



COLLEGE OF AGRICULTURE & LIFE SCIENCES
COOPERATIVE EXTENSION

WATER RESOURCES RESEARCH CENTER

Water Challenges in the Lower Colorado River Basin and the Drought Contingency Plan

Utah State University Spring Runoff Conference

Water Challenges in the West

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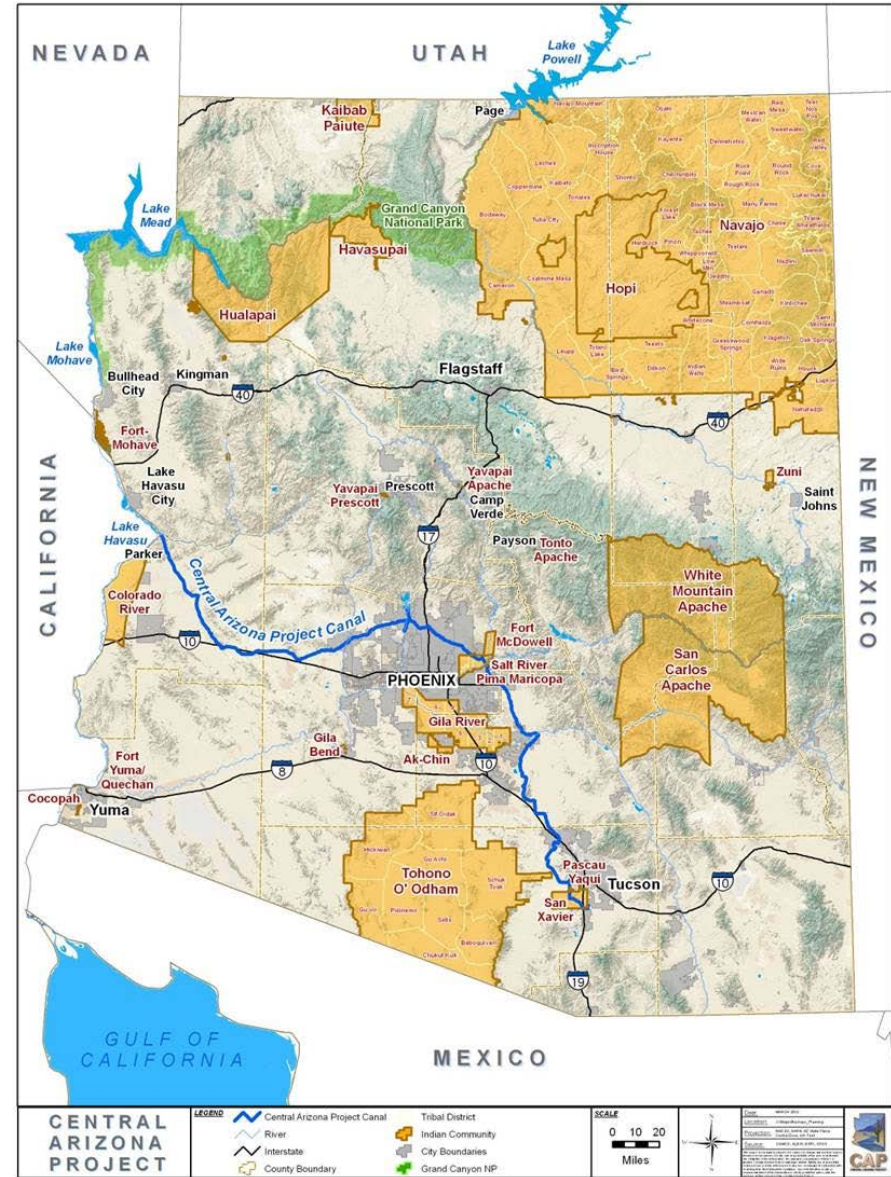
