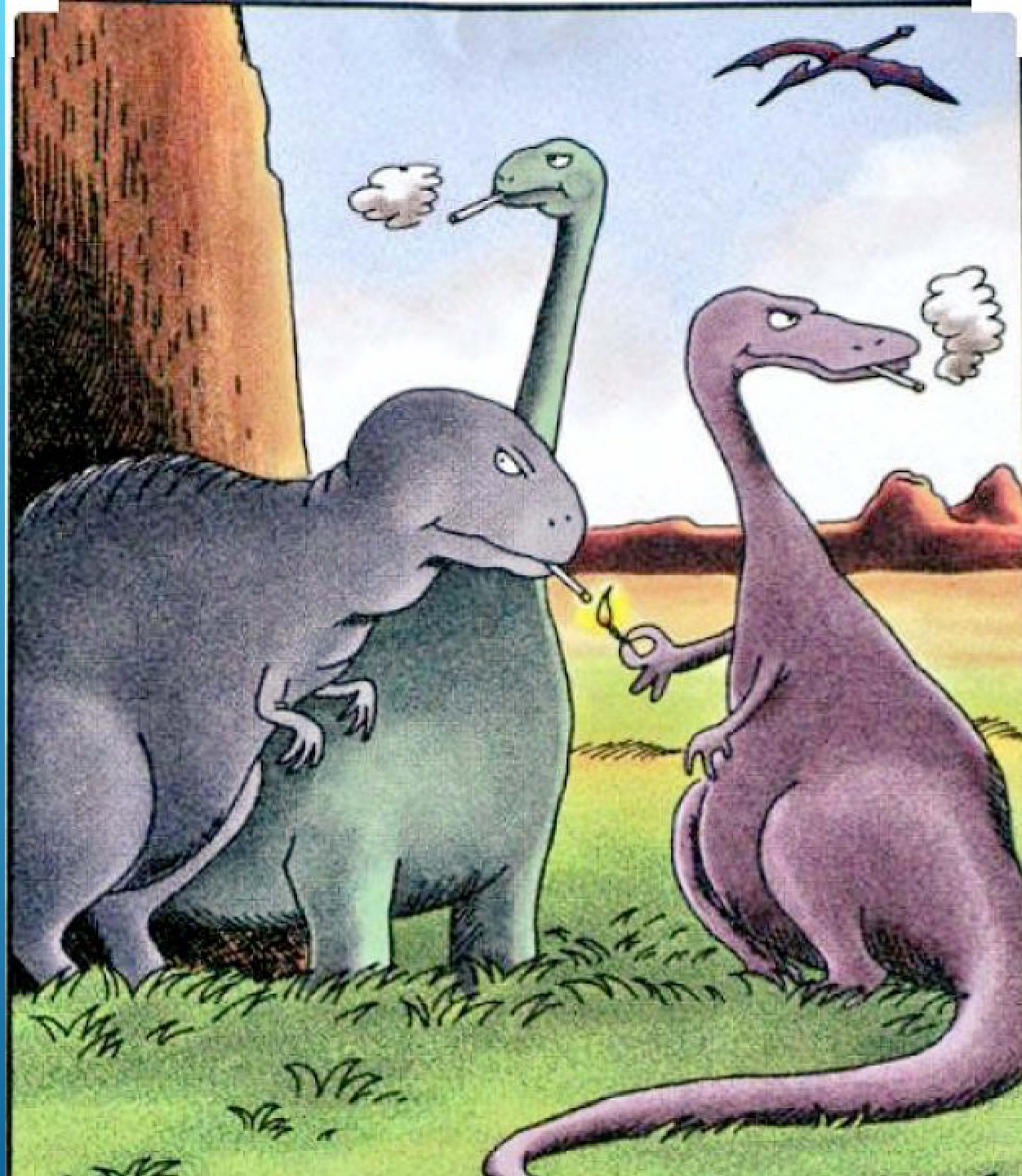
# COLORADO RIVER: Knowing the Past to Understand the Future

Chuck Cullom  
Executive Director  
Upper Colorado  
River Commission



# DROUGHT & DINOSAURS

Evolving in Today's Changing World



# UPPER COLORADO RIVER COMMISSION



- ▶ An interstate water administrative agency established by the 1948 Compact to ensure appropriate allocation of water to the Upper Division States.
- ▶ Serves to ensure commitments under 1922 Compact are met at Lee Ferry and regarding Mexico.
- ▶ Seeks to promote interstate comity and to remove causes of present and future controversies.
- ▶ Comprised of one representative appointed by the Governor of each Upper Division State and one member appointed by the President.

