



Arizona Department of Water Resources  
and  
Central Arizona Project

# **Joint Briefing Lower Basin Drought Contingency Plan**

**June 28, 2018**

**To submit a handwritten question:**

- 1. Get a blue card from ADWR or CAP staff**
- 2. Complete and return to ADWR or CAP staff prior to break**

**To submit a question via text:**

- 1. Text AZDCP to 22333**
- 2. Reply to the automated text with your question**

**To submit a question online:**

- 1. Go to [PolleEV.com/AZDCP](http://PolleEV.com/AZDCP)**
- 2. Enter your name and submit your question**





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**Joint Briefing  
Lower Basin  
Drought Contingency Plan  
June 28, 2018**

Process Overview

Colorado River: Current Hydrology and Hydrologic Risk to System

Lower Basin Drought Contingency Plan: Review of Key Terms

Colorado River System Response

Effects of the Lower Basin Drought Contingency Plan to Arizona Water Users

Break

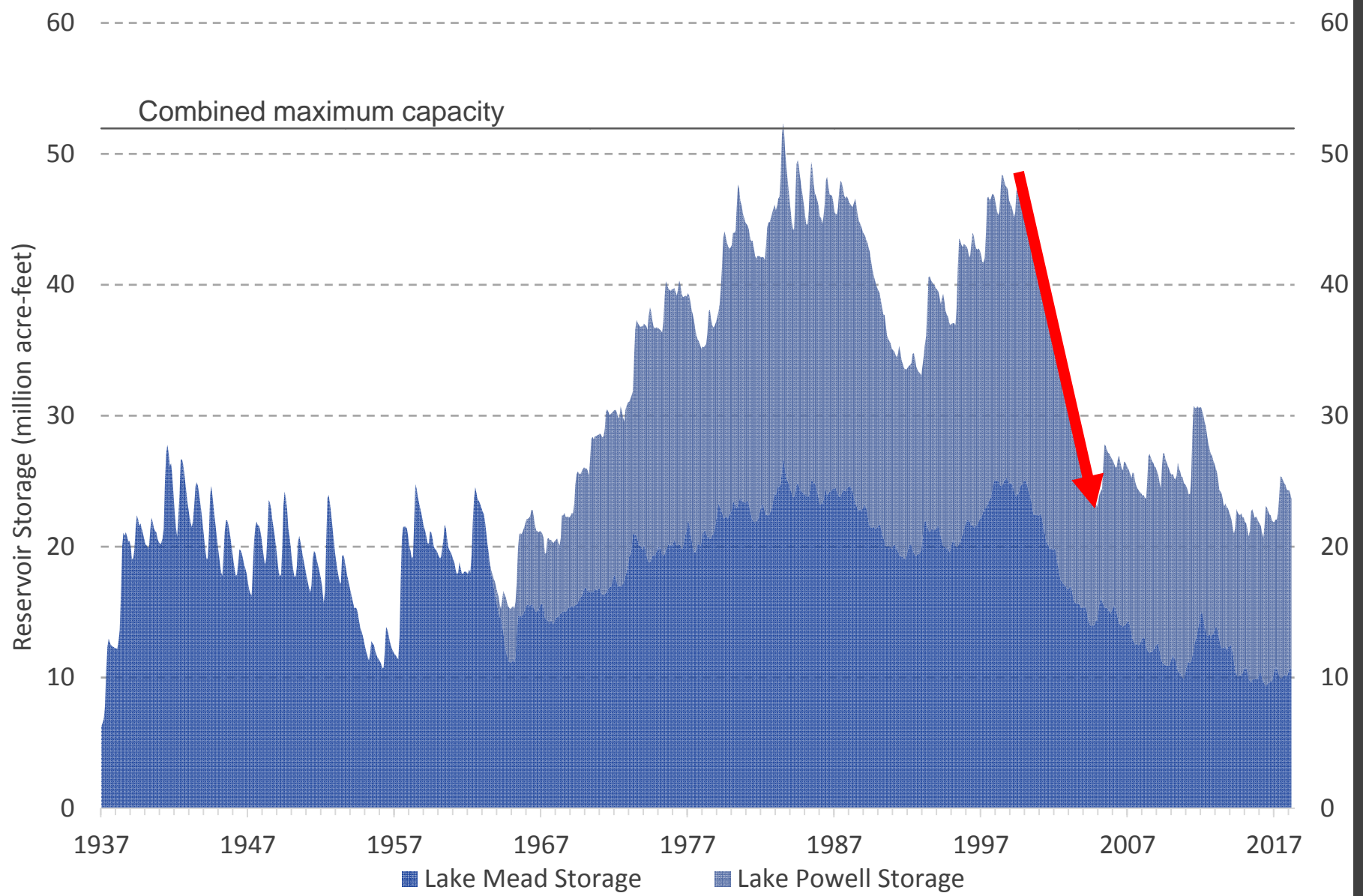
Outline of Process for Stakeholder Engagement and Next Steps

Questions and Answers





# Lake Powell and Lake Mead Combined Storage



# **Colorado River: Current Hydrology and Hydrologic Risks to the System**

**Arizona Workshop – Drought Contingency Plan**

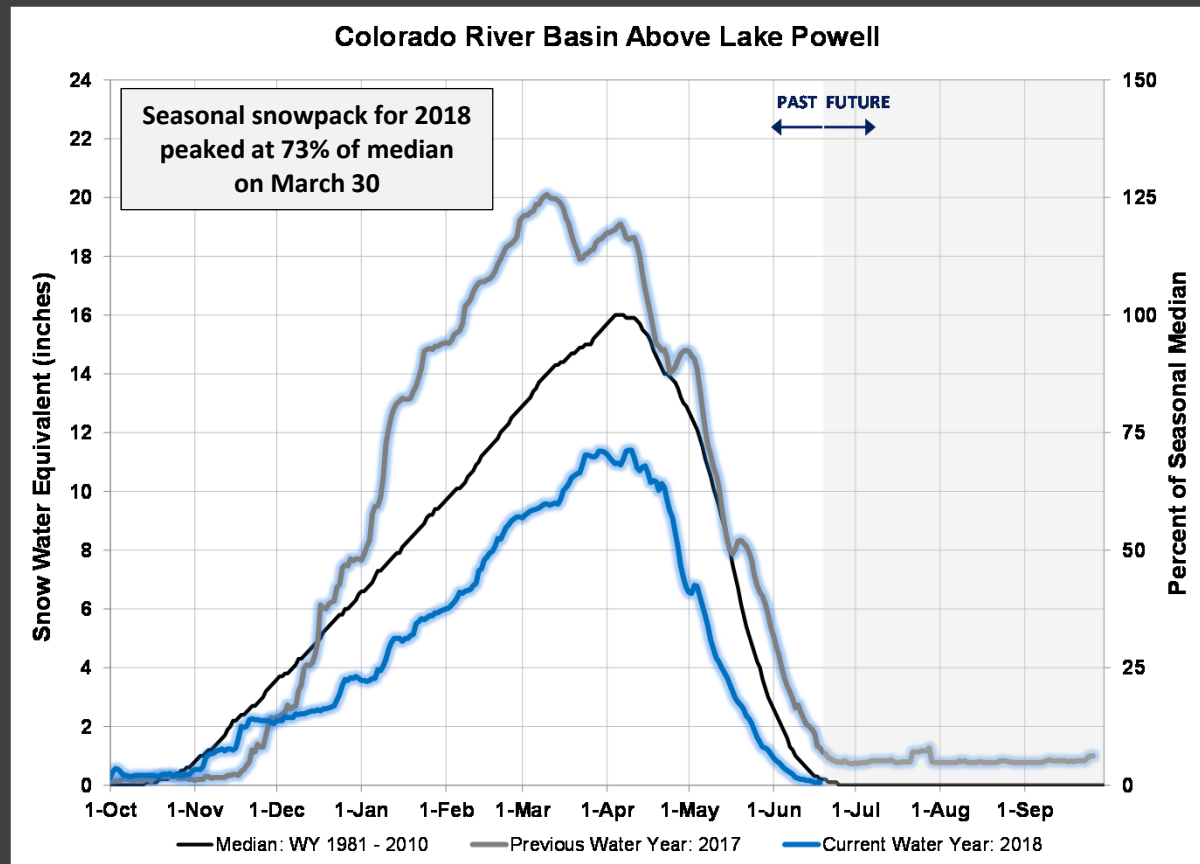
**June 28, 2018**

**Phoenix, Arizona**

# Upper Colorado River Basin Water Year 2018 Snowpack and Forecasted Inflow

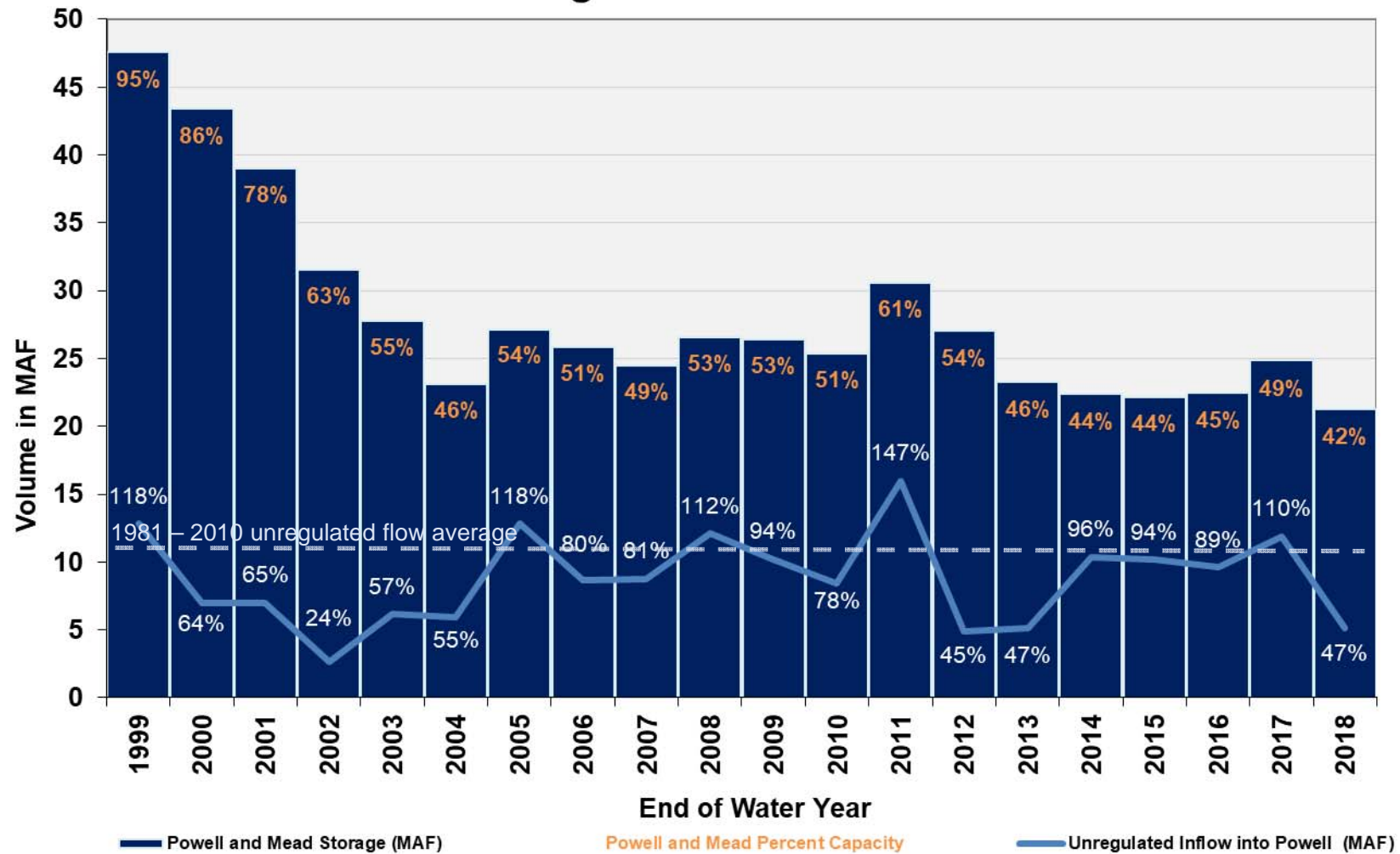
Water Year 2018  
Forecasted  
Unregulated  
Inflow  
(as of 6/18/18)

47% of average





## Lakes Powell & Mead Storage and Percent Capacity and Unregulated Inflow into Lake Powell



Values for Water Year 2018 are projected. Unregulated inflow is based on the latest CBRFC forecast dated June 18, 2018. Storage and percent capacity are based on the June 2018 24-Month Study.

Percentages on the light blue line represent percent of average unregulated inflow into Lake Powell for a given water year. The percent of average is based on the period of record from 1981-2010.

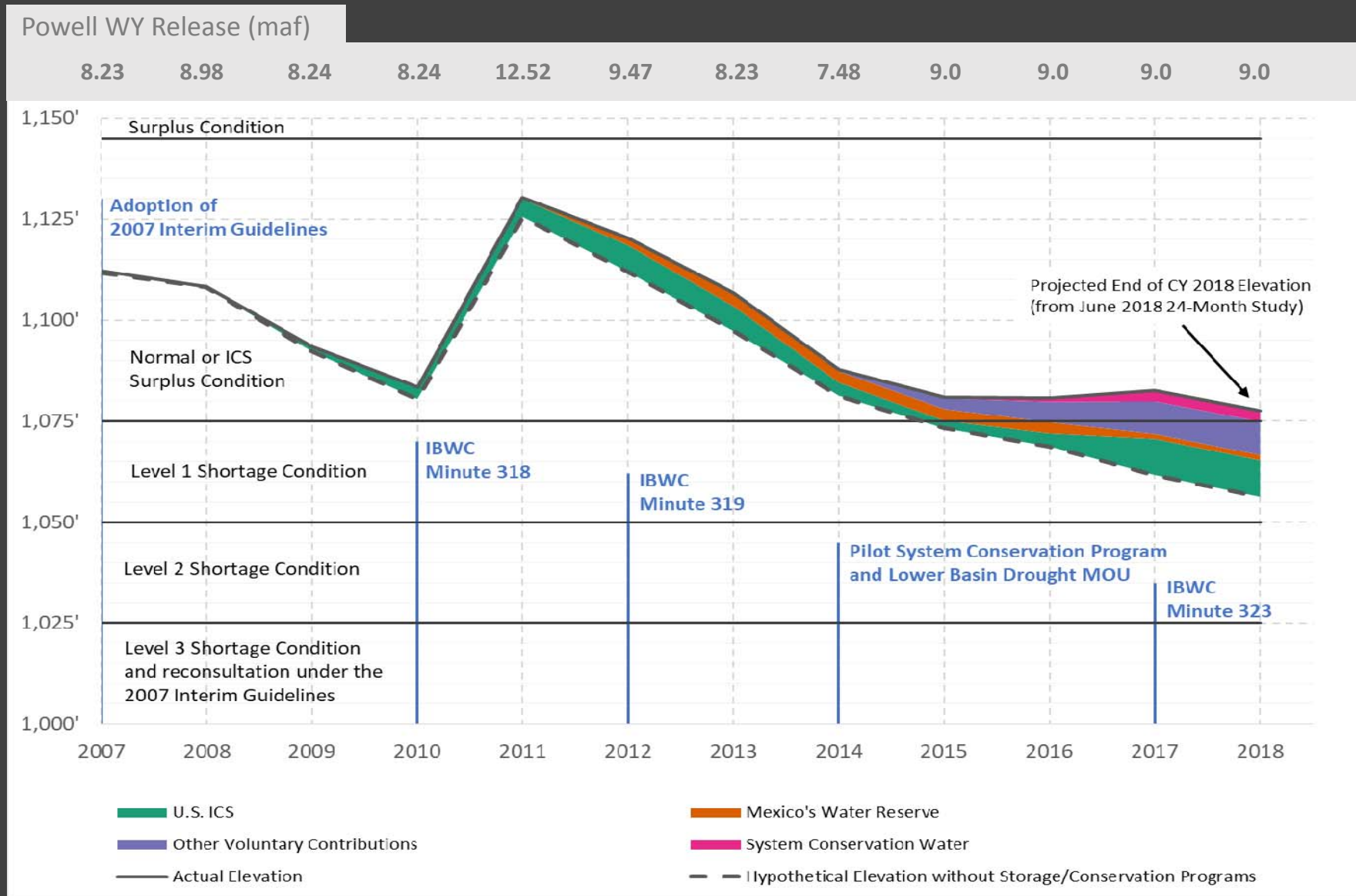
# Colorado River Basin Storage (as of June 25, 2018)

Reservoir	Percent Full	Storage (MAF)	Elevation (Feet)
Lake Powell	53%	12.81	3,611
Lake Mead	38%	9.80	1,077
Total System Storage*	51%	30.53	NA

\*Total system storage was 56% or 33.56 maf this time last year



# Lake Mead End-of-Calendar Year Elevation

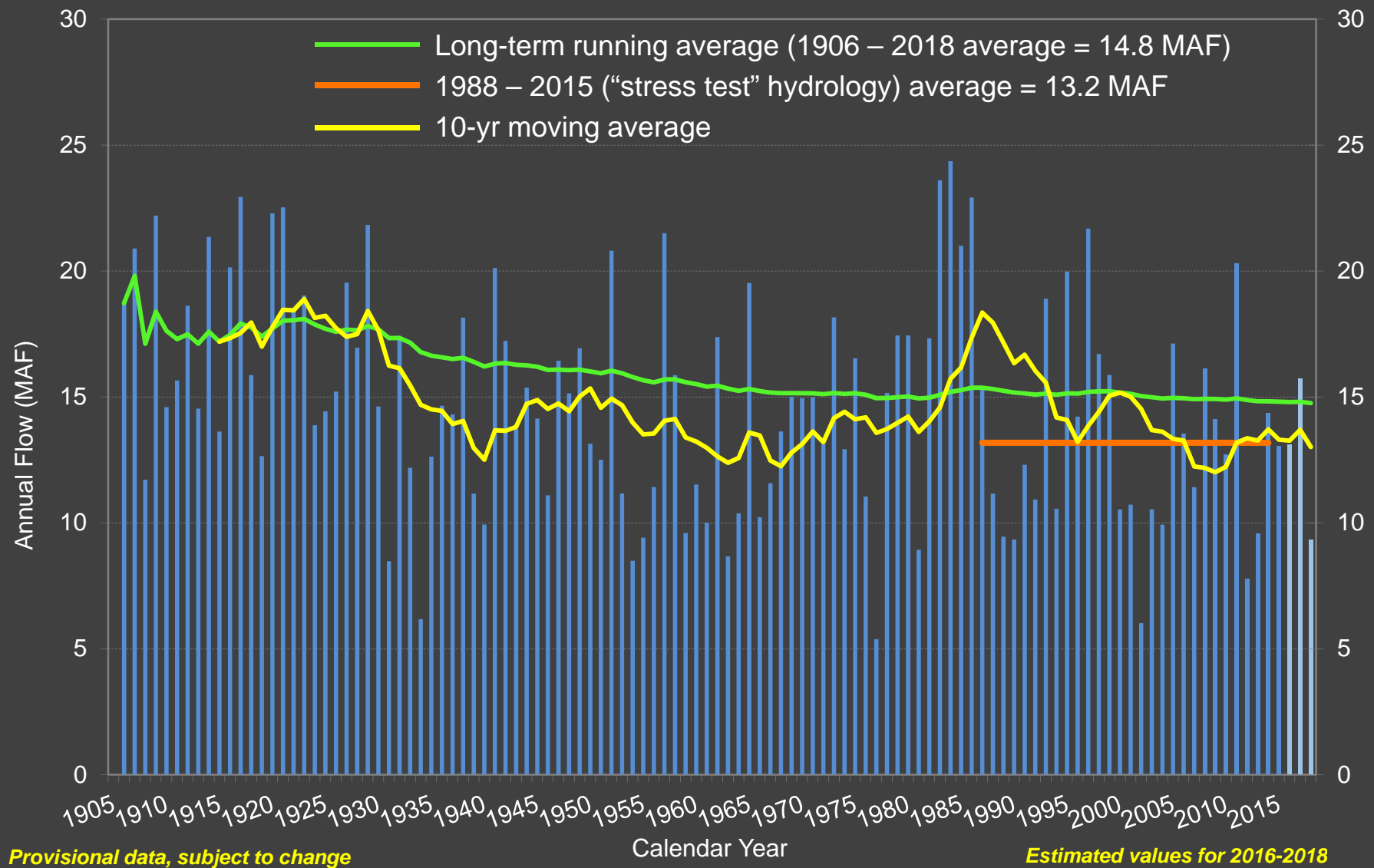


End of calendar year 2018 balances of U.S. ICS and Mexico's Water Reserve, system conservation water, and other voluntary contributions to Lake Mead are provisional and subject to change.

