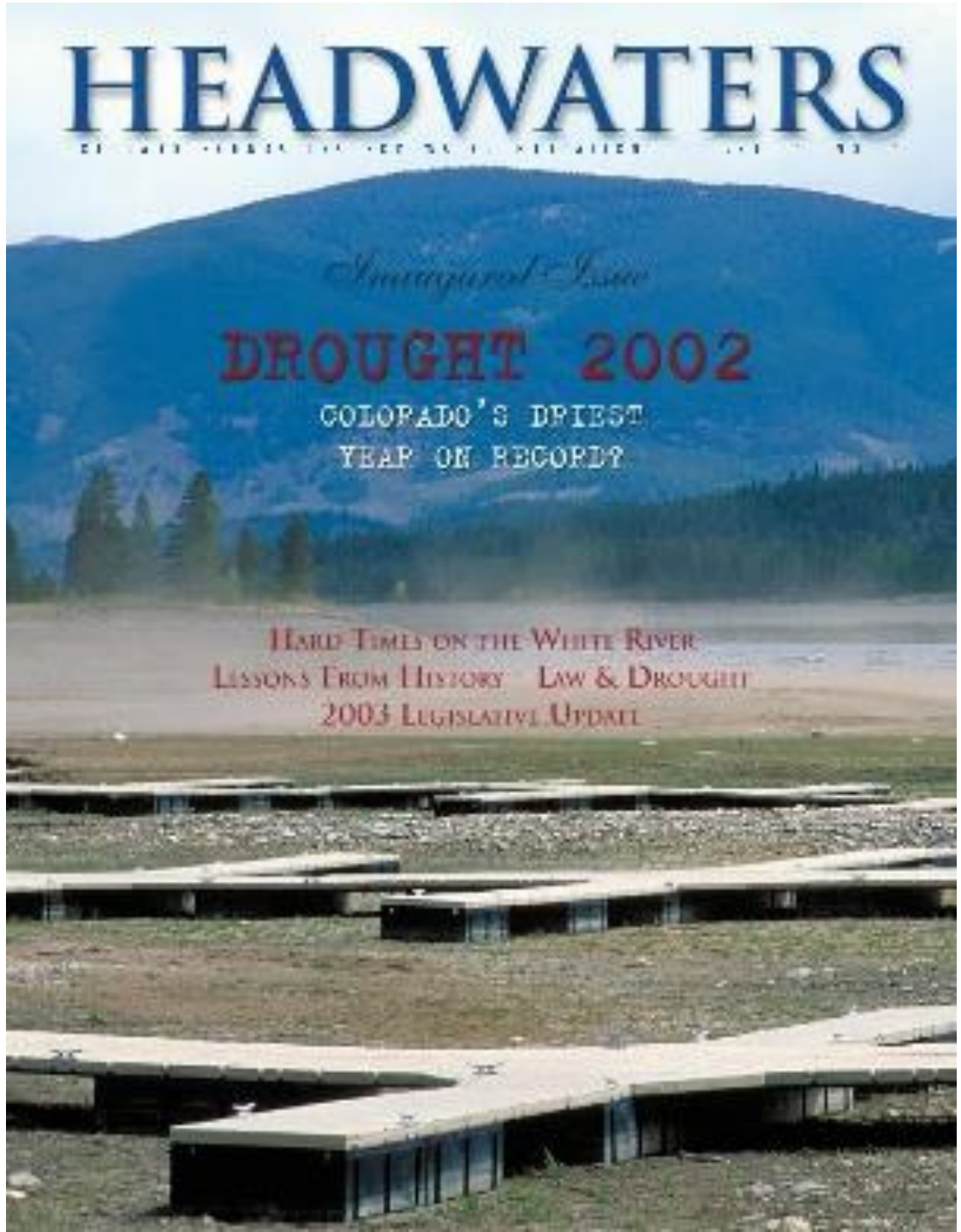
COLORADO WATER CONGRESS
INFORM | CONNECT | TRAIN | ACT

WATER EDUCATION COLORADO

Demystifying Colorado Water for Legislators –

“201” Level Colorado River

March 1, 2023



Legislative founding – HB02 1152

WELCOME FROM DIANE HOPPE
INAUGURAL ISSUE, HEADWATERS MAGAZINE

Welcome, readers, to this inaugural issue of *Headwaters* magazine published by the Colorado Foundation for Water Education. I certainly hope you enjoy it.

The Colorado Foundation for Water Education was established legislatively by the Colorado General Assembly in 2002, during one of the state's worst droughts. The purpose and mission of the Foundation is to promote a better understanding of water issues through educational opportunities and resources, so Colorado citizens will understand water as a limited resource and make informed decisions. The Foundation does not take an advocacy position on any water issue.

Headwaters magazine is designed to provide up-to-date information on recent events and fundamental concerns related to Colorado's water resources. Growth, legal developments, drought, floods and the use of water in the everyday lives of Coloradans are some of the very public and personal themes we will explore in every quarterly issue.

The feature of this inaugural issue is drought, a very timely topic in the fall of 2003. In this issue we recount the 2002 drought – its severity and what it says about our vulnerability to future droughts. Thank you, Roger Pielke, our State Climatologist, for presenting us with important information on just how little precipitation we did receive during last year's withering dry spell. Reagan Waskom, Colorado State University, provides us with critical information on how severe drought conditions in 2002 had significant impacts on the state's economy and natural resources. And, as Justice Hobbs recounts, drought events have profoundly shaped our state's water laws and institutions.

Our 'Profiles' section features individuals from around the state whose lives are shaped by their relationship and dependence on our water resources. In this issue we highlight residents from the small town of Meeker who all managed to "give a little bit" so that the community as a whole could survive in tough times.

In our special section 'Voices' we ask writers and poets to submit their original work. Thank you, Mary Crow, Colorado's Poet Laureate, for creating the poem "Colorado Drought" especially for this inaugural issue of the magazine. Also, thanks to Katie Post, for sharing your River Of Words prize winning poem, "I Am the Headwaters."

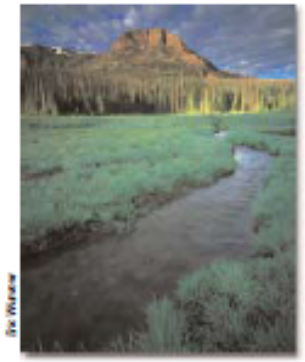
I hope you will consider becoming a member of the Foundation and subscribing to *Headwaters* magazine.

The Foundation for Water Education is a non-profit organization, and proceeds from your membership or subscription will be used to fund additional water education efforts.

Thank you!

Diane Hoppe

State Representative (R Sterling)
& President, CFWE



Flat Tops Wilderness, Upper Colorado River Basin

"Growth, legal developments, drought, floods and the use of water in the everyday lives of Coloradans are some of the very public and personal themes we will explore in every quarterly issue."

THE COLORADO RIVER

How We Got Here and What's Coming Next

Colorado General Assembly

March 1, 2023

Anne Castle

COLORADO RIVER BASIN

SOUND BITES

- Serves 40 million people in US and MX
- Irrigates 5 million acres
- 30 Native American tribes
- 11 National Parks
- Supports $1.4 trillion economy, including $26+ billion recreational industry

UPPER BASIN/COLORADO CONCERNS IN 1922

- California developing much faster than upper states and using up water
- Will there be any water left for us?
- US Supreme Court opinion in Wyoming v. Colorado in 1922
  - Prior appropriation applies between states, unless otherwise agreed

COLORADO RIVER COMPACT 1922

- River divided equally, sort of
- Lower Basin gets 7.5 MAF + 1.0
- Upper Basin gets 7.5 MAF, but . . .
- If deliveries to Mexico in future, split equally between Upper and Lower Basin
- Based on wet hydrology and wishful thinking

No. 6227

United States of America

DEPARTMENT OF STATE

To whom these presents shall come, Greeting:

I Certify That the document annexed is a true copy of the River Compact," signed 24th November, 1922, at the Santa Fe, New Mexico, the original of which is on file in this Department.

In testimony whereof I, Charles E. Hughes, Secretary of State, have hereunto caused the Seal of the Department of State to be affixed and my name subscribed by the Chief Clerk of the said Department, at the City of Washington, this twenty-second day of December, 1922.

Charles E. Hughes
Secretary of State.

By Wm. Phillips Davis
Chief Clerk.

COMPACT LANGUAGE

There is hereby apportioned to the Upper Basin and the Lower Basin, respectively, the exclusive use of 7,500,000 acre-feet of water per annum

The Lower Basin is given the right to increase its use by one million acre-feet per annum

The Upper Basin will not cause the flow of the river at Lee Ferry to be depleted below 75,000,000 acre feet over any period of ten consecutive years

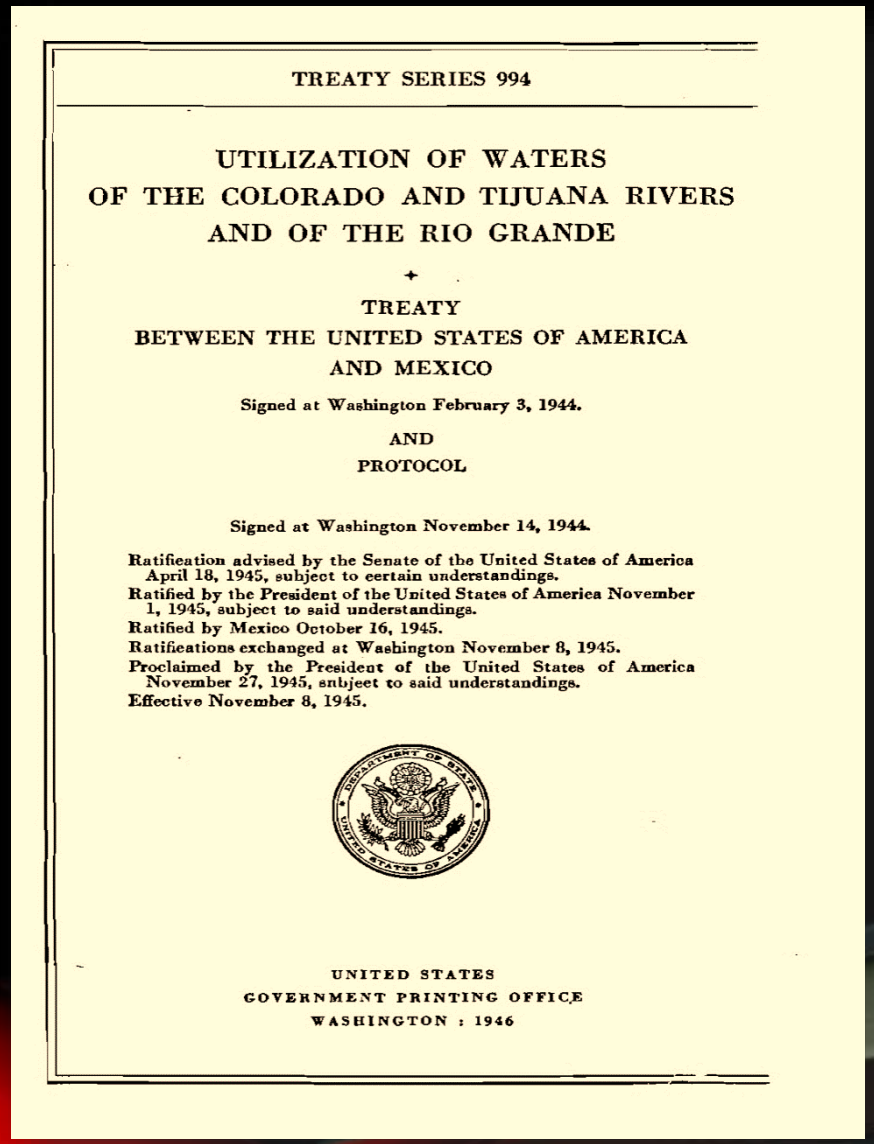
Present perfected rights to the beneficial use of waters of the Colorado River System are unimpaired by this compact.

1928 Boulder Canyon Project Act

- Approved 1922 Compact
- Lower Basin authorized allocations

California:	4.4 MAF
Arizona:	2.8 MAF
Nevada:	0.3 MAF
	7.5 MAF

1944 Treaty - Mexico's Allocation



TREATY SERIES 994

UTILIZATION OF WATERS
OF THE COLORADO AND TIJUANA RIVERS
AND OF THE RIO GRANDE

✦

TREATY
BETWEEN THE UNITED STATES OF AMERICA
AND MEXICO

Signed at Washington February 3, 1944.

AND
PROTOCOL

Signed at Washington November 14, 1944.

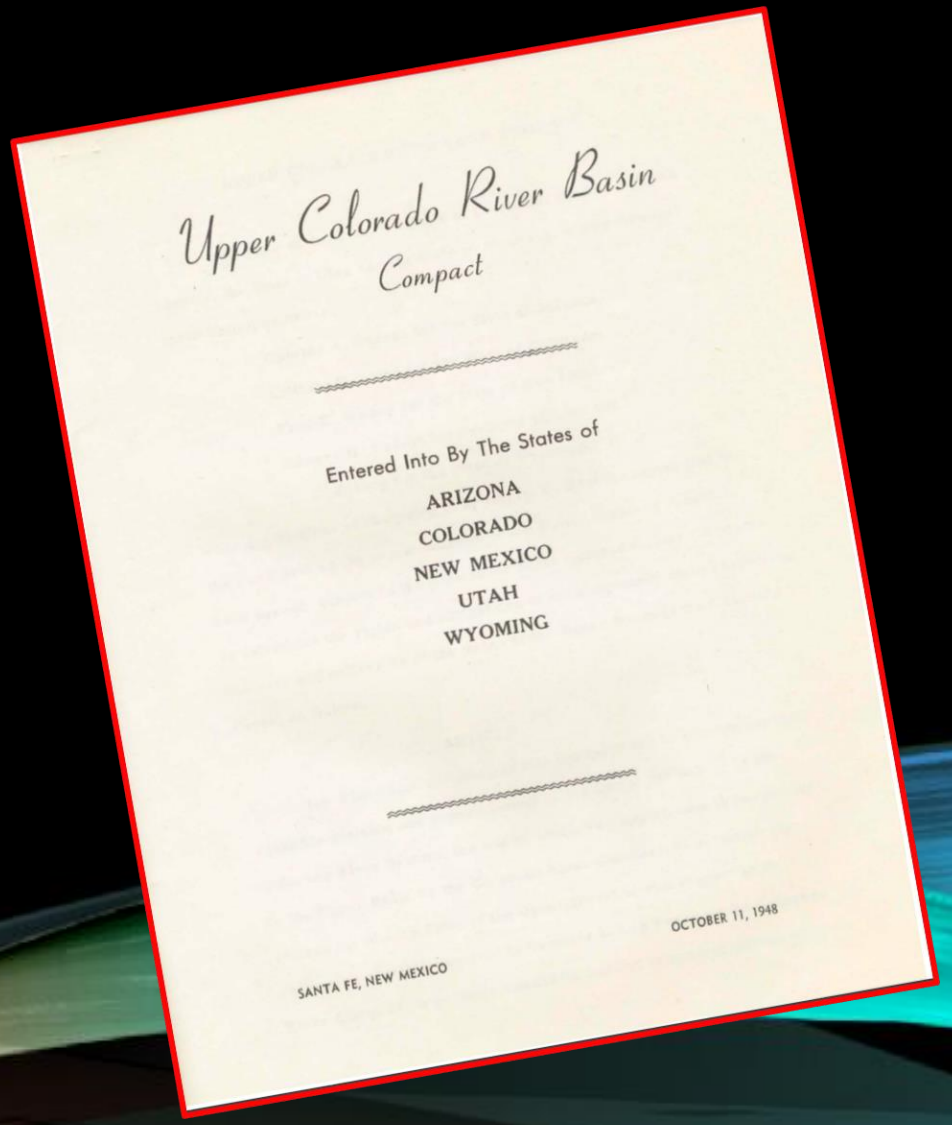
Ratification advised by the Senate of the United States of America April 18, 1945, subject to certain understandings.
Ratified by the President of the United States of America November 1, 1945, subject to said understandings.
Ratified by Mexico October 16, 1945.
Ratifications exchanged at Washington November 8, 1945.
Proclaimed by the President of the United States of America November 27, 1945, subject to said understandings.
Effective November 8, 1945.

UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1946

- 1.5 MAF/year
- Reductions in event of extraordinary drought

1948 Upper Basin Compact

- Allocates water among Upper Basin states
- Establishes Upper Colorado River Commission
  - 1 commissioner from each state; 1 federal
- Anticipates curtailment may be required to comply with Compact



1948 Upper Basin Compact

Upper Basin allocations

Colorado:	51.75%
New Mexico:	11.25%
Utah:	23%
Wyoming:	14%

Next . . .

- 1956 - Colorado River Storage Project Act
  - Authorized Aspinall Project (Blue Mesa), Glen Canyon Dam, Flaming Gorge, many others
- 1968 - Colorado River Basin Project Act
  - Authorized Central Arizona Project
  - **Subordinated CAP to California and Nevada allocations**

21st Century Efforts to Address the "Drought"

DROUGHT CONTINGENCY PLANS

- Additional actions necessary to reduce risk of critical levels in Mead and Powell
- Separate plans for Upper and Lower Basins
- Executed in 2019, effective through 2026

Lower Basin DCP Reductions in Deliveries

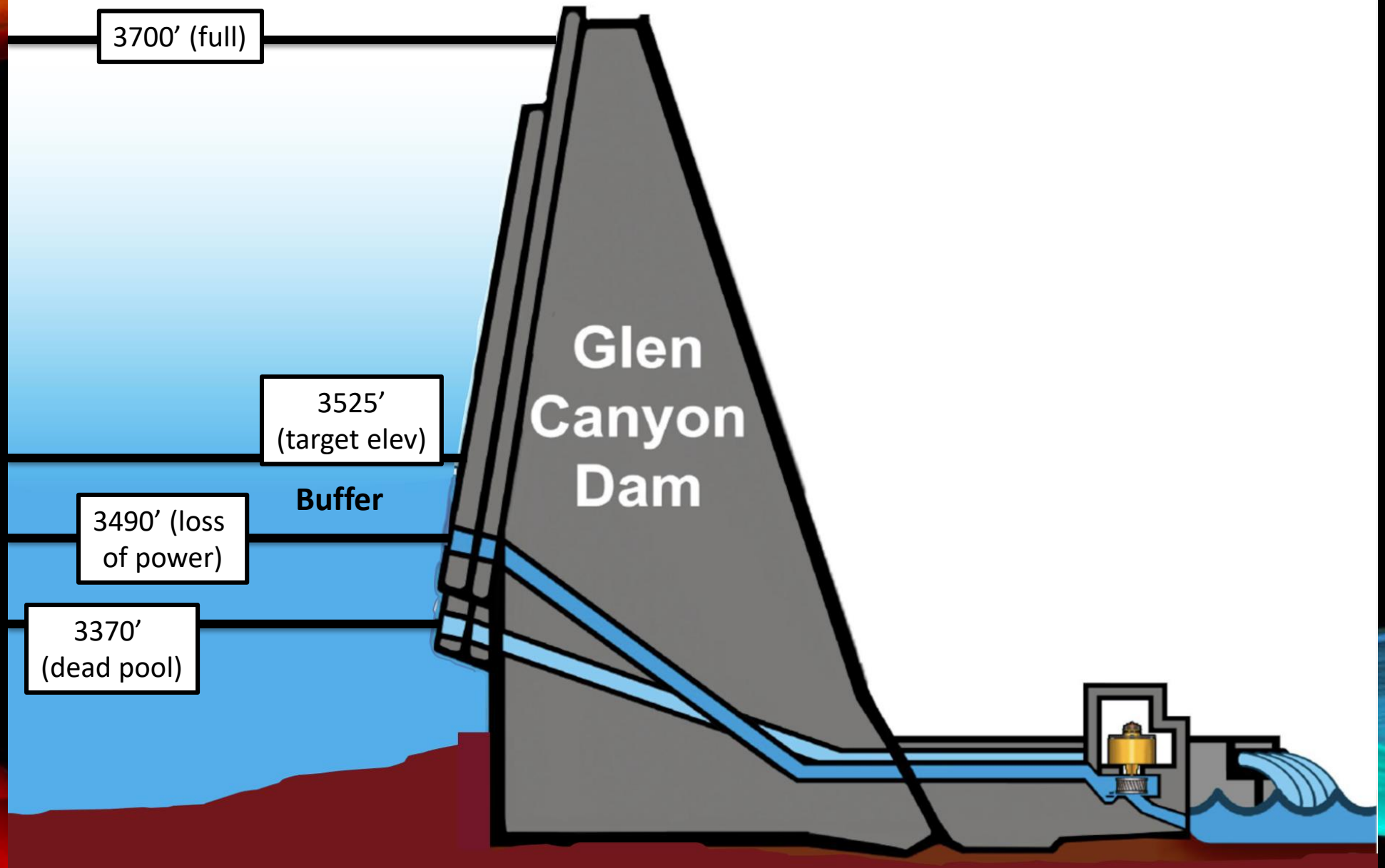
Lake Mead Elevation	AZ 2007	AZ DCP	AZ TOTAL	NV 2007	NV DCP	NV TOTAL	CA 2007	CA DCP	CA TOTAL	BOR DCP	MX Min 323	MX BWSCP	MX Total	TOTAL
≤1090 >1075	0	192K	192K	0	8K	8K	0	0	0	100k	0	41k	41k	341k
≤1075>1050	320K	192K	512K	13K	8K	21K	0	0	0	100k	50k	30k	80k	713k
≤1050>1045	400K	192K	592K	17K	8K	25K	0	0	0	100k	70k	34k	104k	821k
≤1045>1040	400K	240K	640K	17K	10K	27K	0	200K	200K	100k	70k	76k	146k	1,113k
≤1040>1035	400K	240K	640K	17K	10K	27K	0	250K	250K	100k	70k	84k	154k	1,171k
≤1035>1030	400K	240K	640K	17K	10K	27K	0	300K	300K	100k	70k	92k	162k	1,229k
≤1030>1025	400K	240K	640K	17K	10K	27K	0	350K	350K	100k	70k	101k	171k	1,288k
≤1025	480K	240K	720K	20K	10K	30K	0	350K	350K	100k	125k	150k	275k	1,475k

Upper Basin DCP

Drought response operation of Upper Basin reservoirs

Demand management investigation

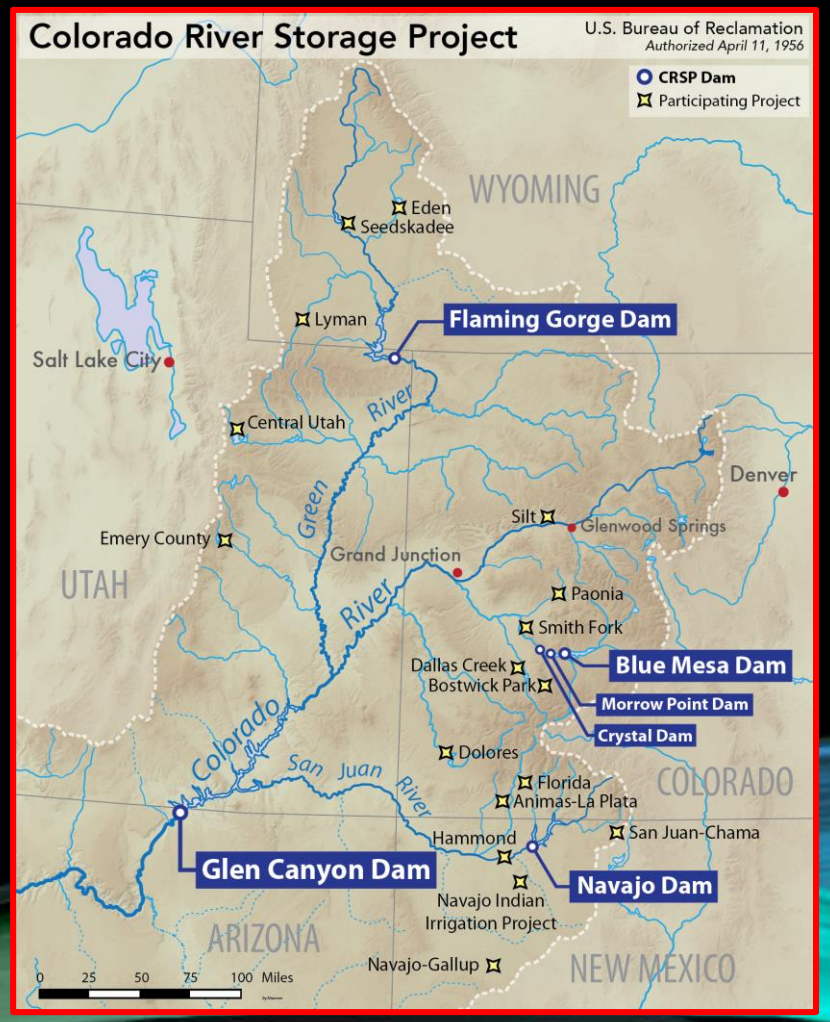
Lake Powell



Adapted from Bureau of Reclamation

Drought Response Ops

- Releases from upper reservoirs
- Maintain target elevation of 3,525 feet at Powell
- Maintain hydropower generation and meet Compact obligations



Actual Drought Response Ops

- **2021-22** – Release of 161,000 acre feet under emergency authority of Secretary of Interior
  - Flaming Gorge Res – 125,000 af
  - Blue Mesa – 36,000 af
- **2022-23** – Planned release of 500,000 af
  - All from Flaming Gorge
  - Proposed reduction of releases in March/April 2023, reducing total to approximately 461,000 af
- **2023-24** – Possible storage recovery at Flaming Gorge

Demand Management Storage

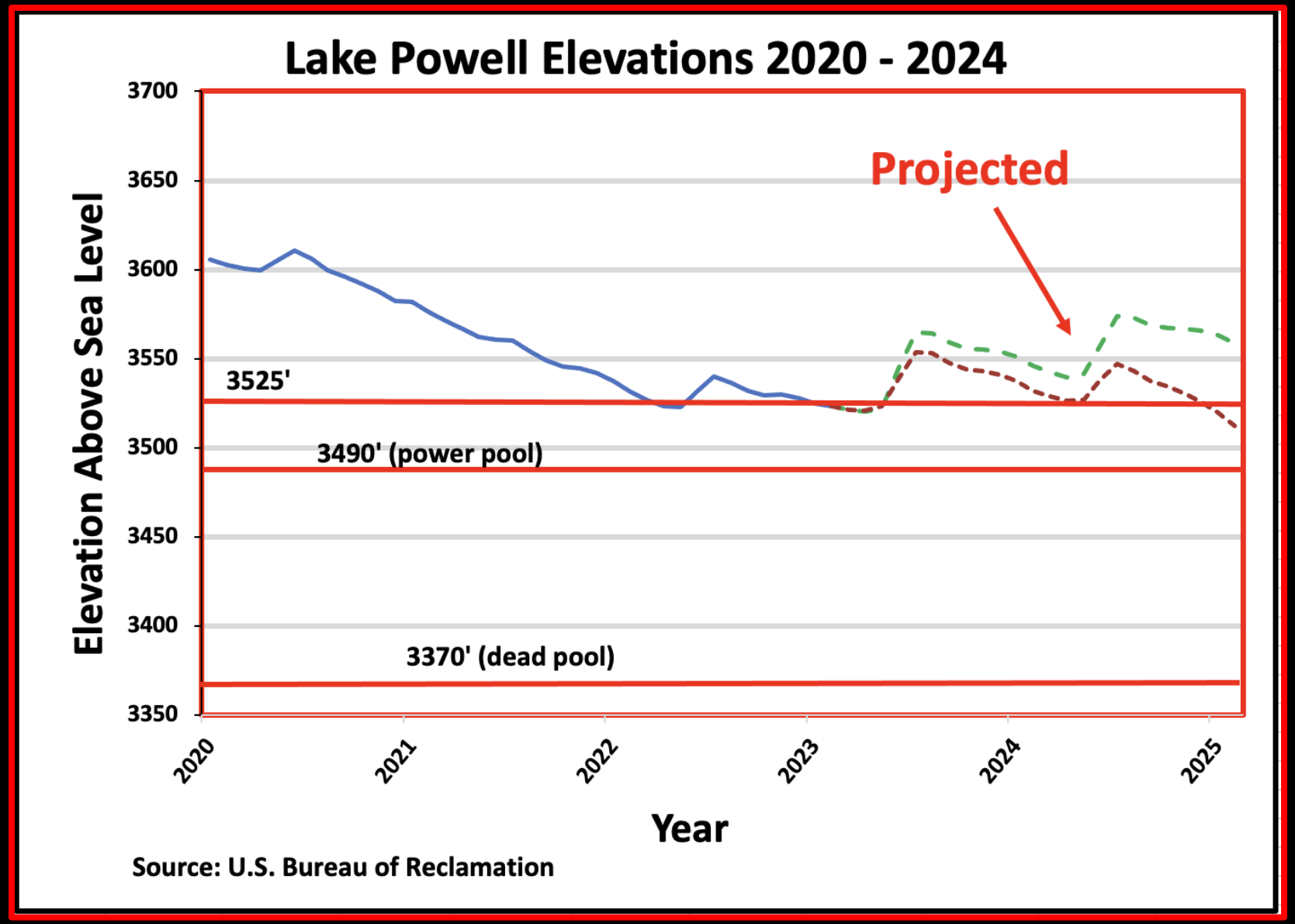
- Authorizes use of unfilled capacity in UB reservoirs
  - No charge
  - No balancing
  - 500,000 af max
- **Provides for exploring DM program – ongoing in each state**

HYDROPOWER GENERATION

- Significant role in agricultural production and reducing fossil fuel reliance
- Backs up wind and solar
- Funds water projects and environmental programs

- Power production has declined precipitously
  - Hoover Dam – down by 25%
  - Glen Canyon Dam – down by 47%

LAKE POWELL PROJECTED LEVELS



STATUS TODAY

Lake Powell - 3521 ft

Lake Mead - 1047 ft

- Reclamation's projections for 2024 (minimum probable)
  - Lake Powell < 3520 ft
  - Lake Mead < 1000 ft

