

City of Phoenix Draft Climate Action Plan



Water and Climate

Workshop

June 17, 2021



C4O
CITIES

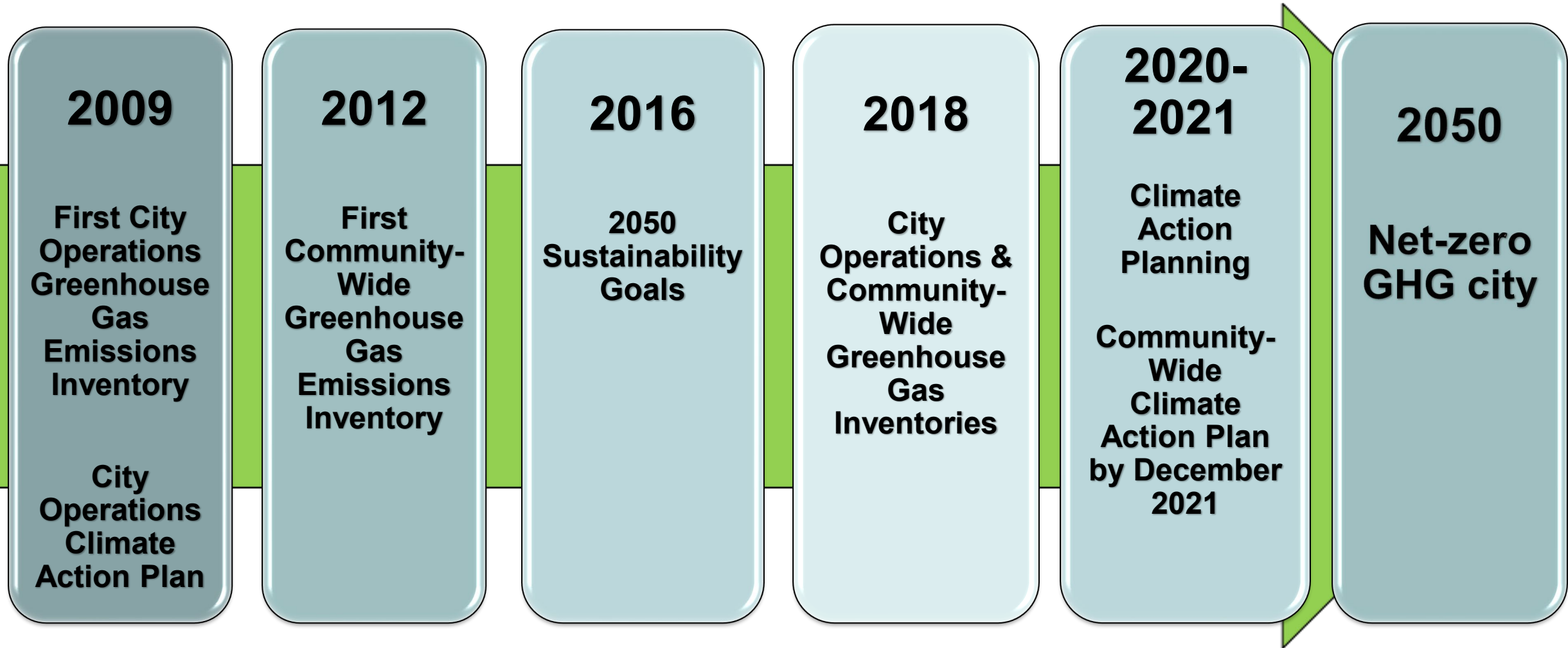
Introduction - C40 Cities



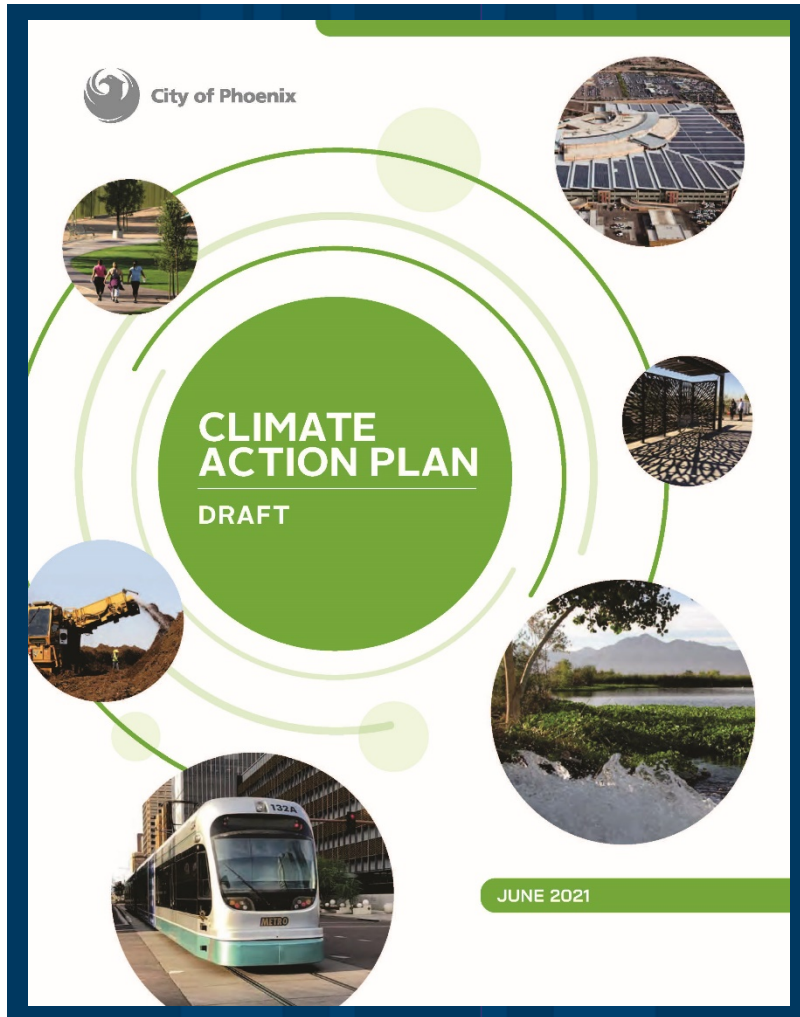
- Mayor Kate Gallego affirmed Phoenix commitment to the Paris Climate Accord – reduce GHG emissions by 2050
- Phoenix joined C40 Cities in Feb. 2020
- C40-compliant Climate Action Plan by Dec 2021
- **Deadline 2020** – 67% Reduction in GHG Emissions by 2030.



Introduction - Ongoing Efforts



Climate Action Plan Draft



GHG Emissions Reduction Goals

Stationary Energy Sector
Transportation Sector
Waste Sector

Resiliency Goals

Air Quality
Local Food Systems
Heat
Water

Climate Action Plan Draft 2050 Goals



GHG Emissions Reduction Goals



New buildings are **Net Positive** in energy & materials




40% of commutes by walking, biking, transit & car-share



Zero Waste through participation in the circular economy

Resiliency Goals



Clean Air
Out-performing federal standards



A thriving vibrant **Food System**



25% Tree and shade canopy



100-Year Clean & reliable supply of water

Next Steps



Draft Plan Public Comment Period

June 2021

Public Engagement
Virtual Workshops & Survey

June 2021

Final Plan to City Council

Fall 2021

Share your Opinions and Ideas

Climate Page, Survey, Future Workshop Information

www.phoenix.gov/climate

Submit questions to
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[@phxenvironment](https://twitter.com/phxenvironment)