# Natural Flow

## Colorado River at Lees Ferry Gaging Station, Arizona

### Water Year 1906 to 2018





# Historical and Future Projected Lake Mead End-of-December Elevations

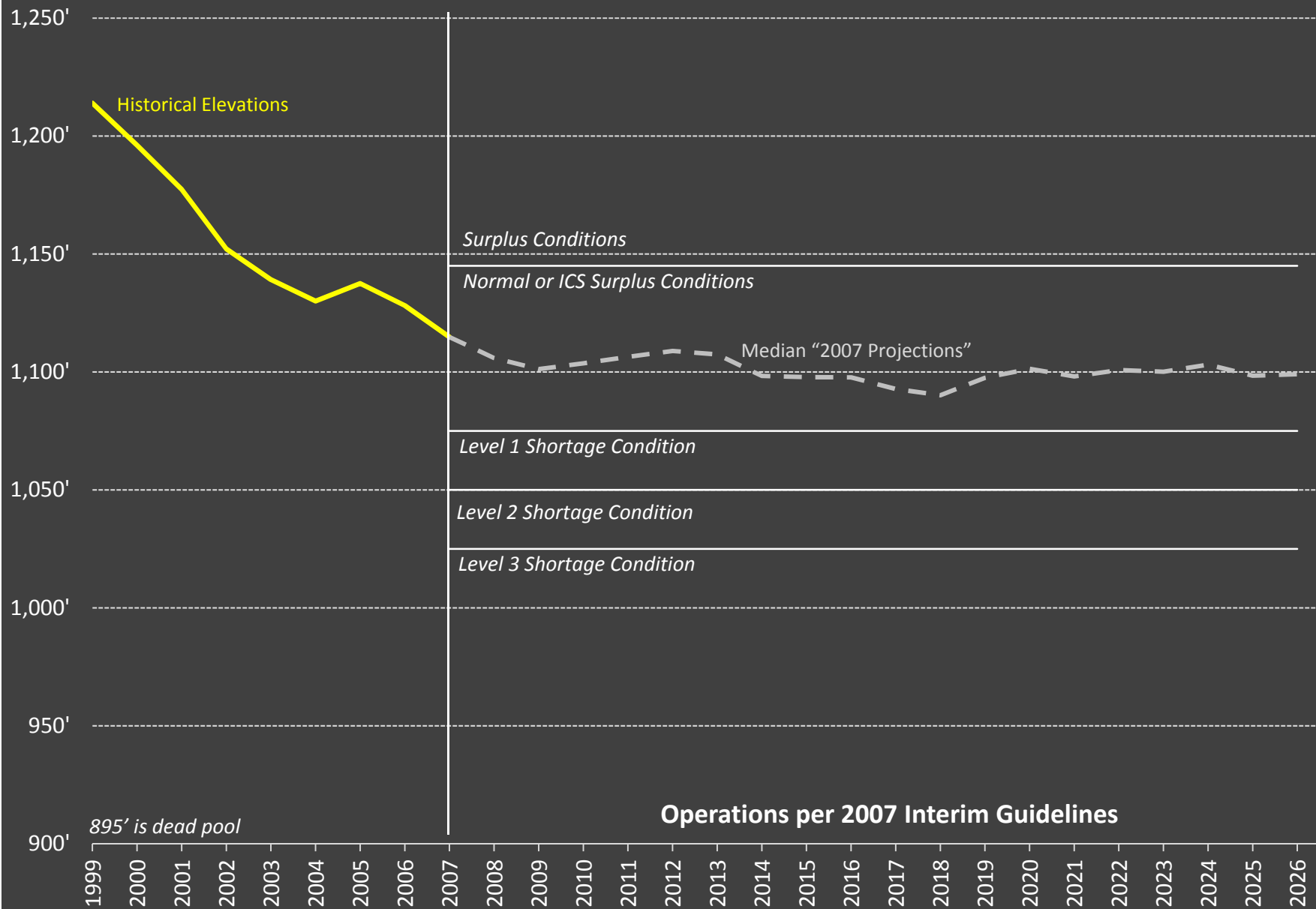


Figure notes:

2007 Projections from Interim Guidelines FEIS. Future hydrology based on resampling of the 1906-2005 natural flow record.

"Full" Hydrology from April 2018 CRSS. Future hydrology based on resampling of the 1906-2015 natural flow record.

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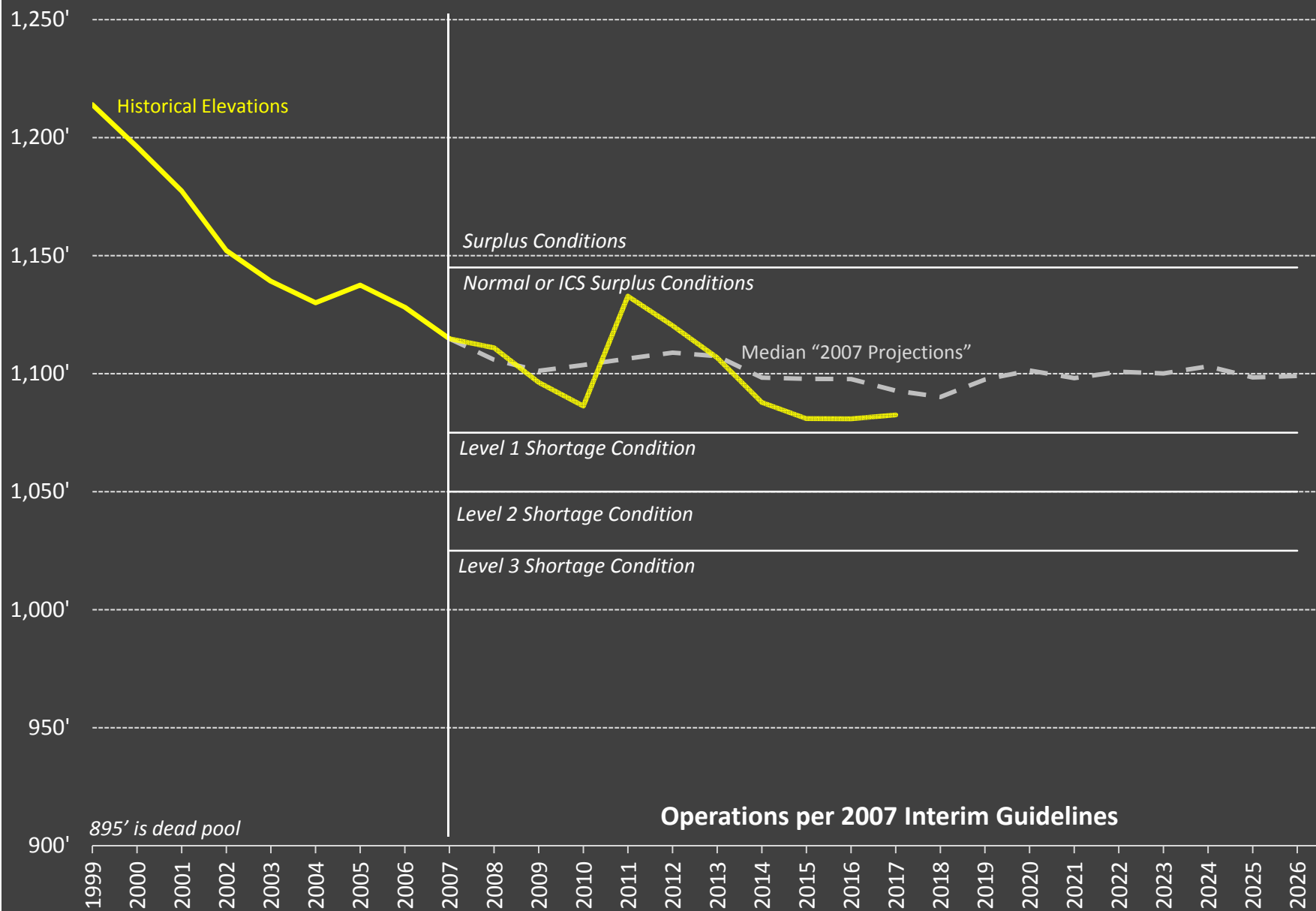


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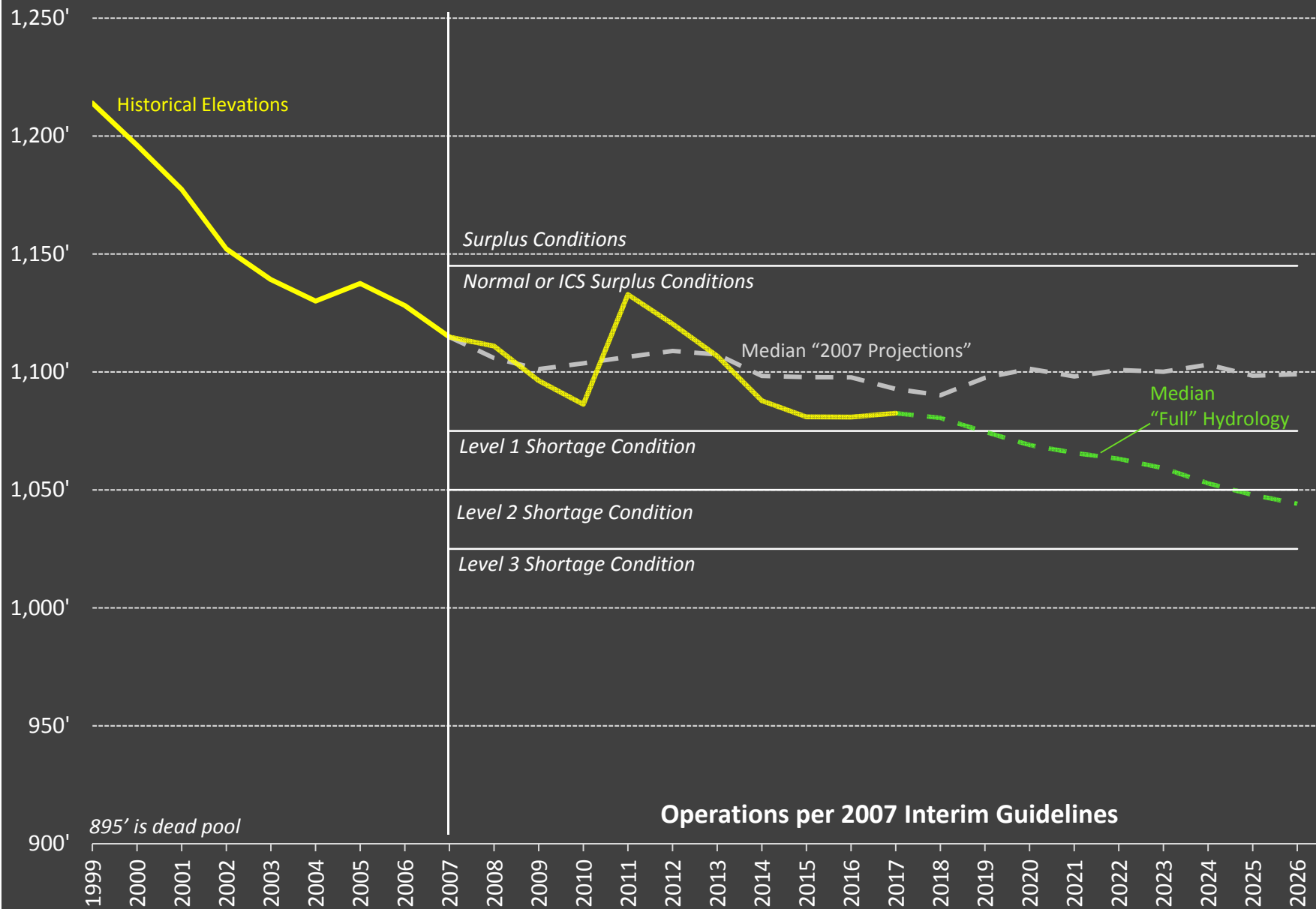


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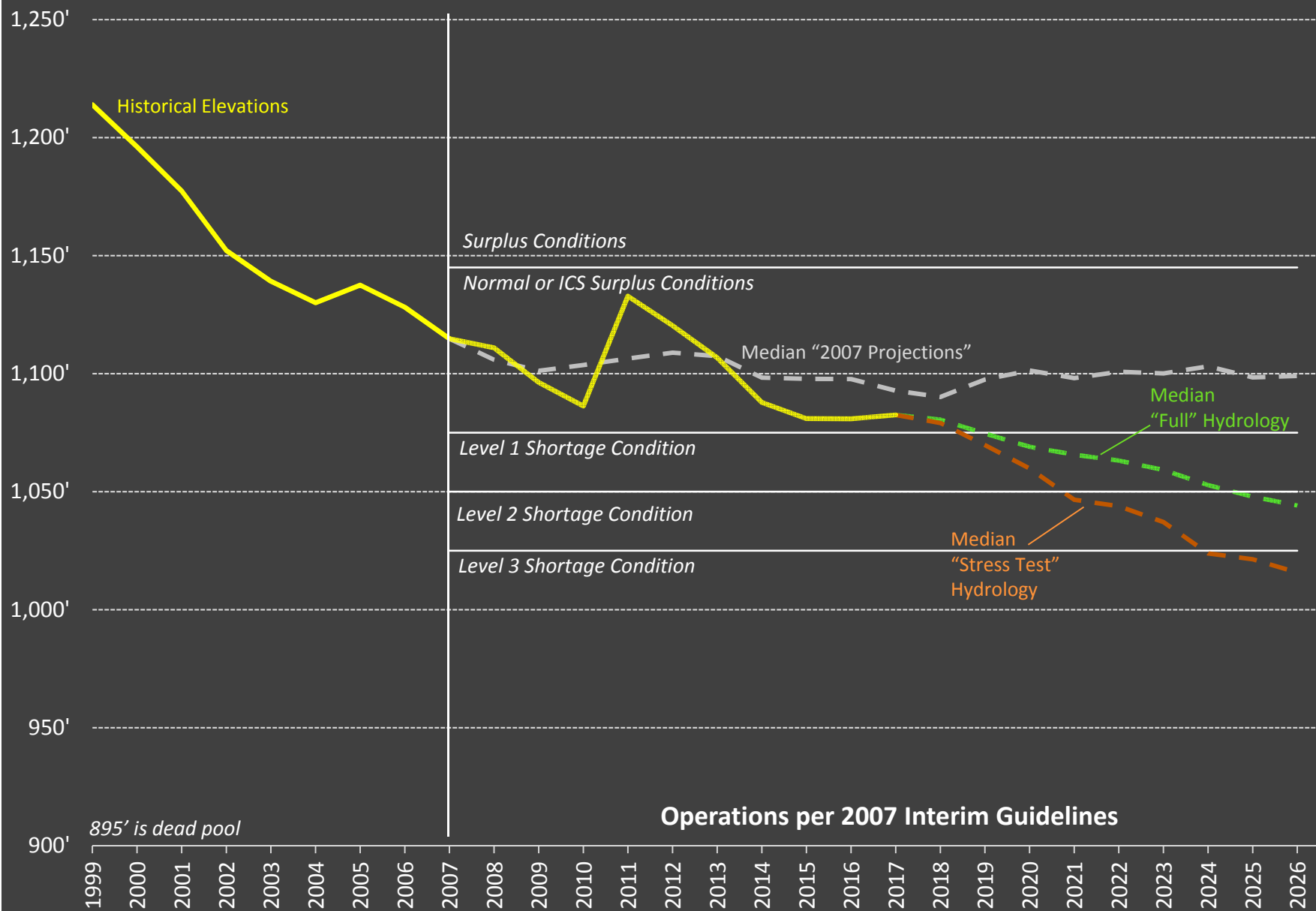