COMMISSIONER'S DIRECTIVE

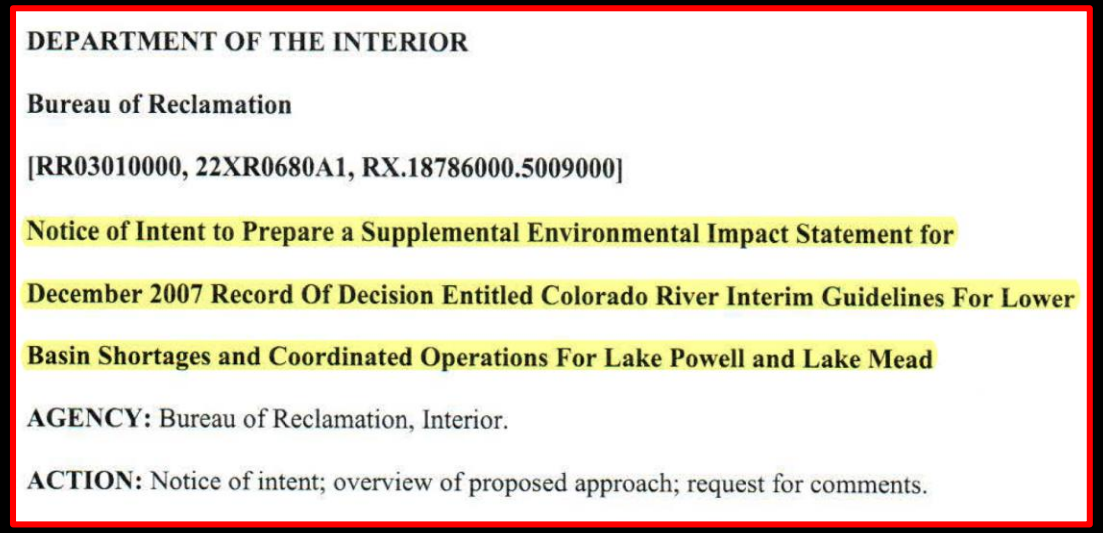
- June 14, 2022 – Hearing of Senate Energy and Natural Resource Committee
- Basin states need to cut 2 – 4 million acre feet of water usage in 2023
- Asked for plan by mid August
- Interior has authority to act unilaterally to protect the system

UPPER BASIN 5-POINT PLAN

- Purpose - proactively support critical infrastructure and resources
- Elements
  1. Reauthorize System Conservation Pilot Program
  2. Commence development of 2023 DROA plan
  3. Consider Upper Basin Demand Management program
  4. Use BIL funding for better measurement & monitoring
  5. Continue strict water management and administration

SUPPLEMENTAL EIS

- Notice from Interior of intent to consider emergency options



DEPARTMENT OF THE INTERIOR

Bureau of Reclamation

[RR03010000, 22XR0680A1, RX.18786000.5009000]

Notice of Intent to Prepare a Supplemental Environmental Impact Statement for December 2007 Record Of Decision Entitled Colorado River Interim Guidelines For Lower Basin Shortages and Coordinated Operations For Lake Powell and Lake Mead

AGENCY: Bureau of Reclamation, Interior.

ACTION: Notice of intent; overview of proposed approach; request for comments.

- Preference for alternative based on consensus of Basin States
  - But prepared to supplement with Interior authority

STATUS

- Modeling assumptions proposed for Interior's environmental compliance analysis
  - One proposal from California
  - One from other 6 states
- No agreement as yet but talks continue
- Major source of disagreement is allocation of reductions to California

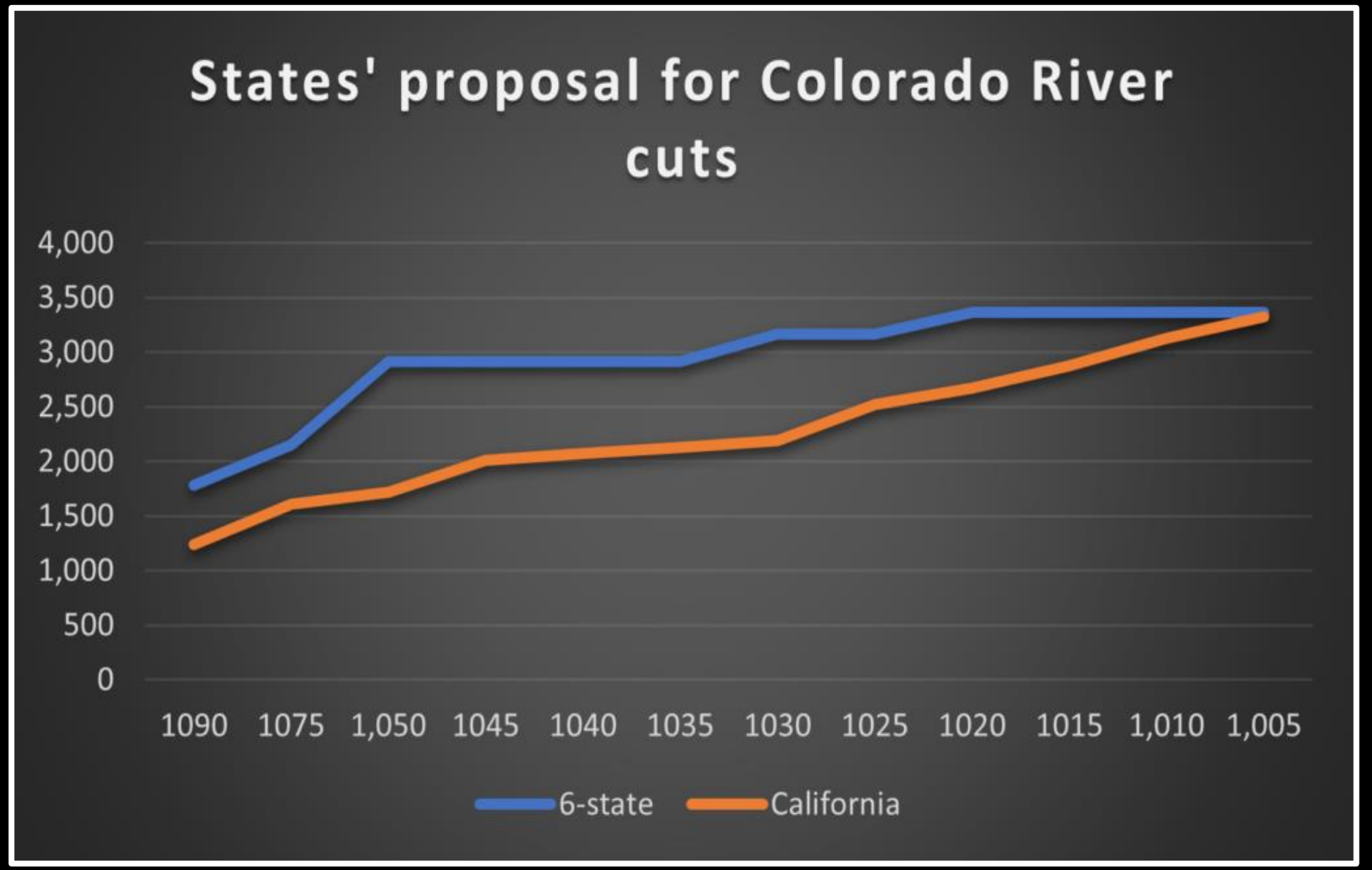
6-STATE PROPOSAL MAJOR COMPONENTS

- Assess evaporation and system losses of 1.543 MAF
  - Based on proportion of use and stream reach
- Additional reductions of 450,000 af below elevation 1030’
- Move Tier 3 shortage reductions to Tier 2 elevation
- Upper Basin
  - Change Lake Powell tier levels and releases for protection
  - DROA releases up to 500,000 af
  - Recognize hydrologic shortage and do additional voluntary conservation (unspecified amount)

CALIFORNIA PROPOSAL MAJOR COMPONENTS

- Assess 1.0 MAF of reductions (not called evaporation, but it could be)
  - Majority allocated to Arizona
- Reduce Lake Mead releases below 1025’ in a graduated manner
- Upper Basin
  - Change Lake Powell tier levels and releases
  - DROA releases up to 500,000 af
  - Up to 500,000 af additional voluntary conservation