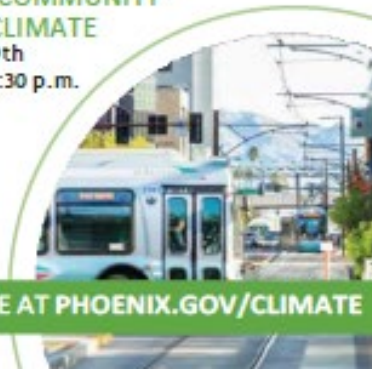


THE FUTURE OF PHOENIX **DRAFT CLIMATE ACTION PLAN**

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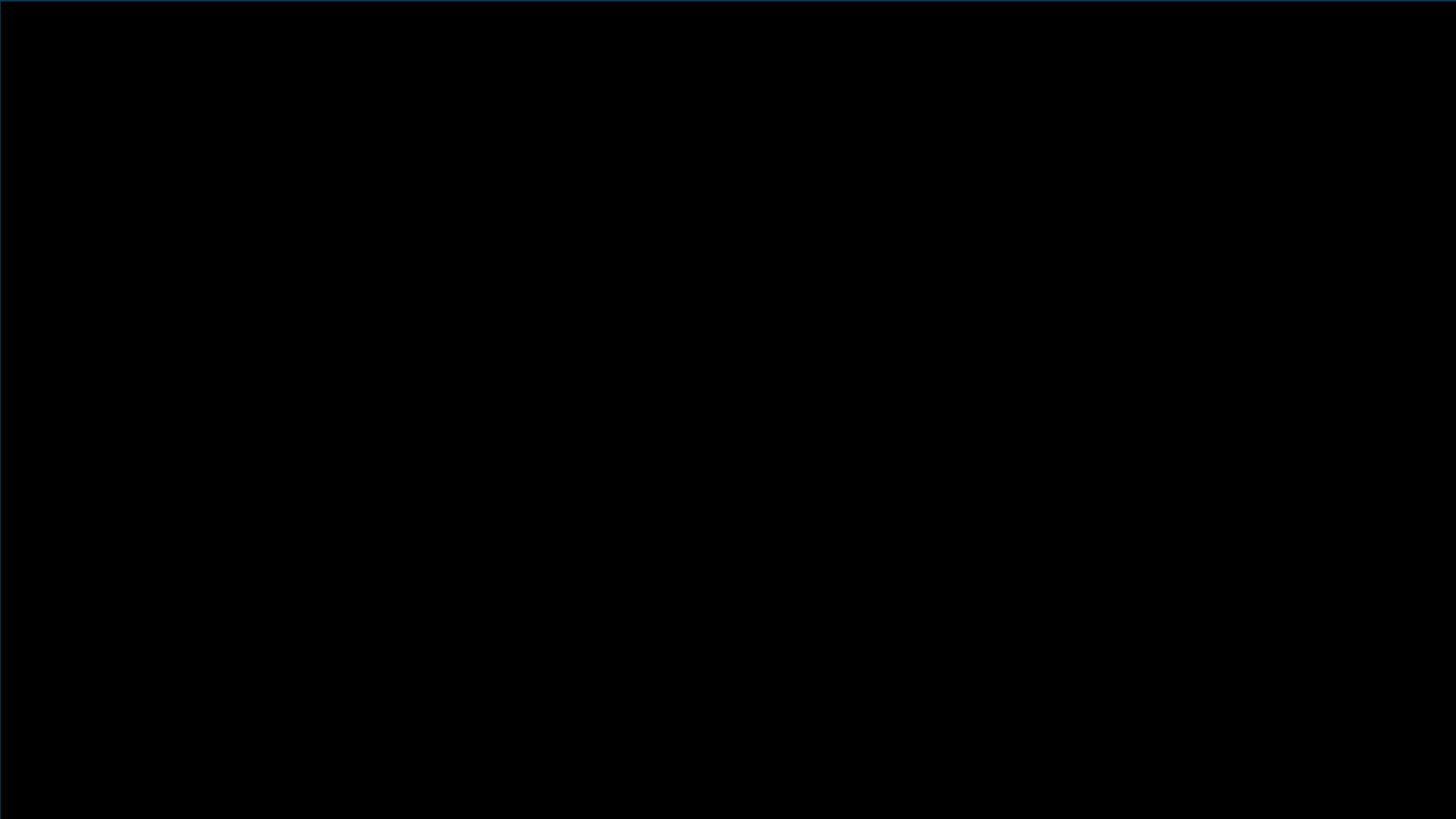
Phoenix Water 101

Troy Hayes, P.E.

DIRECTOR, PHOENIX WATER SERVICES



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PHOENIX TODAY

- 1.7 million customers
- 110 Billion Gallons
- 540 square miles
- Water use approximately 100 gallons per person per day (residential GPCD)





How Water Gets to Us

From River to Tap

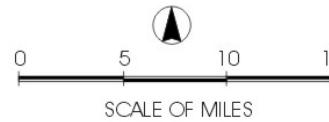
Phoenix Area Water Sources

Verde River



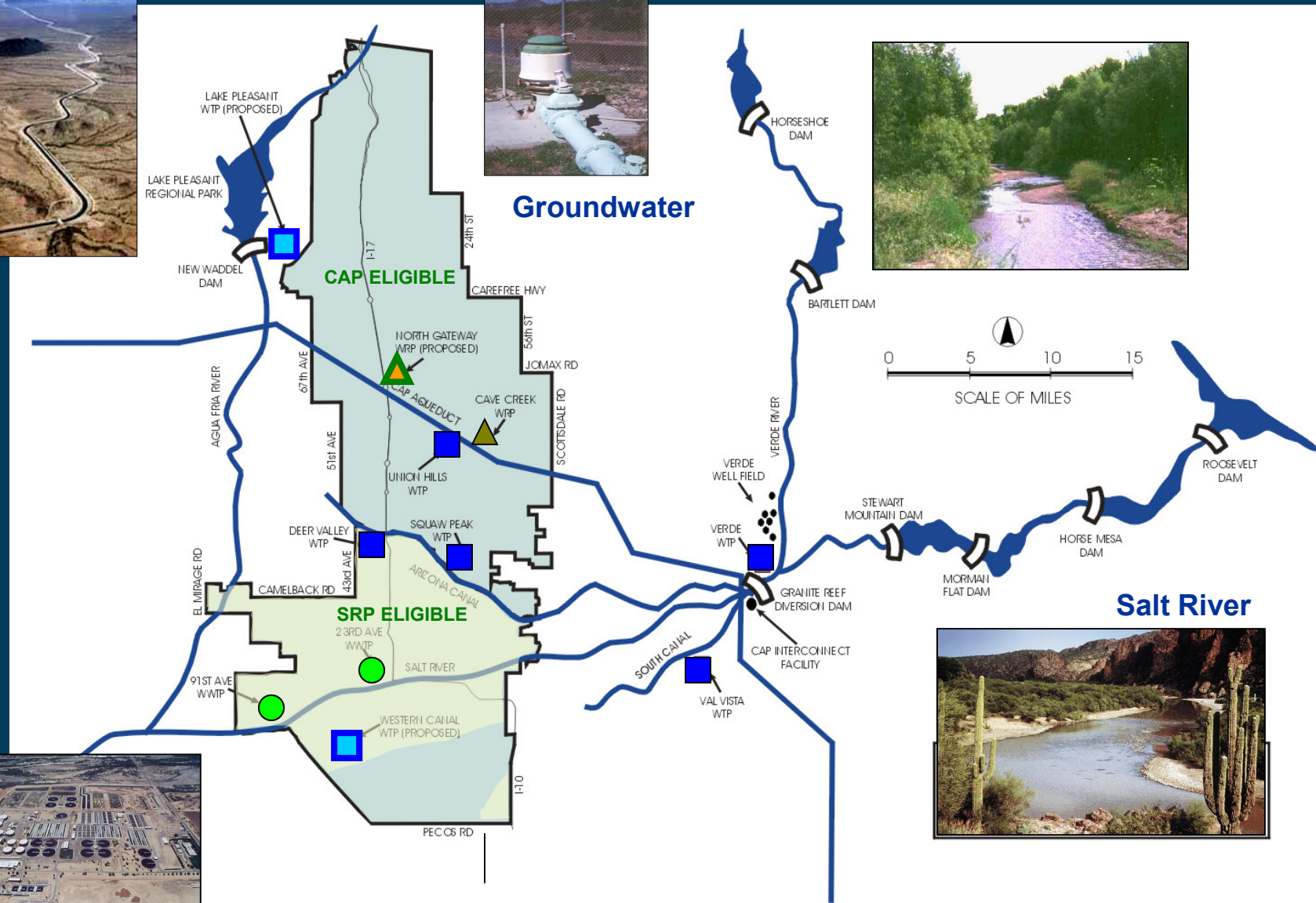
Colorado River
(CAP)