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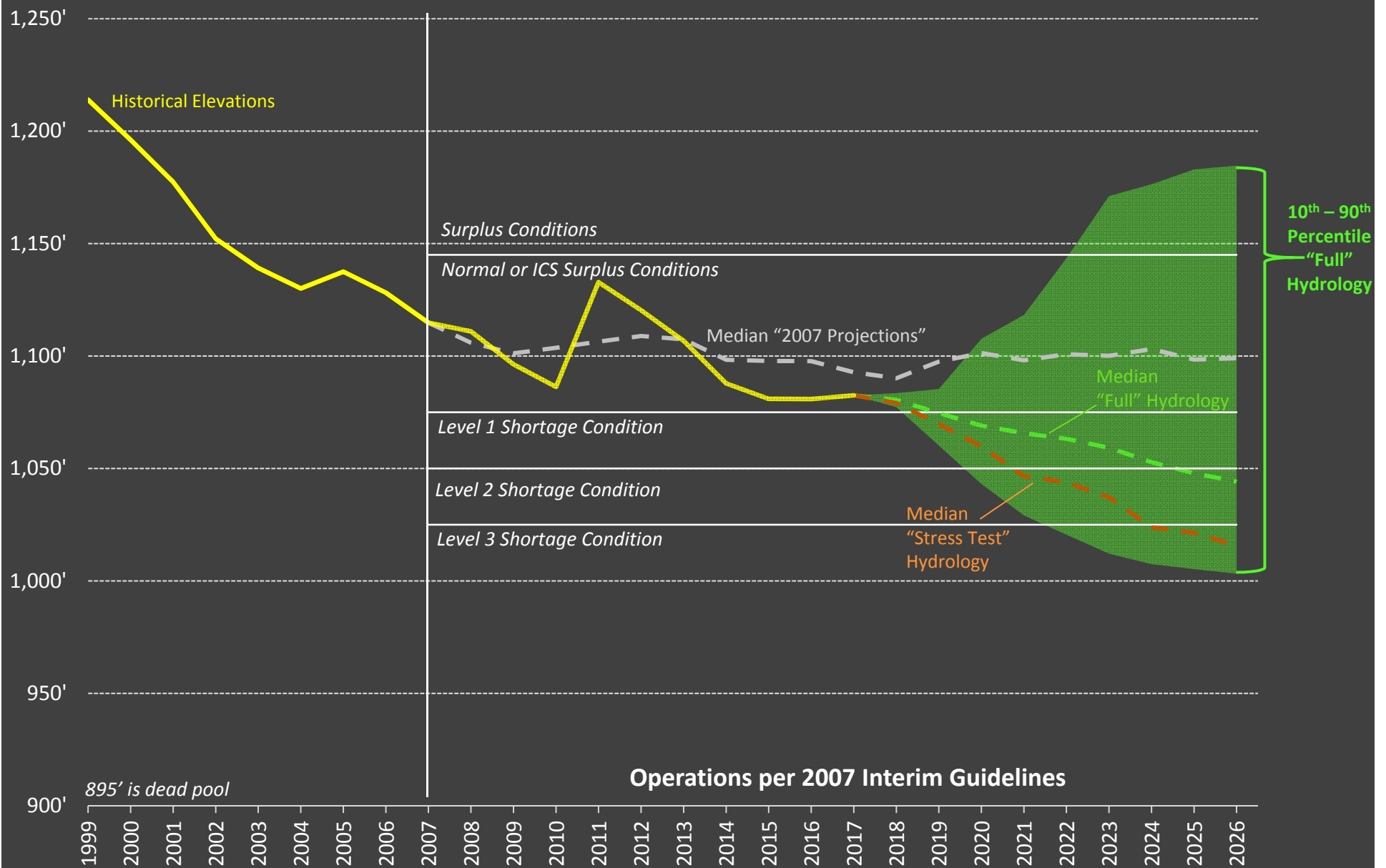


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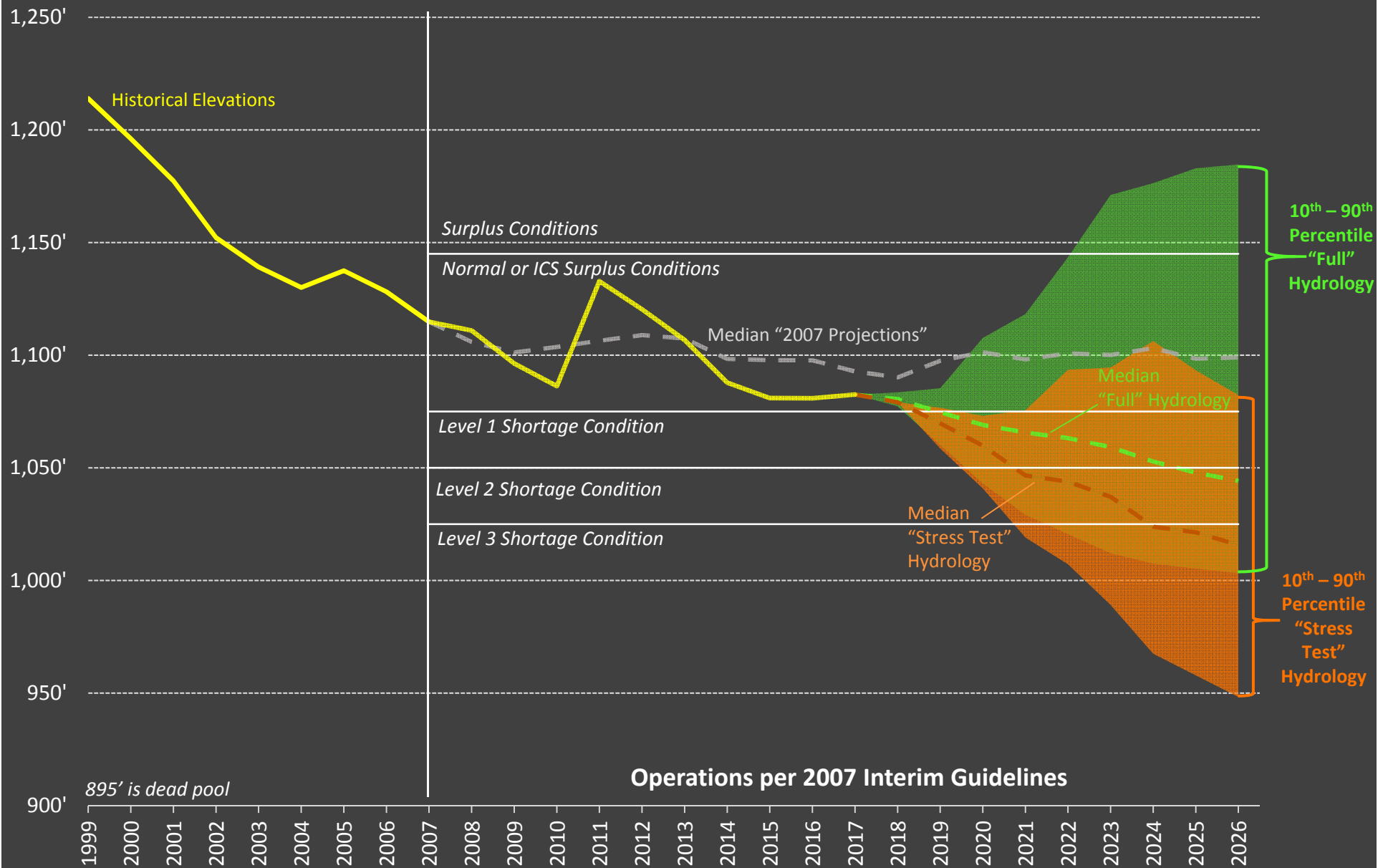


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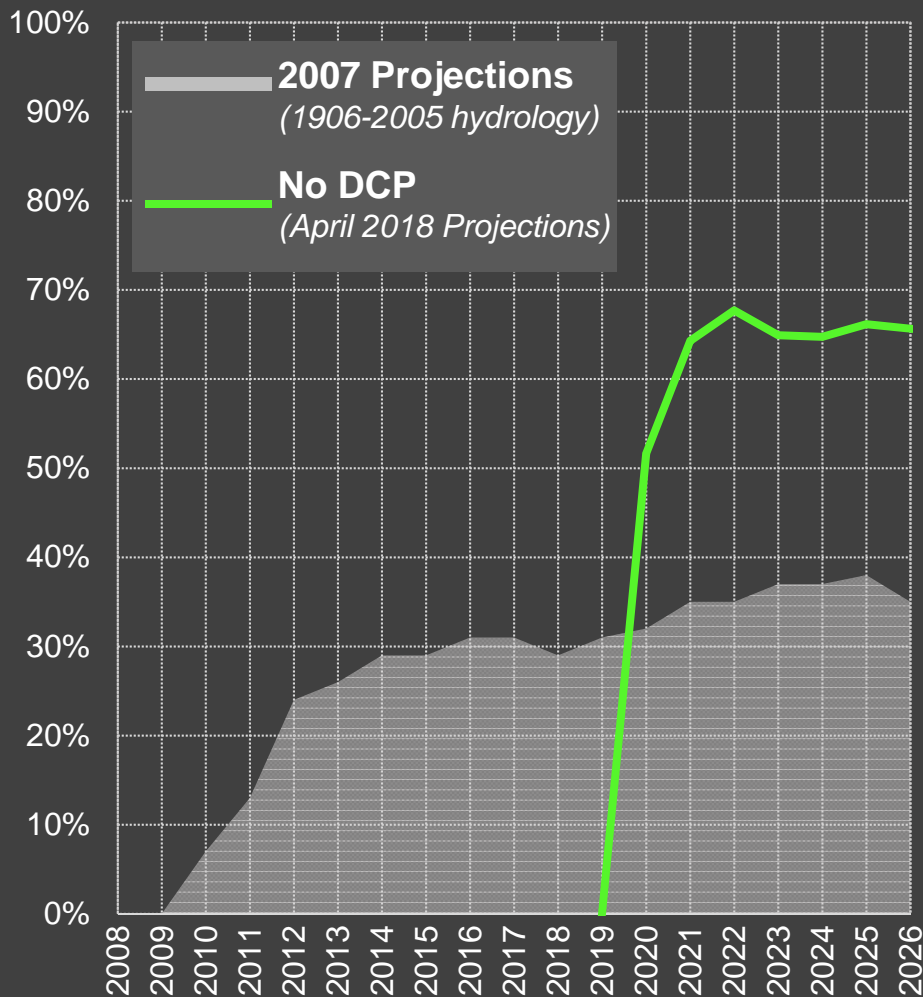
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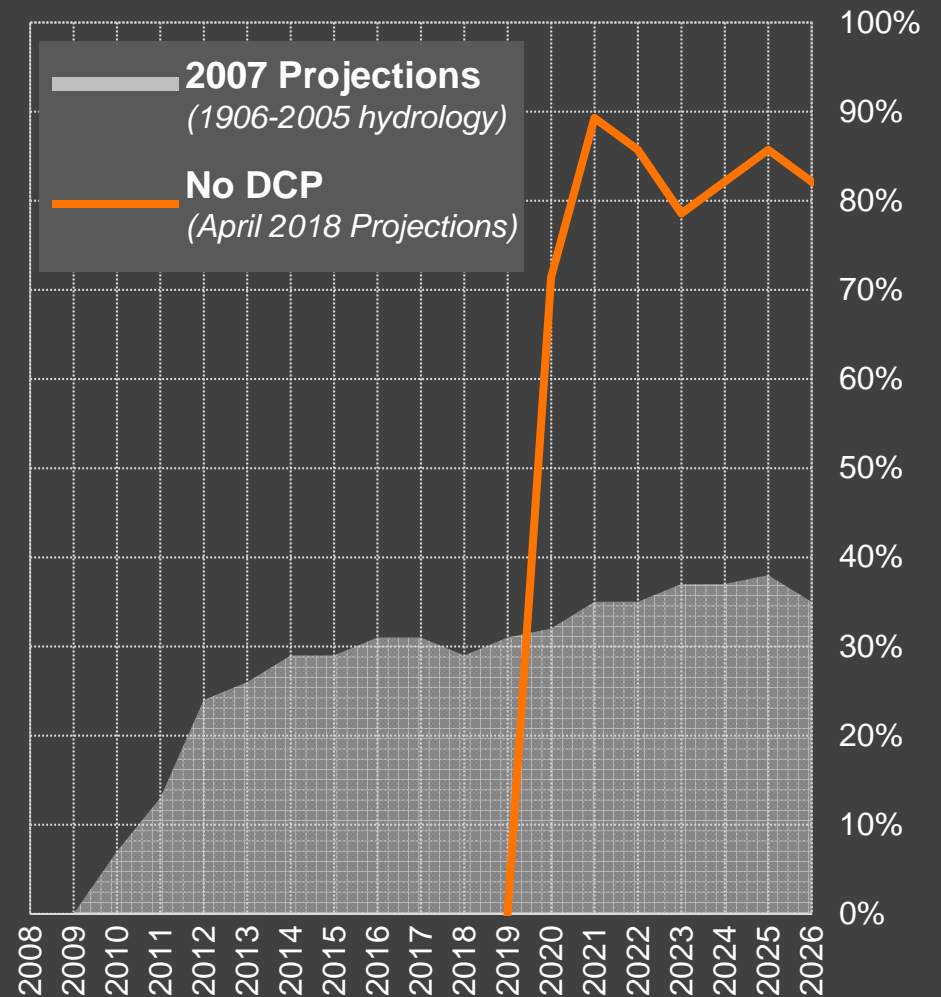
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9.6 maf 1,075'  
37%

Full Hydrology (1906-2015)



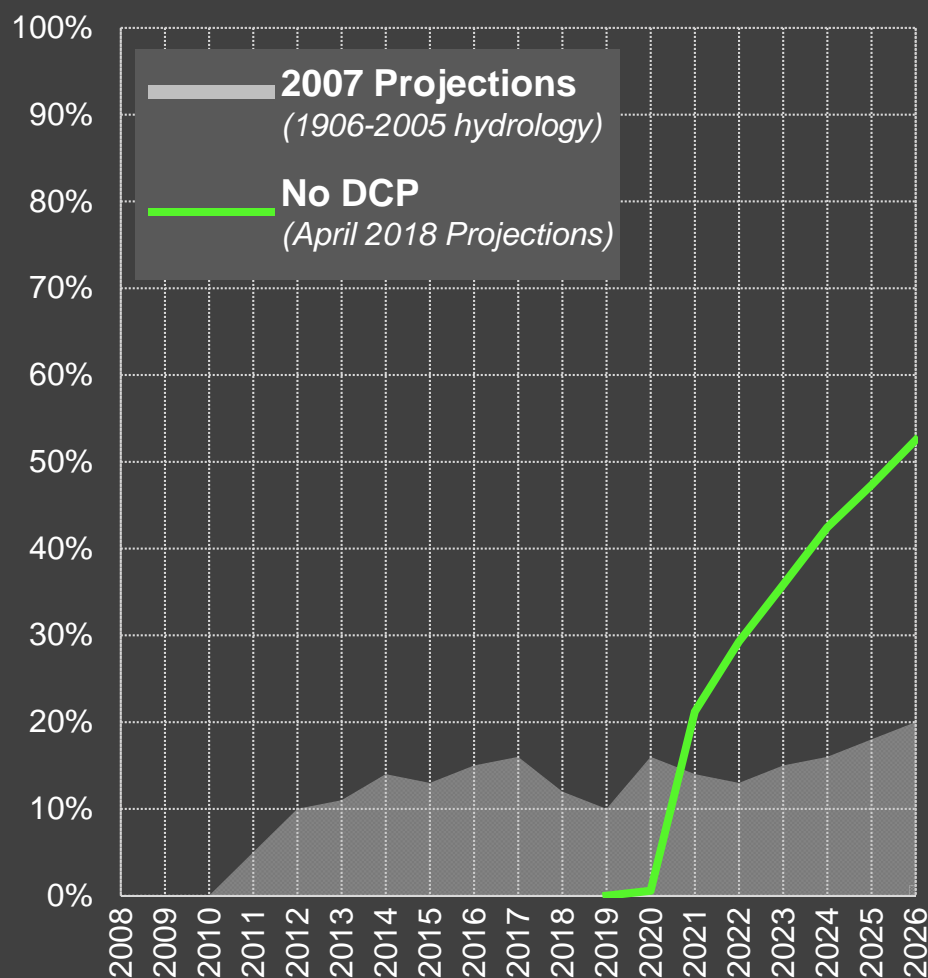
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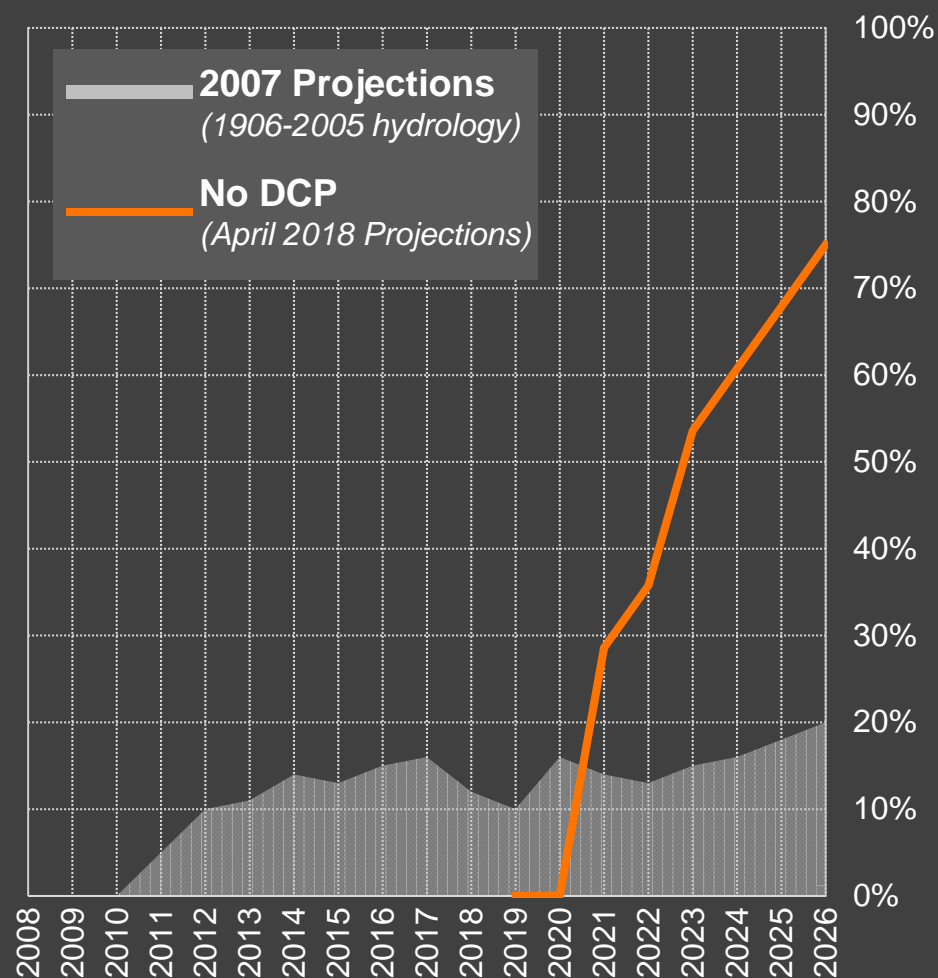
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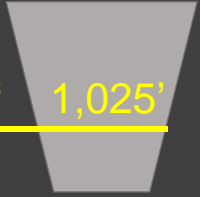
Stress Test Hydrology (1988-2015)