Reduction Comparison

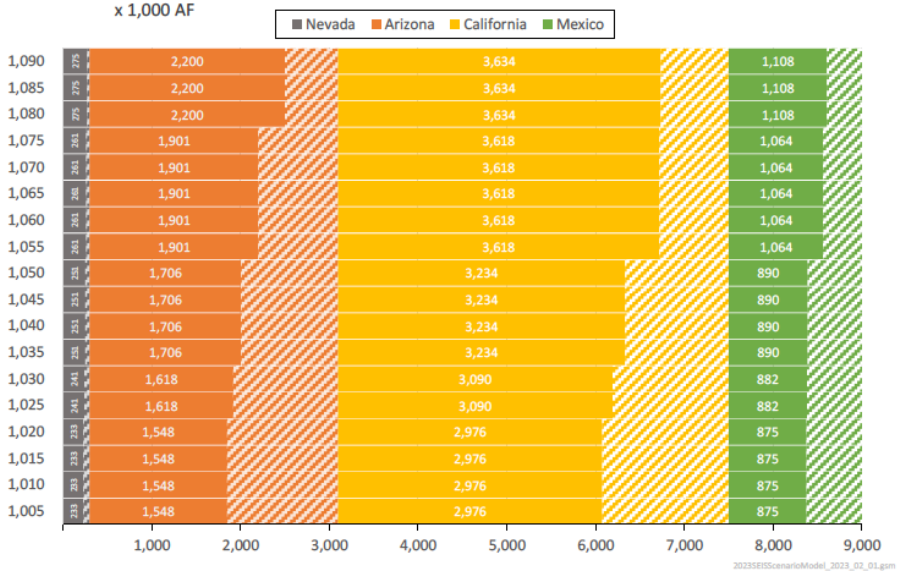


Reduction Comparison

Comparison of Alternatives

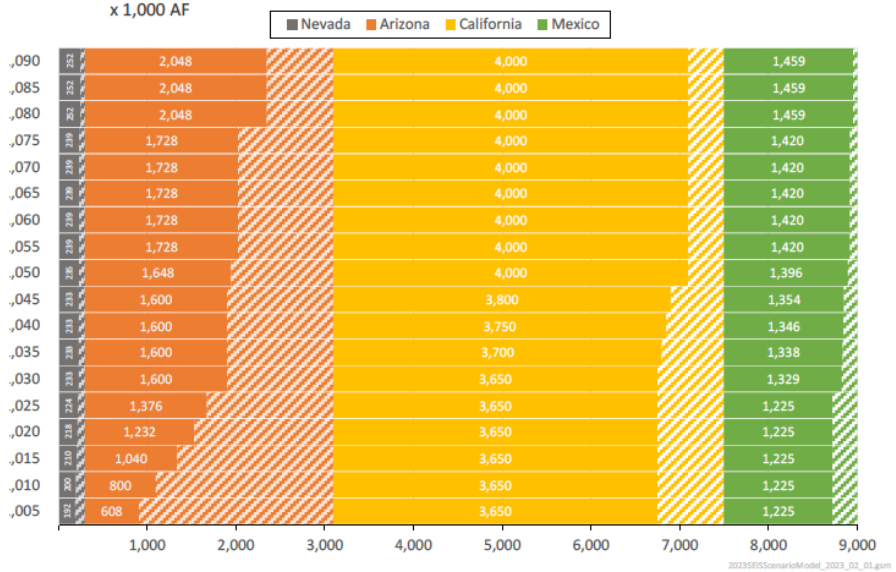
Consensus-Based Modeling Alternative

Available as Compared to Apportionments



California Alternative

Available as Compared to Apportionments



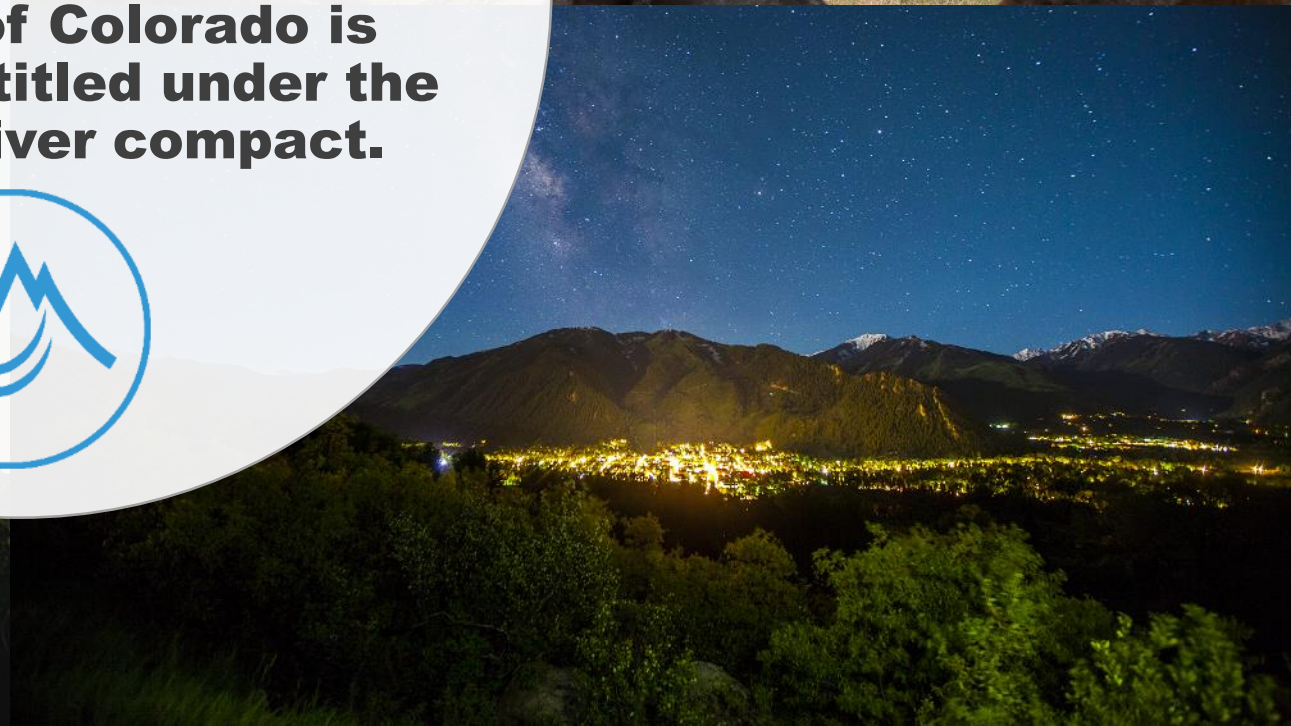
Provisional data, subject to change

CAP
CENTRAL ARIZONA PROJECT

MAJOR ISSUES

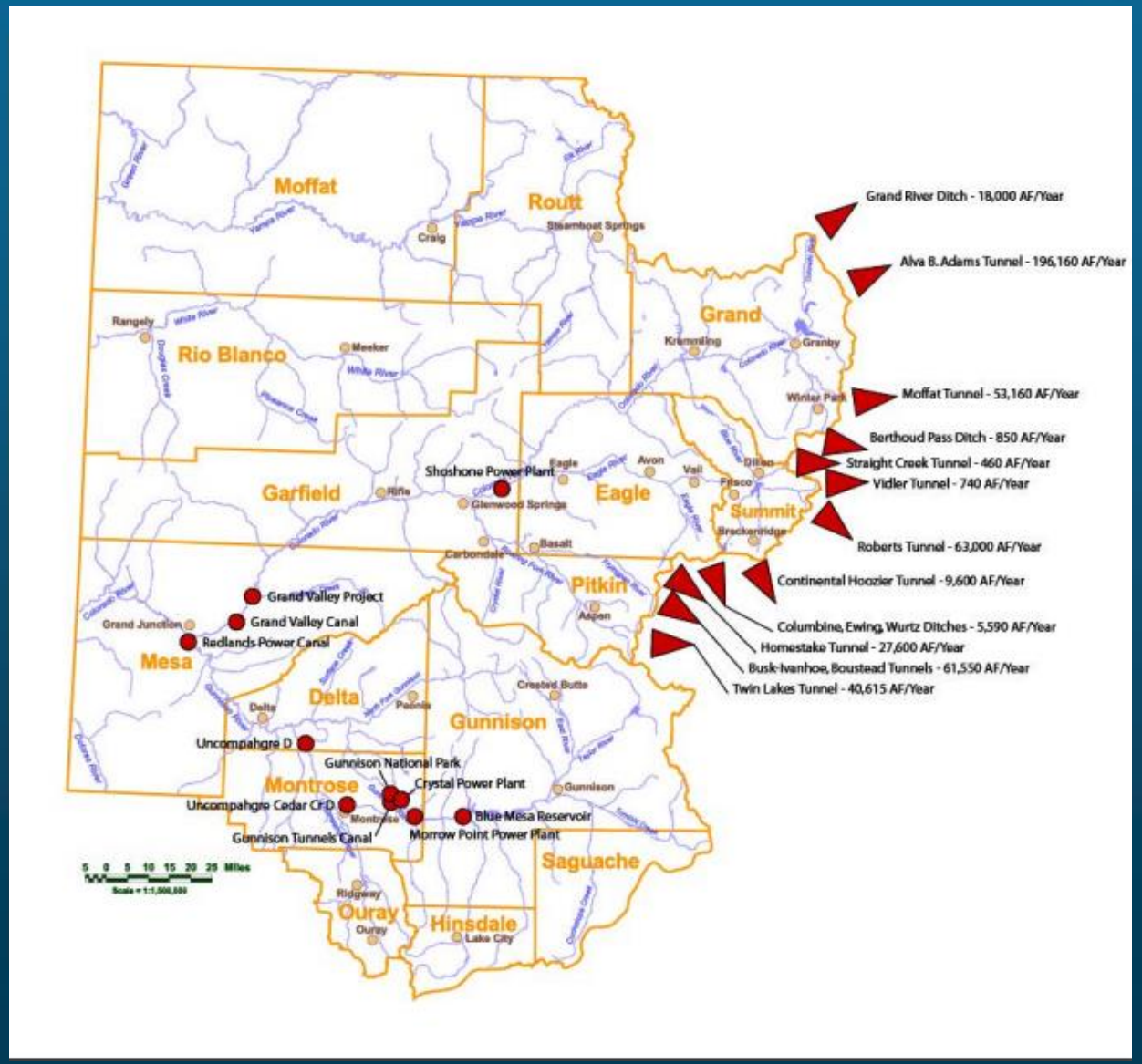
- Allocation of cuts to California
  - 1968 Act subordinated CAP to California
  - CAP normally diverts 1.0 – 1.5 MAF/year
  - < 1.0 MAF in 2022
- Mexico not yet on board
- No specific deals on Tribal rights – issue is primarily in Arizona
- UB states and Tribes meeting regularly

The Colorado River District was formed in 1937 to represent and protect West Slope water users AND to safeguard for Colorado, all waters to which the state of Colorado is equitably entitled under the Colorado river compact.



Minding the source for more than 80 years

- Created by the General Assembly in 1937
- Represent Water Interests of 15 western Colorado counties
- Area Encompassing 28% of Colorado
- 80% of the Water but only 10% of the Population
- Board Representation from Each County
- Funded Exclusively Through Mill Levy & Water Activity Enterprise



COLORADO RIVER DISTRICT
PROTECTING WESTERN COLORADO WATER SINCE 1937

The Colorado River Basin

A System in Crisis and the Headlines to Prove it

The Colorado River drought crisis: How did this happen? Can it be fixed?

The Washington Post
Democracy Dies in Darkness

Conferees told Colorado River action 'absolutely critical'

AP
AP NEWS

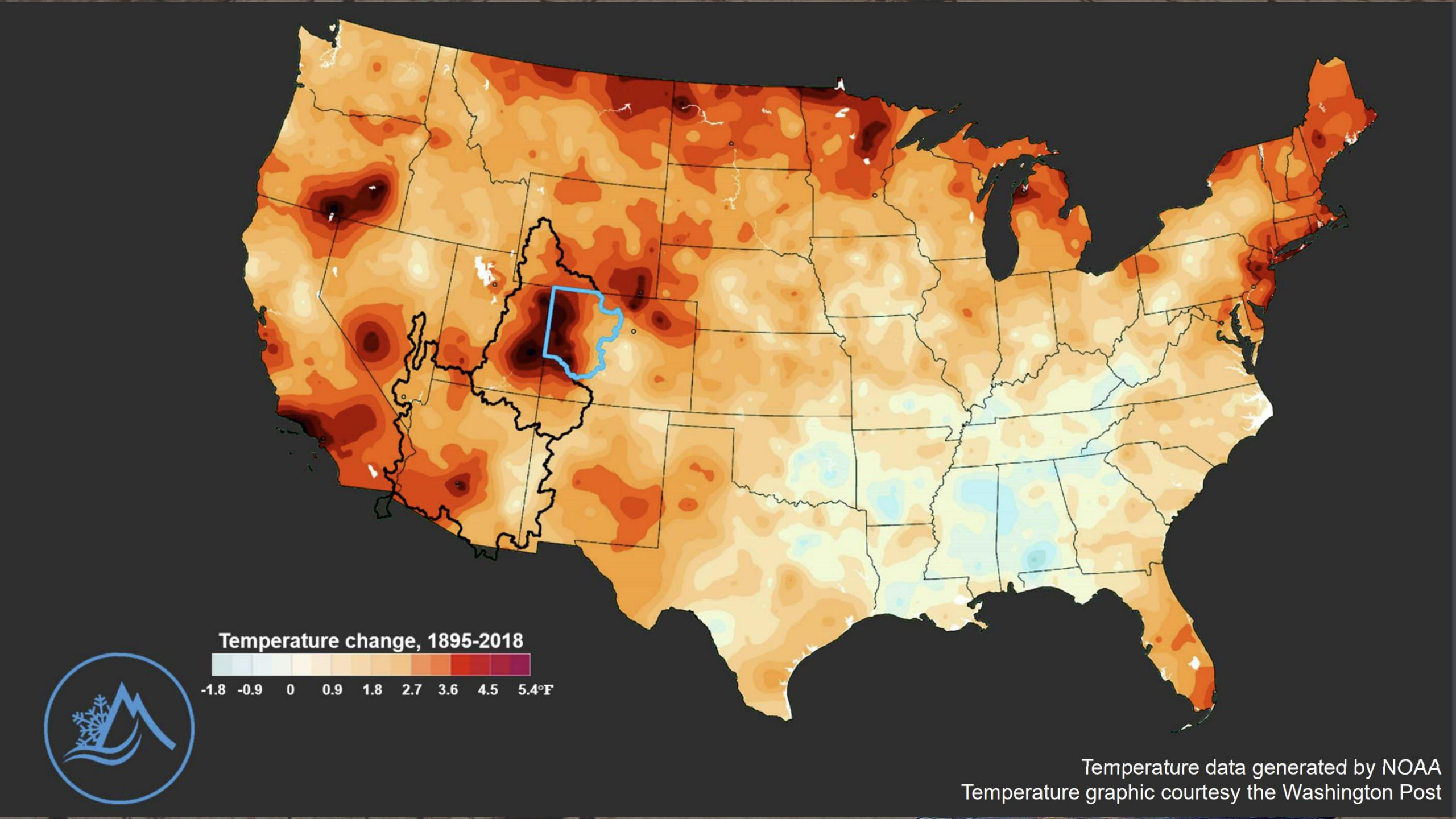
Arizona suburb sues the city of Scottsdale for cutting off its water supply

CNBC

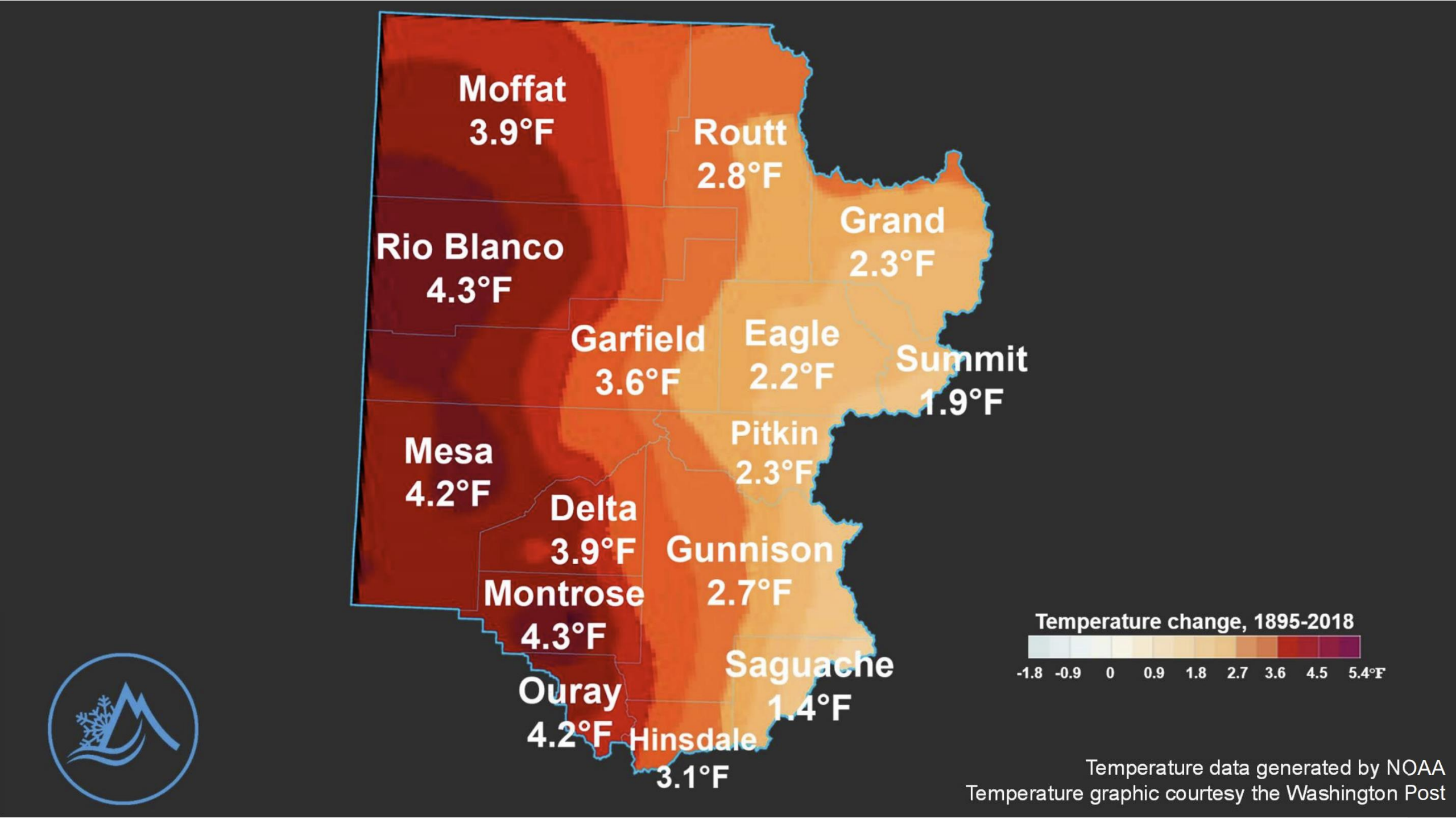
Get Wall Street out of our water

THE DAILY SENTINEL
GRAND JUNCTION, COLORADO


But Why?



Temperature data generated by NOAA
Temperature graphic courtesy the Washington Post