Groundwater



Salt River

Reclaimed
Wastewater



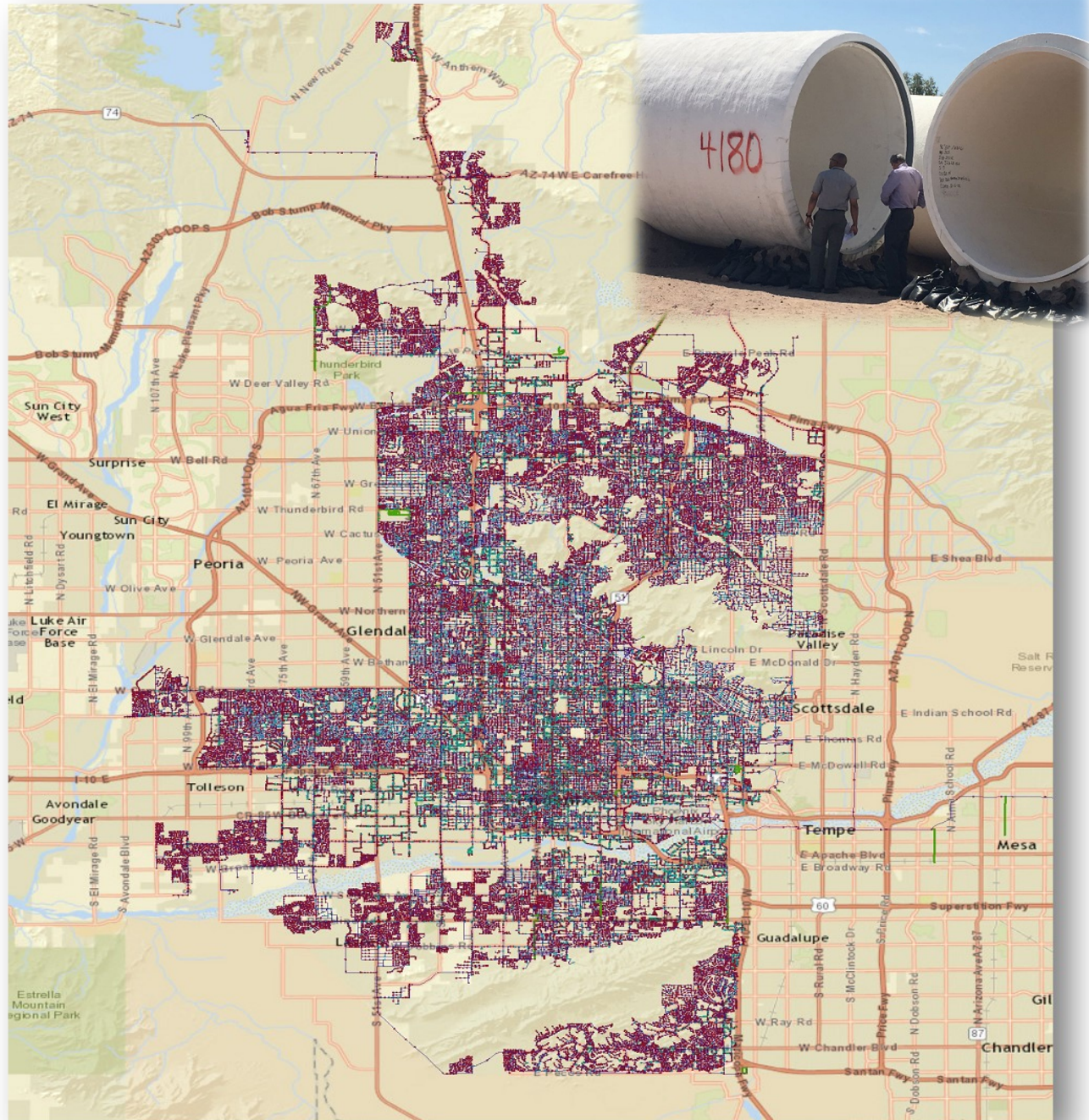
From Canal to



Water Treatment Plant



**7,000
miles of
water
mains
over
540-
square
mile of
land!**



Producing Clean Drinking Water



5 million+ tests and measurements

100 substances

Rigorous standards



From snowpack to your home. **The Water System**



Snow Pack on Mountain



Salt River



Roosevelt Dam and Lake



SRP Canals

1,300 miles



Water Treatment Plant

Phoenix has 6 Water Treatment Plants

Booster Pump Station



Reservoir

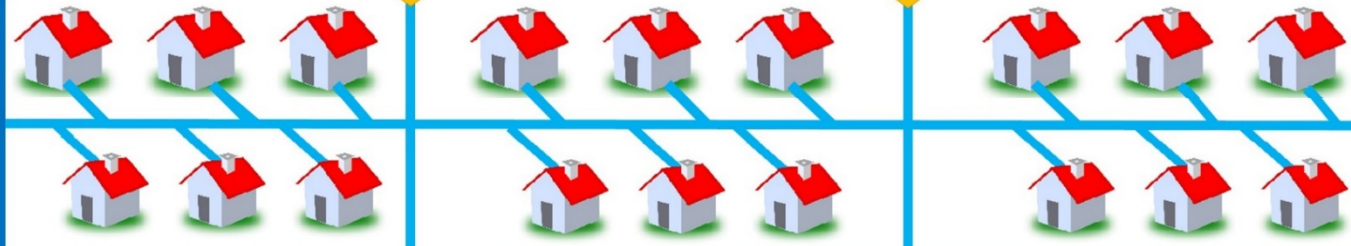


7,000 MILES OF PIPES!

Transmission Main



Pump Stations



Did you know that Phoenix provides 110 billion gallons each year to 1.5 million people?

CITY OF PHOENIX WATER

ANY
QUESTIONS
?



/PHXWATER

PHOENIX.GOV/WATER

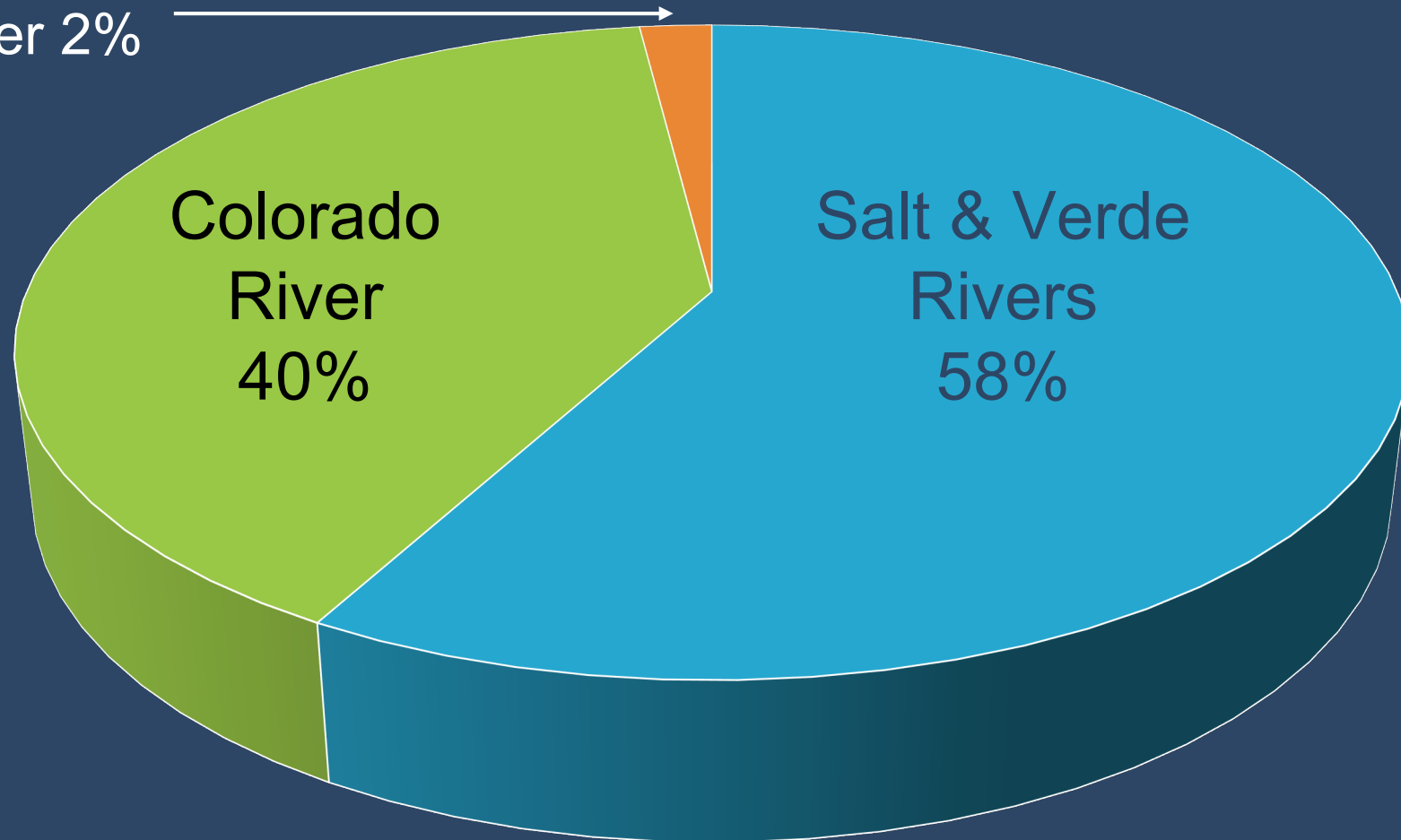
A wide-angle photograph of a desert landscape. In the foreground, a long, straight concrete-lined canal filled with clear blue water stretches from the bottom left towards the center right. The water's surface is calm, reflecting the sky and clouds. The canal is bordered by reddish-brown earth. In the middle ground, there are sparse green and yellow desert shrubs. In the background, a prominent, flat-topped mountain range (mesas) is visible under a vast, blue sky with scattered white and grey clouds. The overall scene is bright and clear, suggesting a sunny day.