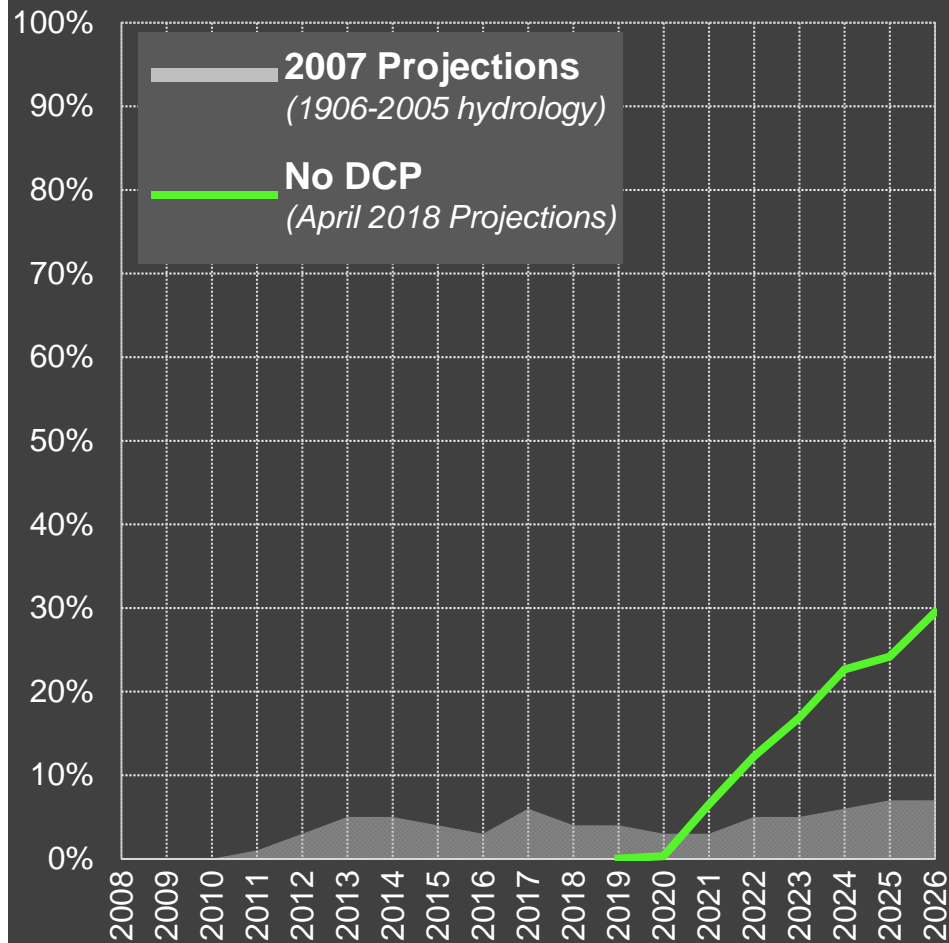


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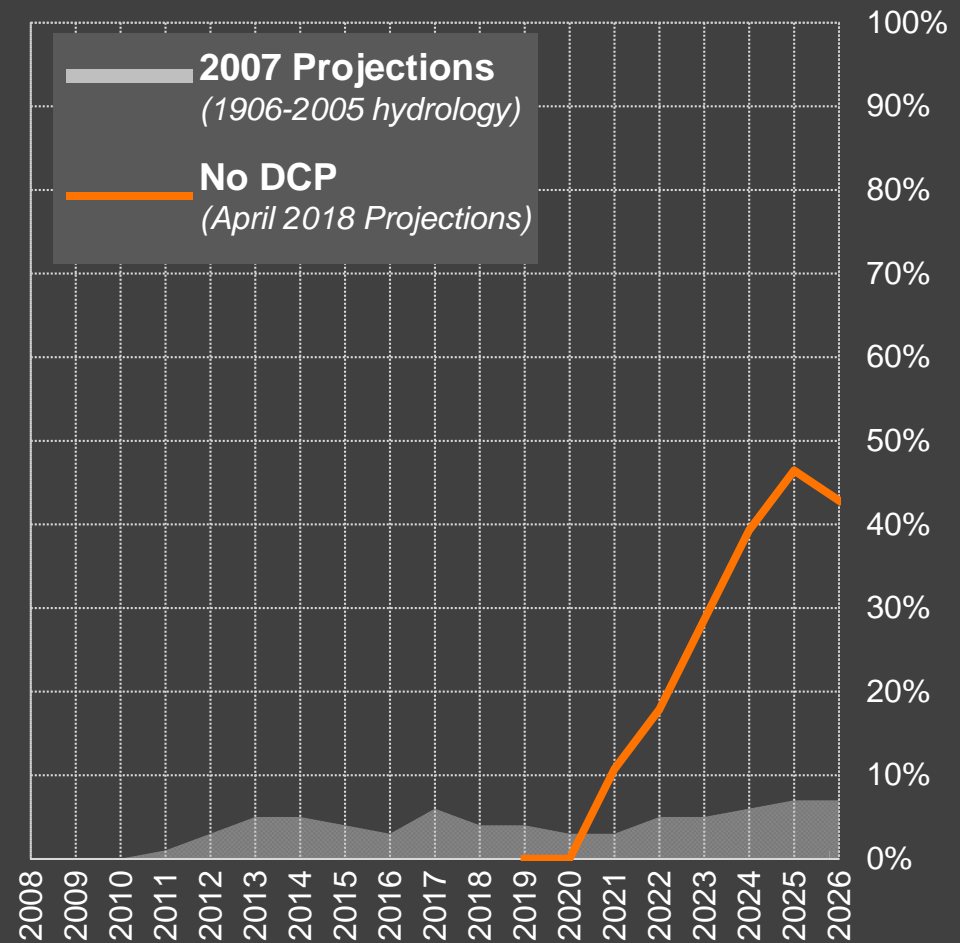
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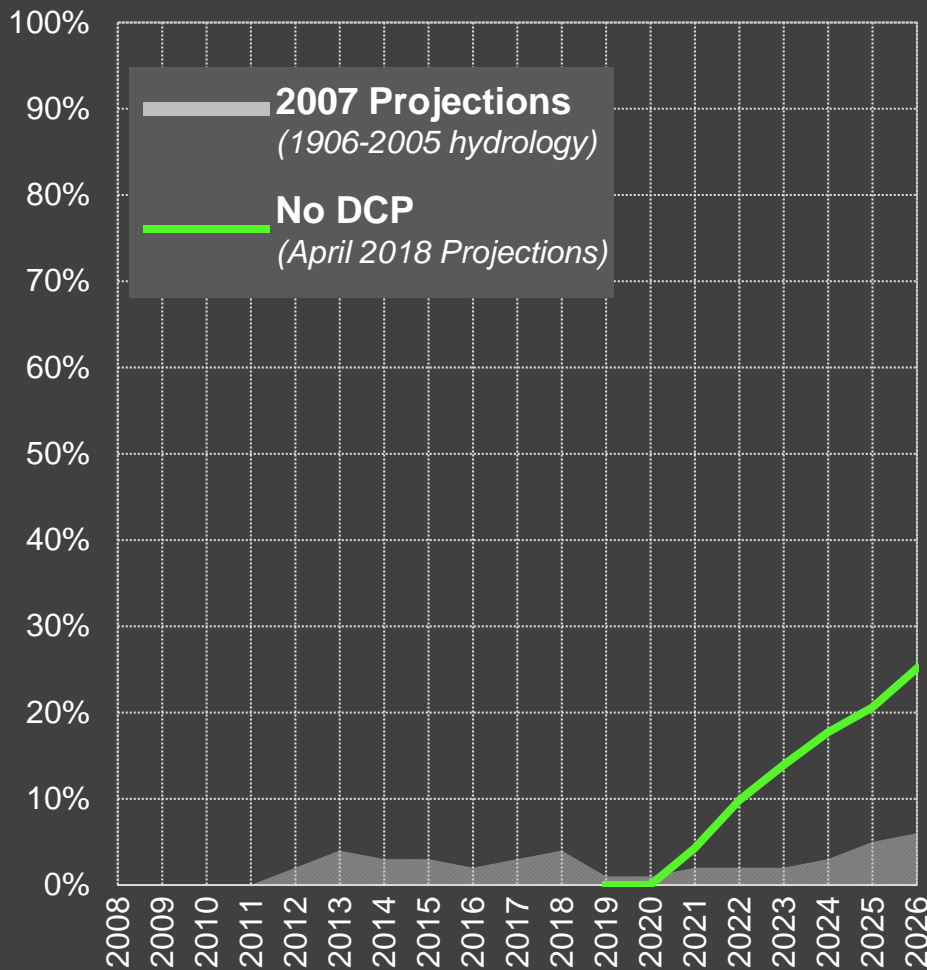
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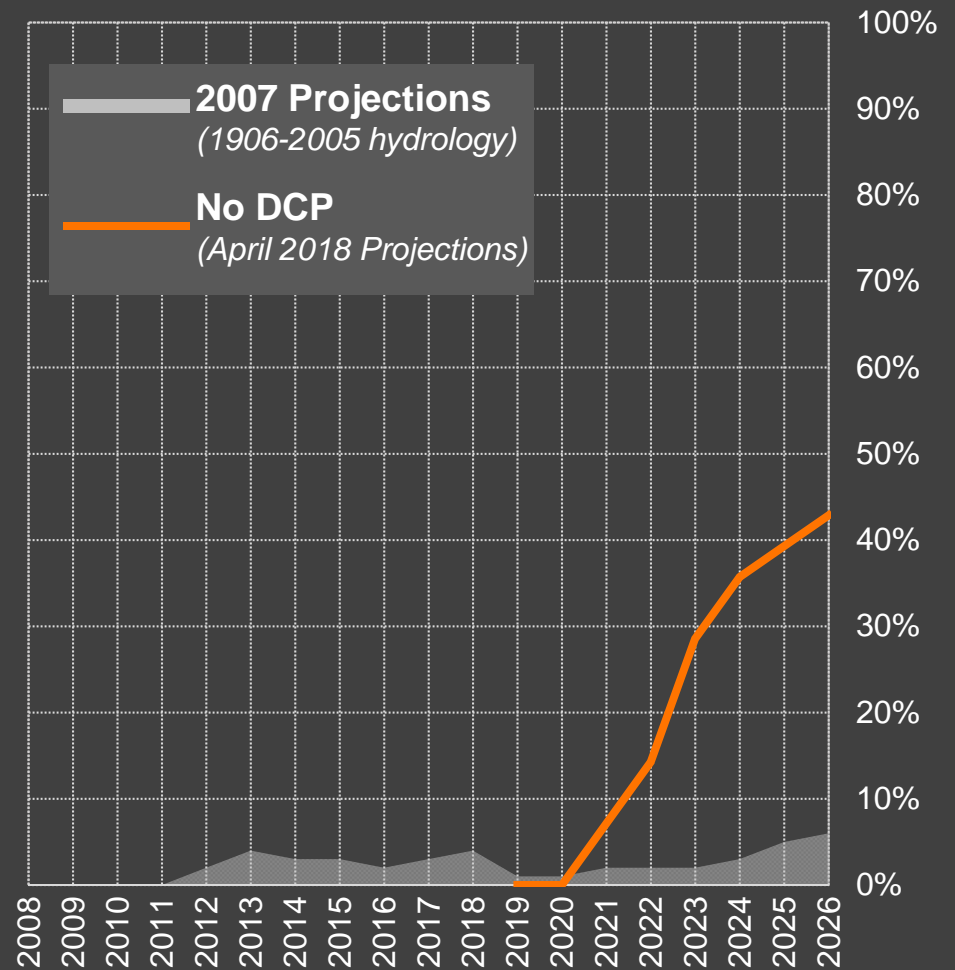
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5.7 maf  
22%  
1,020'

Full Hydrology (1906-2015)



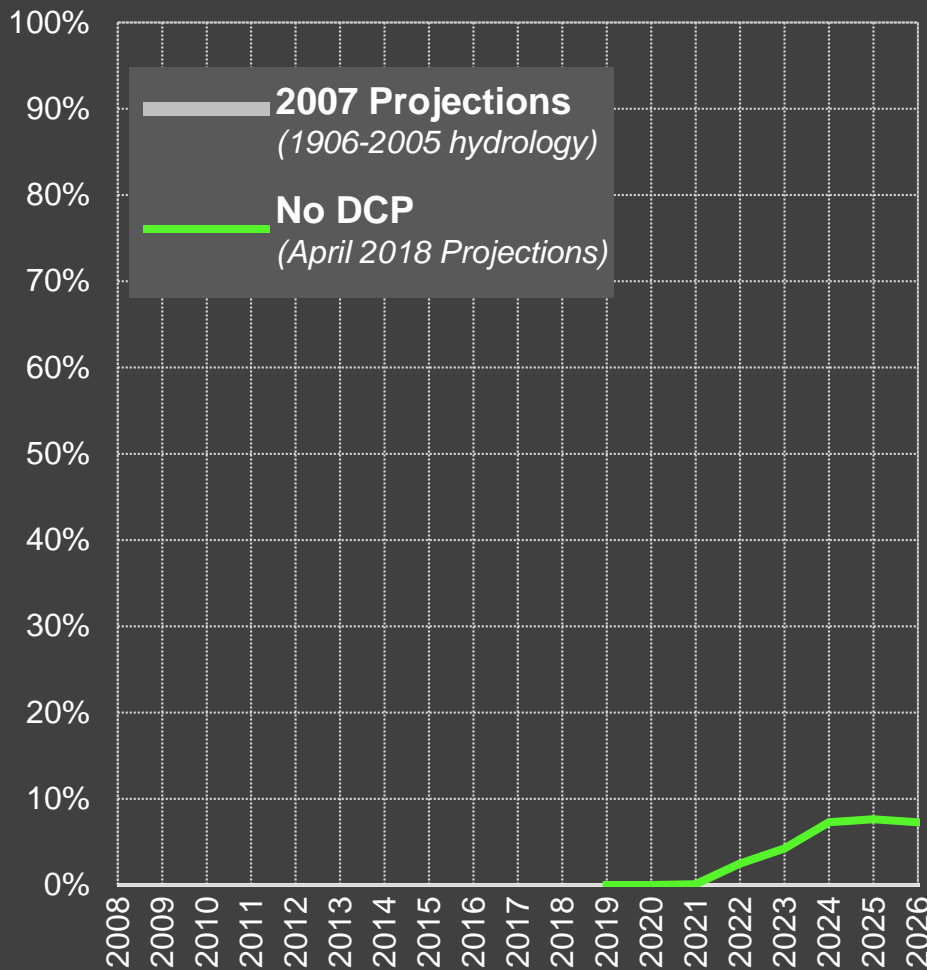
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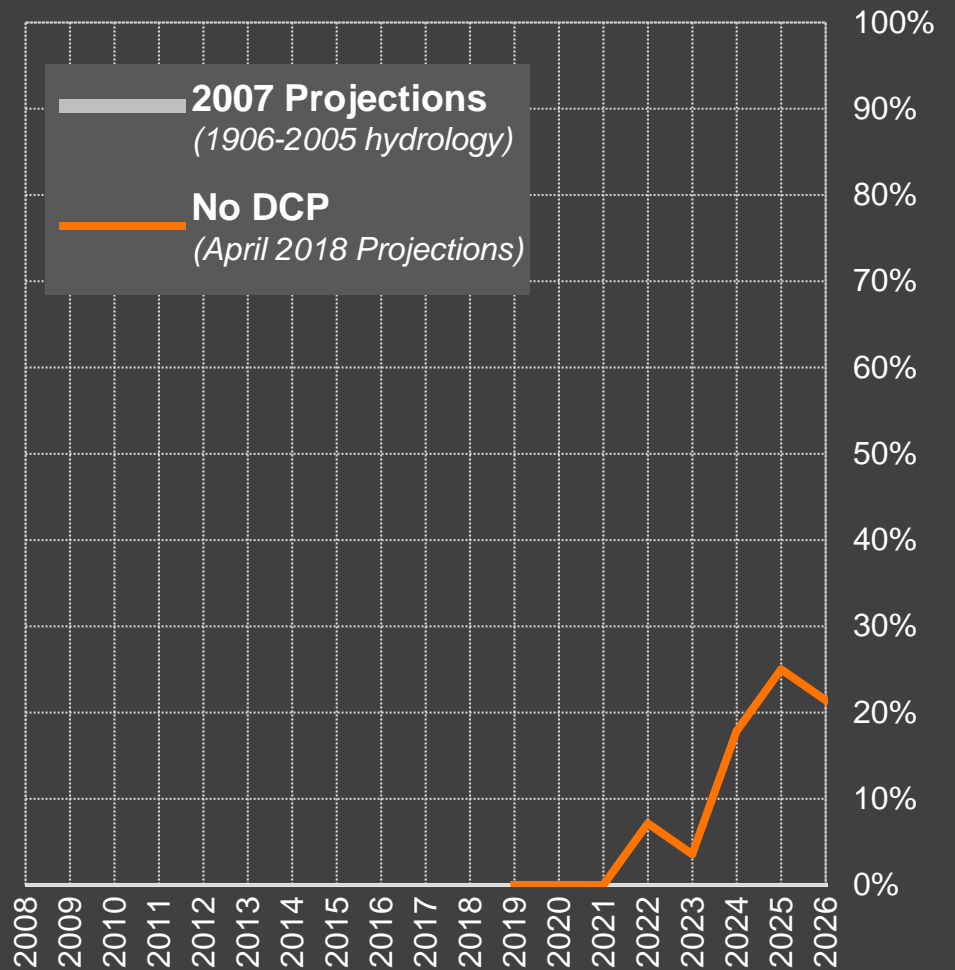
# Risk of Lake Mead < 1,000'

4.5 maf  
17%  
1,000'

Full Hydrology (1906-2015)



Stress Test Hydrology (1988-2015)





Lake Mead, 2015  
~1,075', 9.6 maf







# Lower Basin Drought Contingency Plan: Review of Key Terms

Thomas Buschatzke  
Director

Arizona Department of Water Resources

June 28, 2018 Joint Briefing on the LBDGP

# Lower Basin Drought Contingency Plan

## **The Need:**

The risk of Lake Mead falling below 1025' in the year 2026 has doubled since the development of the 2007 Interim Guidelines. Under “Stress Test” hydrology, the risk is about six times larger.