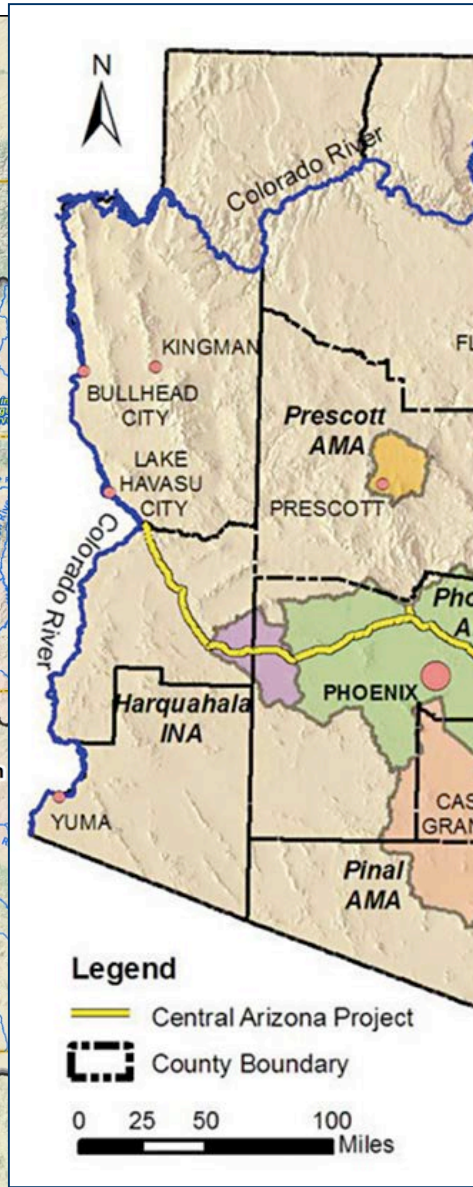
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FOR A CLEAR
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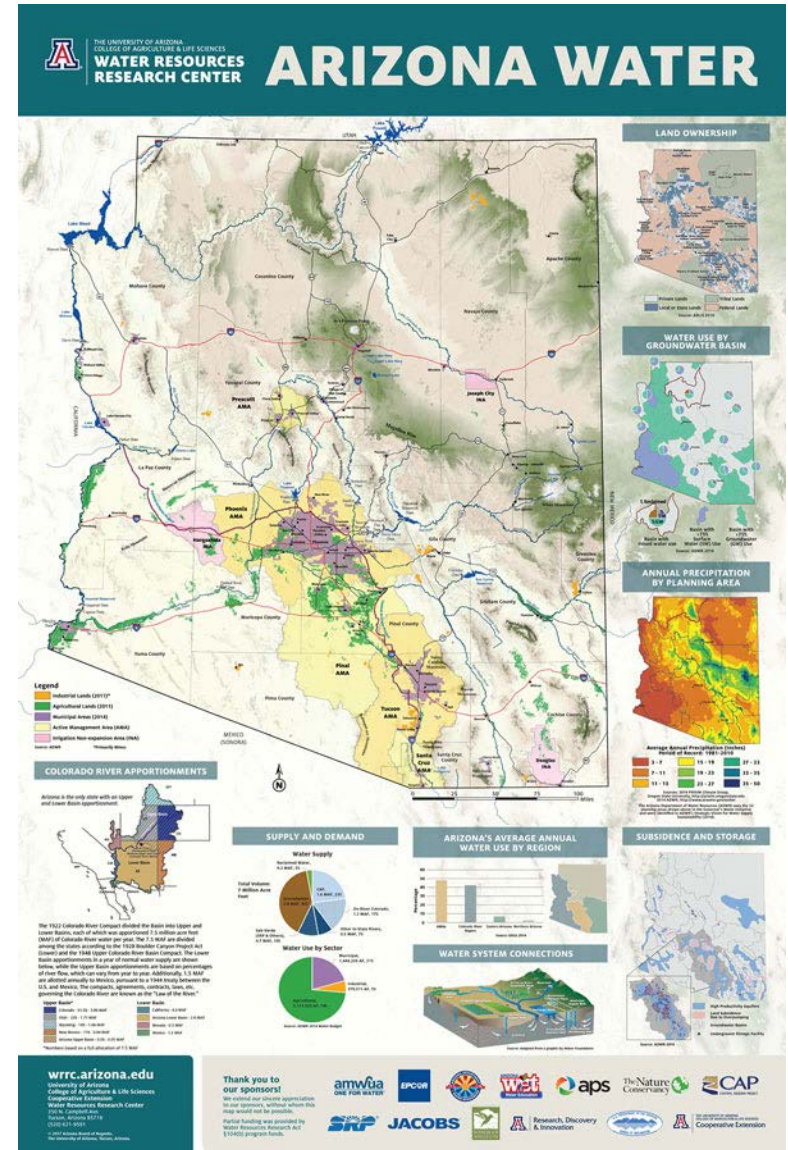
We tackle key water policy and management issues, empower informed decision-making, and enrich understanding through engagement, education, and applied research.