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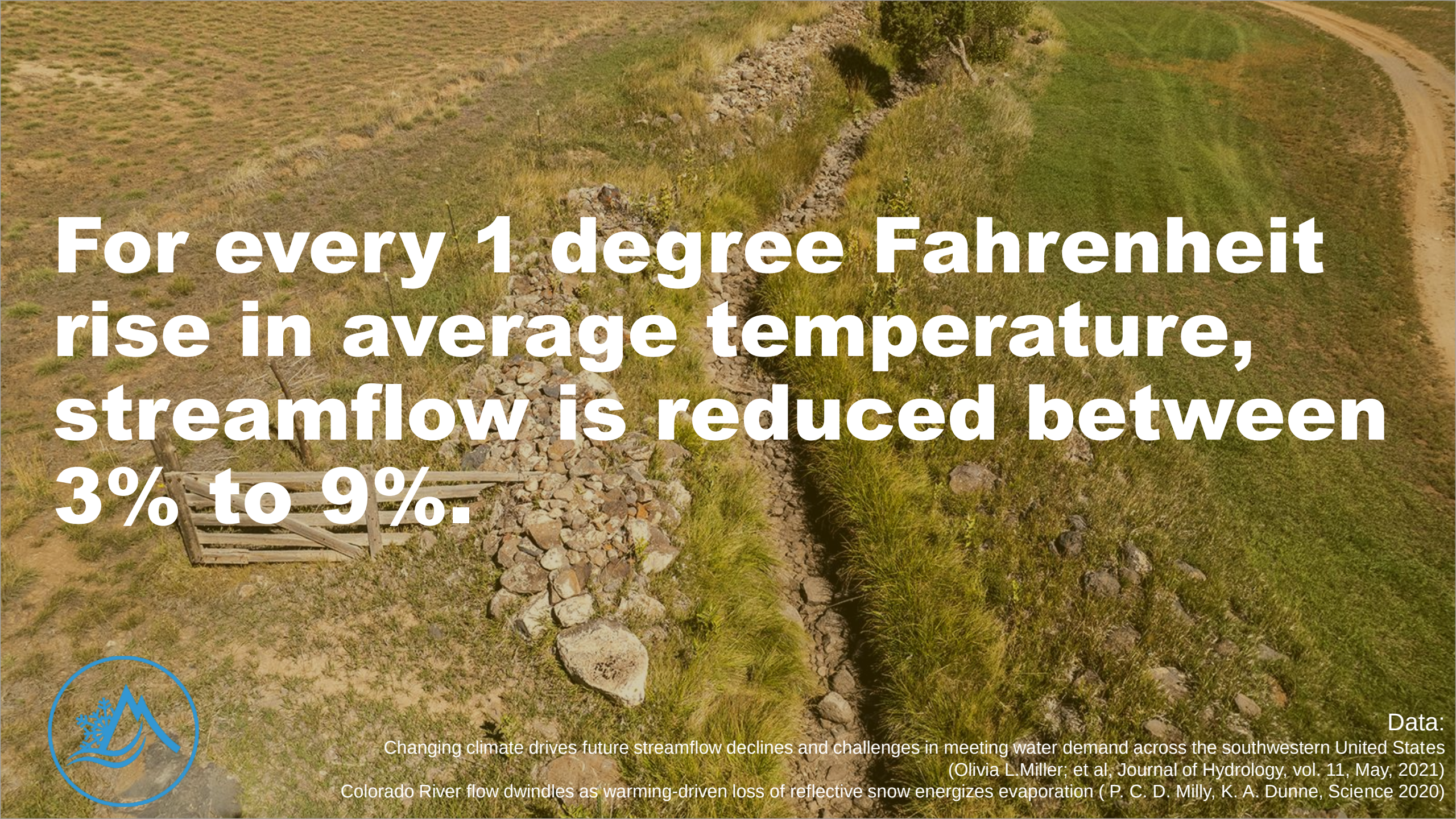
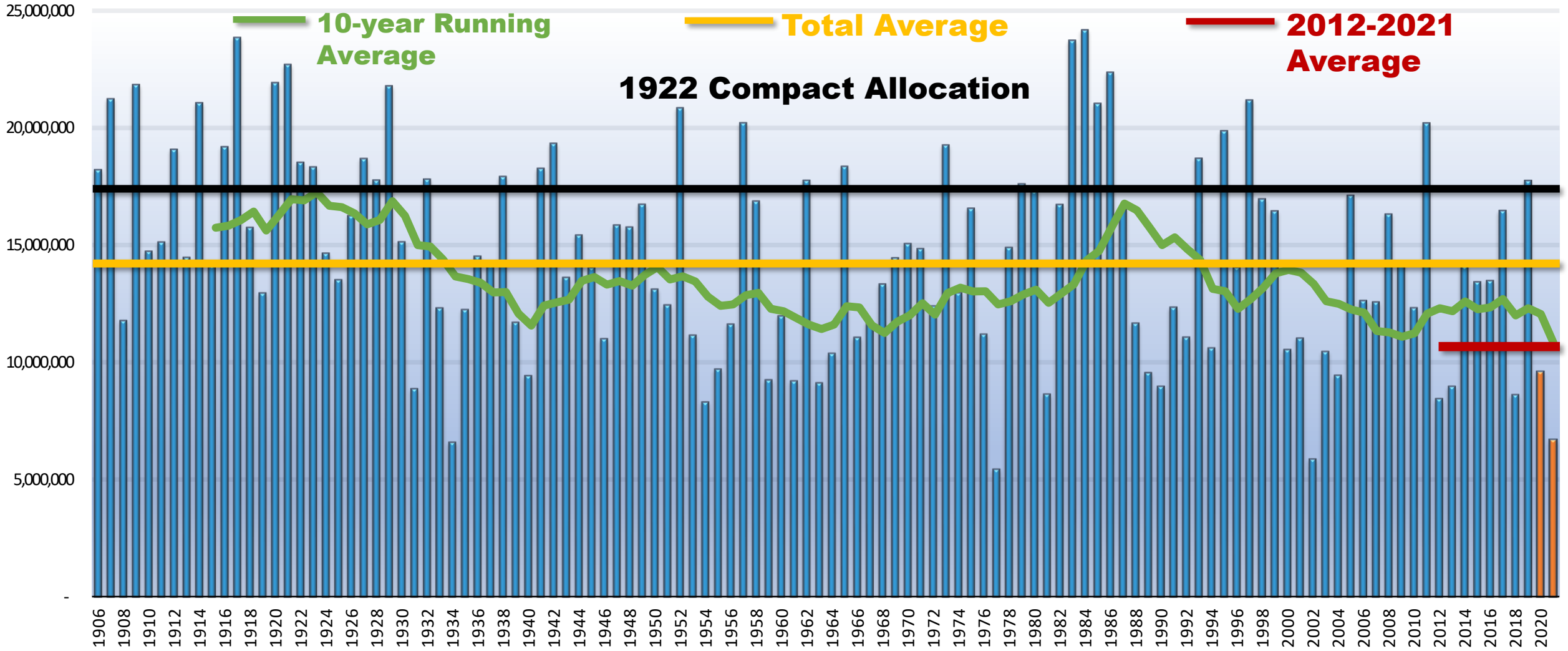


Data:

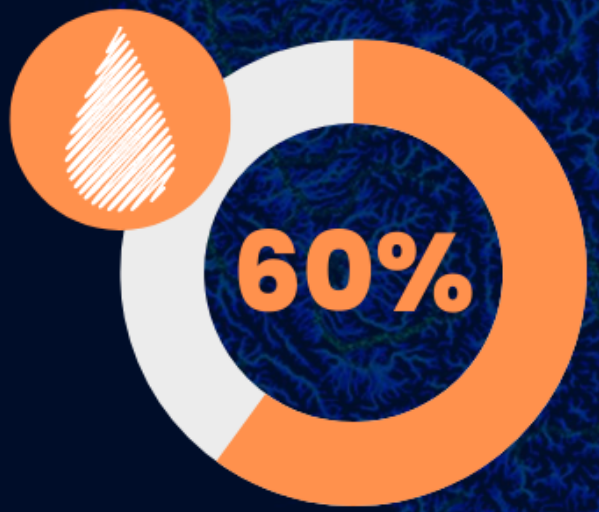
Changing climate drives future streamflow declines and challenges in meeting water demand across the southwestern United States (Olivia L.Miller; et al, Journal of Hydrology, vol. 11, May, 2021)

Colorado River flow dwindles as warming-driven loss of reflective snow energizes evaporation (P. C. D. Milly, K. A. Dunne, Science 2020)

Provisional Natural Flows for the Colorado River at Lee's Ferry (USGS gauge 09380000) Water Years 1906-2021

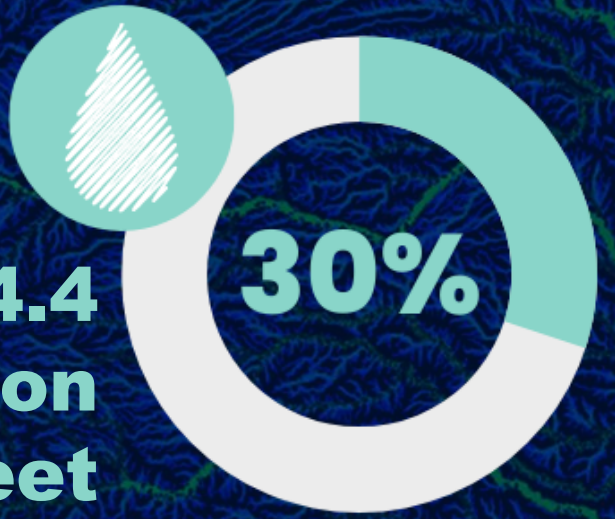


2011-2022 Average Use



8.8 Million Acre Feet

UT WY NM CO



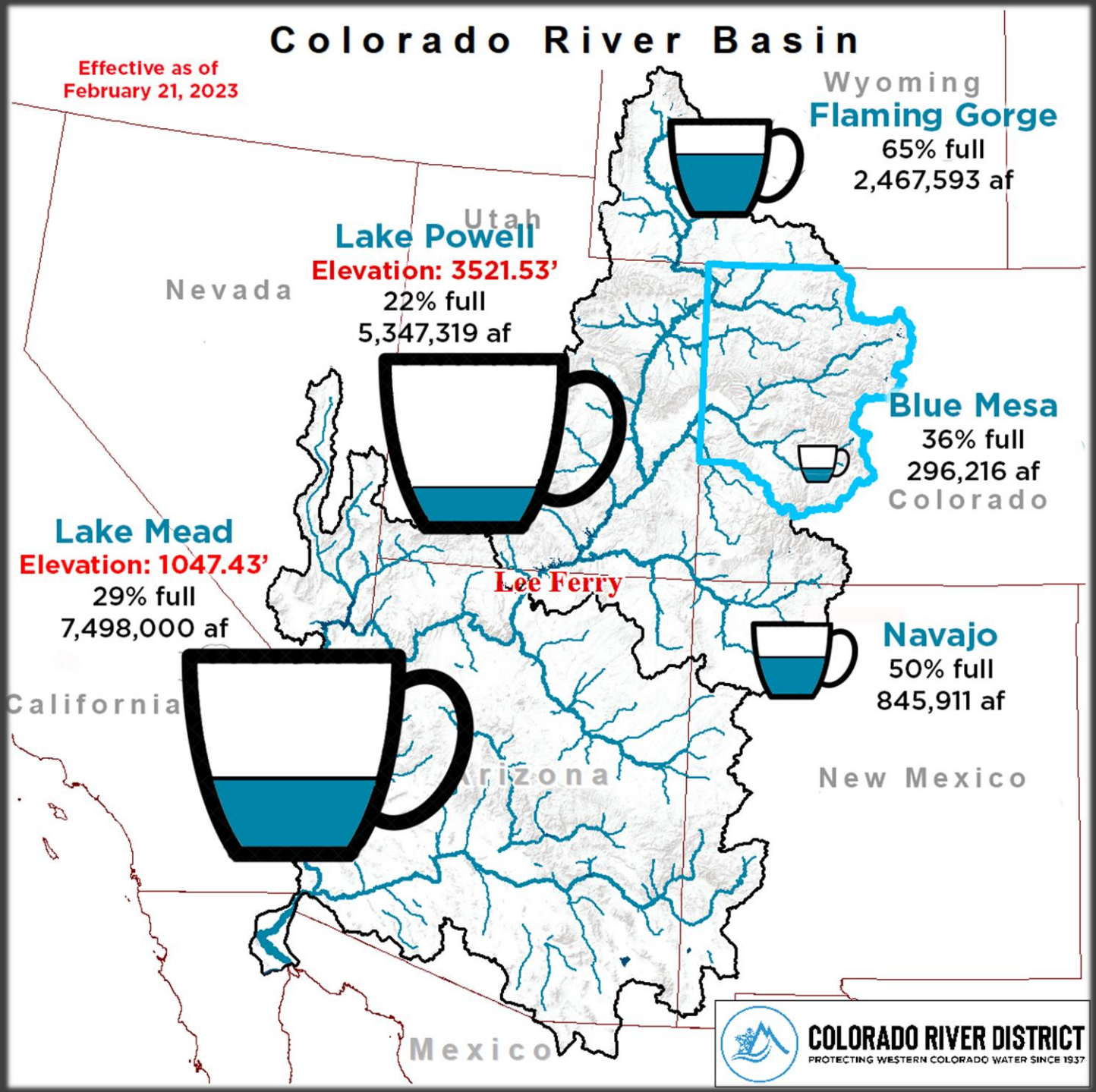
4.4 Million Acre Feet

+ 1.5 Million Acre Feet to Mexico

CA NV AZ

14.7 Million Acre Feet Total

System Storage as of February 21, 2023




COLORADO
RIVER DISTRICT
COLORADORIVERDISTRICT.ORG
Colorado River District
@ColoradoWater
ColoradoRiverDistrict