## **The Goal:**

Reduce the probability of reaching critical elevations that could cause draconian reductions in water deliveries

# Lower Basin Drought Contingency Plan

- In 2015, principal representatives from ADWR, CAWCD, CA, NV, and USBR began negotiations to address the increased risks to Lake Mead elevations.
- The principal representatives sought to:
  - Improve sustainability through increased storage – and a “backstop” – to protect Lake Mead elevations; and
  - Incentivize Intentionally Created Surplus (ICS) creation by increasing flexibility and minimizing the risk of stranding conserved water during shortages.



# Lower Basin Drought Contingency Plan

- The principal representatives developed the LBDCP as an overlay on the 2007 Interim Guidelines to improve sustainability and increase ICS flexibility.
- Lower Basin representatives (and USBR) are continuing to refine the details and to draft the LBDCP documents.
- The LBDCP is one component of a Basin-wide approach that will ultimately incorporate Mexico's participation in parity and alignment with the LBDCP, as well as an Upper Basin DCP.

# Mexico's Participation in LBDGP

- In Minute 323 (executed in September 2017), Mexico committed to a Binational Water Scarcity Contingency Plan (BWSCP) “in parity and alignment” with a Lower Basin DCP.
- Minute 323 provides for Mexico to conserve defined volumes of water at specific elevations “in parity and alignment” with DCP contributions, upon the authorization of a Lower Basin DCP within the U.S.
- Mexico will also benefit from the same flexibility provisions applicable to ICS in the Lower Basin.

# Lower Basin DCP Components

- DCP Contributions
- DCP ICS Recovery (to avoid stranding conserved water)
- ICS Flexibility (to incentivize conservation)
- Commitment to protect elevation 1020 feet in Lake Mead (i.e., the “backstop”)
- Allows interstate banking during shortage years

# DCP Contributions

- DCP Contributions may be made by:
  - Converting ICS to DCP ICS
  - Simultaneous creation of ICS and conversion to DCP ICS
  - Reductions in delivery of Colorado River water to create system water
- California parties intend to make DCP Contributions through the conversion of ICS to DCP ICS.
- All states will make DCP Contributions even if ICS is not available.



# 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

# DCP ICS

- DCP ICS is created by conversion of ICS.
- DCP ICS is only accessible under certain conditions – meaning it will remain in Lake Mead longer to support reservoir elevations.
- To ensure that DCP ICS is not stranded in the reservoir, DCP ICS is recoverable through 2057.

# DCP ICS Recovery

Through 2026:

- Recovery when Lake Mead is above elevation 1110 feet
- Between 1025 – 1110 feet elevation, may “borrow” DCP ICS for one year (i.e., take delivery of DCP ICS for one year with the obligation to repay full volume in the following calendar year).
- No DCP ICS delivery at or below 1025 feet.

# DCP ICS Recovery

2027 through 2057:

- Recovery when Lake Mead is above elevation 1110 feet
- Between 1025 – 1075 feet elevation, may “borrow” DCP ICS for one year.
- Between 1075 – 1110 feet elevation, may “borrow” with 5-year repayment OR recover with additional 20% deduction in account. Must decide whether to repay or to take additional 20% deduction by the end of year 4.
- No DCP ICS delivery at or below 1025 feet.
- DCP ICS is subject to 3% assessment per year.



	Through 2026			2027 - 2057			
	Mead Projections > 1110 on Jan 1	Mead > 1025 but ≤ 1110	Mead ≤ 1025	Mead > 1110' on Jan 1	Mead projections > 1075 but ≤ 1110	Mead > 1025 but ≤ 1075	Mead ≤ 1025
Delivery of DCP-ICS	✓			✓			
Borrow for 1 year, must repay by end of next year		✓				✓	
Borrow with 5 year repayment or recover with additional 20% deduction in account					✓		
Delivery of DCP-ICS not allowed			✓				✓

# DCP ICS Recovery

DCP ICS recovery and “borrowing” (in any year through 2057) are subject to existing annual maximum ICS delivery volumes for each state:

Arizona: 300,000 AF

California: 400,000 AF

Nevada: 300,000 AF

# ICS Flexibility

2007 Interim Guidelines established maximum annual ICS creation volume for each State.

Existing ICS creation volume:	Arizona: 100,000 AF
	California: 400,000 AF
	Nevada: 125,000 AF

Under LBDGP, States may “share” unused annual ICS creation capacity. If one state is not creating its maximum amount, another state could “borrow” the unused creation volume in that year, allowing for additional storage in Lake Mead.

# ICS Flexibility

Consistent with the need to incentivize additional conservation, each state will receive an additional 200,000 acre-feet of accumulated ICS (including DCP ICS) capacity.

Increased maximum capacity:

Arizona: 500,000 AF

California: 1,700,000 AF

Nevada: 500,000 AF



# ICS Flexibility

2007 Guidelines	LBDCP
<ul style="list-style-type: none"><li>• 5% assessment in the year of creation (for system benefit)</li><li>• 3% assessment every year thereafter (for evaporation)</li></ul>	<ul style="list-style-type: none"><li>• One-time, 10% assessment (for system benefit and evaporation)</li><li>• For existing ICS, assess to bring up to 10%, then no additional assessment through 2026</li><li>• No assessment if repaying ICS delivered in previous year (to encourage contractors to replace ICS)</li></ul>

# ICS Flexibility

- Under 2007 Guidelines ICS cannot be delivered when Lake Mead falls below elevation 1075
- Under LBDGP, ICS may be delivered during shortage years under the following conditions:
  - Between elevations 1045-1075 in Lake Mead, deliveries of ICS, including DCP ICS borrowing, limited by annual state maximums
  - Between elevations 1025-1045, deliveries of ICS, including DCP ICS borrowing AND conversion of ICS to DCP ICS for DCP Contributions, limited by annual state maximums
  - Below 1025: No ICS delivery
- Allowing California to take delivery of more than 4.4 MAF during shortage will require federal legislation.

# Commitment to Protect Elevation 1020 Feet in Lake Mead

- The Lower Basin parties commit “to individual and collective action in the Lower Basin to avoid and protect against the potential for Lake Mead to decline to elevations below 1,020 feet.”
- Commitment is implemented through the following provision:  
“In any 24-Month Study when Lake Mead elevation is projected to be at or below 1,030 feet any time within the succeeding two Years, the Parties agree to consult and determine what additional measures will be taken by the Parties to avoid and protect against the potential for Lake Mead to decline to below 1,020 feet.”
- Volume, timing, and contributors to additional reductions will be determined through the consultation process.

# Need for Lower Basin Drought Contingency Plan

- In the past, Reclamation has made projections of the additional volumes of water (above the reductions under the 2007 Guidelines) that would be needed to protect elevations 1025' and 1000' in Lake Mead. In those projections, reductions of 1 MAF, 2 MAF, or larger would be required to stabilize Lake levels.
- It is unclear how such reductions would be applied and to whom. Some parties assert that a strict interpretation of the Colorado River Basin Project Act, which assigns CAP a junior priority, could put all CAP supplies at risk prior to reductions to more senior users.



# Lower Basin Drought Contingency Plan

- We recognize that the LBDCP would have different incremental impacts on different water users within Arizona, as CAWCD will discuss.
- The LBDCP significantly reduces the probability of Lake Mead reaching critical elevations, as will be shown by Reclamation.

# Colorado River System Response to the DCP

**Arizona Workshop – Drought Contingency Plan**

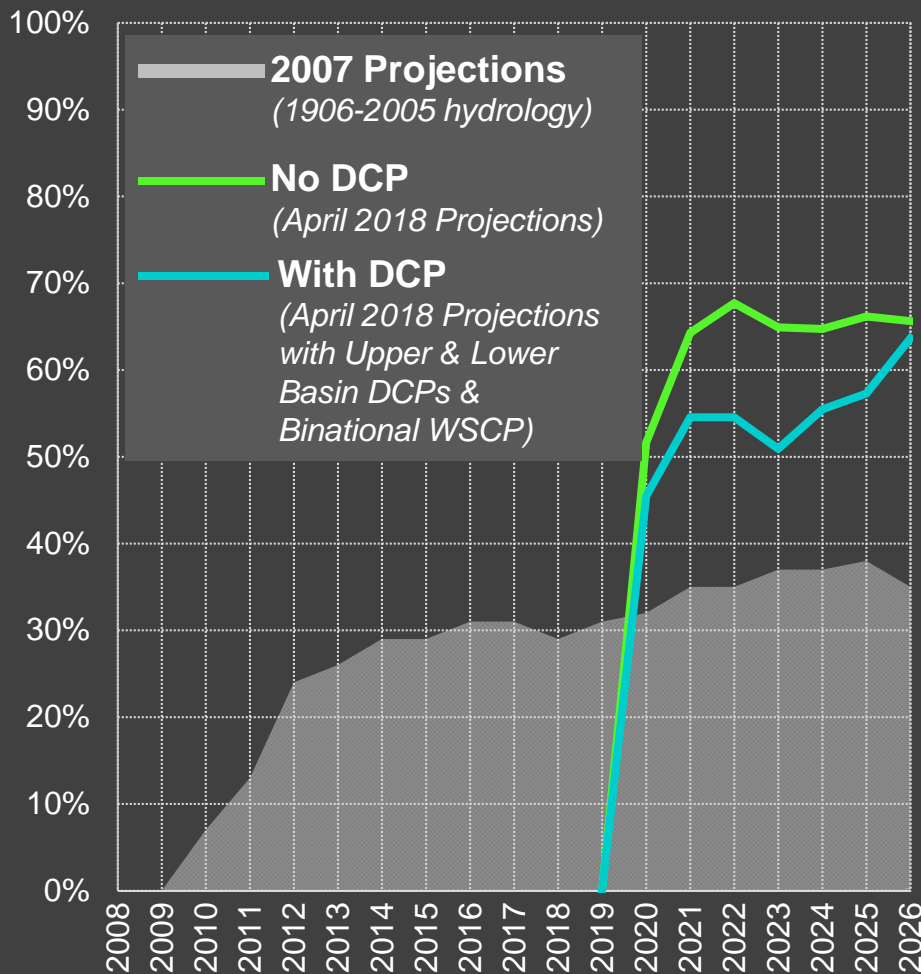
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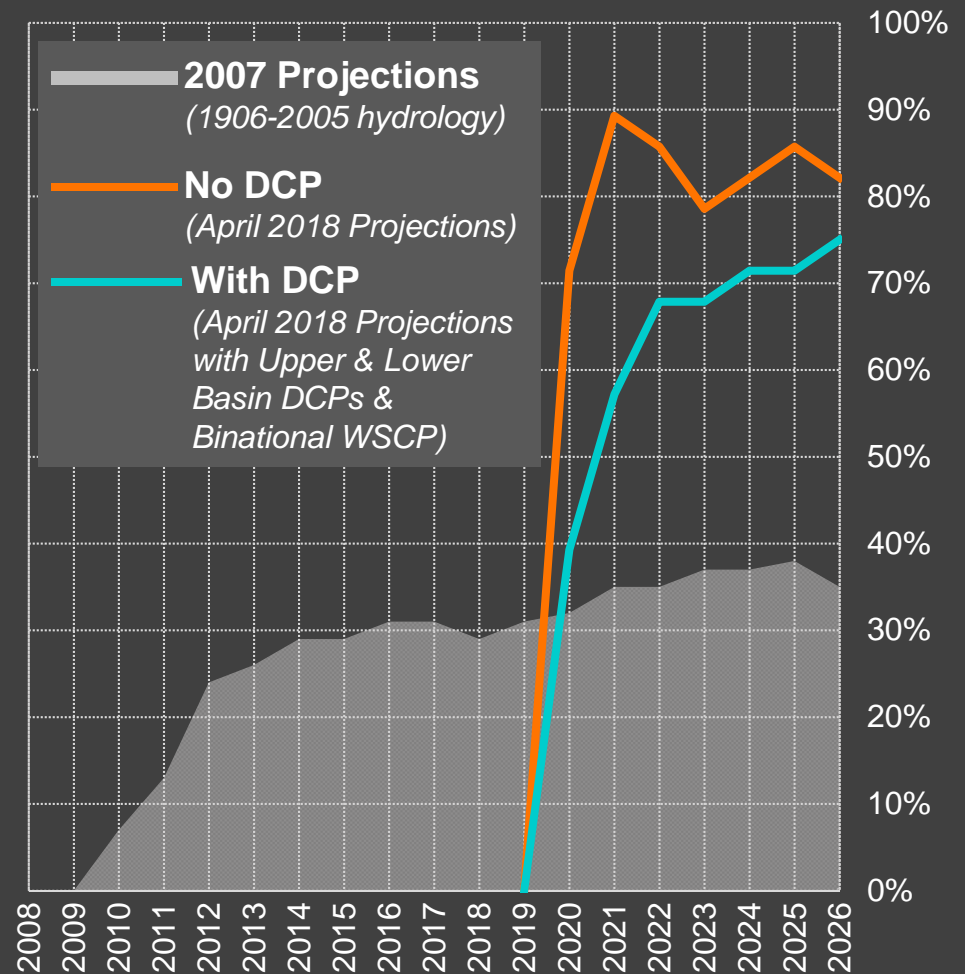
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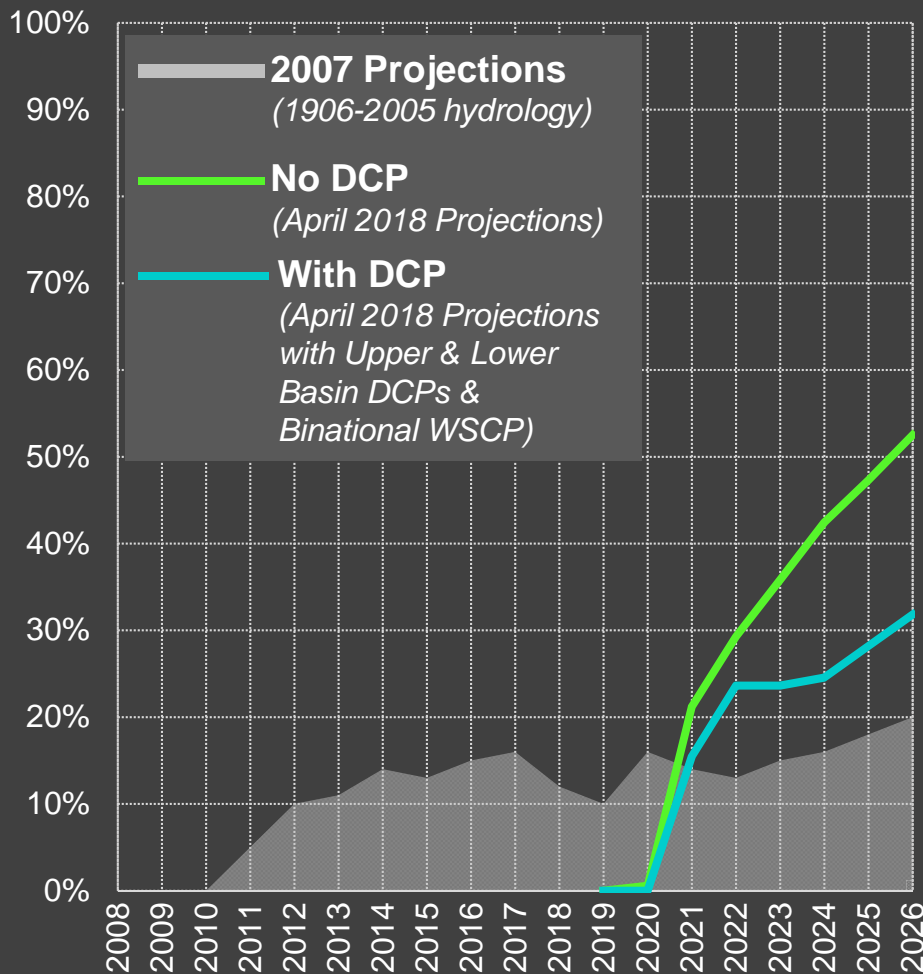
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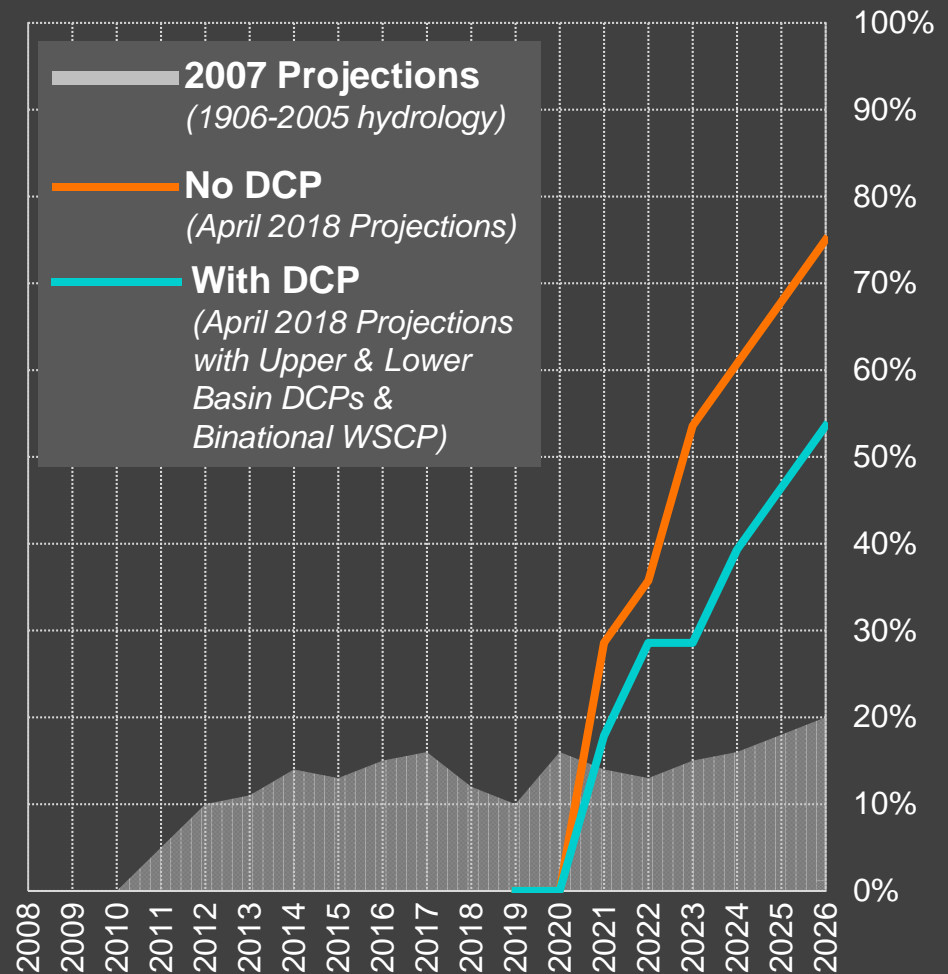
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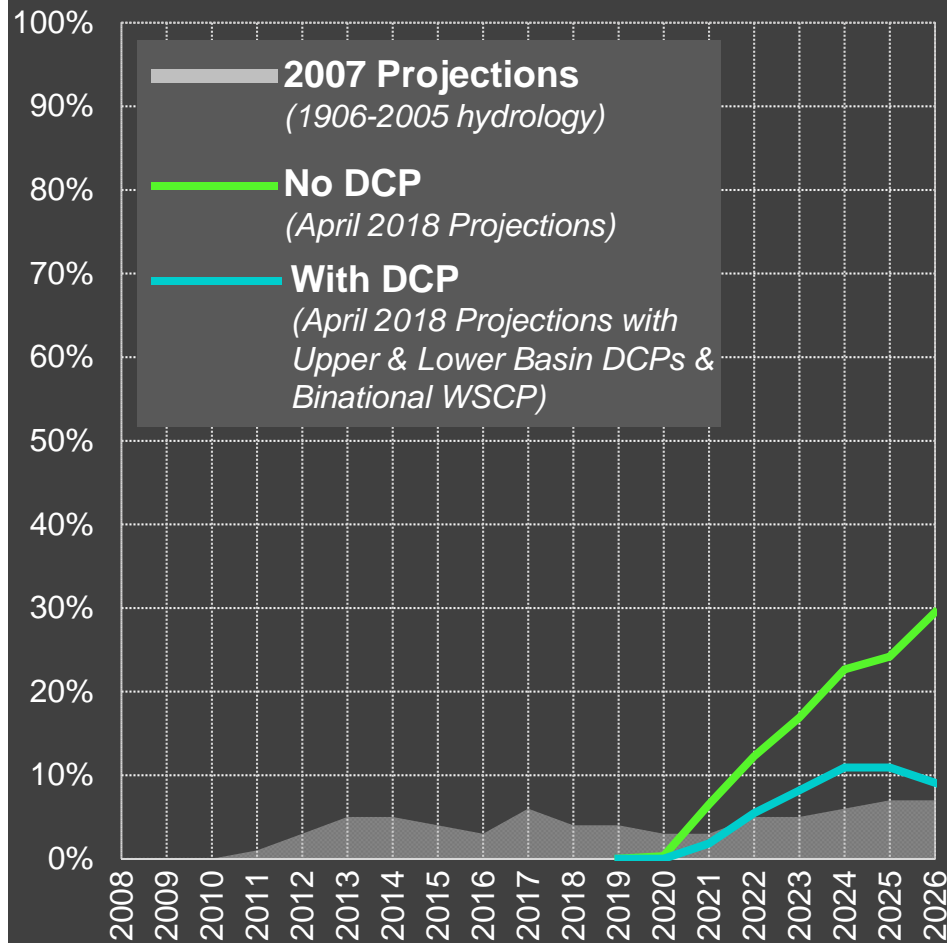