# Colorado River Framing Questions:

*How did we get here?*

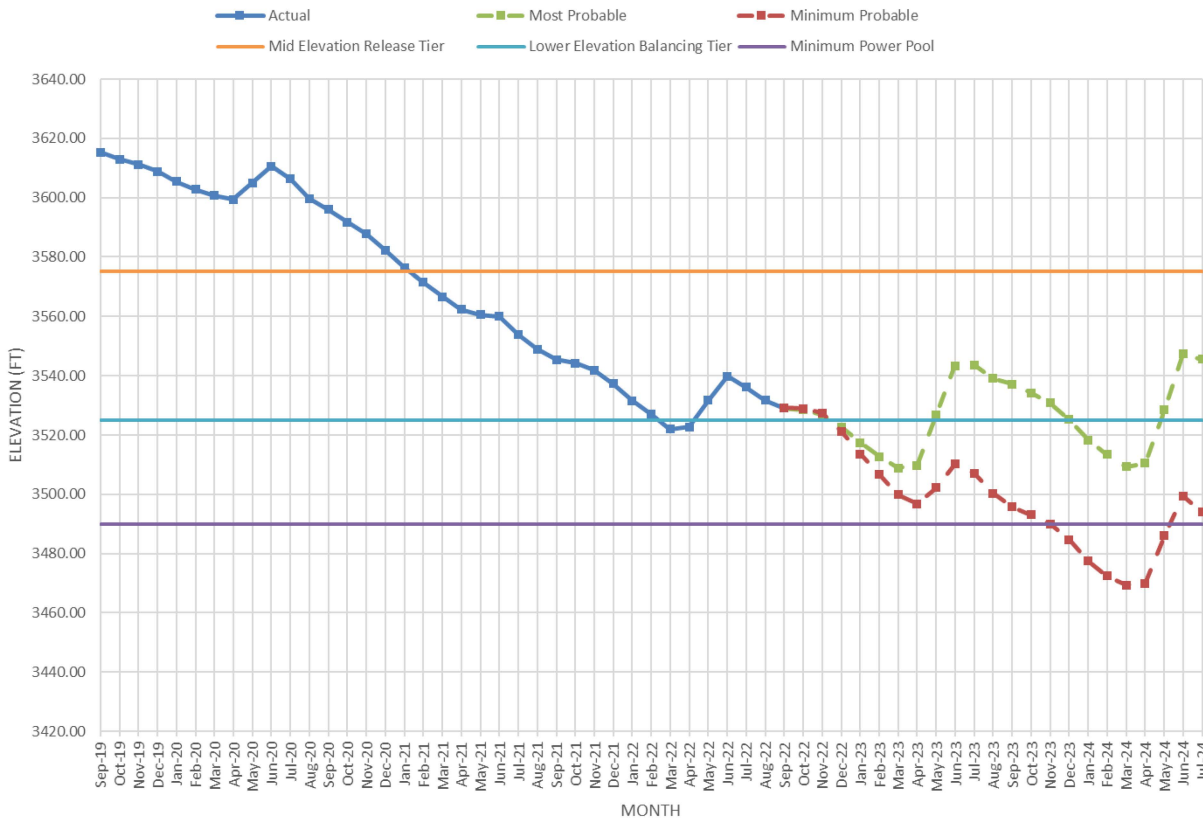
- Lower Basin is suffering Tier 1 and DCP reductions in 2022 & Tier 2 in 2023
- Additional DCP actions have been triggered (but have they?)
- DCP Upper Basin Drought Response Operating Agreement Provisions have been triggered
- Projections show significant risks of continued reductions going forward.

*Where are we heading?*

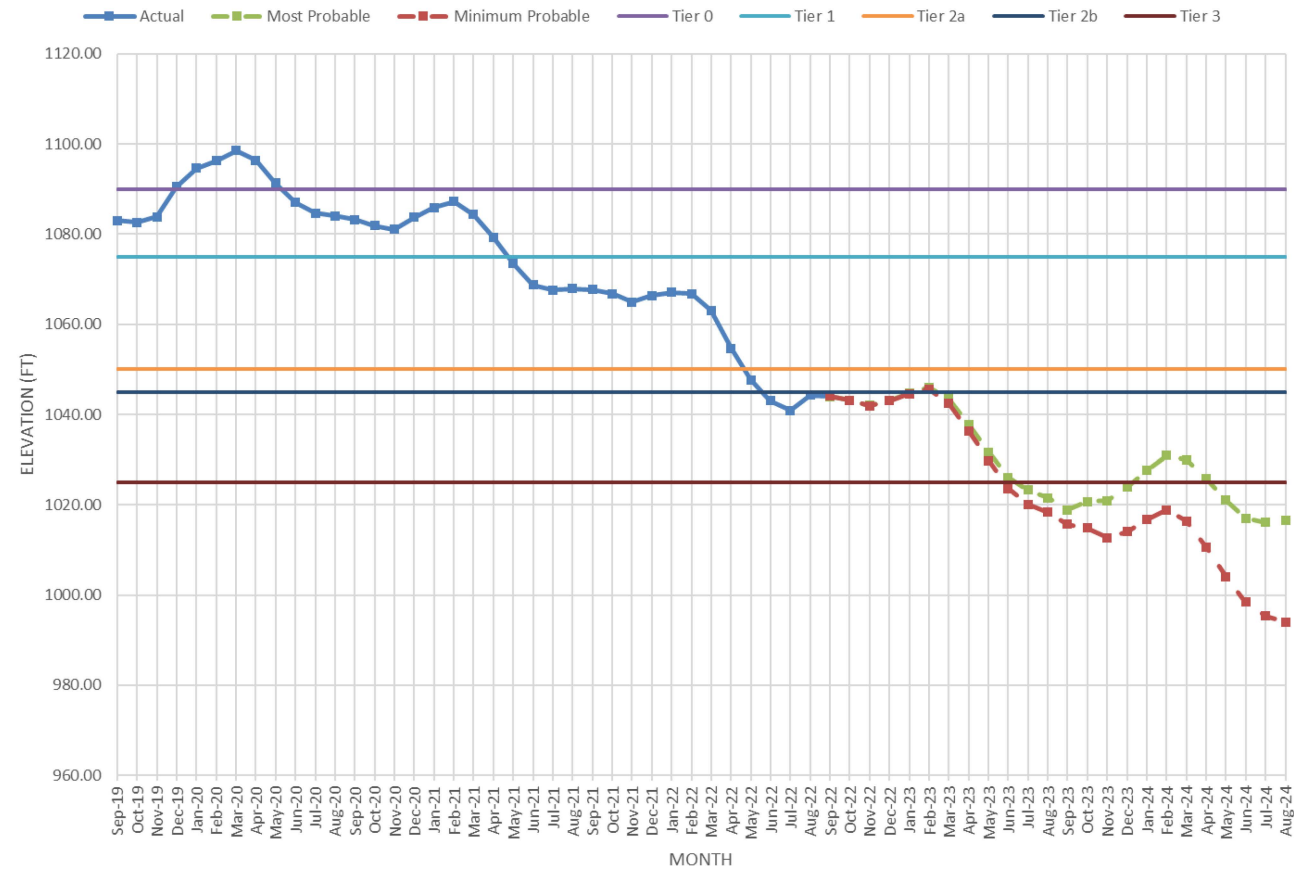
*What is our vision of the future of the Colorado River?*