PHOENIX WATER RESOURCES

Cynthia Campbell
WATER RESOURCE MANAGEMENT ADVISOR

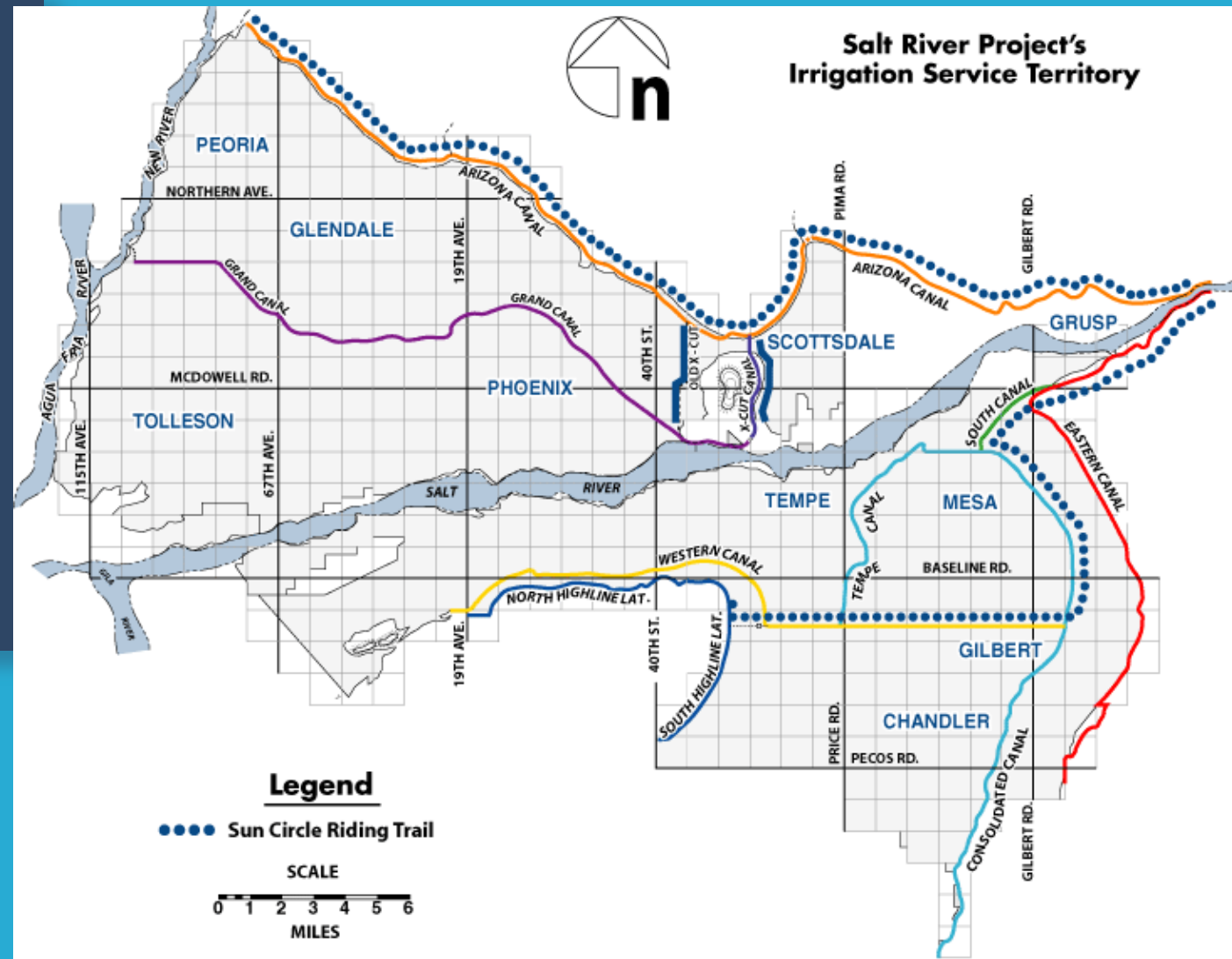
PHOENIX WATER SUPPLY

Groundwater 2%



SRP SUPPLIES

- Phoenix receives most of its surface water from the Salt and Verde Rivers as members of the Salt River Project
- The SRP water use is limited to “on-project” areas – lands in the City that have Kent Decree rights or are otherwise within the SRP District.



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OTHER SALT/VERDE SUPPLIES

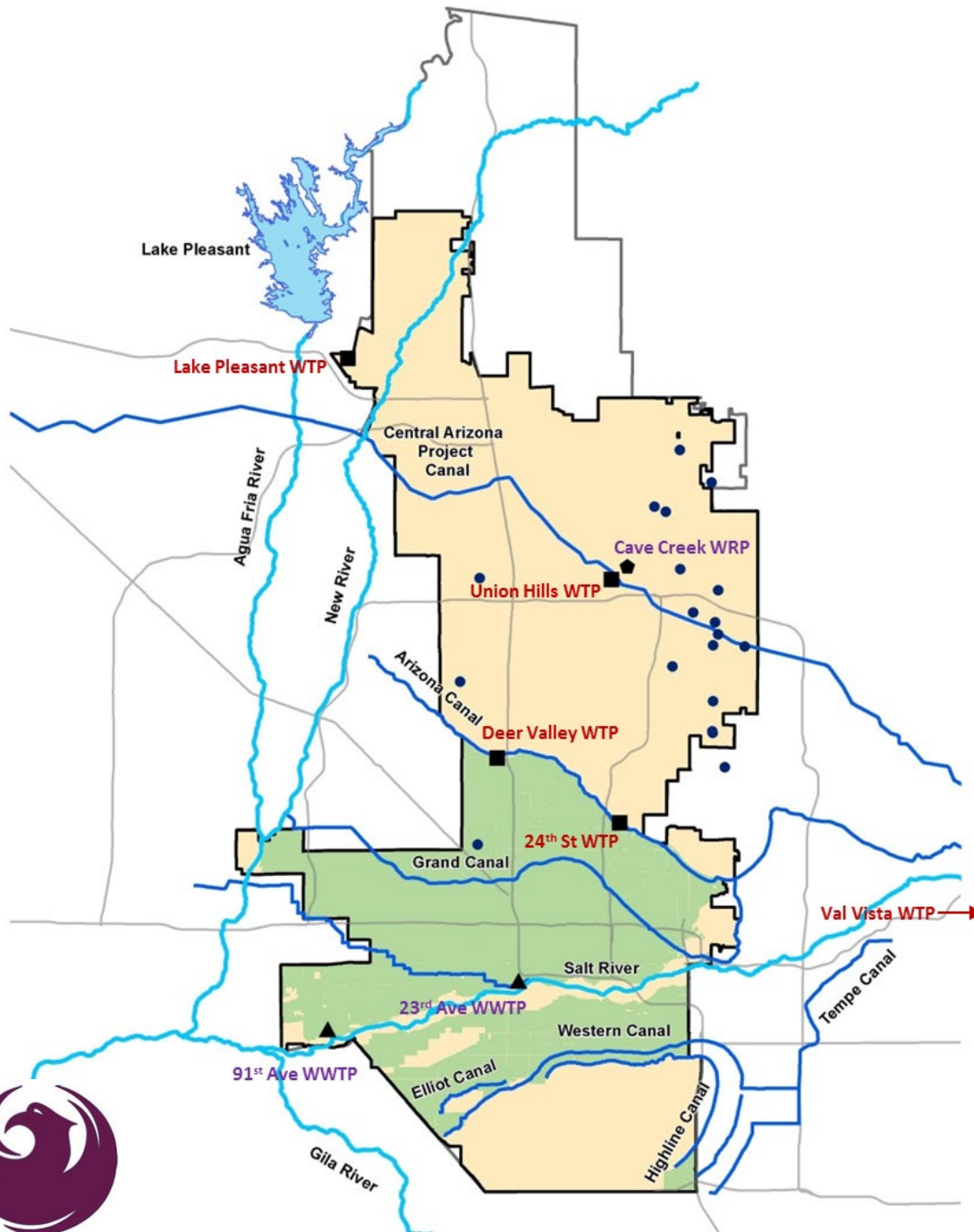
- In the 1950s Phoenix built gates on the top of Horseshoe Reservoir on the Verde and has appropriative rights to “Gatewater” which can be used anywhere in Phoenix.
- In the 1990s, Phoenix helped built “New Conservation Space” at Modified Roosevelt Dam on the Salt. NCS Water can be used throughout Phoenix.
- Phoenix will turn to both supplies during CAP shortages.



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CAP SUPPLIES

- The Central Arizona Project delivers Colorado River water to the Phoenix metropolitan area
- Phoenix receives its allocation of Colorado River water through several water treatment plants located along the CAP
- Phoenix has a M&I subcontract, some NIA priority water and leases for Indian priority water.



GROUNDWATER

- 1980 Groundwater Management Act – Active Management Areas
- Designation of Assured Water Supply
- 2% groundwater used in Phoenix
- Water storage – long term storage credits