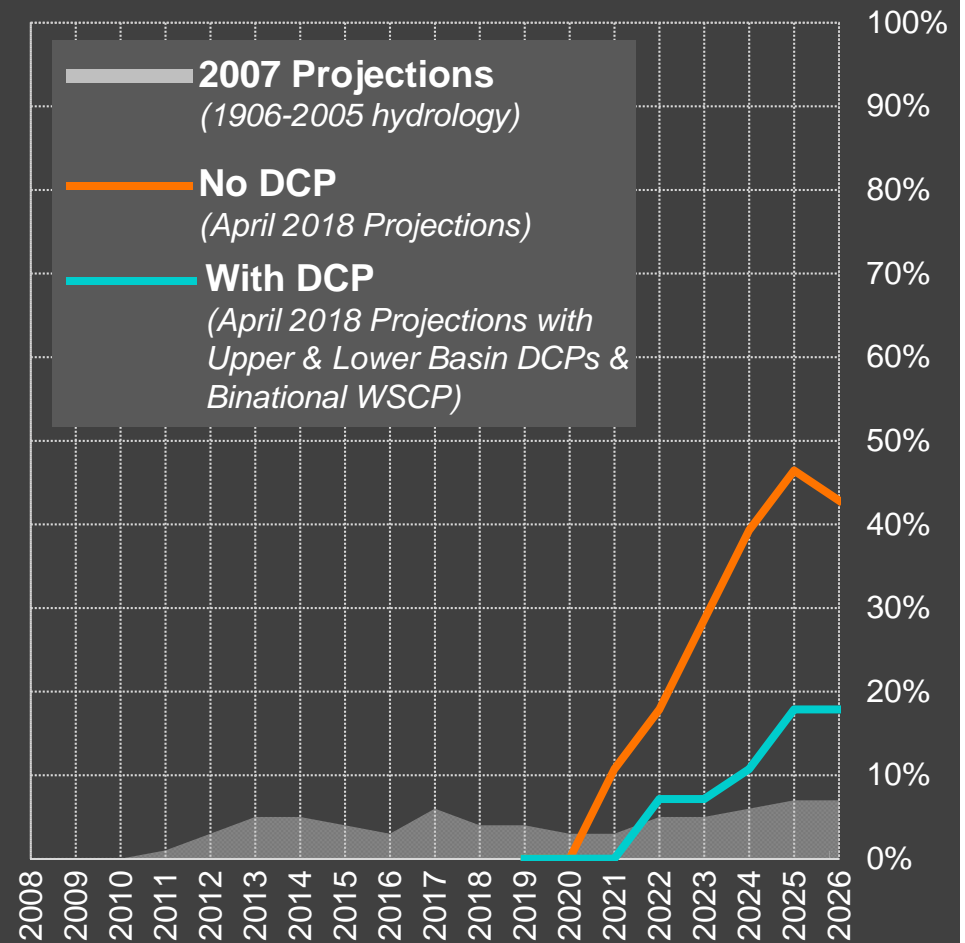
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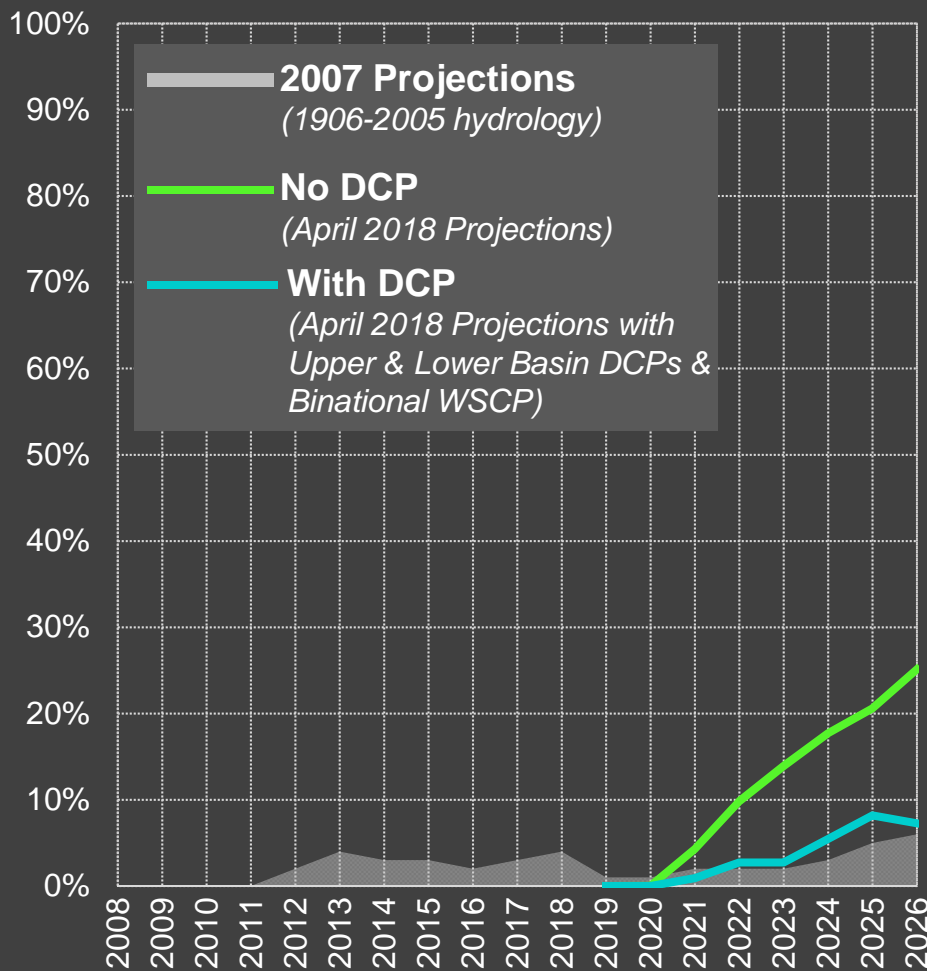
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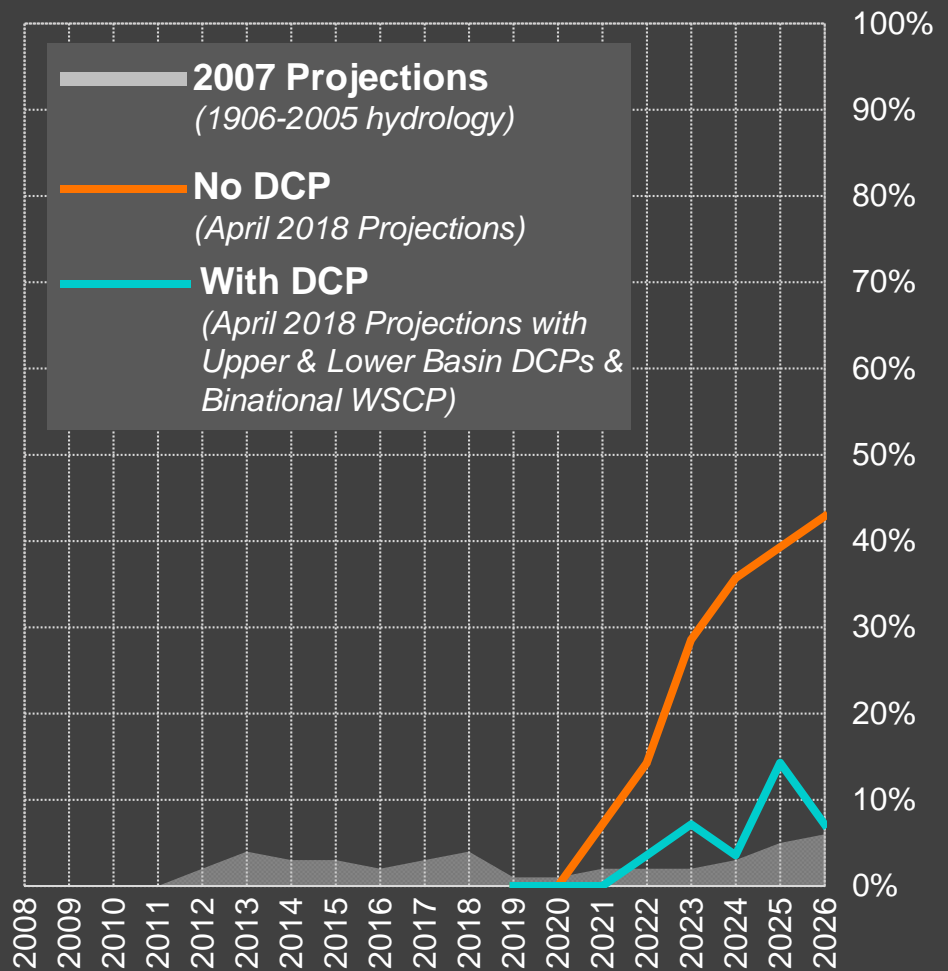
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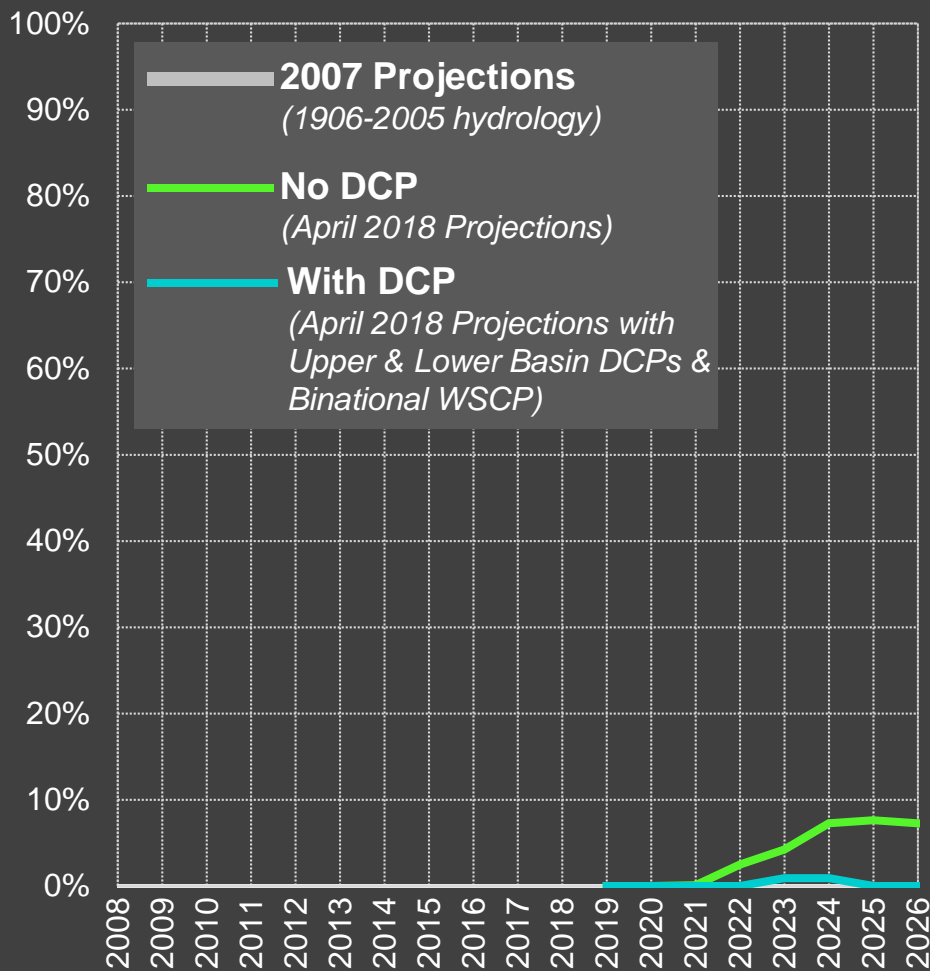
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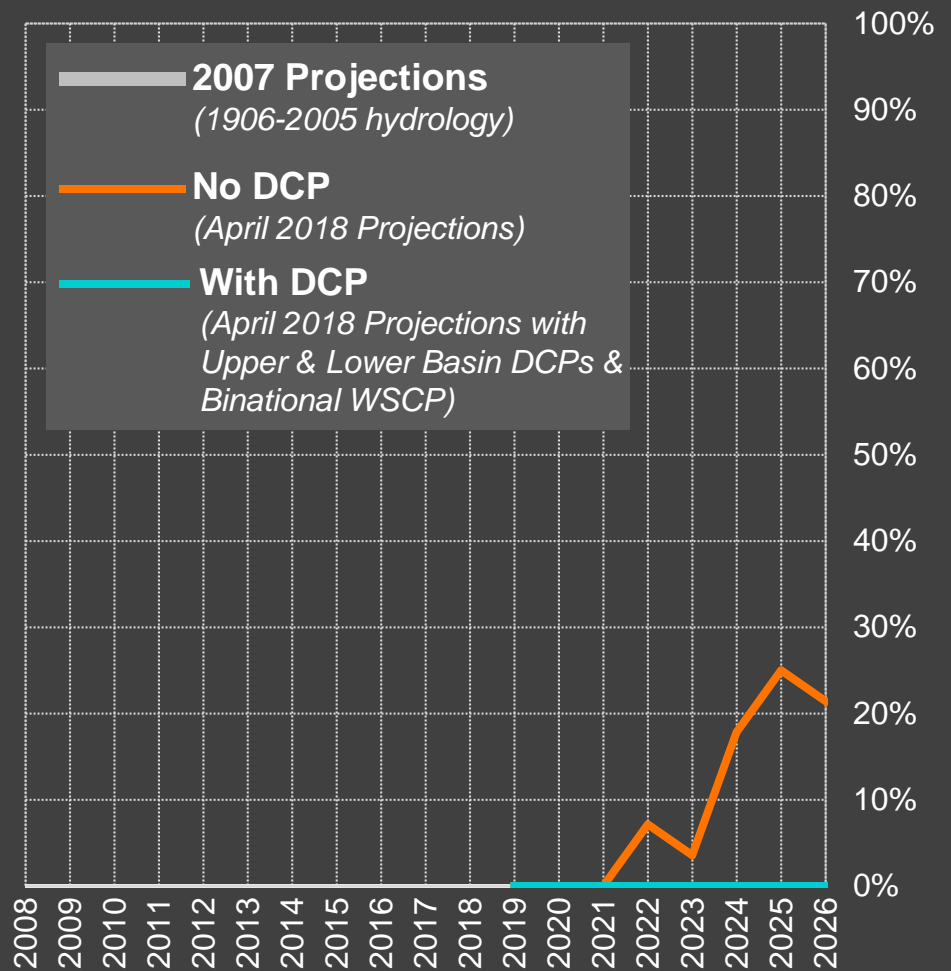
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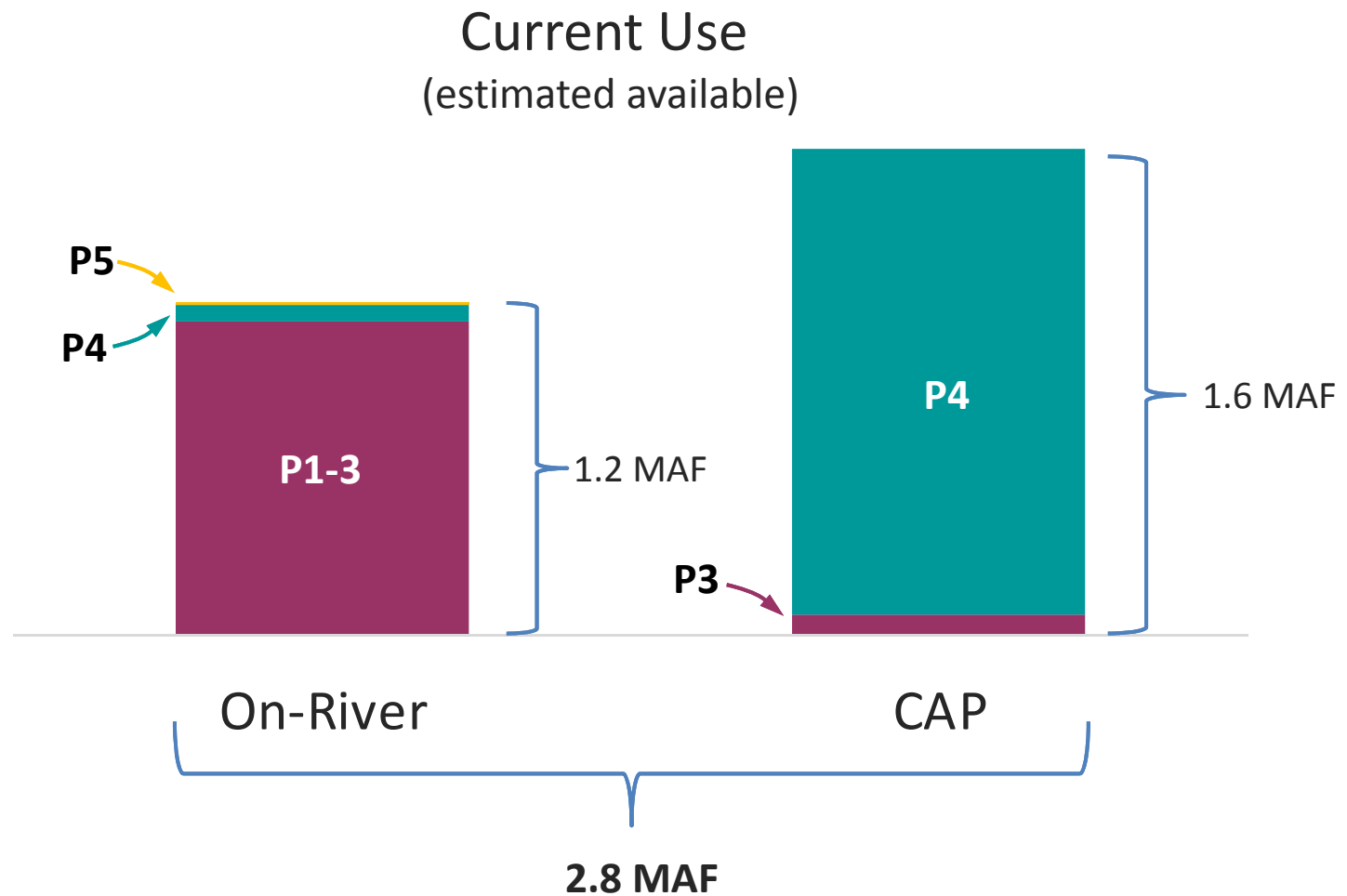
# Effects of the Lower Basin Drought Contingency Plan to Arizona Water Users