LAKE POWELL 24 MONTH STUDY SEPTEMBER 2022



LAKE MEAD 24 MONTH STUDY SEPTEMBER 2022



# Four Themes to Understand the Colorado River System:

## 1. *Mass Balance Drives the System*

- Hydrology first and foremost
- $\text{Inflow} = \text{Outflow} \pm \text{Storage}$

## 2. *History Reflects Episodic Adaptive Management to Address Risks*

- Law of the River was born out of conflict and has adapted to changing circumstances

## 3. *The River Community Moves Towards Shared Values and Cooperation*

## 4. *Scarcity (real or perceived) Drives Innovation or Conflict!?*



# WATER POLICY - WISDOM FROM OLAF (FROZEN 2)



- ▶ Water has Memory!
- ▶ The Past is not what it seems!
- ▶ All one can do is the next right thing!

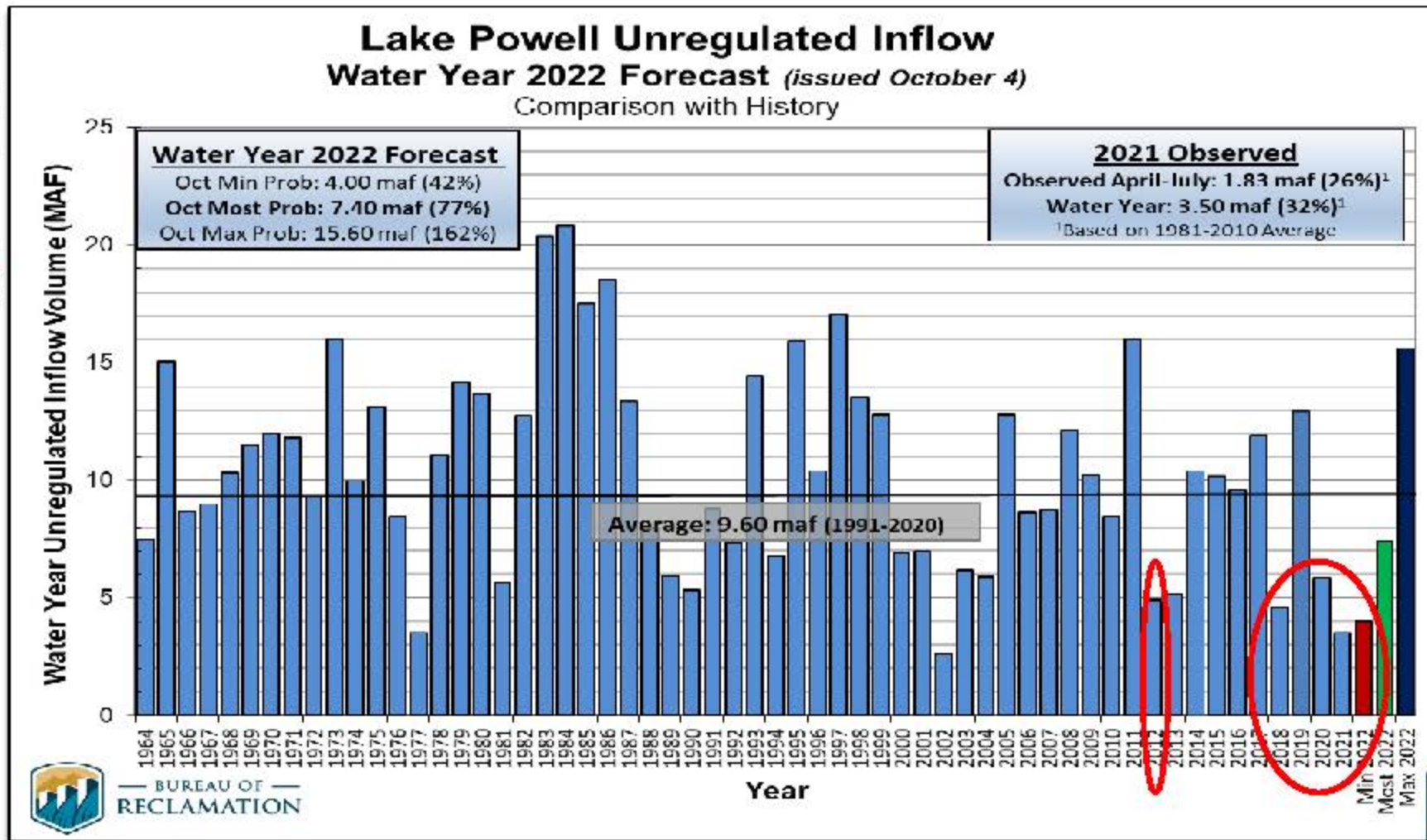
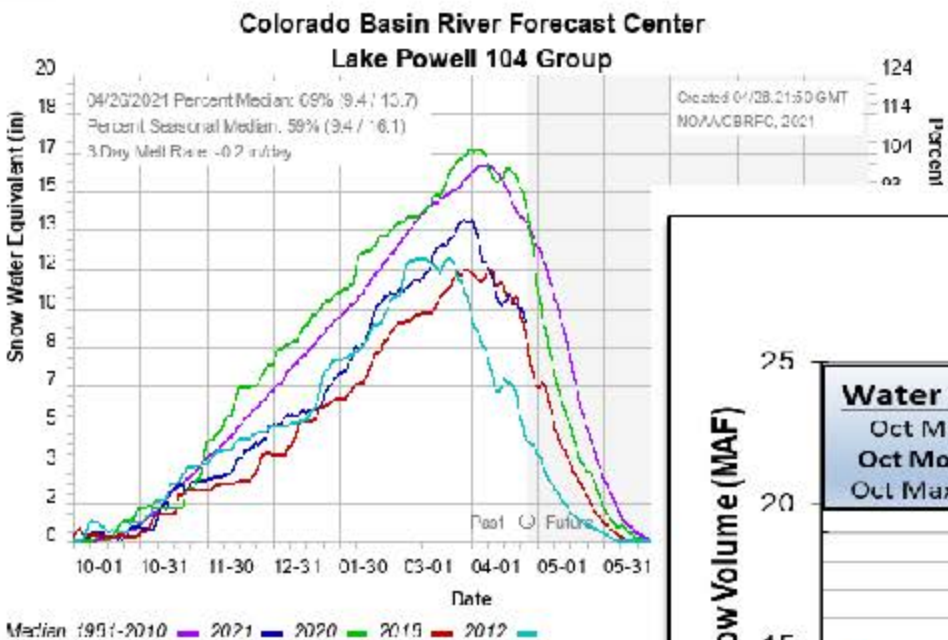
# Water has Memory:

## 1. Mass Balance Drives the System

- Hydrology first and foremost
  - Snow Matters
  - Timing Matters
  - Temperature Matters
  - Highly Variable
- **INFLOW = OUTFLOW +/- STORAGE**



# Snow Matters, Timing Matters & Soil Memory Matters



# What Drives Inflows to Lake Powell?

## 1. *Mass Balance Drives the System*

- Snow pack is the Mass!
- April influences runoff efficiency
- Fall/Spring temps influence runoff (aka soil moisture deficit)
- Water availability drives uses (low runoff ~ low uses)
- **INFLOW = OUTFLOW +/- STORAGE**



# Basin Depletion Trends 2019 - 2021

- **Depletions:**

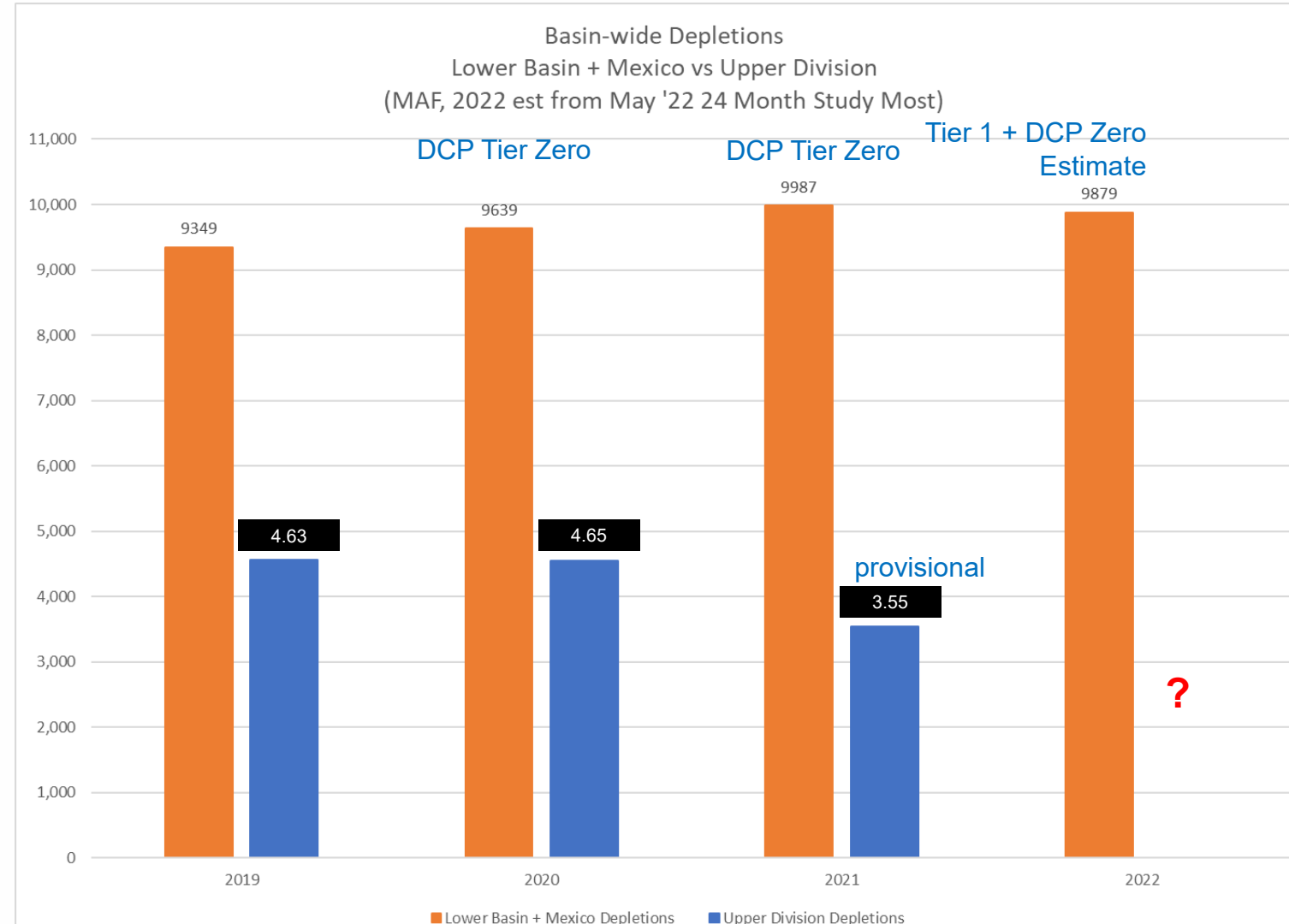
- **Mainstem Lower Basin + Mexico Depletions = Mead CU + Mead Evaporation + Mead Releases (releases serve mainstem CU, evaporation and losses)**
- **Upper Basin Depletions = Uses + CRSPA evaporation, reported in CU&L, supported by UCRC Natural Flow**

- **Trends:**

- **Increasing Lower Basin uses 2019 – 2021, despite significant conservation and contributions**
- **Lower Basin uses out of synch with hydrology, relying on storage and Lake Powell releases**
- **Significant reductions in Upper Basin reflecting impacts of drought**