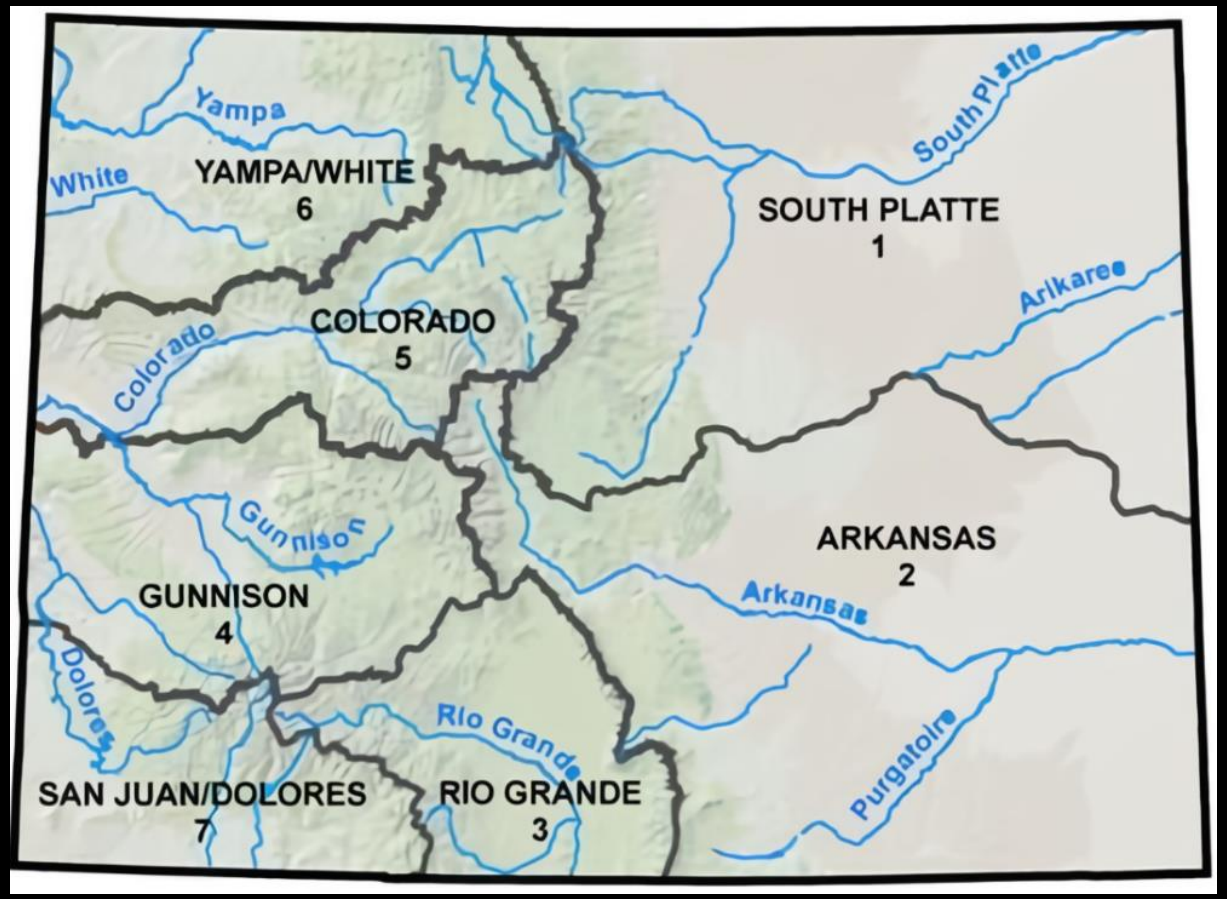
Northern Water

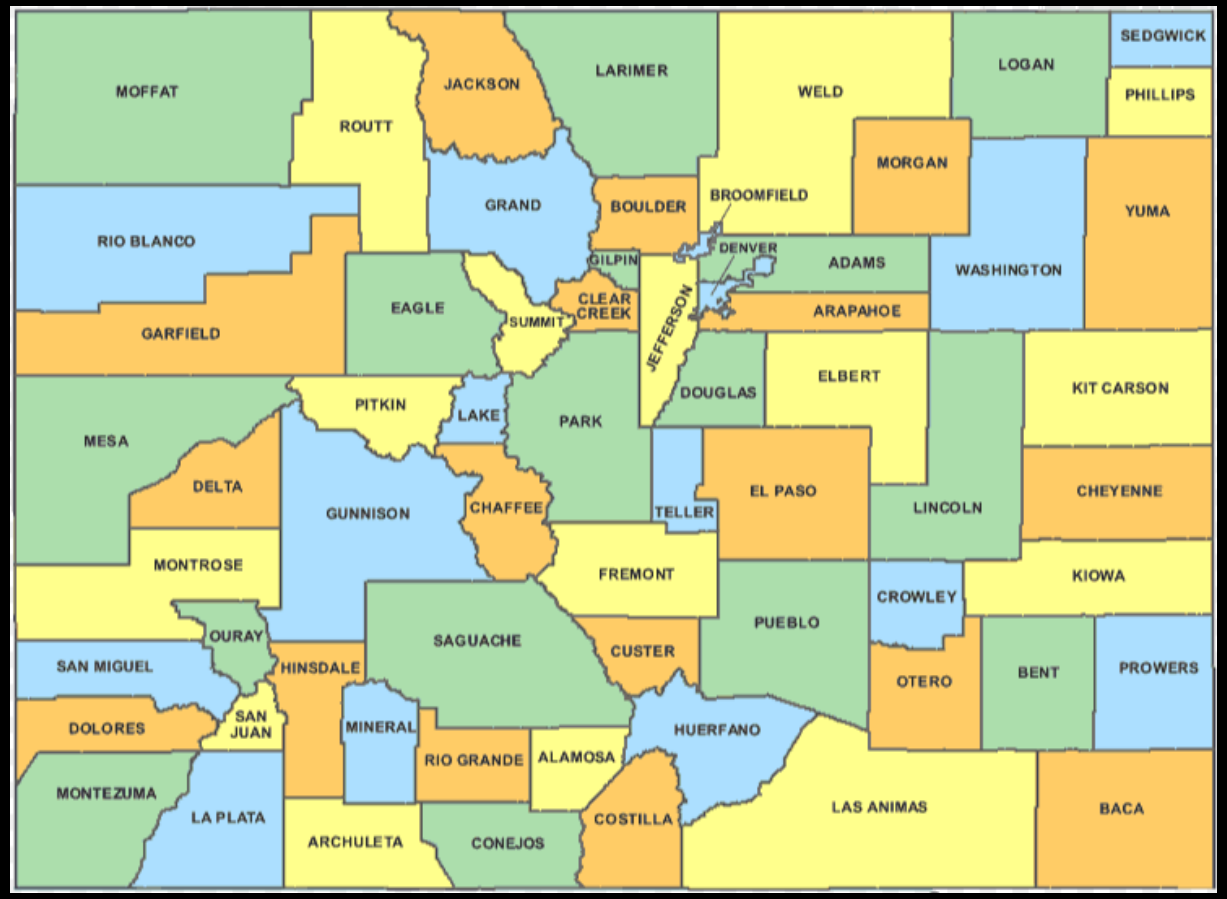
Legislative Water Workshop

Kyle Whitaker
kwhitaker@northernwater.org
work: (970) 622-2259
cell: (970) 618-0373

March 2023

All Coloradans are Connected to the Colorado River





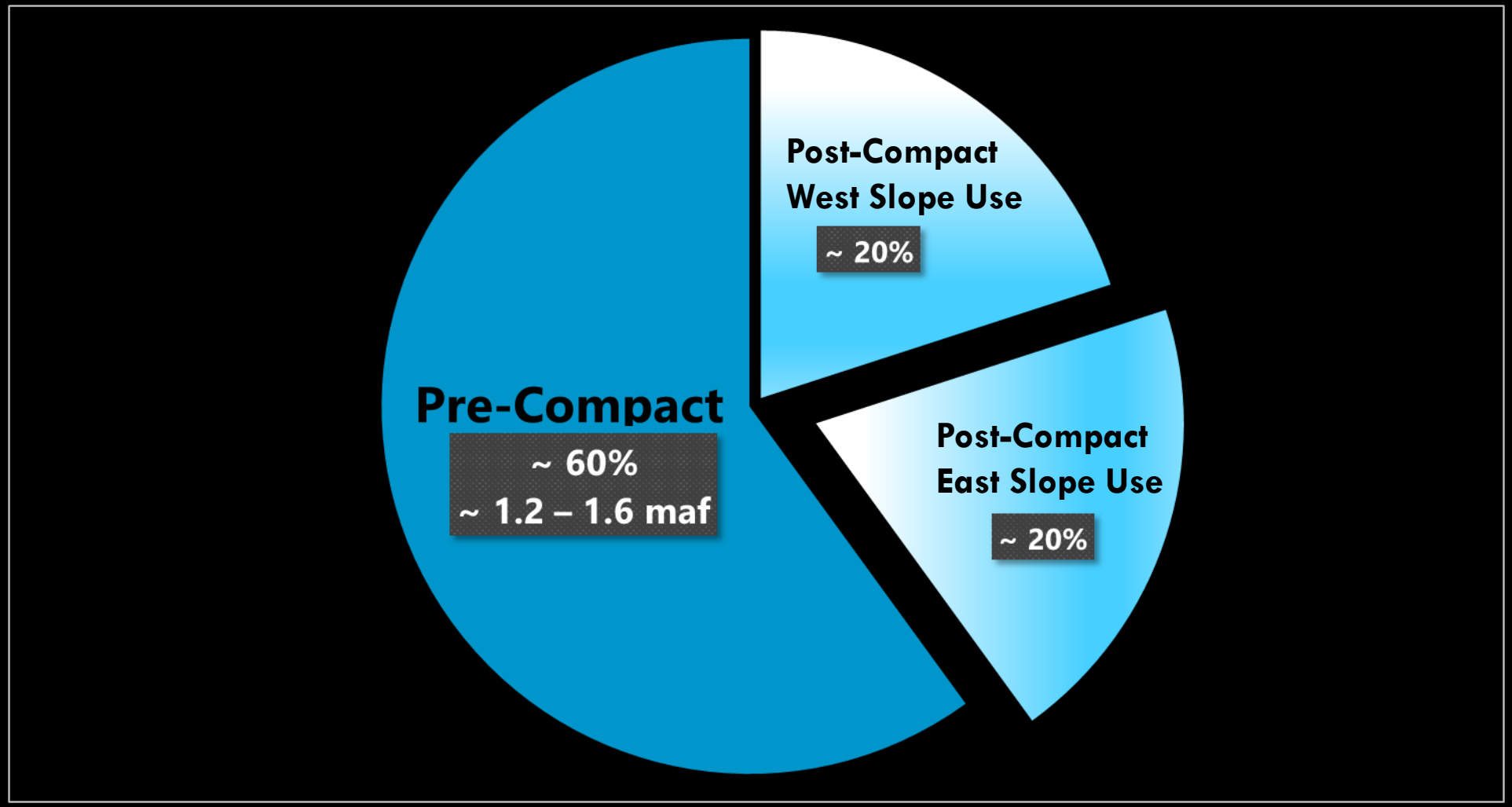
Colorado River “Basin”

“… all of the drainage area of the Colorado River System and all other territory within the United States of America to which the waters of the Colorado River System shall be beneficially applied.”

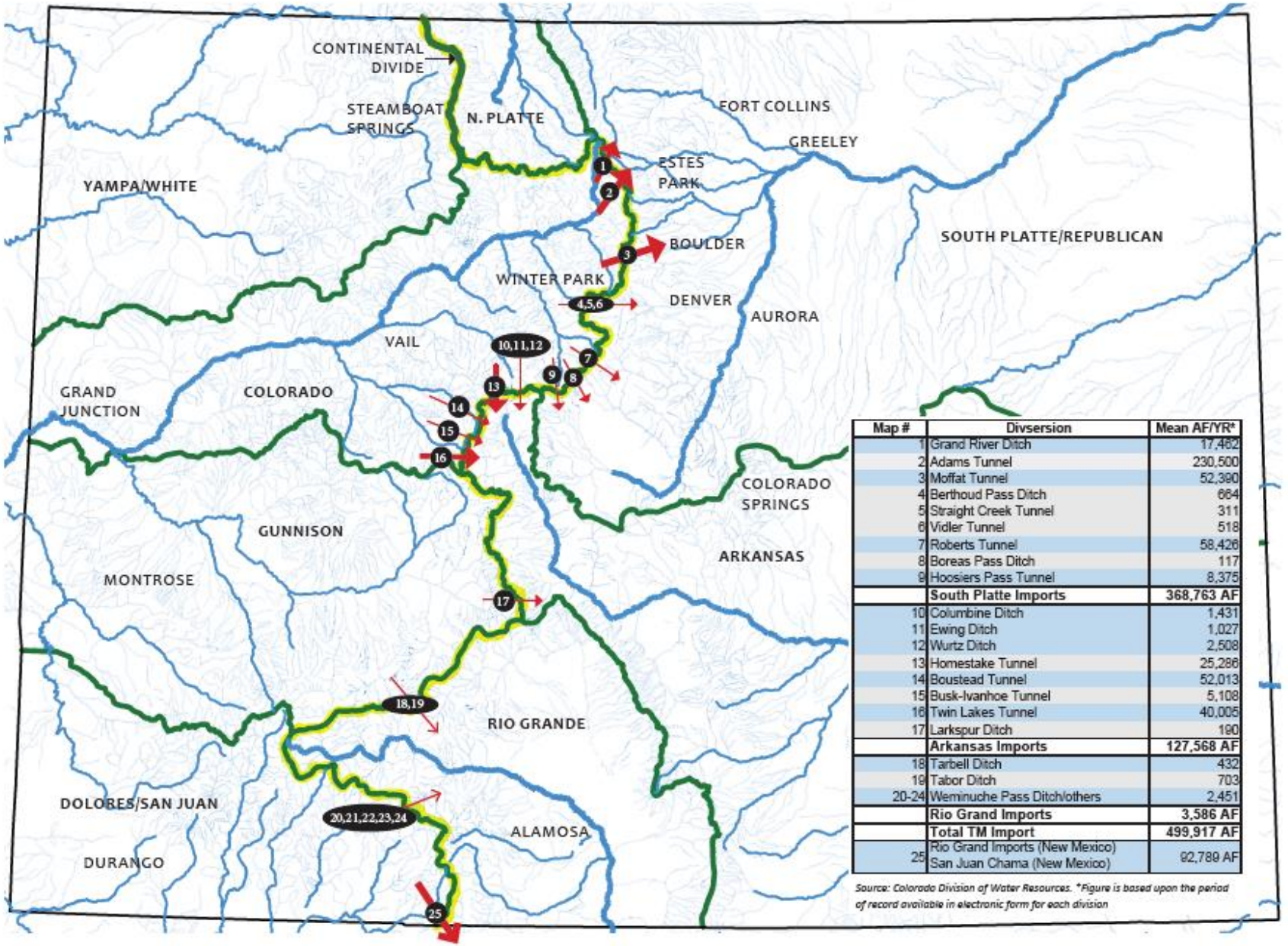
Bridging the Divide

- Agricultural Viability and Sustainability
- Water Supply Resiliency and Certainty
- Endangered Species Recovery Program
- Compensatory Storage / Mitigation Components
- Cooperative Projects, Agreements, Operations

Colorado River Water Use (within Colorado)



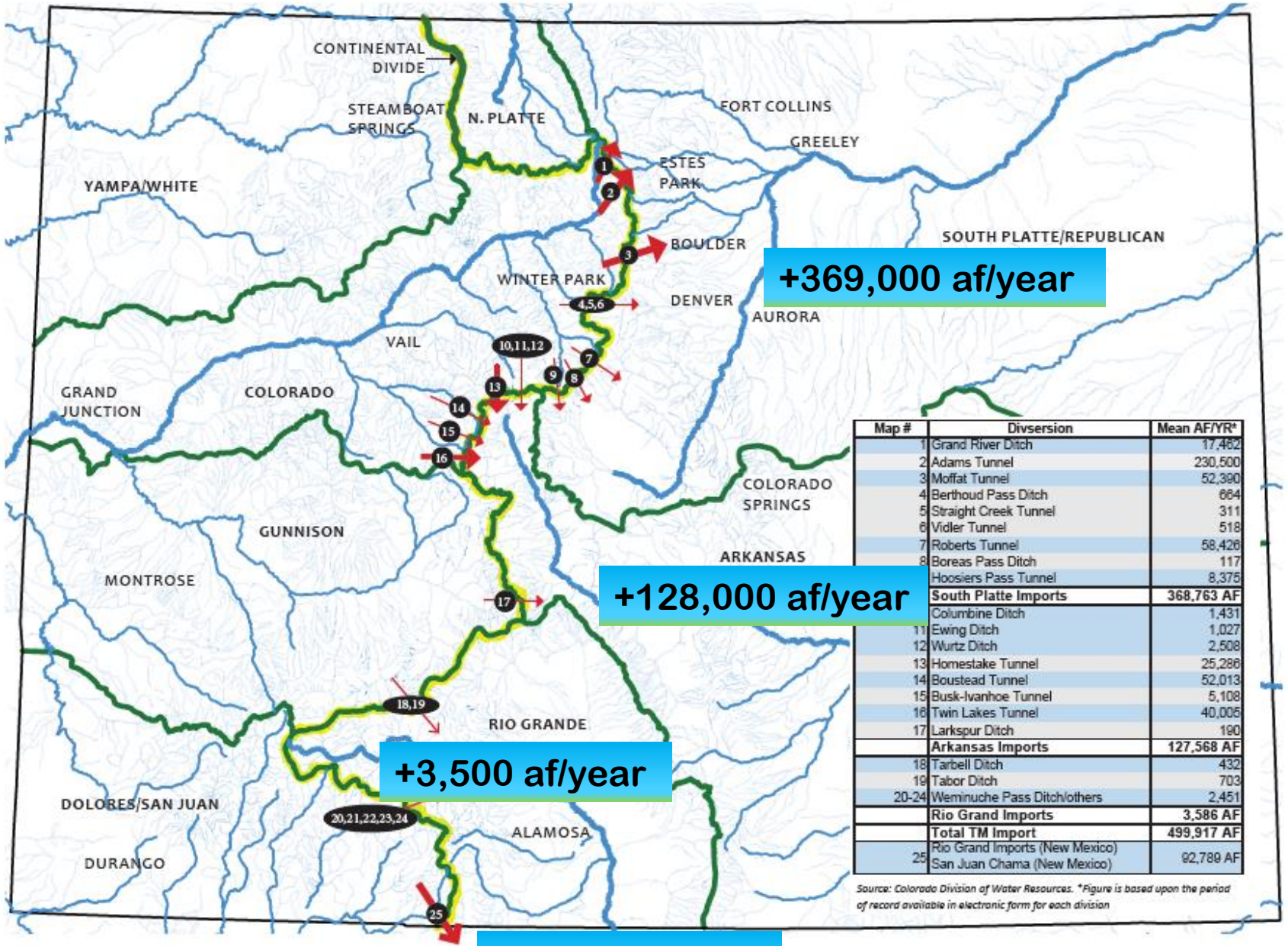
Colorado's Transmountain Diversions



Map #	Divsersion	Mean AF/YR*
1	Grand River Ditch	17,482
2	Adams Tunnel	230,500
3	Moffat Tunnel	52,390
4	Berthoud Pass Ditch	664
5	Straight Creek Tunnel	311
6	Vidler Tunnel	518
7	Roberts Tunnel	58,426
8	Boreas Pass Ditch	117
9	Hoosiers Pass Tunnel	8,375
	South Platte Imports	**368,763 AF**
10	Columbine Ditch	1,431
11	Ewing Ditch	1,027
12	Wurtz Ditch	2,508
13	Homestake Tunnel	25,286
14	Boustead Tunnel	52,013
15	Busk-Ivanhoe Tunnel	5,108
16	Twin Lakes Tunnel	40,005
17	Larkspur Ditch	190
	Arkansas Imports	**127,568 AF**
18	Tarbell Ditch	432
19	Tabor Ditch	703
20-24	Weminuche Pass Ditch/others	2,451
	Rio Grand Imports	**3,586 AF**
	Total TM Import	**499,917 AF**
25	Rio Grand Imports (New Mexico) San Juan Chama (New Mexico)	92,789 AF