RECYCLED/RECLAIMED WATER



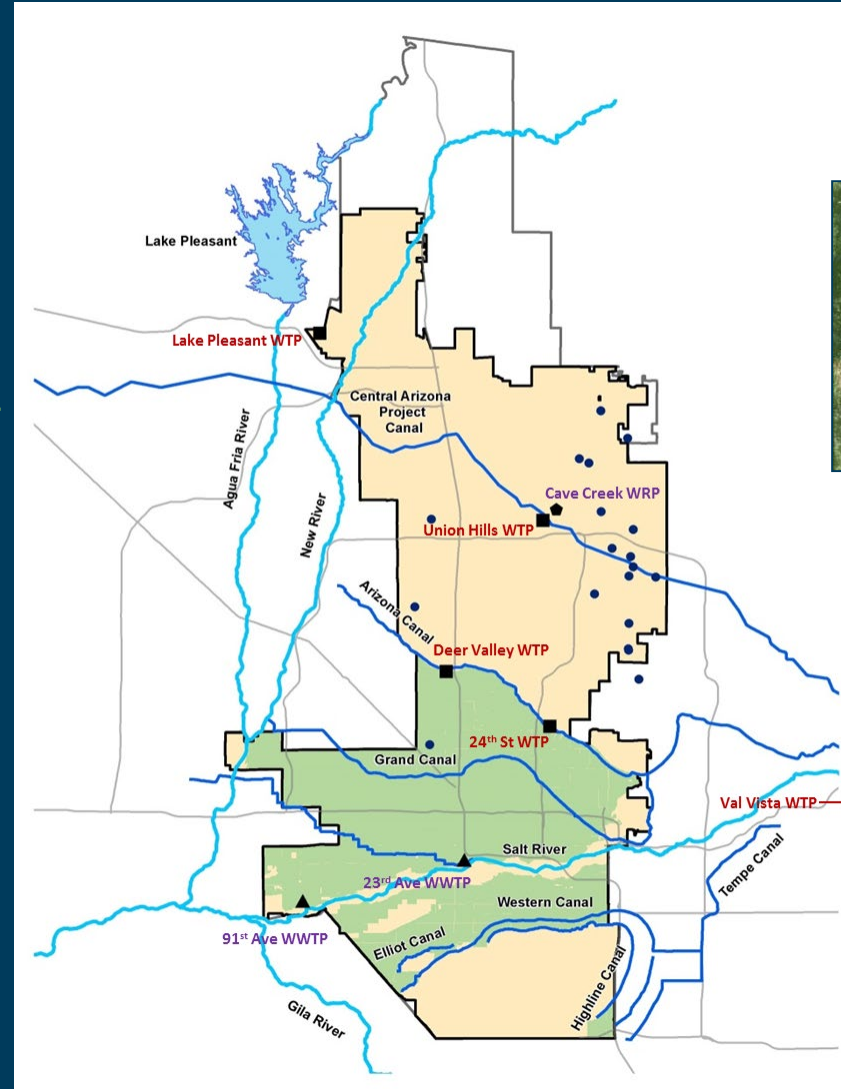
Many water sources...Desert Lifestyle



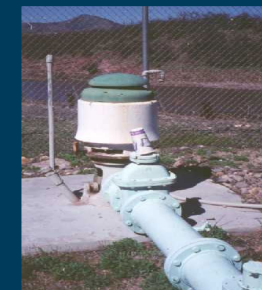
Central Arizona Project (CAP)
Colorado River (40%)



Reclaimed Wastewater
•Palo Verde NGS
•Turf and Agriculture Irrigation



Salt River Project (SRP)
Salt/Verde River (58%)



Groundwater (2%)

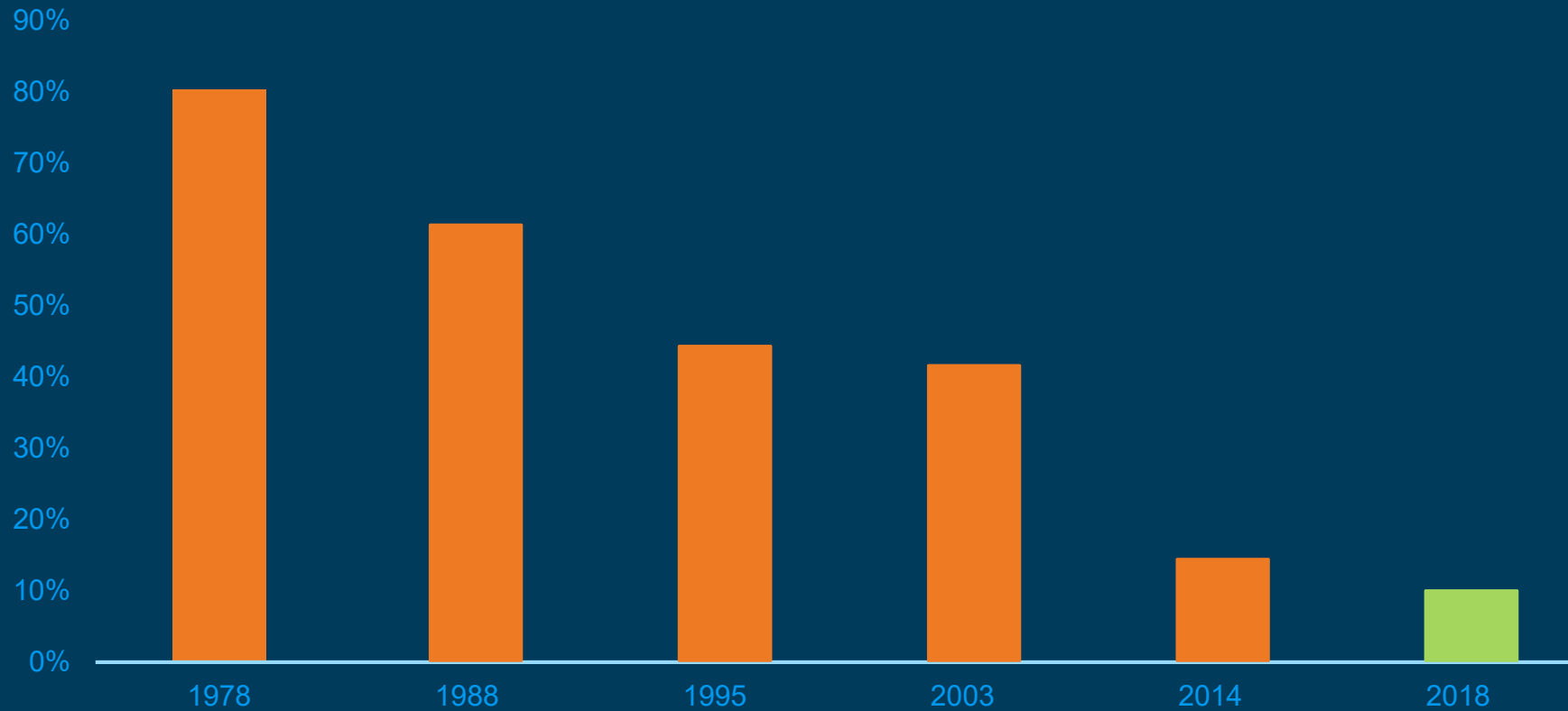
Conservation

- Phoenix has developed a culture of conservation for many years with its customers and in City operations.
- This avoids mandatory water restrictions during anticipated shortages.
- Efficiencies in plumbing
- Landscape changes
- Just under 100 gallons per capita per day (residential)
- Water loss under 10%



Water Use

PHOENIX PROPORTION OF SINGLE-FAMILY HOMES WITH MAJORITY TURF



Phoenix Conservation 1990-2020



QUESTIONS



WATER CONSERVATION IN PHOENIX

Warren Tenney

EXECUTIVE DIRECTOR

ARIZONA MUNICIPAL WATER USERS
ASSOCIATION (AMWUA)



- Conservation supports our way of life in the desert
- Since 1980, the State has mandated conservation requirements
- Phoenix has conservation programs and tools to assist its residents to be water smart
- We need to continue to develop and expand our conservation ethic

Water conservation and efficiency are vital to a sustainable future

2019 Ad Hoc Water Conservation Committee



Made recommendations to continue Phoenix's legacy as a leader in water conservation

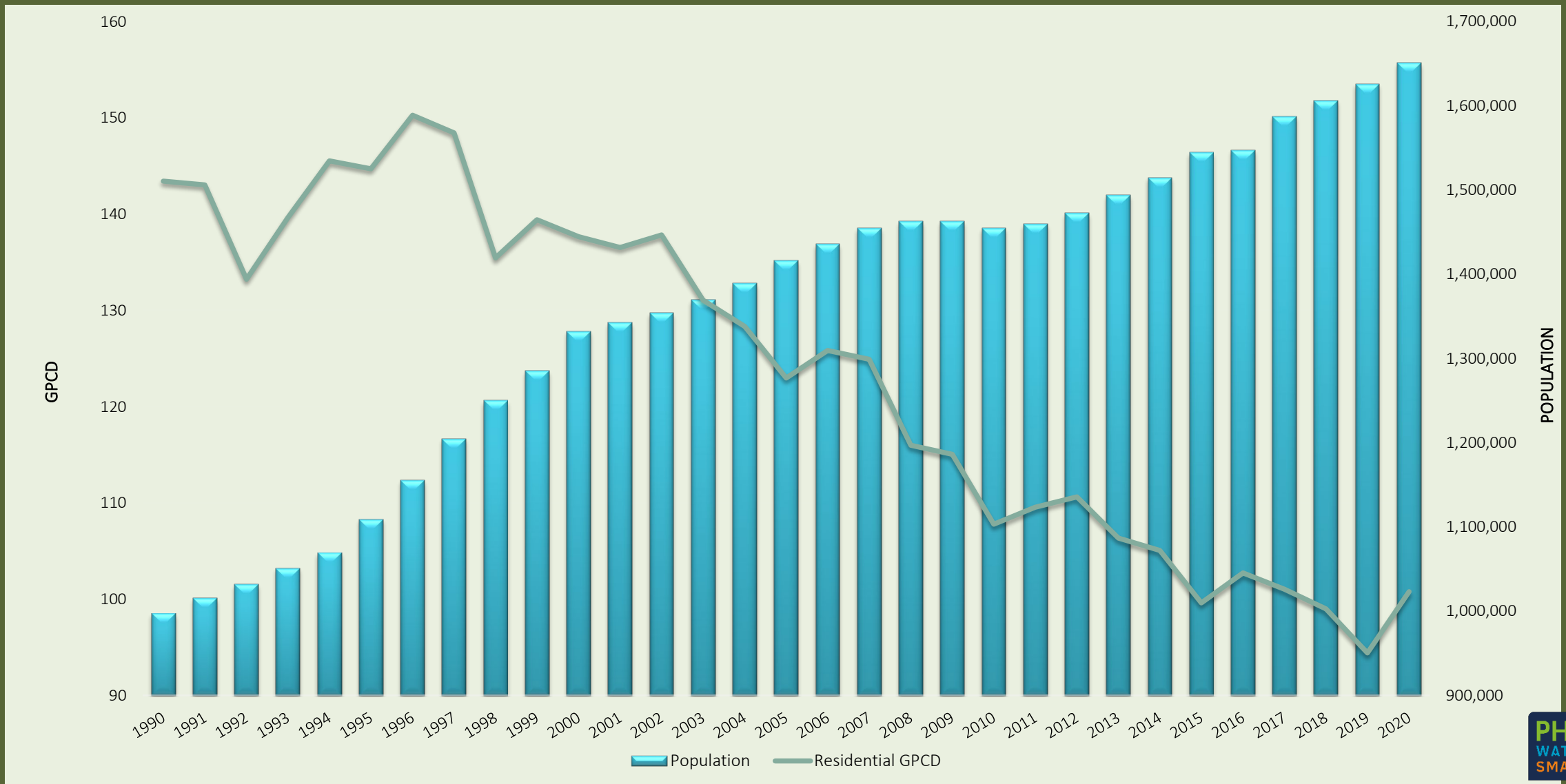
Focus on:

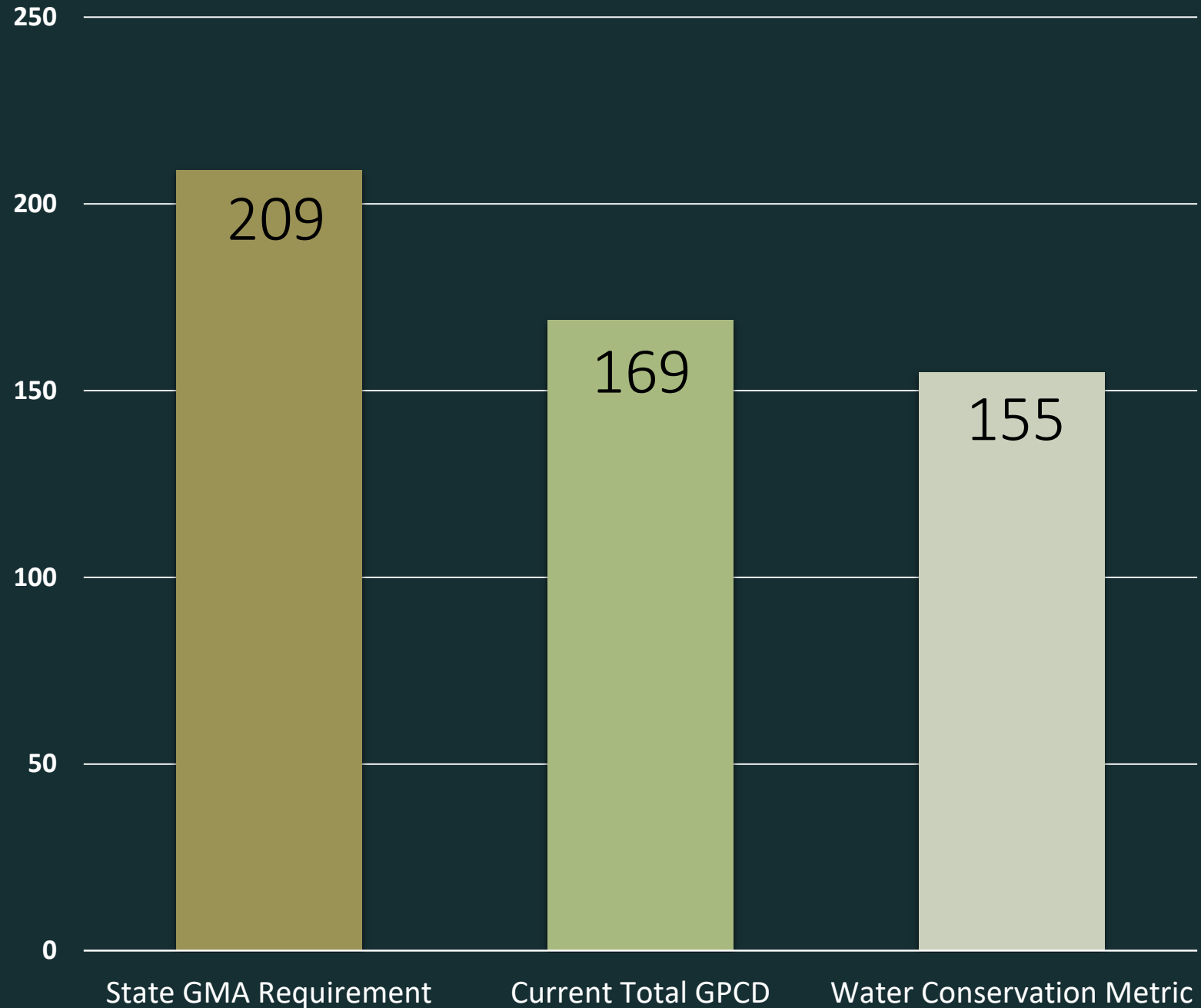
- **Landscaping & Outdoor Water Use**
- **Codes & Incentives**
- **Education & Outreach**

- In 2019, the Phoenix City Council adopted a goal or metric for water conservation.
- Gallons per capita per day (GPCD) – How much water is consumed per person.
- Total GPCD considers all water user type and factors in growth.

Water Conservation Metric

GPCD Trends





GPCD - Water Conservation Metric

CONSERVATION PROGRAMS

Implemented:

- Water Budget Calculator
- Water Education from the Cloud
(phoenix.gov/watercloud)
- Incorporating water budgets into City landscape contracts (pilot program with Water Services)

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CONSERVATION PROGRAMS

Upcoming in 2021/22:

- Smart Irrigation Controller Subsidy with SRP
- Expand HOA Audit Program
- Commercial Cooling Tower Program
- Free Xeriscape plans for residential customers
- Volunteer program

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CONSERVATION PROGRAMS

Future Programs:

- Regular building code updates
- Expand Youth Educational Outreach
- Review State educational standards for water conservation
- Expand Toilet Retrofit program
- Tres Rios Visitors' Center

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Colorado River & the DCP

Sarah Porter



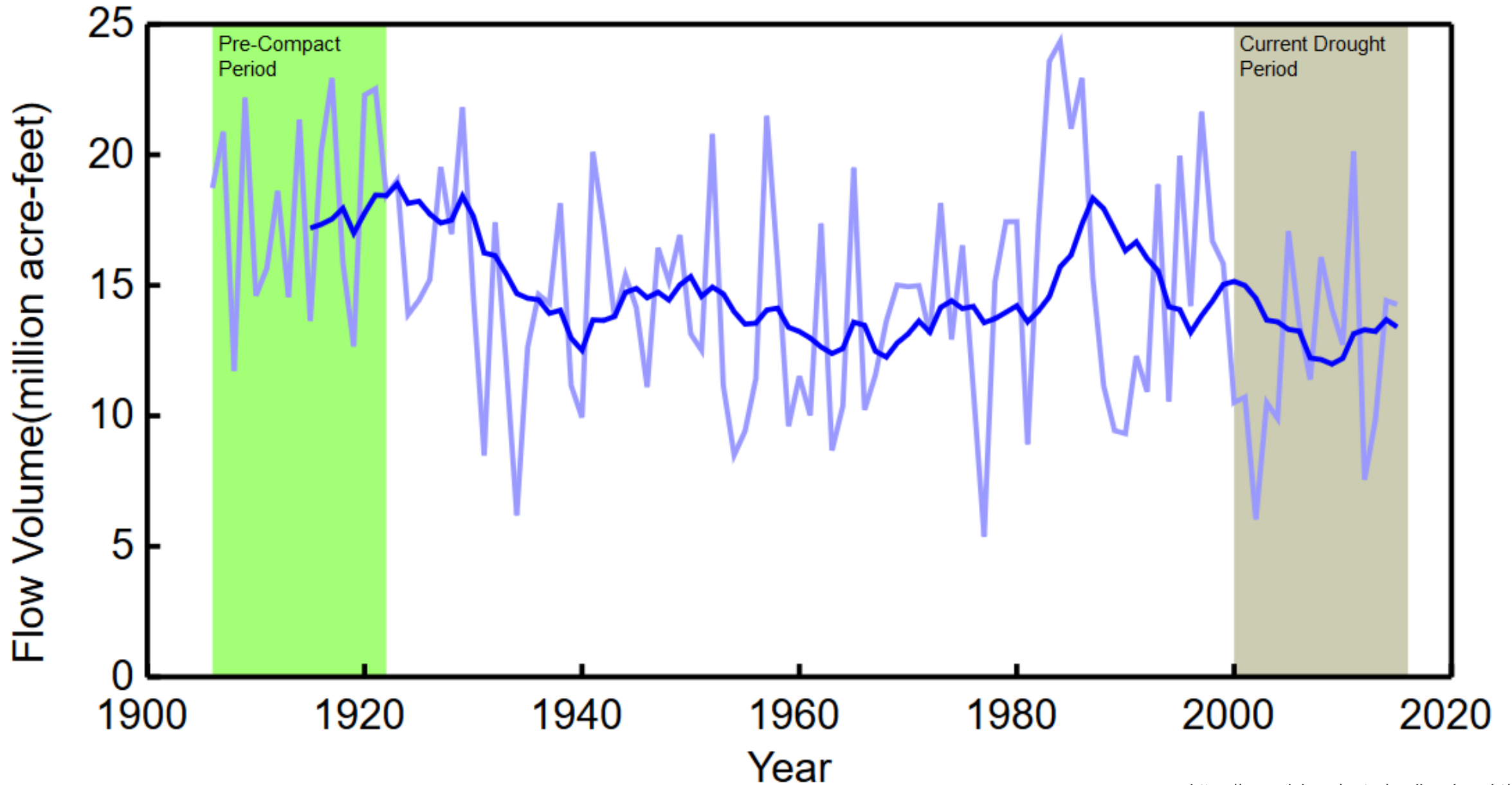
ASU® Kyl Center for Water Policy
at Morrison Institute
Arizona State University