- **Sources:**

- **BOR Lower Basin Water Accounting Reports**
- **BOR CU&L including provisional Data**
- **'22 May 24 Month Study Most Probable**



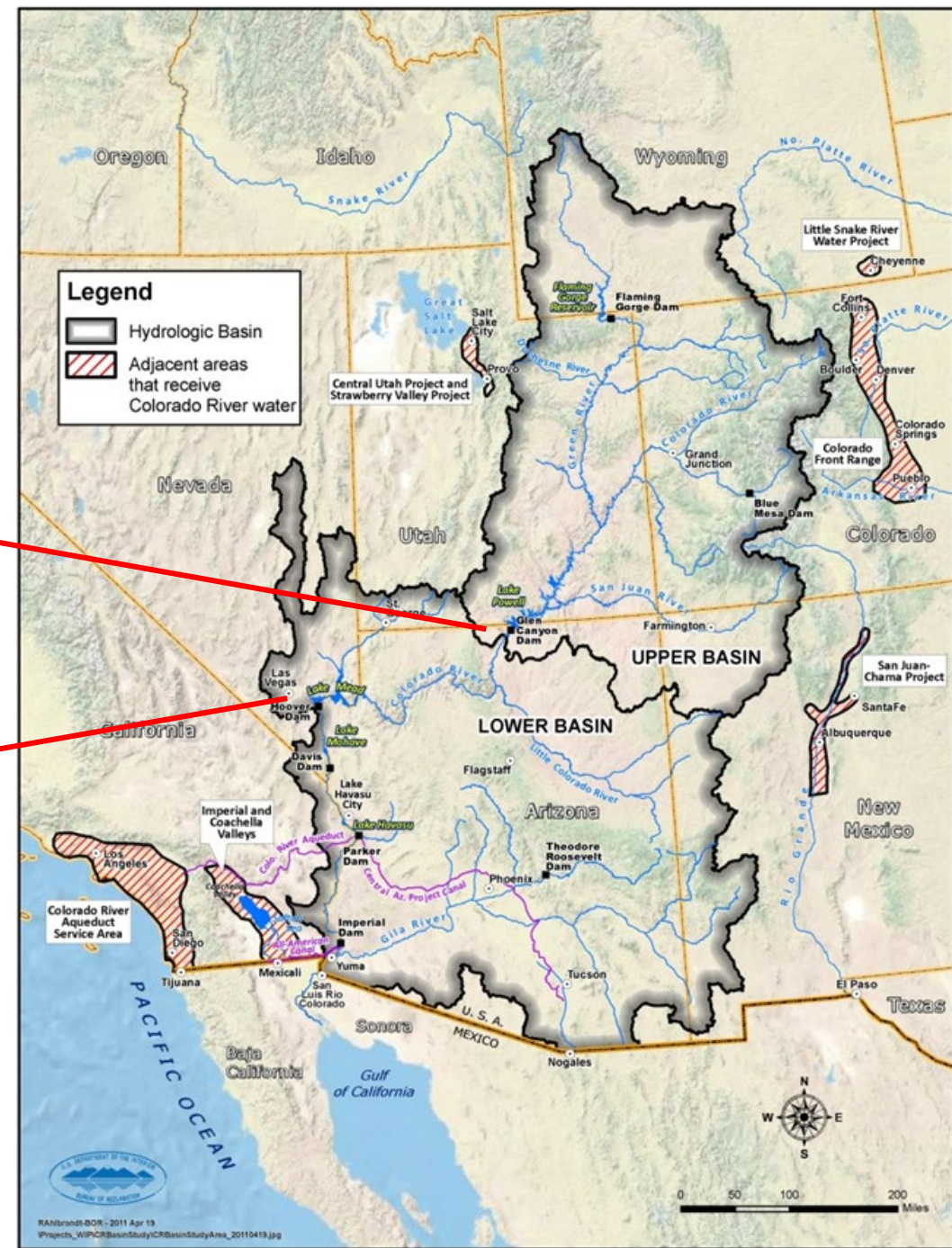
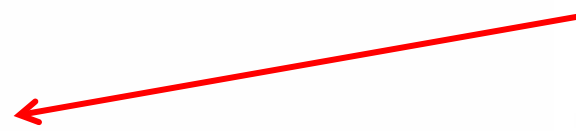
# The Built System: Powell & Mead + Everything Else



25%  
5.8 MAF  
3,530'