*Source: Colorado Division of Water Resources. *Figure is based upon the period of record available in electronic form for each division*

Colorado's Transmountain Diversions



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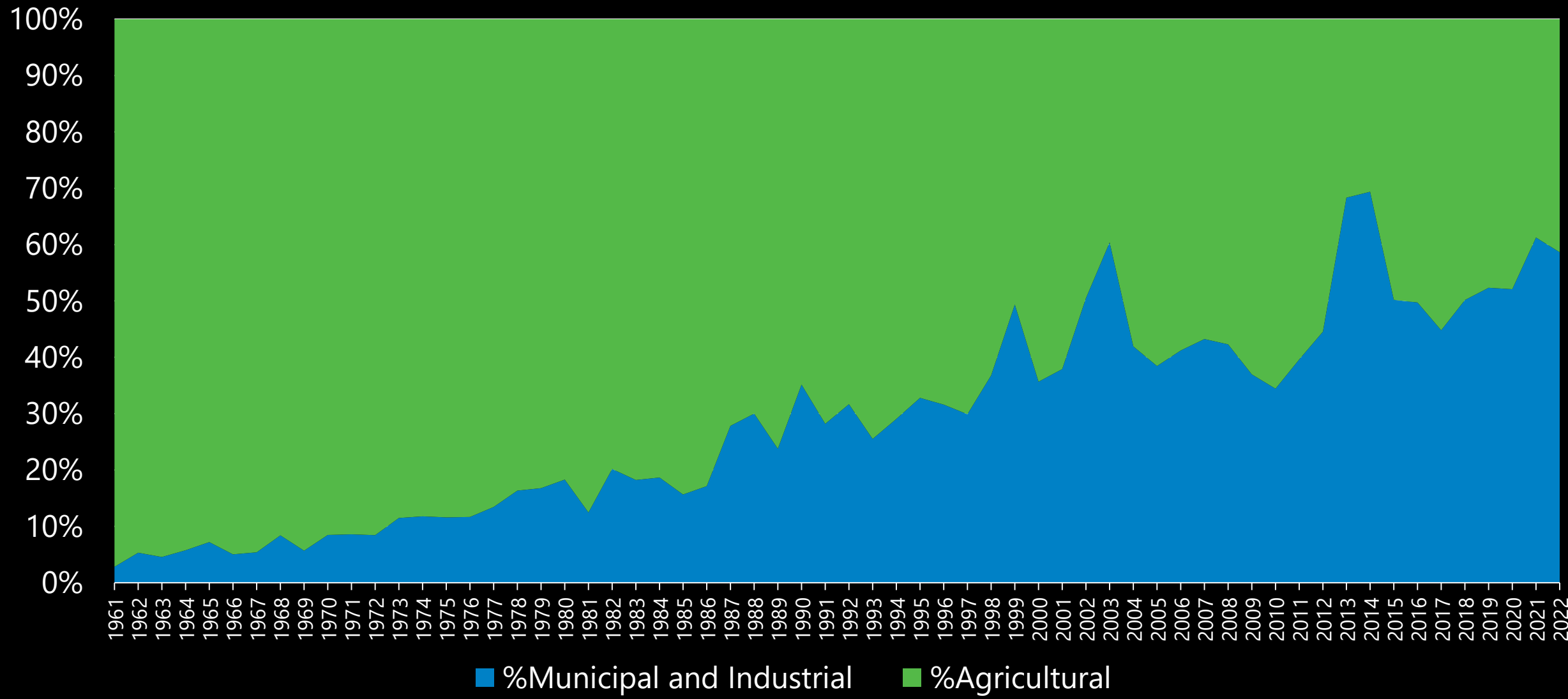
	Total TM Import	**499,917 AF**
25	Rio Grand Imports (New Mexico) San Juan Chama (New Mexico)	92,789 AF

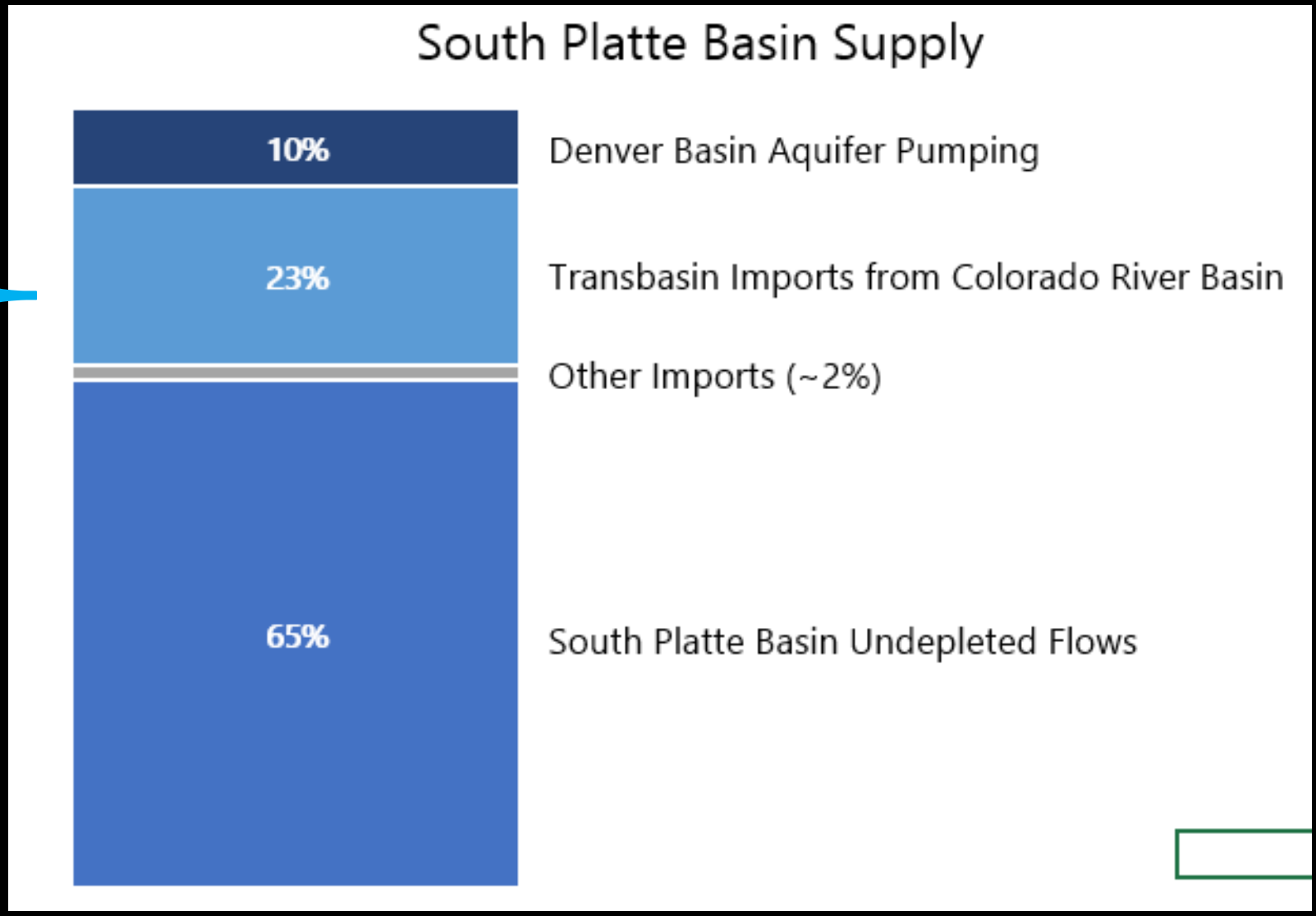
*Source: Colorado Division of Water Resources. *Figure is based upon the period of record available in electronic form for each division*

CBT Deliveries



South Platte Flows

- CBT/WG + 230,000
- Denver Water + 110,000 af/year
- WSSC + 17,000 af/year
- Others + 22,000 af/year
- **Total + 369,000 af/year**



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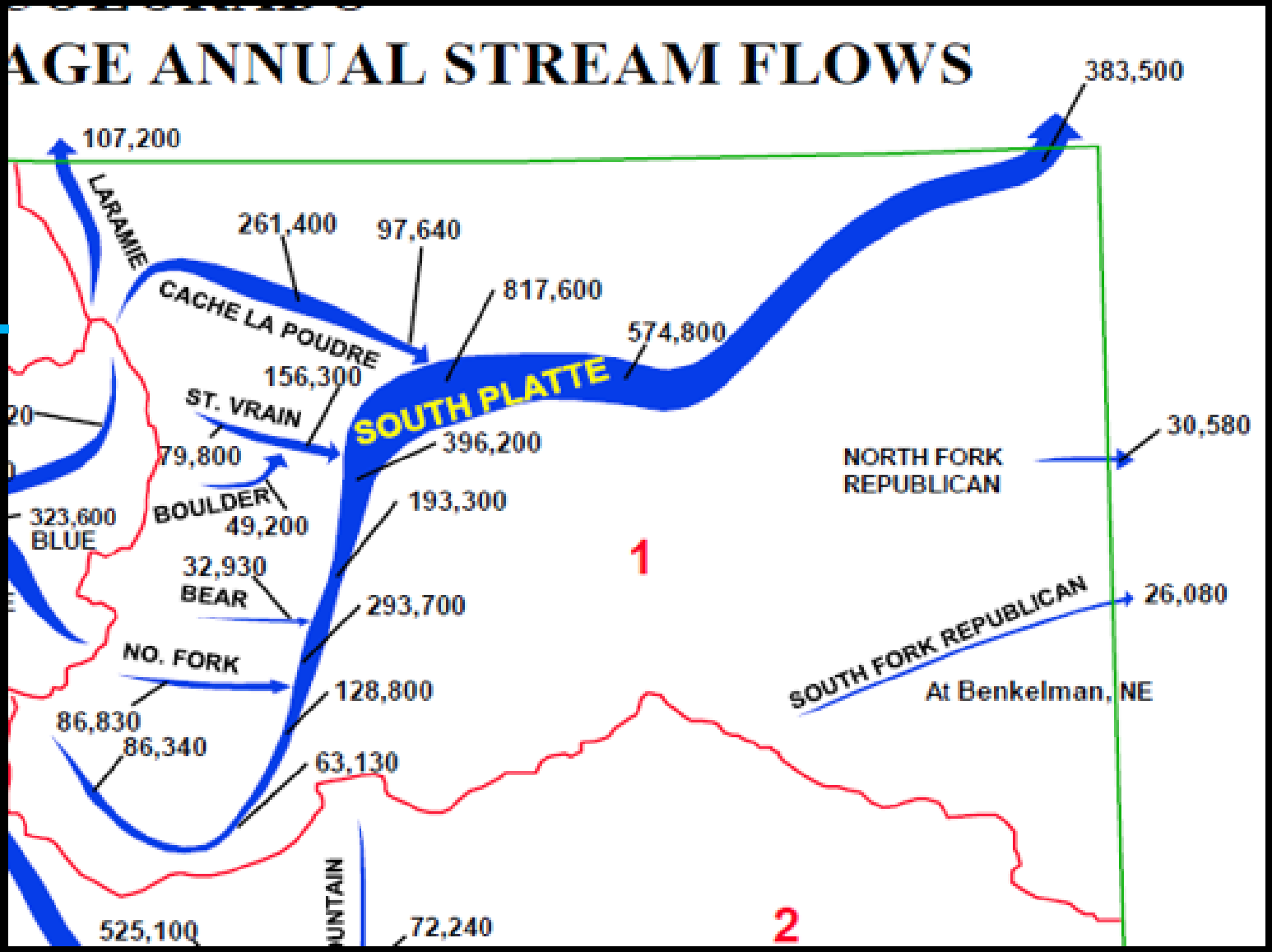
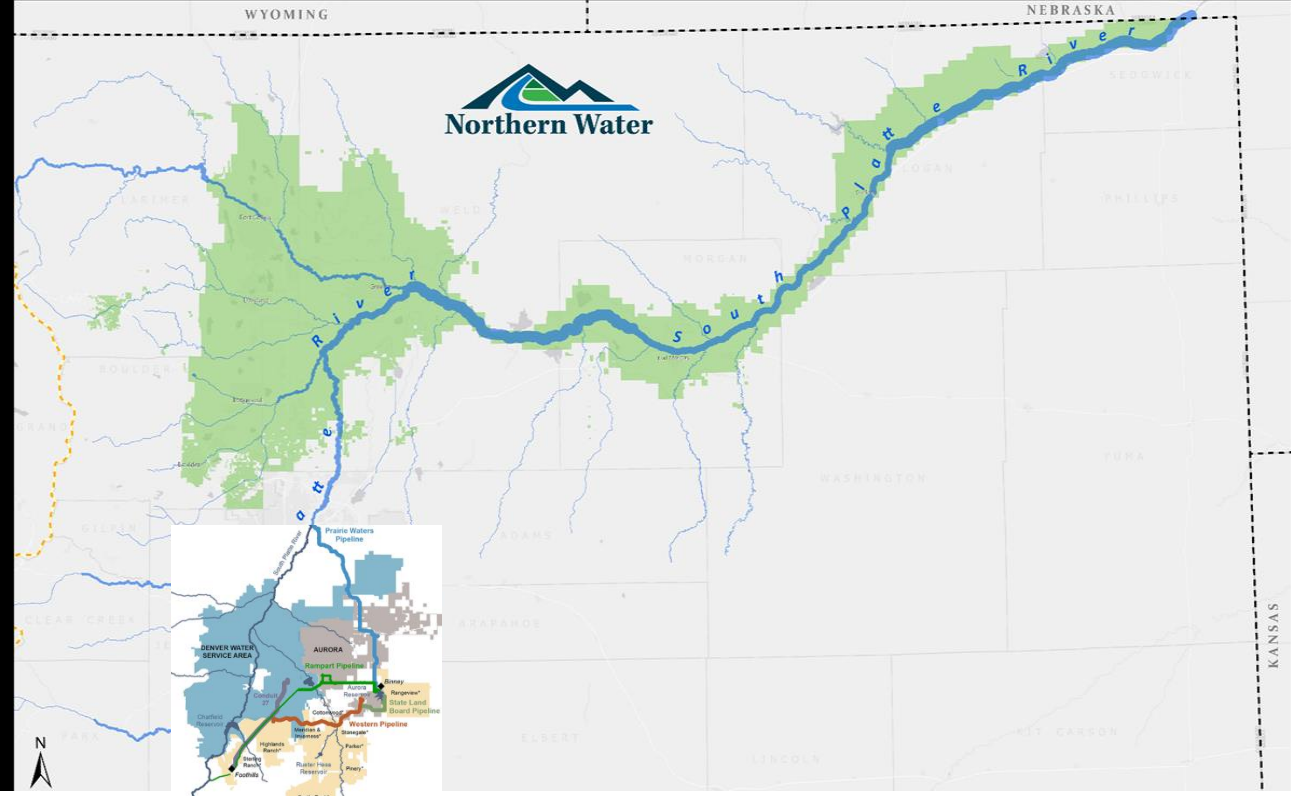