**Ted Cooke**, General Manager  
Central Arizona Project

ADWR & CAP Joint Briefing on the LBDCP, June 28, 2018, Tempe, Arizona



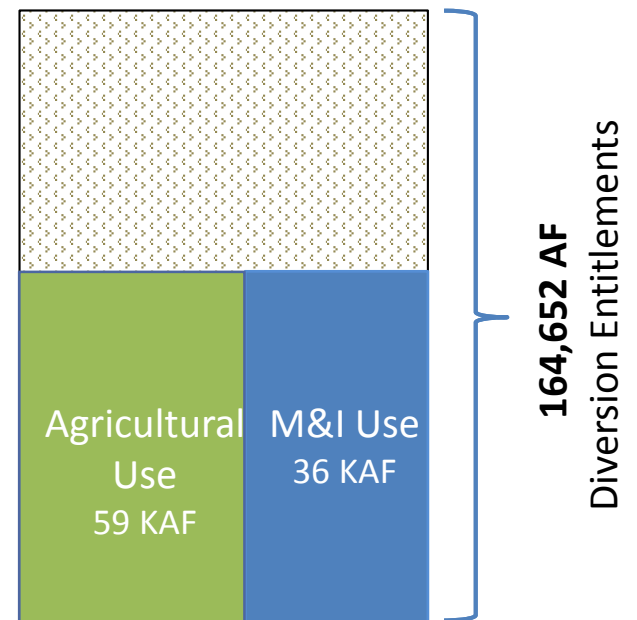
# Arizona Colorado River Priorities



# Arizona Shortage Sharing

- CAP's unquantified 4<sup>th</sup> Priority contract is co-equal to 164,652 AF of on-River P4 diversion contracts
- The Director's 2006 Recommendation for 4<sup>th</sup> Priority shortage sharing is calculated on available supply and entitlements
- Based on current on-River use, shortage reductions to Arizona will fall almost exclusively on CAP through 2026

## 4<sup>th</sup> Priority On-River (Current Use)



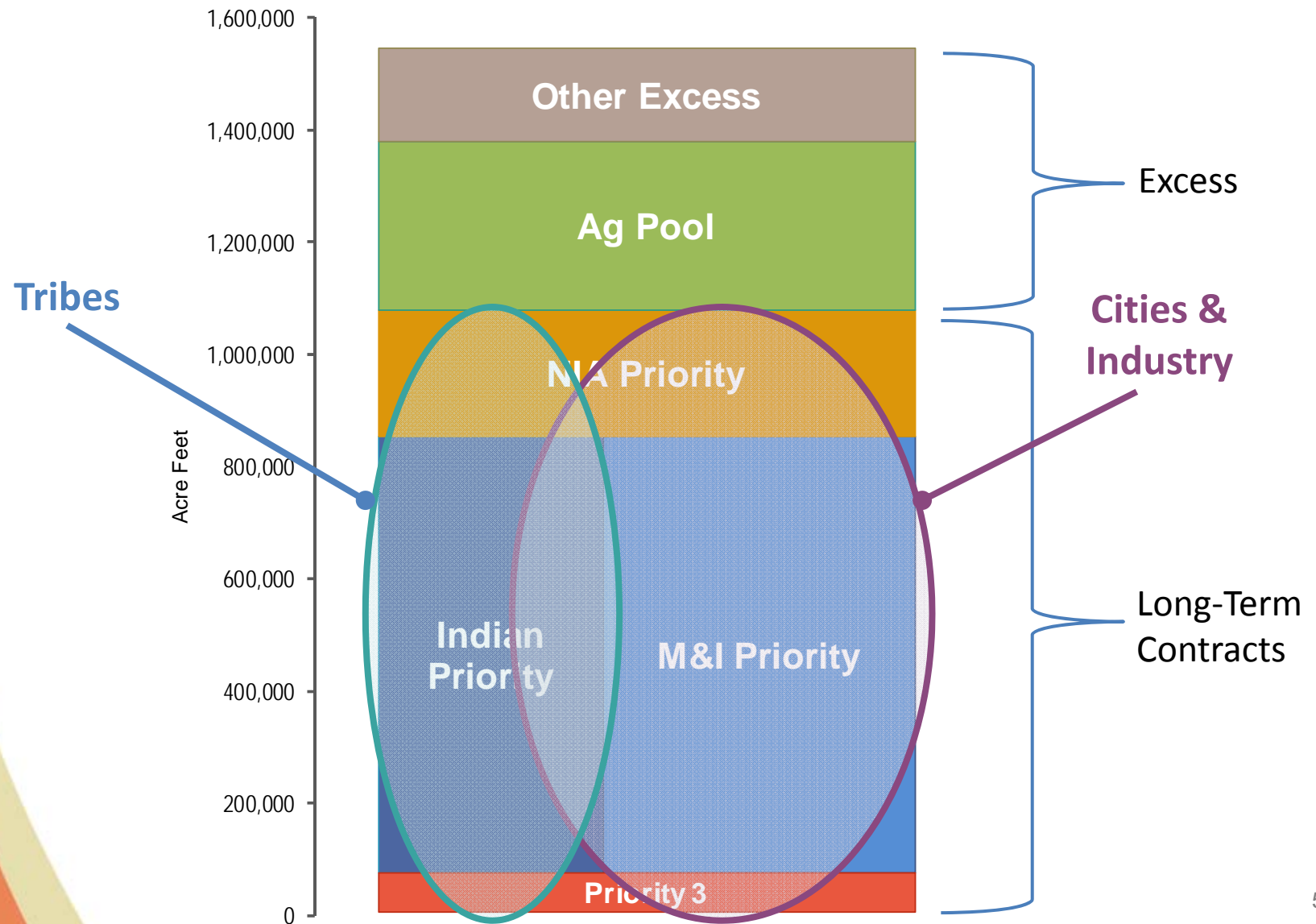
2016 Use:  
95,436 AF Diversion  
(59,210 AF CU)

# CAP Priority Pools

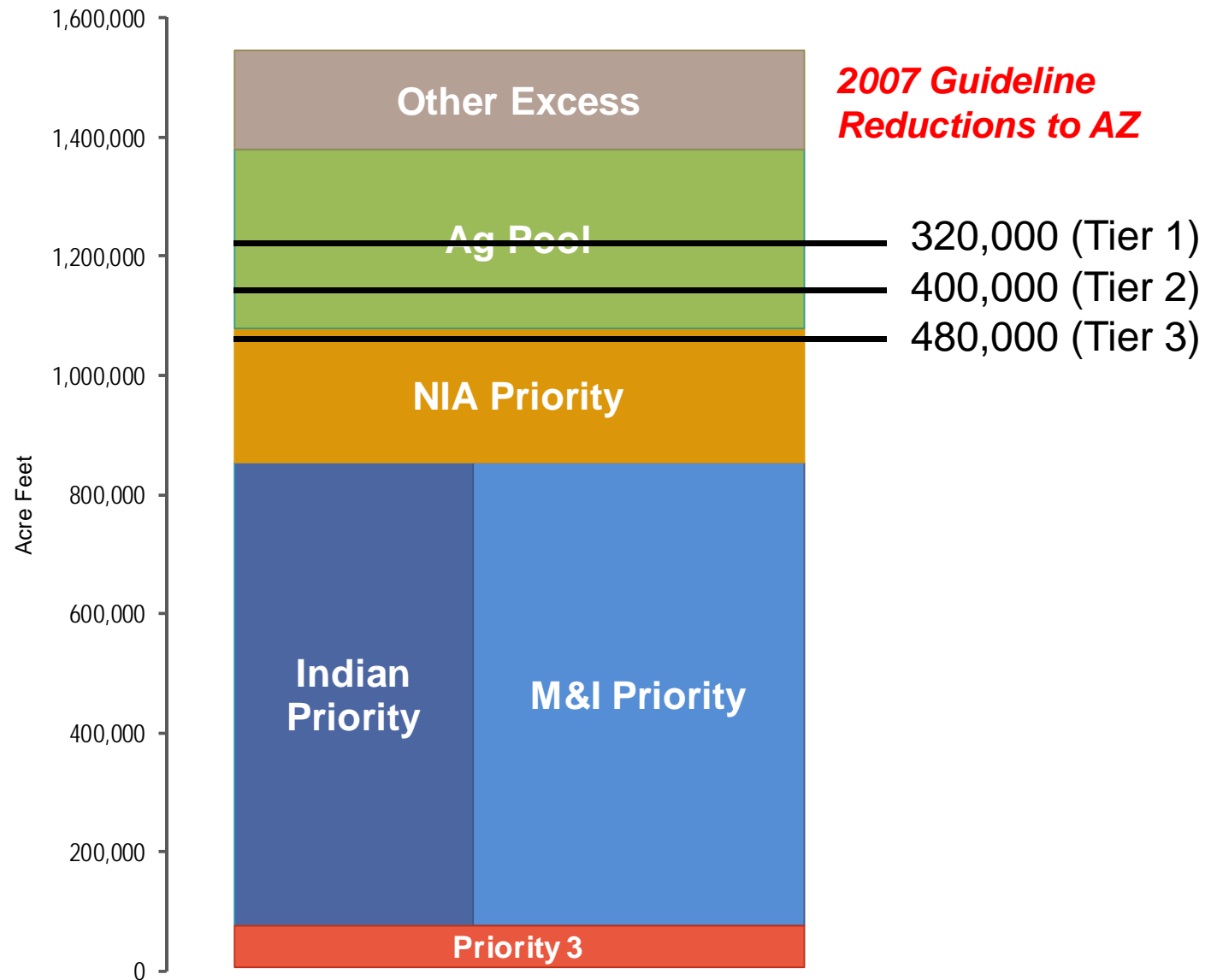
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- Annual CAP water deliveries first meet **Long-term Contract** demands, in priority order
  - **P3**, then **Indian** and **M&I**, then **NIA** priority
- Then **Excess** demands can be met
  - Excess includes the **Ag Pool**, and **Other Excess** for underground storage and replenishment
- Note: LBDCEP reductions would be implemented based on Arizona and CAP priorities, unless opportunities for alternatives, based on voluntary agreements among contractors, are developed.