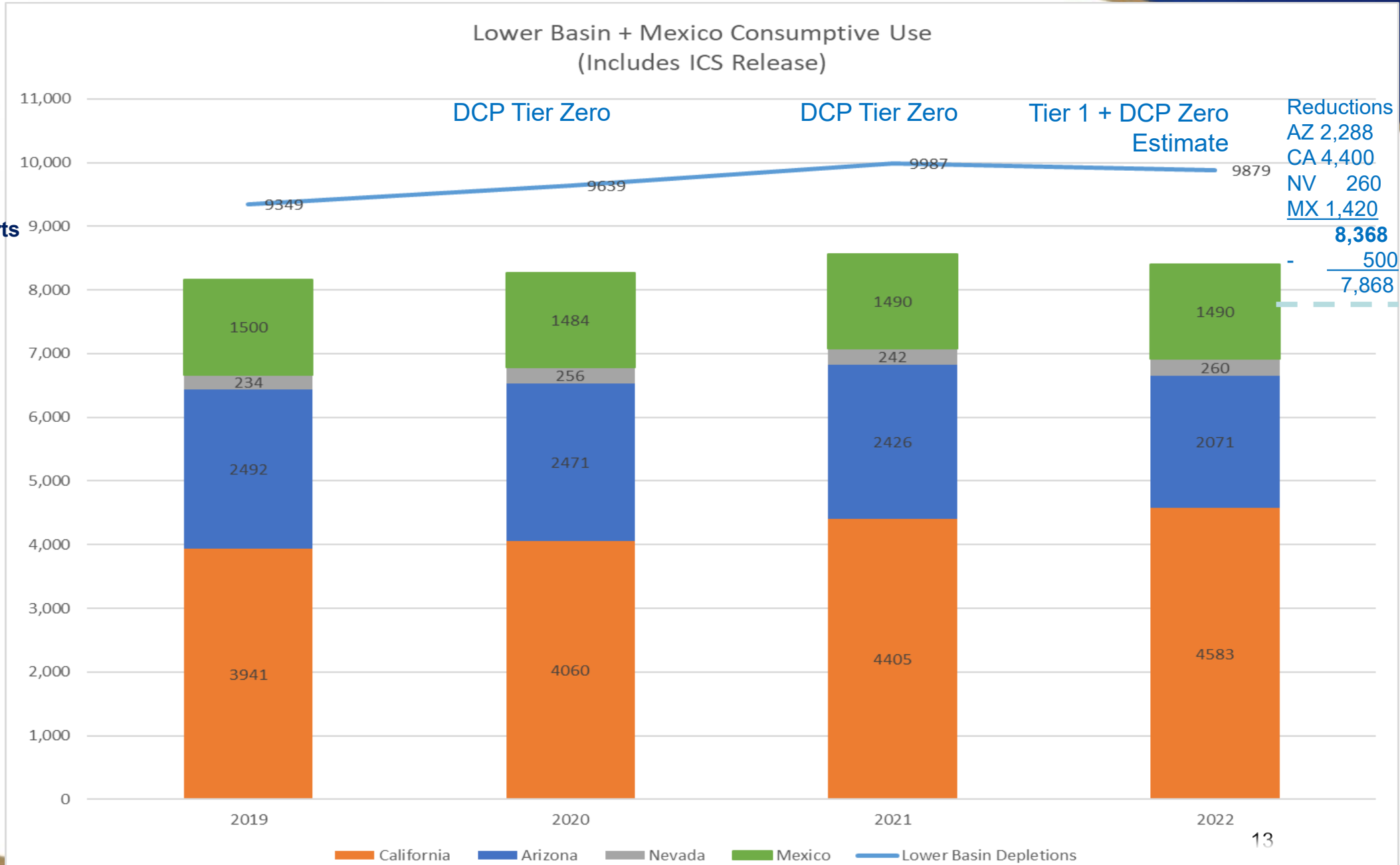


28%  
7.2 MAF  
1,044'



# Lower Basin Use out of synch with flows – relying on storage

- Lower Basin + Mexico CU:**
- Trends:**
    - CA uses increase
    - AZ reductions
  - BOR Accounting Reports**



## Four Themes:

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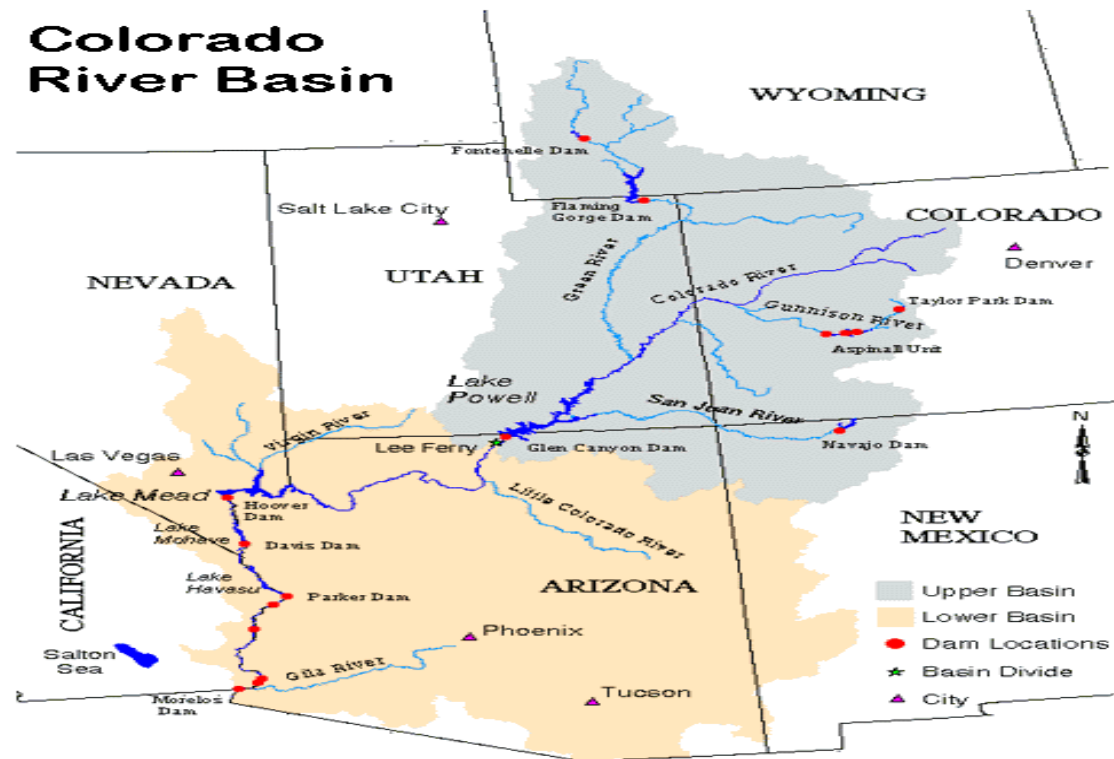
Law of the River Born Out of Conflict – Adaptive & Innovative – **History isn't what it seems**

## 1922 Colorado River Compact

- Imperial Irrigation District vs. Everybody
- Fall Davis Report and Companion Legislation
- Compact Negotiations & Arizona Conflict

### Compact Innovations

- “Promote Interstate Comity” with commitments to work collaboratively
- Recognizes Binational nature of the Colorado River and path for Treaty with Mexico
- Creates space for development and management outside of prior appropriation (equitable apportionment)