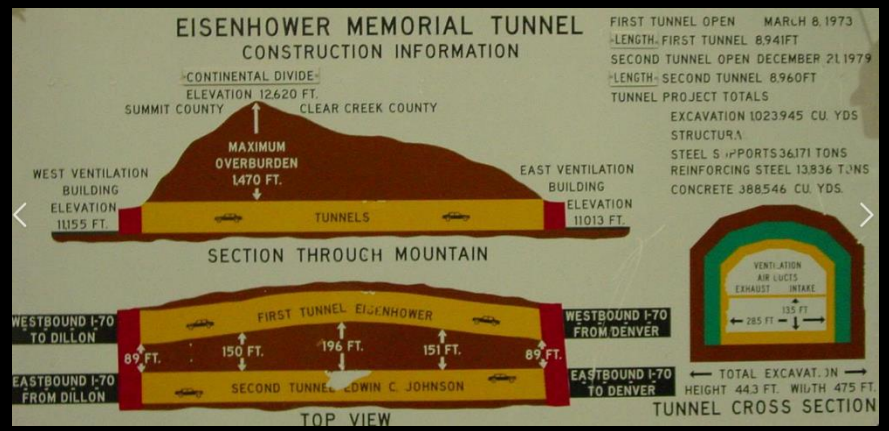
Benefits of Imports

- 25+ Counties Receive Colorado River Supplies
  - ~ 20% South Platte Basin Supplies
  - ~ 15% Arkansas Basin Supplies
- Irrigated Agriculture
  - ~ 640,000 acres South Platte Basin
  - ~ 265,000 acres Arkansas Basin
- Municipal/Domestic
  - ~3 million South Platte River Basin
  - ~ 900,000 Arkansas River Basin
- Recreation
  - Rivers
  - Reservoirs
- Environmental/Ecological
  - Riparian
  - Fish & Wildlife



Bridging the Divide

- Agricultural Viability and Sustainability
- Water Supply Resiliency and Certainty
- Endangered Species Recovery Programs
- Compensatory Storage / Mitigation Components
  - Green Mountain Reservoir & Colorado-Big Thompson
  - Fry-Ark Project & Ruedi Reservoir
  - Windy Gap Project & Wolford Reservoir
- Cooperative Projects, Agreements, Operations



March 1, 2023

Colorado River 201

Rebecca Mitchell
Director, Colorado Water Conservation Board
Colorado River Commissioner

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Department of Natural Resources

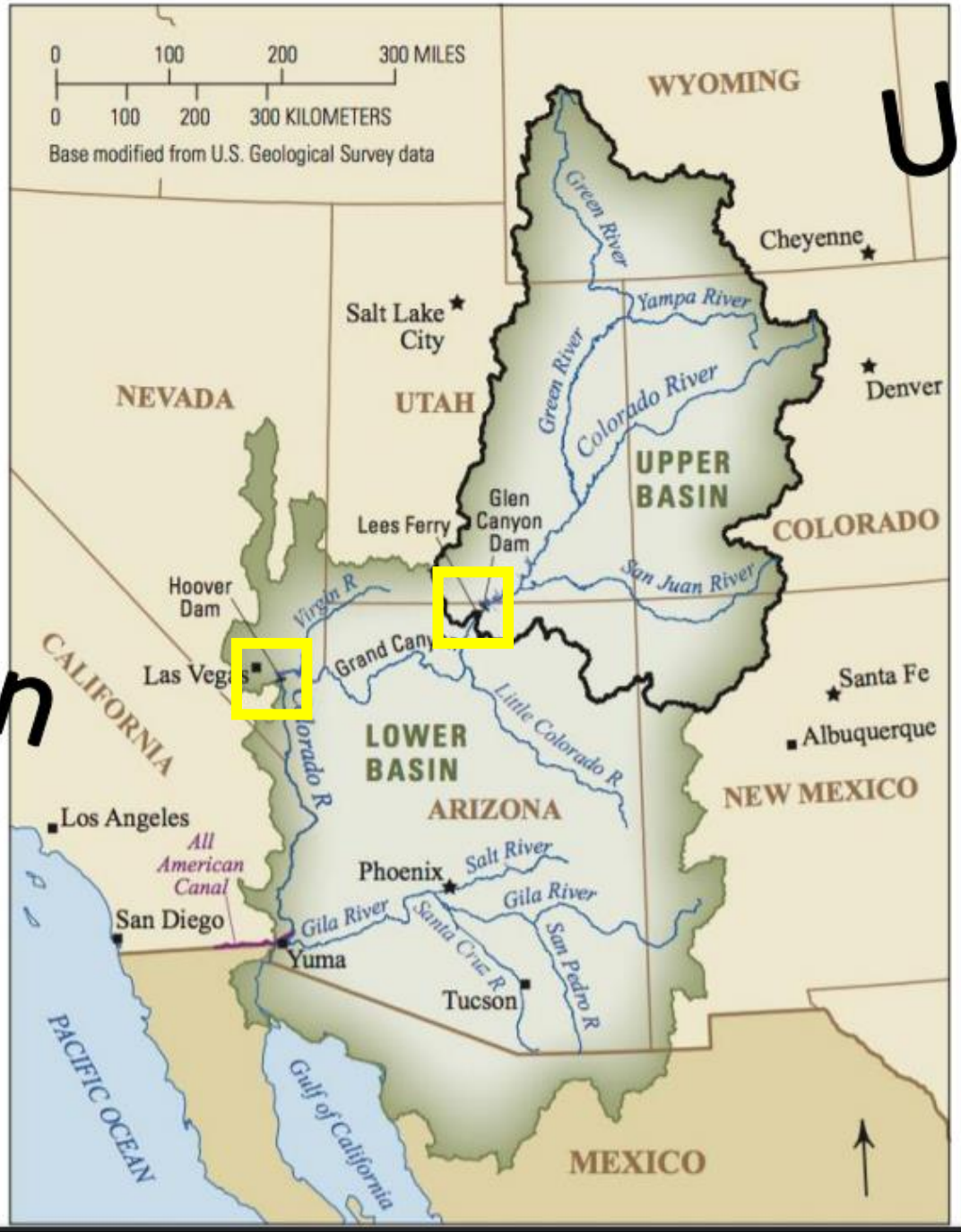
Total Allocation before 1944 is 16 maf

Allocation to Mexico TBD

Lower Basin

7.5 maf

+1 maf



Upper Basin

7.5 maf

6-State Consensus-Based Modeling Approach

Upper Basin Components

- Recognition of hydrologic shortages with additional voluntary measures as possible
- Consideration of additional releases from Upper Basin reservoirs, pursuant to the Drought Response Operations Agreement
- Adjustments to Powell operations

Lower Basin Components

- Reductions in Lower Basin deliveries to account for evaporation and transit losses
- Additional Lower Basin reductions to protect Lake Mead

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Upper Basin 5-Point plan

System Conservation Pilot Program
- Temporary, voluntary, compensated reductions in consumptive use across the Upper Basin
- Application period currently open through **March 1** at www.ucrcommission.com

2023 Drought Response Operations Plan
- Potential reservoir releases from Flaming Gorge, Navajo, and Blue Mesa reservoirs
- Ongoing discussions about accounting and effectiveness analysis

Demand Management Feasibility Investigation
- Temporary, voluntary, compensated reductions in consumptive use, shepherding to Powell
- Investigation ongoing with UCRC reports recently released

Bipartisan Infrastructure Funding
- Use of bipartisan infrastructure law funds
- Enhanced measurement, monitoring, reporting

Strict Water Rights Administration
- Administer water rights pursuant to legal and physical availability
- Intrastate conservation efforts

Thank You

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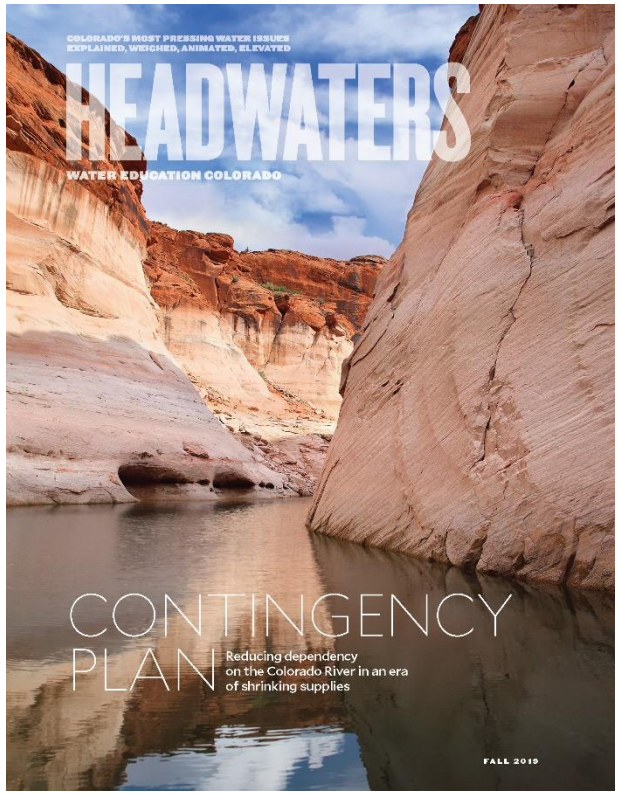
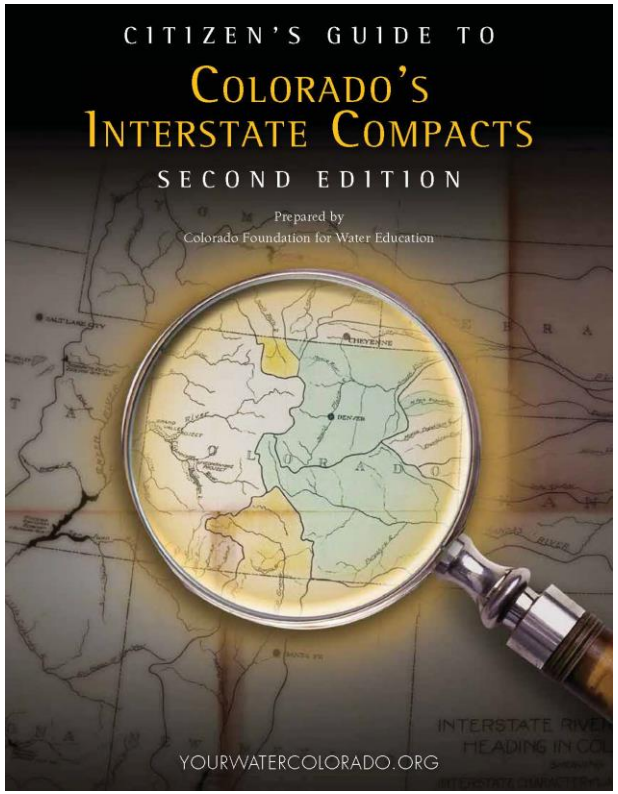
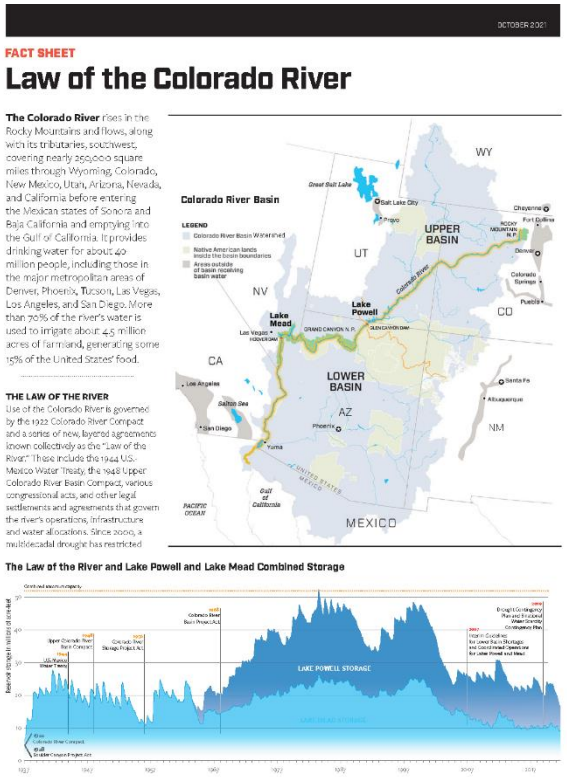
WATER EDUCATION COLORADO

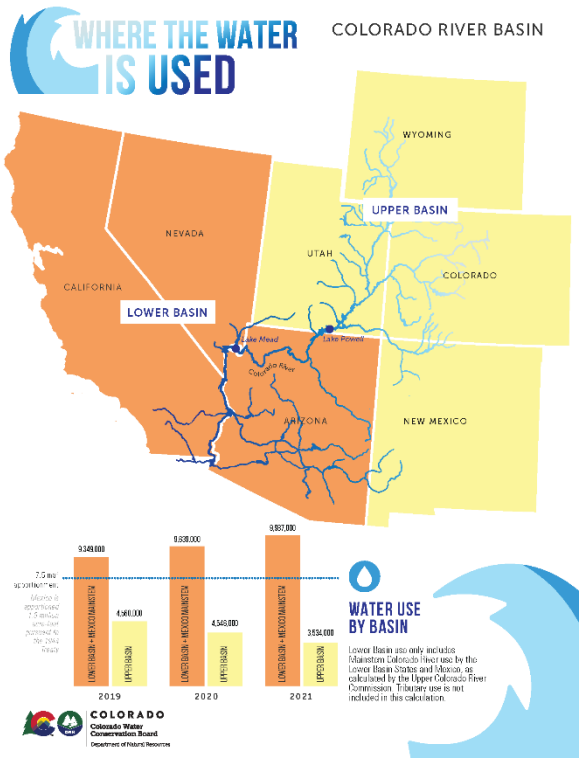
COLORADO WATER CONGRESS
INFORM | CONNECT | TRAIN | ACT

Related Resources









Thank you for coming!
Next “201” on Ag Water is on Colorado Ag Day, March 22 – 7:15am-8:45am

www.wateredco.org/2023-legislative-water-workshops/
www.cowatercongress.org