The Colorado River Basin and Arizona



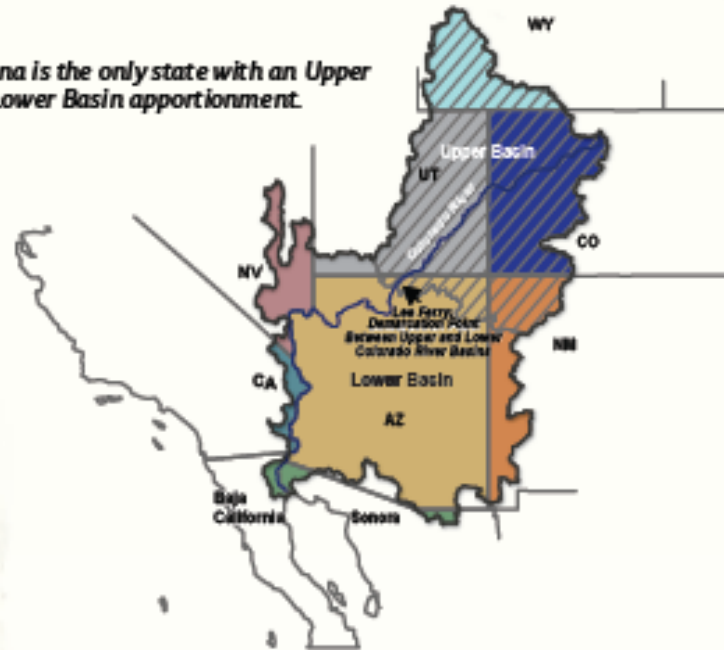
Arizona Snapshot

- Population of 6.5 million people expected to almost double by 2050.
- Water use estimated to be about 7 Million Acre Feet (MAF) (8,633 MCM)
 - Approx. 40% of total use is groundwater
 - Approx. 3% is recycled or reclaimed water
 - Of the remaining use, which is surface water, 2.8 MAF (3,453 MCM) is from the Colorado River
 - 1.5 to 1.6 MAF (1,850 MCM) of that is delivered through the Central Arizona Project (CAP)
- Approx. 70% of water diverted or extracted by agriculture
- Groundwater and surface water laws not integrated



COLORADO RIVER APPORTIONMENTS

Arizona is the only state with an Upper and Lower Basin apportionment.



The 1922 Colorado River Compact divided the Basin into Upper and Lower Basins, each of which was apportioned 7.5 million acre feet (MAF) of Colorado River water per year. The 7.5 MAF are divided among the states according to the 1928 Boulder Canyon Project Act (Lower) and the 1948 Upper Colorado River Basin Compact. The Lower Basin apportionments in a year of normal water supply are shown below, while the Upper Basin apportionments are based on percentages of river flow, which can vary from year to year. Additionally, 1.5 MAF are allotted annually to Mexico, pursuant to a 1944 treaty between the U.S. and Mexico. The compacts, agreements, contracts, laws, etc. governing the Colorado River are known as the "Law of the River."