Colorado River Supplies

Lake Mead “Structural Deficit”

Inflow	+ 9.0 MAF
Outflow	- 9.6 MAF
Evaporation	- 0.6 MAF
	<hr/>
Balance	- 1.2 MAF

10-year Average Natural Flow at Lees Ferry



CAP delivers ~ 1.5 MAF/yr

- Maricopa
- Pinal
- Pima



JUNIOR PRIORITY



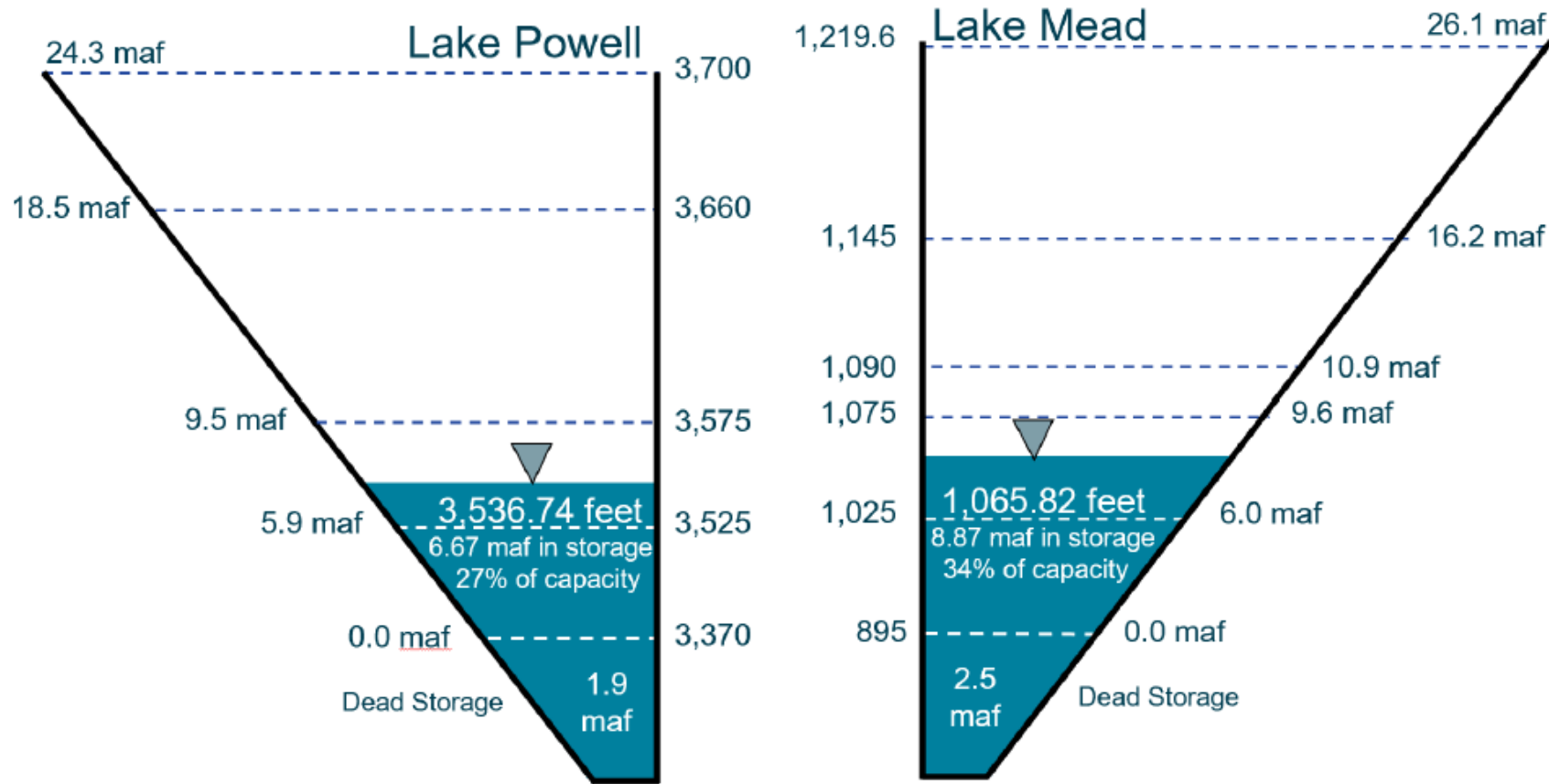
Lower Basin Drought Contingency Plan

Lake Mead Elevation	AZ [2007]	AZ [Plan]	AZ TOTAL	NV [2007]	NV [Plan]	NV TOTAL	CA [2007]	CA [Plan]	CA TOTAL	BOR	TOTAL
1090-1075	0	192K	192K	0	8K	8K	0	0	0	100k	300k
1075-1050	320K	192K	512K	13K	8K	21K	0	0	0	100k	633k
1050-1045	400K	192K	592K	17K	8K	25K	0	0	0	100k	717k
1045-1040	400K	240K	640K	17K	10K	27K	0	200K	200K	100k	967k
1040-1035	400K	240K	640K	17K	10K	27K	0	250K	250K	100k	1,017k
1035-1030	400K	240K	640K	17K	10K	27K	0	300K	300K	100k	1,067k
1030-1025	400K	240K	640K	17K	10K	27K	0	350K	350K	100k	1,117k
<1025	480K	240K	720K	20K	10K	30K	0	350K	350K	100k	1,200k

End of Calendar Year 2021 Projections

May 2021 24-Month Study Most Probable Inflow Scenario¹

Based on a Lake Powell release of 8.23 maf in WY 2021 and 7.48 maf in WY 2022

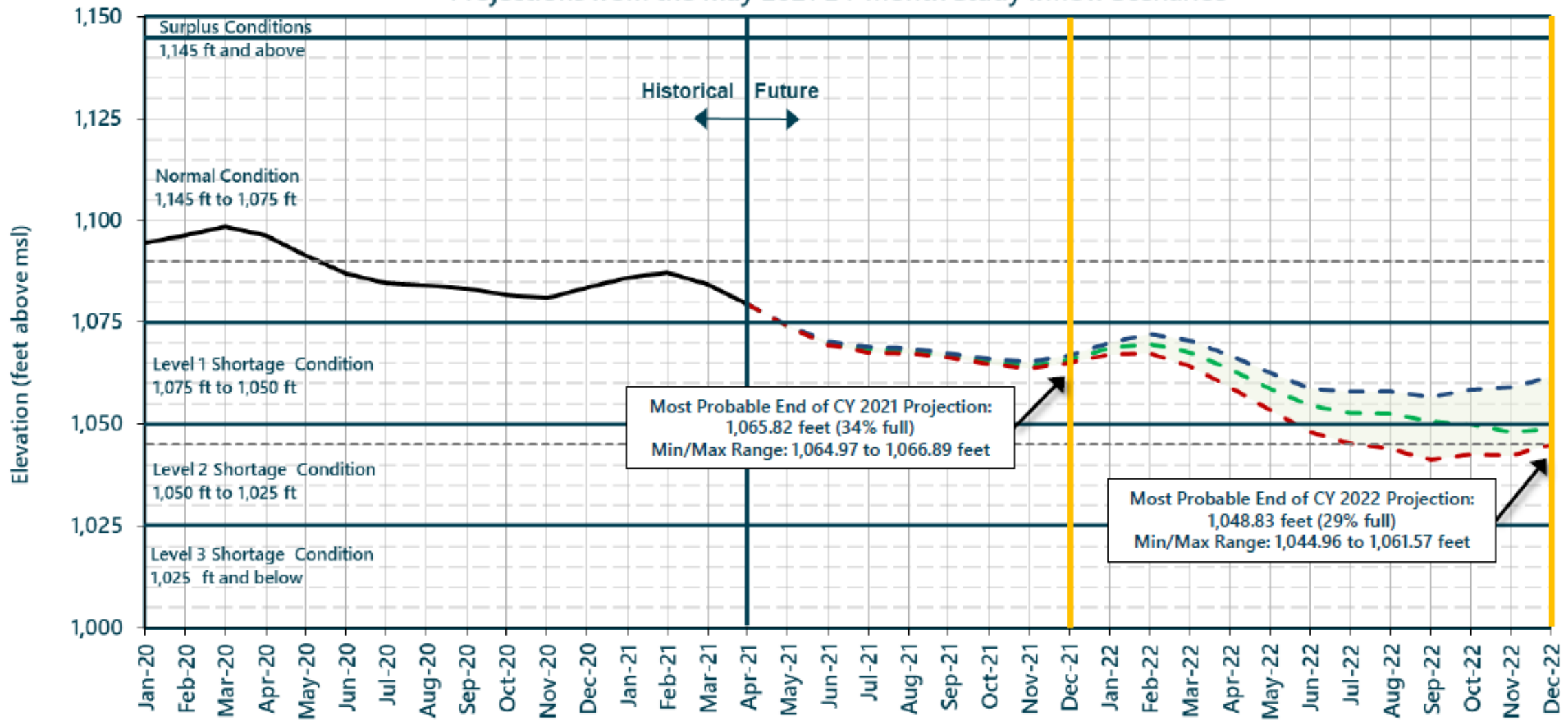


Not to Scale

¹ WY 2021 unregulated inflow into Lake Powell is based on the CBRFC forecast dated 5/4/21.