## ***1944 Water Treaty with Mexico***

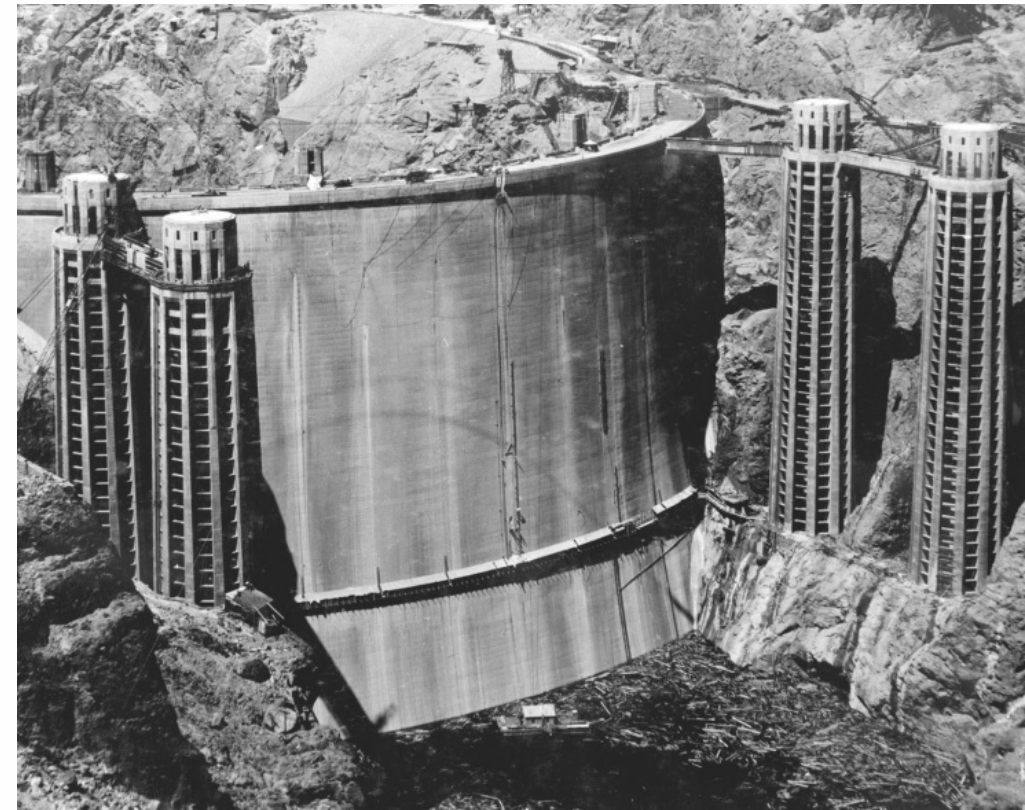
- Conflict due to U.S. upstream development
- U.S. needed to resolve water supply uncertainty with Mexico PRIOR to additional upstream development: CRSP & CBRP

### ***Treaty Innovations***

- Concept of shared risks and shared opportunities between Mexico and the U.S.: drought and surplus provisions
- Recognizes Binational nature of the Colorado River and need for cooperation/collaboration
- Creates unique binational agency to implement the Treaty: IBWC with Mexico and U.S. sections



Signing of 1944 Treaty



Law of the River Born Out of Conflict – Adaptive & Innovative – **History isn't what it seems**

## ***1948 Upper Colorado River Basin Compact***

- Resolves apportionments among Upper Division States
- Necessary to resolve uncertainty among Upper Division PRIOR to additional development: CRSP & CBRP

### ***Compact Innovations***

- Collaboration among the Upper Division States to address shared risks, obligations and opportunities
- Creates unique interstate water agency to implement the Compact: Upper Colorado River Commission



## 1964 Arizona v. California Decree

- Resolves enduring conflict between Arizona and California: Ended ERA of Conflict
- Necessary to resolve uncertainty PRIOR to additional development: CBRP & Central Arizona Project,

### *Decree Innovations*

- Enshrined the Federal role established in the Boulder Canyon Project Act
- Guidance for implementing surplus and shortages
- Framework for transparency and accounting



**Law of the River Born Out of Conflict – Pivot to Shared Values and Cooperation – All one can do is the Next Right Thing**

**1969 National Environmental Protection Act**

**- Structured Decision Making and Stakeholder Engagement**

**1973 Endangered Species Act**

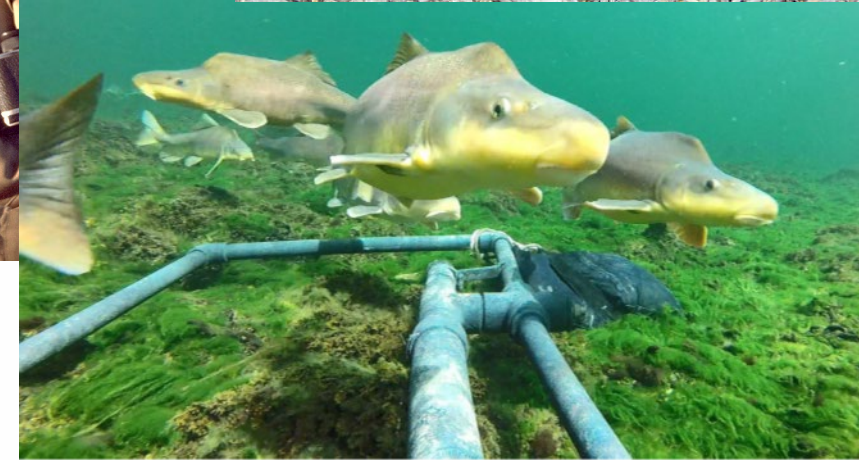
**- More than Engineers in the Decision Space**

**1974 Colorado River Basin Salinity Control Act**

**- Formal venue for Basin-wide collaboration and engagement**

**1992 Grand Canyon Protection Act**

**- Structured and inclusive engagement on Glen Canyon operations (AMWG)**



WHERE ARE WE HEADING? WHAT IS OUR  
VISION FOR THE COLORADO RIVER -  
WISDOM FROM OLAF  
(FROZEN 2)