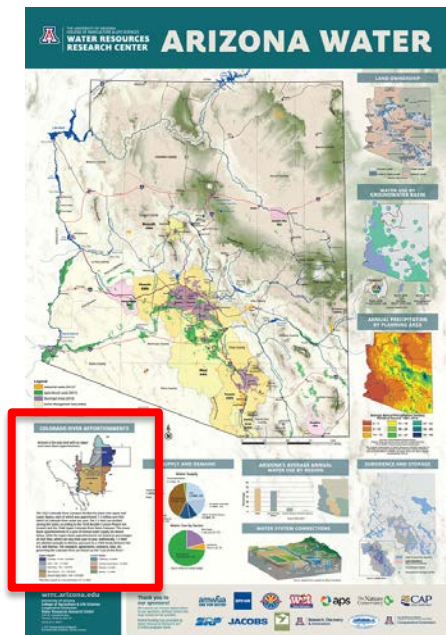
Upper Basin*

Colorado	- 51.5% - 3.86 MAF
Utah	- 23% - 1.71 MAF
Wyoming	- 14% - 1.04 MAF
New Mexico	- 11% - 0.84 MAF
Arizona Upper Basin	- 0.5% - 0.05 MAF

Lower Basin

California	- 4.4 MAF
Arizona Lower Basin	- 2.8 MAF
Nevada	- 0.3 MAF
Mexico	- 1.5 MAF

*Numbers based on a full allocation of 7.5 MAF



Acknowledgement and Disclaimer

- Much but not all of the following materials are from presentations made by the Director of the Arizona Department of Water Resources (ADWR) and/or the General Manager of the Central Arizona Project (Central Arizona Water Conservation District or CAP) or their designees.
- Any views expressed are my own, although some actions have been voted upon by the elected, 15-person CAP Board of Directors, of which I am a member.

Why the Lower Basin Drought Contingency Plan (LBDCP)?

- Without LBDCP, entities that have stored water in Lake Mead will likely remove the water earlier than they otherwise would.
- Lake Mead elevations will be protected through collective actions by California, Arizona, Nevada, and Mexico.
- Mexico has already agreed to take reductions in parity and alignment with those agreed to by the Lower Basin states if LBDCP is adopted.
- We are experiencing long-term drought. Even in the absence of these conditions, more water has been allocated to the Lower Basin states than is available on average; there is a structural deficit.



Photo credit: Rudolfo Peón 2015

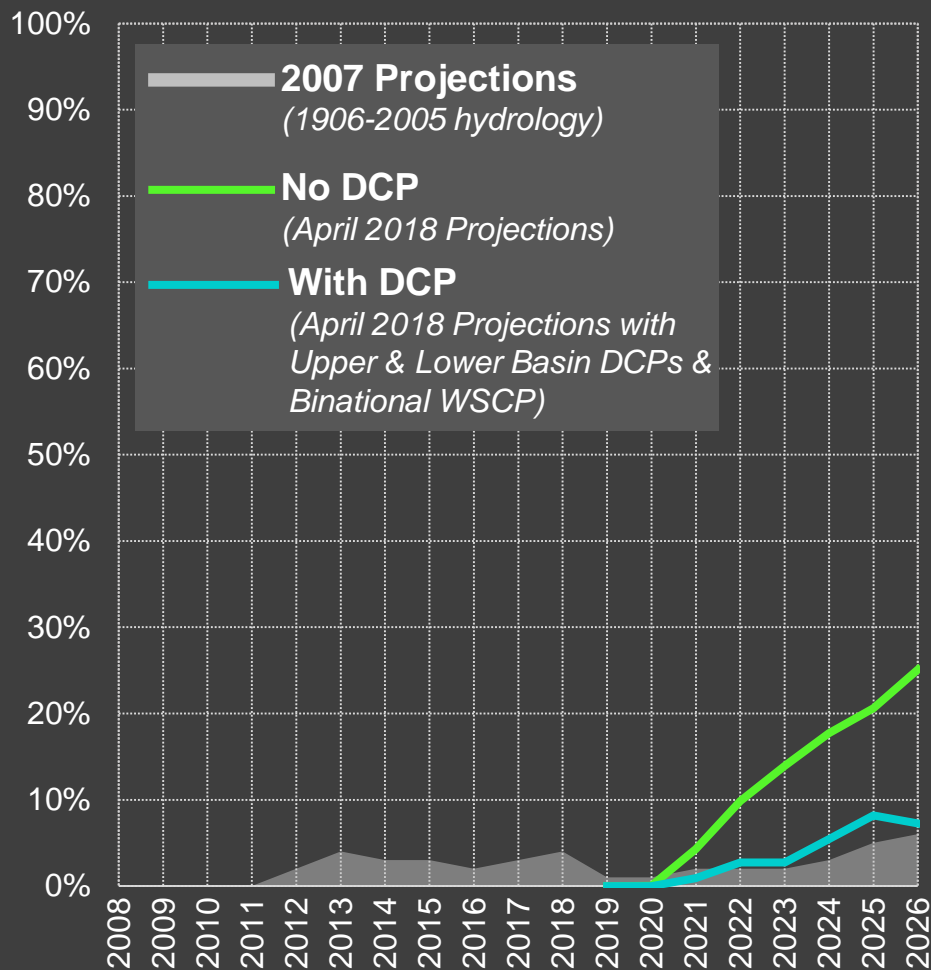
The Lower Basin Drought Contingency Plan (LBDCP) is Important to Arizona