Lake Mead End of Month Elevations

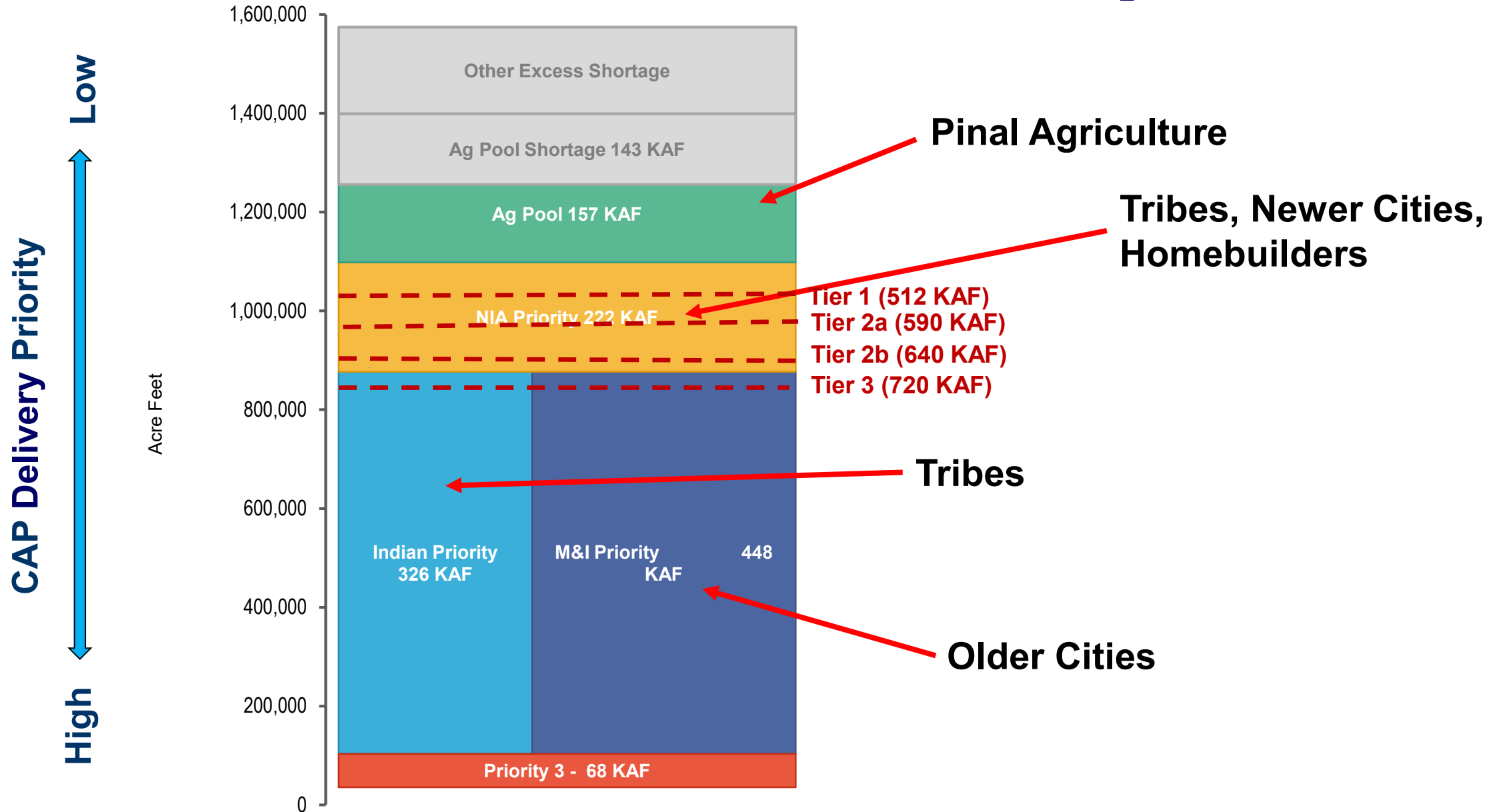
Projections from the May 2021 24-Month Study Inflow Scenarios



- Historical Elevations
- May 2021 Most Probable Inflow with a Lake Powell release of 8.23 maf in WY 2021 and 7.48 maf in WY 2022
- May 2021 DROA* Maximum Probable Inflow with a Lake Powell release of 8.23 maf in WY 2021 and 7.48 maf in WY 2022
- May 2021 DROA* Minimum Probable Inflow with a Lake Powell release of 8.23 maf in WY 2021 and 7.00 maf in WY 2022

*The Drought Response Operations Agreement (DROA) can be found online at: <https://www.usbr.gov/dcp/finaldocs.html>.

Arizona DCP – Who's Impacted



Lower Basin – Lake Mead

Percent of Traces with Event or System Condition

Results from April 2021 CRSS using the Full Hydrology and Stress Test Hydrology (values in percent)

Event or System Condition	2021	2022	2023	2024	2025	2021	2022	2023	2024	2025
Surplus Condition – any amount (Mead \geq 1,145 ft)	0	0	0	1	4	0	0	0	0	0
Surplus – Flood Control	0	0	0	0	<1	0	0	0	0	0
Normal or ICS Surplus Condition (Mead < 1,145 and > 1,075 ft)	100	3	6	17	19	100	3	8	9	6
Recovery of DCP ICS / Mexico's Water Savings (Mead $>/\geq$ 1,110 ft)	0	0	0	4	9	0	0	0	0	<1
DCP Contribution / Mexico's Water Savings (Mead \leq 1,090 and > 1,075 ft)	100	3	5	11	10	100	3	7	9	3
Shortage Condition – any amount (Mead \leq 1,075 ft)	0	97	94	82	77	0	97	92	91	94
Shortage / Reduction – 1 st level (Mead \leq 1,075 and \geq 1,050)	0	97	81	37	34	0	97	71	31	33
DCP Contribution / Mexico's Water Savings (Mead \leq 1,075 and > 1,050 ft)	0	97	81	37	34	0	97	71	31	33
Shortage / Reduction – 2nd level (Mead < 1,050 and \geq 1,025)	0	0	13	44	32	0	0	21	60	36
DCP Contribution / Mexico's Water Savings (Mead \leq 1,050 and > 1,045 ft)	0	0	11	9	6	0	0	17	6	7
DCP Contribution / Mexico's Water Savings (Mead \leq 1,045 and > 1,040 ft)	0	0	2	9	6	0	0	4	11	6
DCP Contribution / Mexico's Water Savings (Mead \leq 1,040 and > 1,035 ft)	0	0	<1	11	8	0	0	0	16	6
DCP Contribution / Mexico's Water Savings (Mead \leq 1,035 and > 1,030 ft)	0	0	0	10	7	0	0	0	17	6
DCP Contribution / Mexico's Water Savings (Mead \leq 1,030 and \geq 1,025 ft)	0	0	0	5	6	0	0	0	9	10
Shortage / Reduction – 3 rd level (Mead < 1,025)	0	0	0	1	11	0	0	0	<1	25
DCP Contribution / Mexico's Water Savings (Mead $</\leq$ 1,025 ft)	0	0	0	1	11	0	0	0	<1	25

Notes:

¹ Modeled operations include the 2007 Interim Guidelines, Upper Basin Drought Response Operations, Lower Basin Drought Contingency Plan, and Minute 323, including the Binational Water Scarcity Contingency Plan.

² Reservoir initial conditions on March 31, 2021 were simulated using the April 2021 MTOM based on the CBRFC unregulated inflow forecast ensemble dated April 2, 2021.

³ Each of the 35 initial conditions from MTOM were coupled with 114 hydrologic inflow sequences from the Full Hydrology that resamples the observed natural flow record from 1906-2019 for a total of 3,990 traces analyzed and with 32 hydrologic inflow sequences from the Stress Test Hydrology that resamples the observed natural flow record from 1988-2019 for a total of 1,120 traces analyzed.

⁴ Percentages shown in this table may not be representative of the full range of future possibilities that could occur with different modeling assumptions.

⁵ Percentages shown may not sum to 100% due to rounding to the nearest percent.



ASU® **Kyl Center for Water Policy**
at Morrison Institute
Arizona State University

Sarah Porter
602-828-0866
s.porter@asu.edu

Panel Discussion



- Enter your questions in the chat.
 - Troy Hayes – Director, Water Services Director
 - Cynthia Campbell – Water Resources Advisor
 - Sarah Porter – Director, ASU Kyl Center for Water Policy
 - Warren Tenney – Executive Director, Arizona Municipal Water Users Association

Share your Opinions and Ideas

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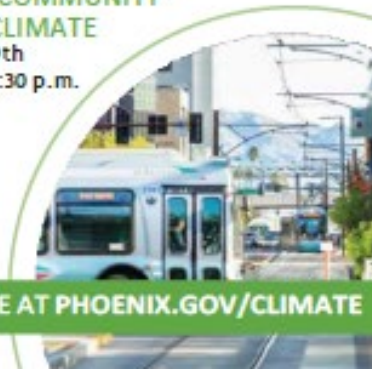


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