- ▶ I wish it could be this way forever, and yet **change is mocking us with her beauty!**

# Fake News = Upper Basin isn't Doing Stuff

## Upper Division Conservation Summary

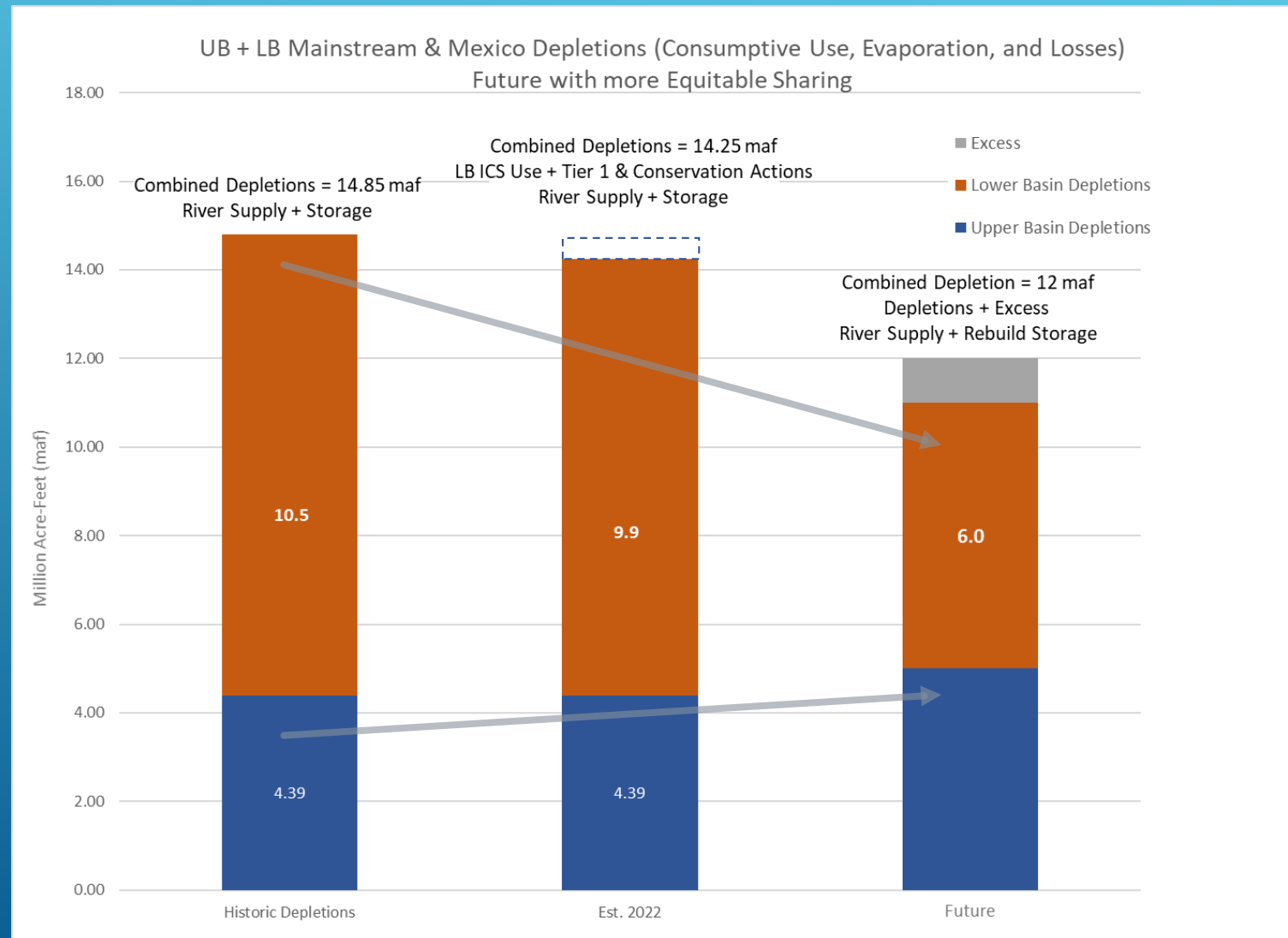
- Upper Division States focus on local and regional water resiliency including water conservation and management (very abbreviated highlights)
- Colorado:
  - Aurora **reduction in water use 36% over 20 year – similar trends along the Front Range**
  - Front Range outdoor water use restrictions EVERYYEAR
  - Legislation to reduce turf/grass
  - \$20M forest and watershed health
- New Mexico
  - Albuquerque reduction in water use to **129 gpcd**
  - Santa Fe water use to **80 gpcd**
  - Outdoor water use restriction EVERYYEAR
- Utah
  - \$500M for water conservation initiatives
  - Statewide turf removal program
  - Ag efficiency programs
  - Water banking
  - Outdoor water use restrictions including 1 day/week limits
- Wyoming
  - Cheyenne non-functional turf removal
  - **84 gpcd**
  - Outside water use efficiency + enforcement

# Fake News = Upper Basin isn't Doing Stuff

## Upper Division 5 Point Plan Components

- Upper Division States response to Commissioner Touton's call for additional actions to protect Colorado River infrastructure – Glen Canyon and Hoover Dam, as well CRSP upstream initial units
  - System Conservation Pilot Program
  - Consider DROA 2023 Planning in August 2022
  - Consider Demand Management Program
  - Implement BIL DCP Funding
  - Continue Strict Water Management
    - Regulation and enforcement of water rights consistent with annual available supply
    - Implement new aggressive water conservation programs

# A FUTURE THAT BALANCES DEPLETIONS WITH SUPPLIES = RESILIENT, ADAPTABLE, IMPLEMENTABLE, SUSTAINABLE & EQUITABLE





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# Upper Colorado River Commission

Fostering Partnerships on the Colorado River

ABOUT THE UCRC