- Risks are increasing due to poor hydrology. Before this winter, we had been projected to be in Tier 1 shortage in 2020. A Tier 1 shortage will reduce by 11% the amount of Colorado River water that Arizona receives.
- The vast majority of reductions in a Tier 1 shortage would be concentrated on Central Arizona Project water users, reducing the CAP supply by about 20%.
- DCP is not designed to prevent a Tier 1 shortage, but DCP reduces the risk that the river system will decline to critically low levels. LBDCP protects the highest priority CAP water users in Arizona – CAP Municipal and Industrial and Indian Priority.

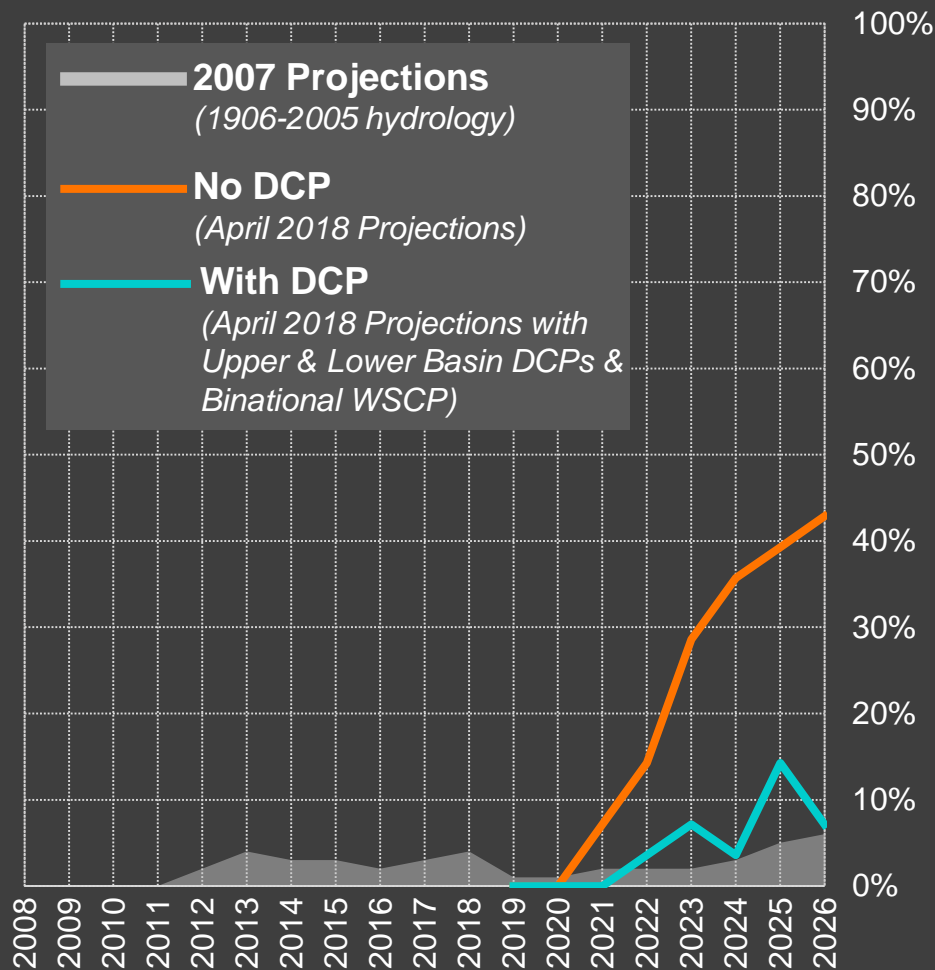
Risk of Lake Mead < 1,020'

5.7 maf 1,020'
22%

Full Hydrology (1906-2015)



Stress Test Hydrology (1988-2015)



2007 Interim Guidelines Shortage Reductions and Incremental DCP Contributions

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

DRAFT



Arizona had to work through an Arizona Implementation Plan

- After a period of contentious discussions, ADWR and CAP convened a large steering committee in July 2019 to develop work through the trade-offs and challenges
- Parties involved and their roles:
 - Central Arizona Project: Funding and Water
 - Salt River Project: Water in exchange
 - CAP M&I Users: Store water in Underground Storage Facilities (USF) and Groundwater Savings Facilities (GSF)
 - Gila River Indian Community: Water for Intentionally Created Surplus/System Conservation
 - CAP AG: Shared investment in groundwater pumping infrastructure
 - State of Arizona: Funding
 - Arizona Water Banking Authority: Long-term storage credits for USF-GSF credit exchanges, Firming
 - United States: Funding of groundwater infrastructure (proposed), Firming
 - NGOs: Funding
 - Colorado River Indian Tribes: Water for System Conservation



Implementing LBDCP in Arizona

4 Essential Elements

- **CAP Ag Mitigation** – The CAP Ag Pool faces reductions under the LBDCP, but receives limited benefits
- **Tribal Intentionally Created Surplus (ICS)** – Currently, the Non-Indian Ag (NIA) Pool is largely held by CAP Tribes with settlements. The Tribal ICS tool provides some flexibility for management of supplies provided from settlements and on-River entitlements.
- **CAP Excess Water Plan** – continuation of the collaborative approach to achieving multiple benefits from the CAP Excess Water supply. The CAP Excess Water supply is the major contributor to “tier zero” reductions
- **Arizona Conservation Plan** – a new collaborative process to foster broader participation to help meet Arizona’s LBDCP reductions

AZ LBDCP Implementation Plan Key Components

- Mitigation Component
 - Wet water CAP deliveries for mitigation
 - Payment for reductions (compensated mitigation) when wet water mitigation is insufficient
 - Money for new groundwater infrastructure for CAP Ag
- Offset Component
 - System conservation and ICS creation to replace CAP ICS that is used for mitigation
 - Pre-firming concept to address NIA firming obligations from Indian water settlements

Base Example

Mitigation Costs ~\$60M

	2019 No Shortage	2020 Tier 1 Shortage
AG POOL	0	105,000
CAP Water	0	105,000
GW Infrastructure	0	0
NIA	0	76,169
GRIC Compensated ¹	0	76,169
GRIC CAP Water	0	0
Cities NIA CAP water	0	0
M&I	0	0
INDIAN PRIORITY	0	0
TOTAL	0	181,169

¹ GRIC prefers wet water deliveries, if available, rather than compensated mitigation and is actively soliciting NIA Pool users to also accept compensation in lieu of water

Poor Hydrology

Mitigation Costs ~\$57M for Compensated Mitigation

	2019 No Shortage	2020 Tier 1 Shortage	2021 Tier 2a Shortage	2022 Tier 2a Shortage	2023 Tier 2b Shortage	2024 Tier 2b Shortage	2025 Tier 3 Shortage	2026 Tier 3 Shortage	TOTALS IN AF
AG POOL	0	105,000	70,000	70,000	76,500	76,500	70,000	70,000	538,000
CAP Water	0	105,000	70,000	70,000	76,500	76,500	70,000	70,000	538,000
GW Infrastructure	0	0	0	16,500	70,000	70,000	70,000	70,000	292,500
NIA	0	77,007	145,730	145,424	78,366	78,366	0	0	524,893
GRIC Compensated ¹	0	34,190	67,116	57,965	32,449	29,449	0	0	218,169
GRIC CAP Water	0	15,000	30,000	30,000	15,000	18,000	0	0	111,000
Cities NIA CAP water	0	27,817	48,614	57,459	30,917	30,917	0	0	195,724
M&I	0	0	0	0	0	0	0	0	0
INDIAN PRIORITY	0	0	0	0	12,767	12,767	0	0	25,534
TOTAL	0	182,007	215,730	215,424	167,633	167,633	70,000	70,000	1,088,427

¹ GRIC prefers wet water deliveries, if available, rather than compensated mitigation and is actively soliciting NIA Pool users to also accept compensation in lieu of water



Lake Mead Offset

	2019 No Shortage	2020 Tier 1 Shortage	2021 Tier 1 Shortage	2022 Tier 1 Shortage	2023 Tier 2a Shortage	2024 Tier 2a Shortage	2025 Tier 2b Shortage	2026 Tier 3 Shortage	TOTALS IN AF
SC	0	50,000	50,000	50,000	0	0	0	0	150,000
GRIC/AWBA Firming	0	0	0	0	0	0	0	0	0
SRP Exchange ICS	0	0	10,000	10,000	10,000	10,000	10,000	0	50,000
Tribal ICS	0	25,000	25,000	0	0	0	0	0	50,000
US/GRIC Firming	100,000	0	0	0	0	0	0	0	100,000
TOTAL	150,000	75,000	85,000	60,000	10,000	10,000	10,000	0	400,000



Completed Actions Necessary for AZ to Execute the Lower Basin Drought Contingency Plan Agreements

#	Action	Parties	Status
1	State legislation authorizing ADWR, on behalf of the State of Arizona, to execute the LBDCP Agreements	Arizona legislature	<ul style="list-style-type: none">Passed on January 31, 2019Signed by Governor Ducey on January 31, 2019Immediately effective
2	Agreement Regarding Lower Basin Drought Contingency Plan Obligations	CAWCD and the United States	<ul style="list-style-type: none">Final AgreementApproved by CAWCD Board on 1/31/19To be executed by the U.S. with all DCP Agreements
3	Arizona ICS Framework Agreement	United States, CAWCD and ADWR	<ul style="list-style-type: none">Final AgreementApproved by CAWCD Board on 3/7/19Awaiting execution by ADWR and the United States
4	Exchange of Letters between CAWCD and ADWR	CAWCD and ADWR	<ul style="list-style-type: none">CompletedLetters executed and exchanged on 1/30/19

Other Agreements to Implement LBDCP in AZ

#	Agreement Name	Parties	Status
1	Overarching Implementation Agreement	CAWCD, ADWR and others TBD	<ul style="list-style-type: none">Term Sheet drafted
2	CAP Ag Mitigation Agreement	CAWCD and CAP Agricultural Districts	<ul style="list-style-type: none">Term Sheet drafted, negotiations largely complete
3	CAP NIA Mitigation Agreement	CAWCD and CAP NIA water users	<ul style="list-style-type: none">Agreement in draft form, under negotiation
4 *	CAWCD – SRP Exchange Agreement	CAWCD and Salt River Project	<ul style="list-style-type: none">Final AgreementFully executed by parties
6	CRIT System Conservation Agreement	ADWR, United States, CRIT and CAWCD	<ul style="list-style-type: none">Agreement in draft form
7	GRIC Pre-Firming Agreement	AWBA and GRIC	<ul style="list-style-type: none">Agreement in draft form
8	GRIC Firming Agreement	United States and GRIC	<ul style="list-style-type: none">Draft Concept
9	USF to GSF Agreements (2 forms of agreement)	<ol style="list-style-type: none">Pinal CAP AG districts, cities and othersAWBA and cities	<ol style="list-style-type: none">Close to final formAWBA credit exchange Approved by AWBA
10	AWBA Recovery Agreements	AWBA and recovery partners	<ul style="list-style-type: none">Draft Concept
11 *	GRIC/CAGRD Water Supply Acquisition Agreements	CAWCD, GRIC and GRWS (Gila River Water Storage LLC)	<ul style="list-style-type: none">Final AgreementFully executed by partiesU.S. approval pending

* means agreement complete

Two Important DCP Dates



March 19, 2019

January 31, 2019





March 19, 2019

Dear Members of Congress,

The designated representatives of the seven States of the Colorado River Basin collectively seek your support in promptly securing legislation to implement necessary actions in the Colorado River Basin in order to respond to the historic drought and ongoing dry conditions in the Basin.

The Colorado River provides water to approximately 40 million people and 5.5 million acres of irrigated agriculture in the Upper Basin (Colorado, New Mexico, Utah and Wyoming) and Lower Basin (Arizona, California and Nevada). Since 2000, the Basin has experienced historically dry conditions and combined storage in Lakes Powell and Mead has reached its lowest level since Lake Powell initially began filling in the 1960s. Last year's runoff into the Colorado River was the second lowest since 2000, and there is no sign that the trend of extended dry conditions will end any time soon even if 2019 provides above average runoff. Lakes Powell and Mead could reach critically low levels as early as 2021 if conditions do not significantly improve. Declining reservoirs threaten water supplies that are essential to the economy, environment, and health of the Southwestern United States.

Working together, the seven Basin States have developed drought contingency plans (DCPs) that are reflected in the agreements attached to this letter. We hereby request passage of federal legislation that would authorize and direct the Secretary of the Interior to sign and implement the agreements upon execution by the non-federal parties.

We look forward to working with you on legislation directing the Secretary of the Interior to implement the DCPs upon their execution by the Basin States and without granting any additional authority to the Secretary. Furthermore, the DCP agreements themselves reserve and recognize each party's existing rights and do not disturb the rights of other water users or stakeholders with interests in the Colorado River.

Federal legislation and subsequent implementation of the agreements will enable prompt action to enhance conservation of Colorado River water and provide us with water management tools necessary to address a looming crisis. These tools will assist us in reducing the probability that Lakes Powell and Mead will decline to critically low elevations. Our goal is


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Colorado River Drought Contingency Plan
March 19, 2019
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to have authorizing legislation in place so that the seven Basin States can execute the drought contingency plan agreements no later than April 22, 2019.

Over the past quarter century, the seven Basin States have worked together to better manage and share the waters of the Colorado River. Each Basin State has its own unique considerations and challenges. Historic dry conditions and the resulting decline in water supply in each of the states has contributed and will likely continue to contribute to significant economic, environmental and other impacts throughout the Basin. We support regional, state and local stakeholders in ongoing efforts to obtain federal funding through existing or future programs to help address those impacts.


We appreciate your support in advancing federal legislation that would allow us to implement the DCPs upon our execution of those agreements. We stand ready to provide additional information and background on the need for and the benefits of the DCPs, and to further explain the need for immediate legislative action. We look forward to working with you in this critical effort.

Respectfully,


Thomas Buschatzke
Governor's Representative
State of Arizona

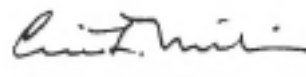

L. James Eldund
Governor's Representative
State of Colorado


Peter Nelson
Governor's Representative
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John J. Entsminger
Governor's Representative
State of Nevada


John R. D'Antonio, Jr.
Governor's Representative
State of New Mexico


Patrick T. Tyrrell
Governor's Representative
State of Wyoming


Eric L. Millis
Governor's Representative
State of Utah

And the work will continue...locally, regionally, state-wide, Colorado River Basin-wide, and with Mexico, and will include renegotiation of the 2007 Interim Shortage Sharing Guidelines, which must begin by the end of 2020.

Thank you!

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