# CAP Priority Pools *(current use, estimated available)*

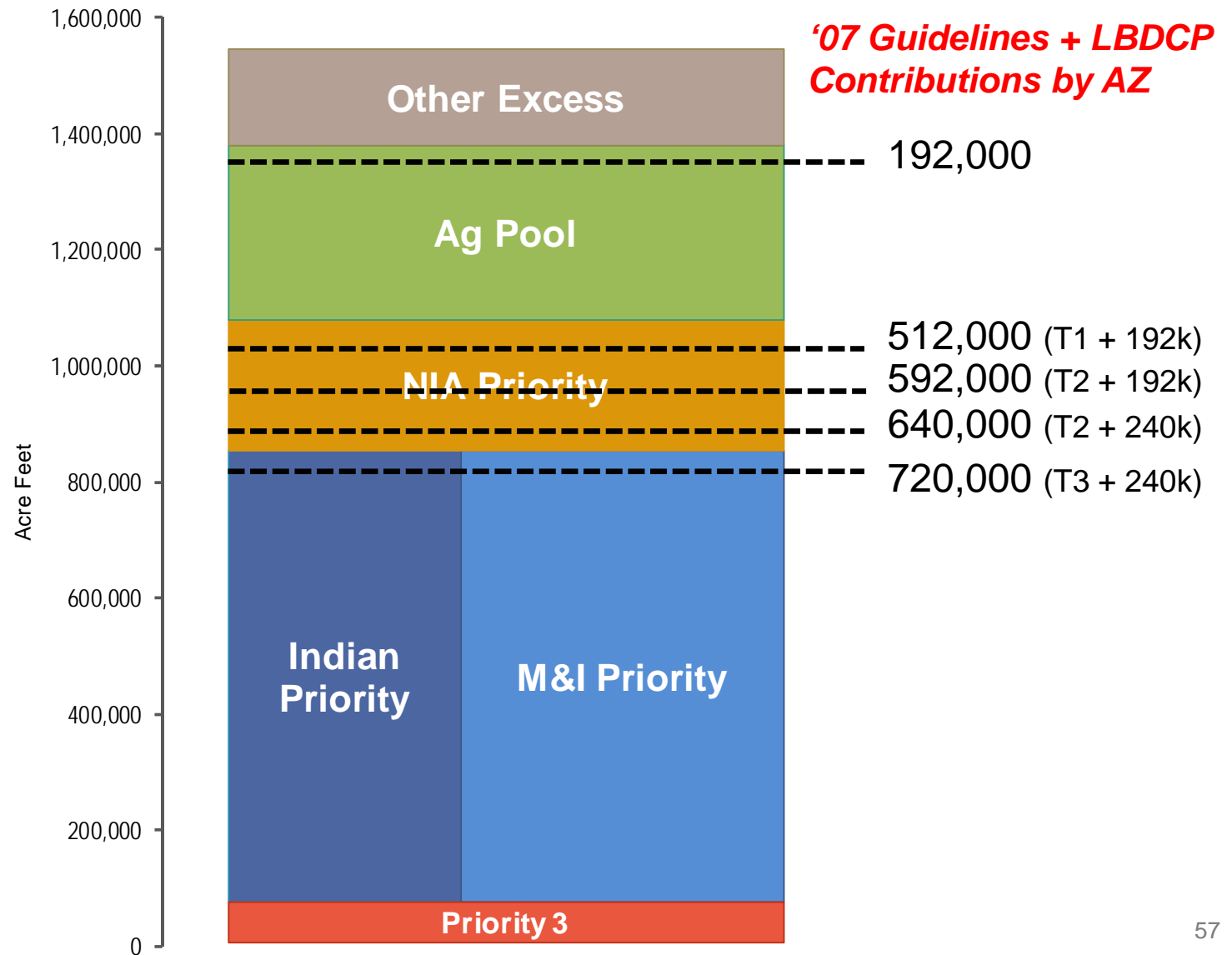


# CAP Priority Pools – '07 Guidelines





# CAP Priority Pools – LBDCP

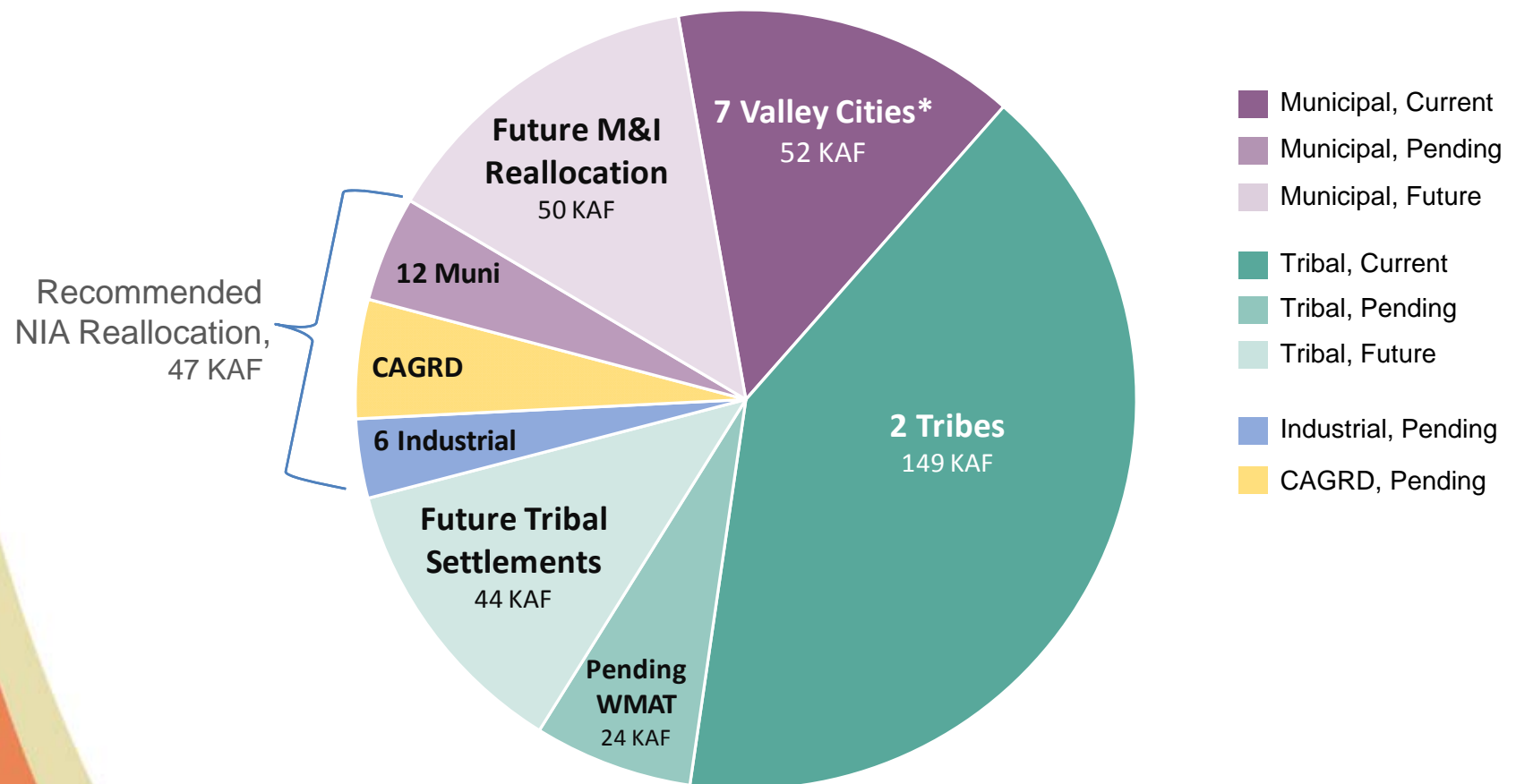


# Implications to CAP Rates

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- As CAP deliveries are reduced, the Fixed OM&R and overall water delivery rates will increase
  - For example, 2020 CAP published rates: Fixed OM&R = \$98/AF, and delivery (including Fixed OM&R and Pumping Energy) = \$152/AF
- Current CAP rates assume about 192 KAF of contribution to Lake Mead, equivalent to the first level of the LBDCCP
- The 2007 Guidelines reductions are estimated to increase the Fixed OM&R rate by ~10 to 25%, and the overall water delivery rate by ~7 to 17%
- The incremental LBDCCP contributions are estimated to increase the Fixed OM&R rate by an additional ~20 to 30%, and the overall water delivery rate by ~13 to 20%

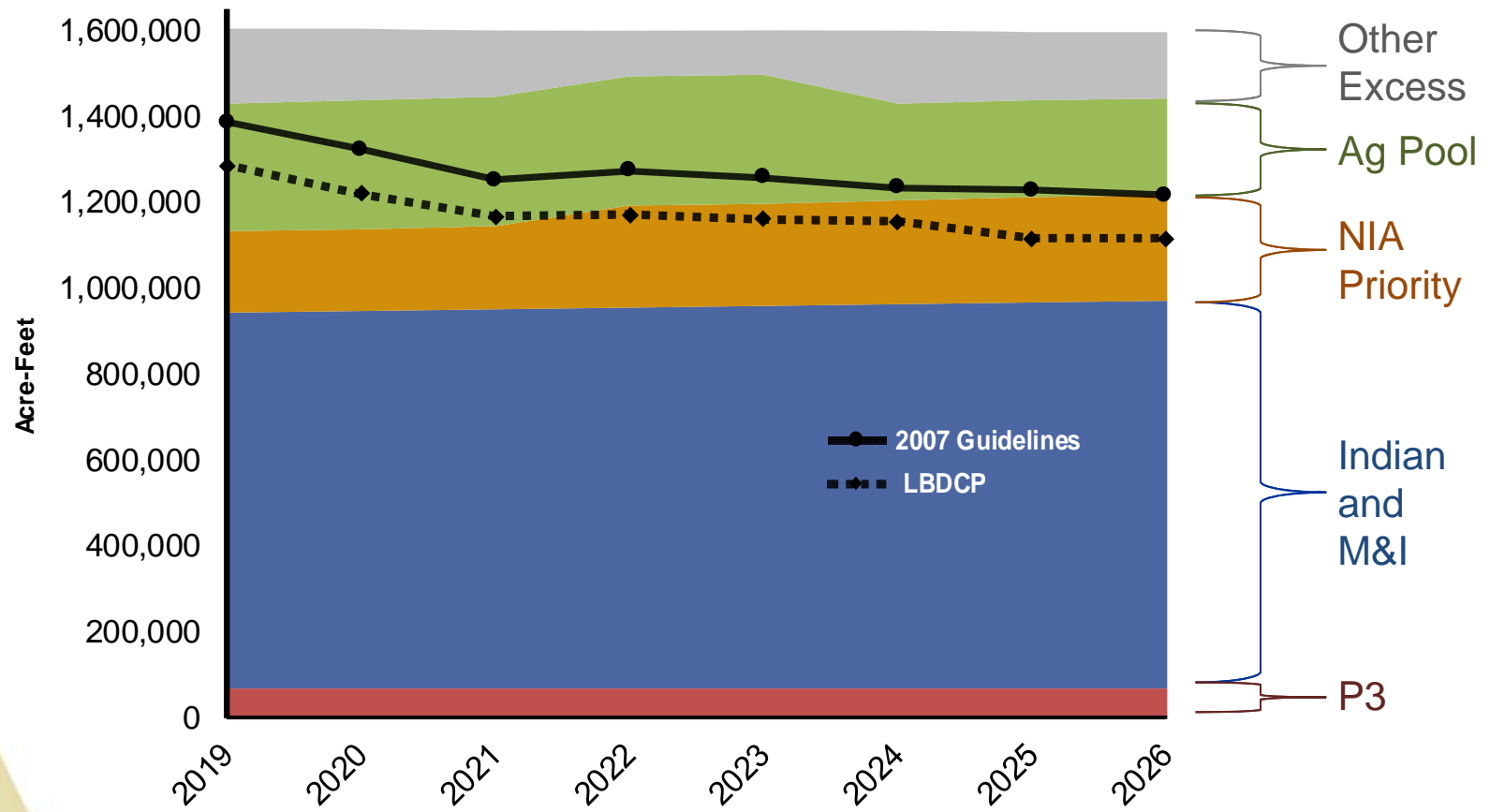
# Status of NIA Priority Supplies



# LBDCP vs. Guidelines

## Stress Test Hydrology (1988—2015)

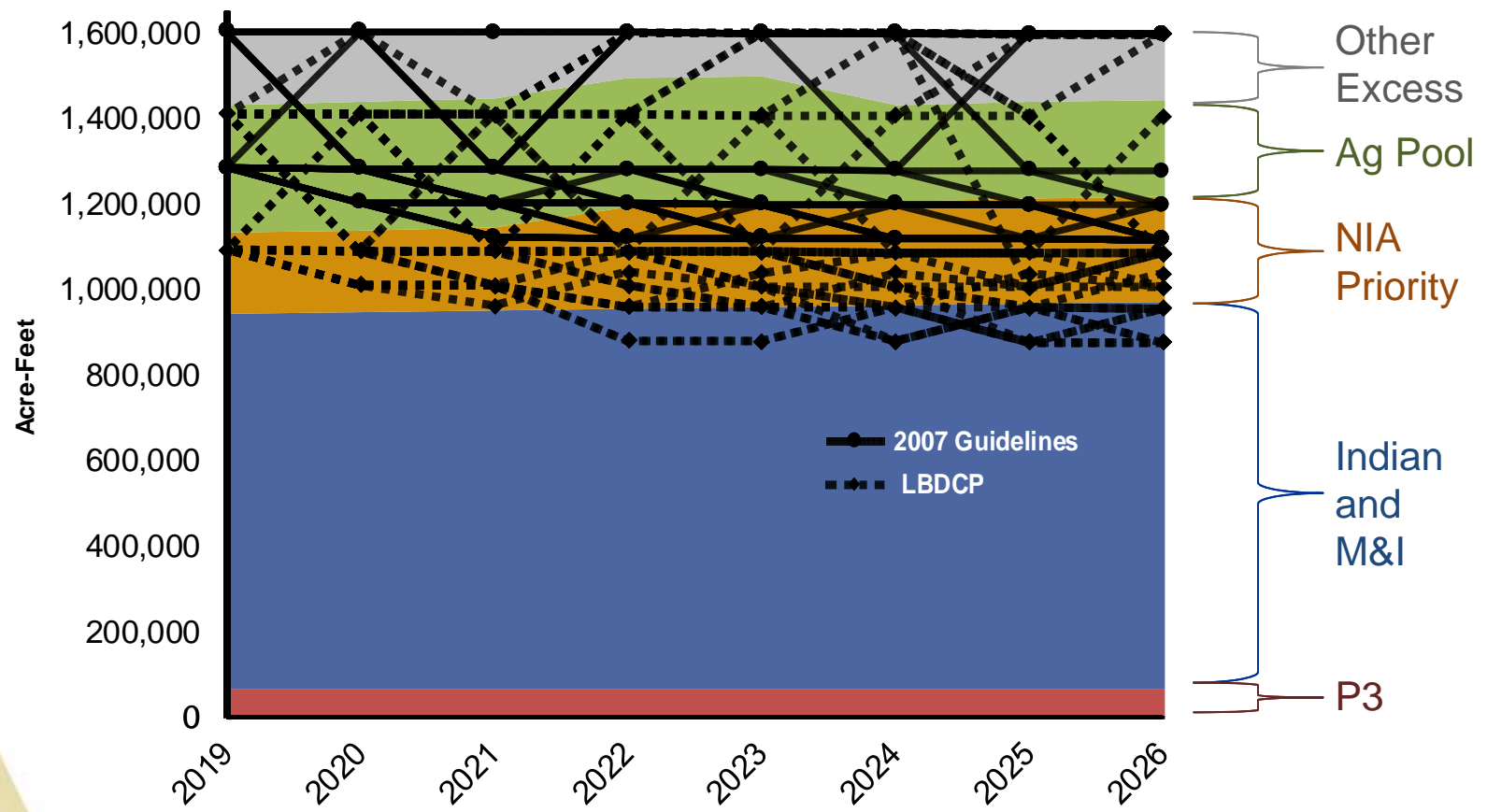
### Average Supply



# LBDCP vs. Guidelines

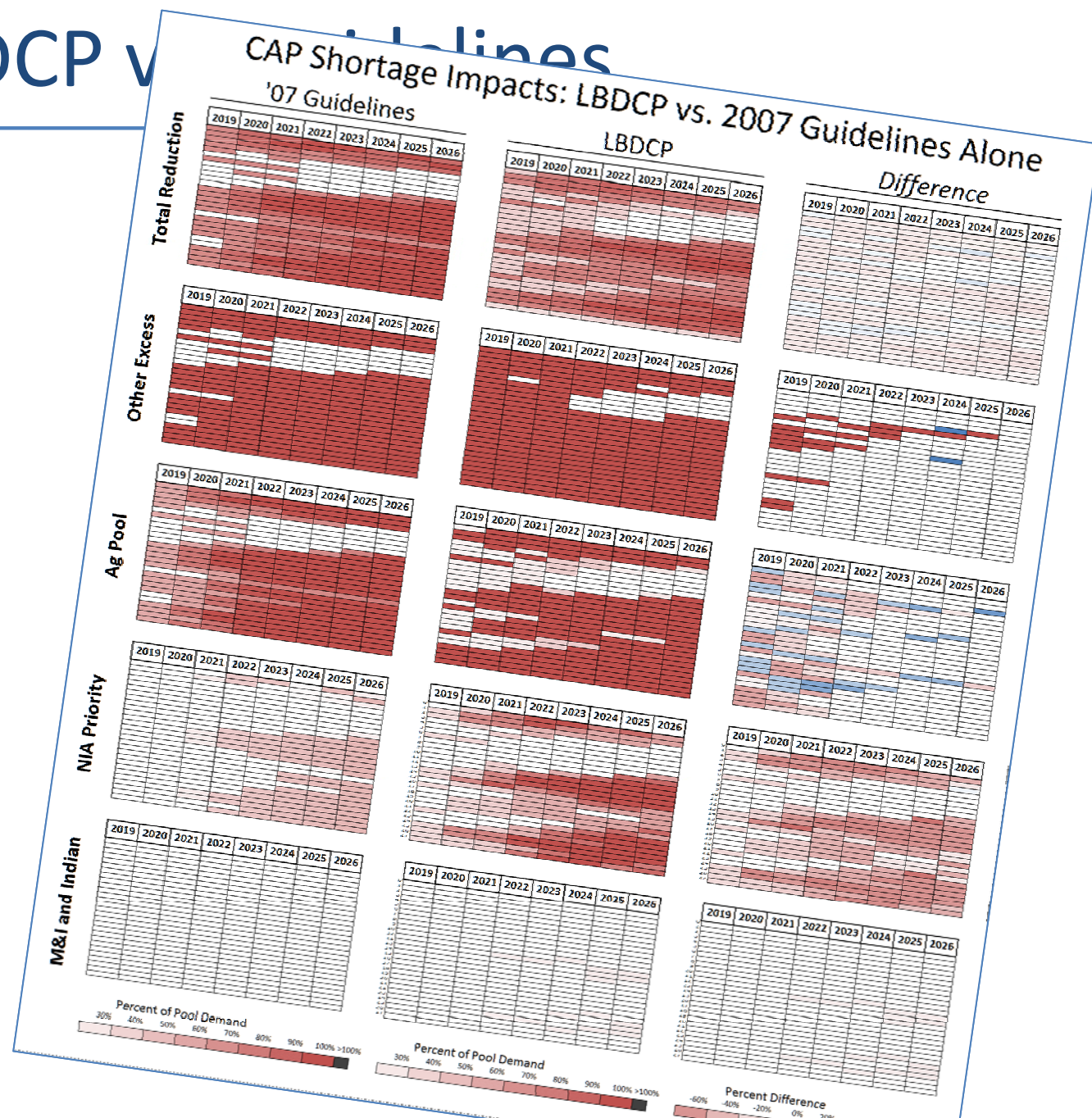
Stress Test Hydrology (1988—2015)

## All Model Runs



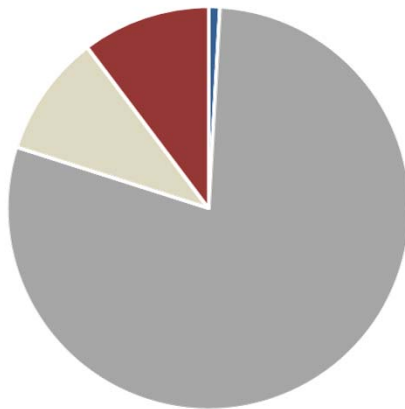


# LBDACP v Guidelines

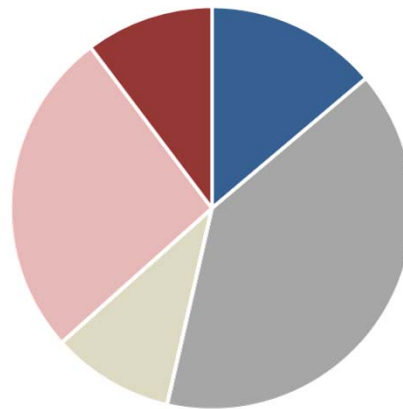


# LBDCP vs. Guidelines

Other Excess



Ag Pool

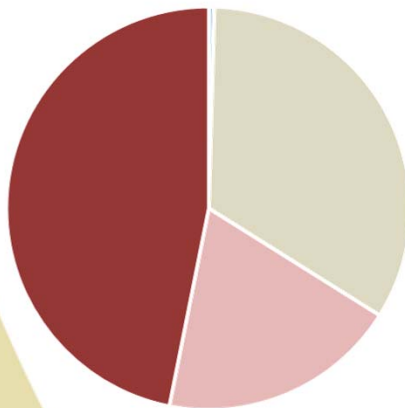


## Legend

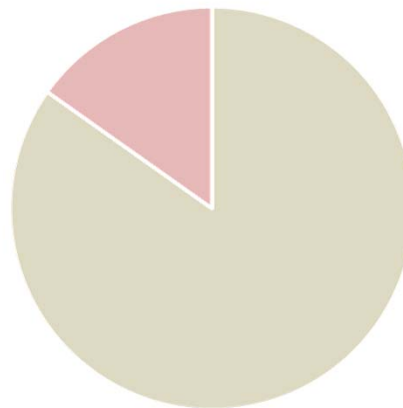
### Available Supply

- A Lot More
- A Little More
- No Change, No Supply
- No Change, Full Supply
- A Little Less
- A Lot Less

NIA Priority



M&I + Indian



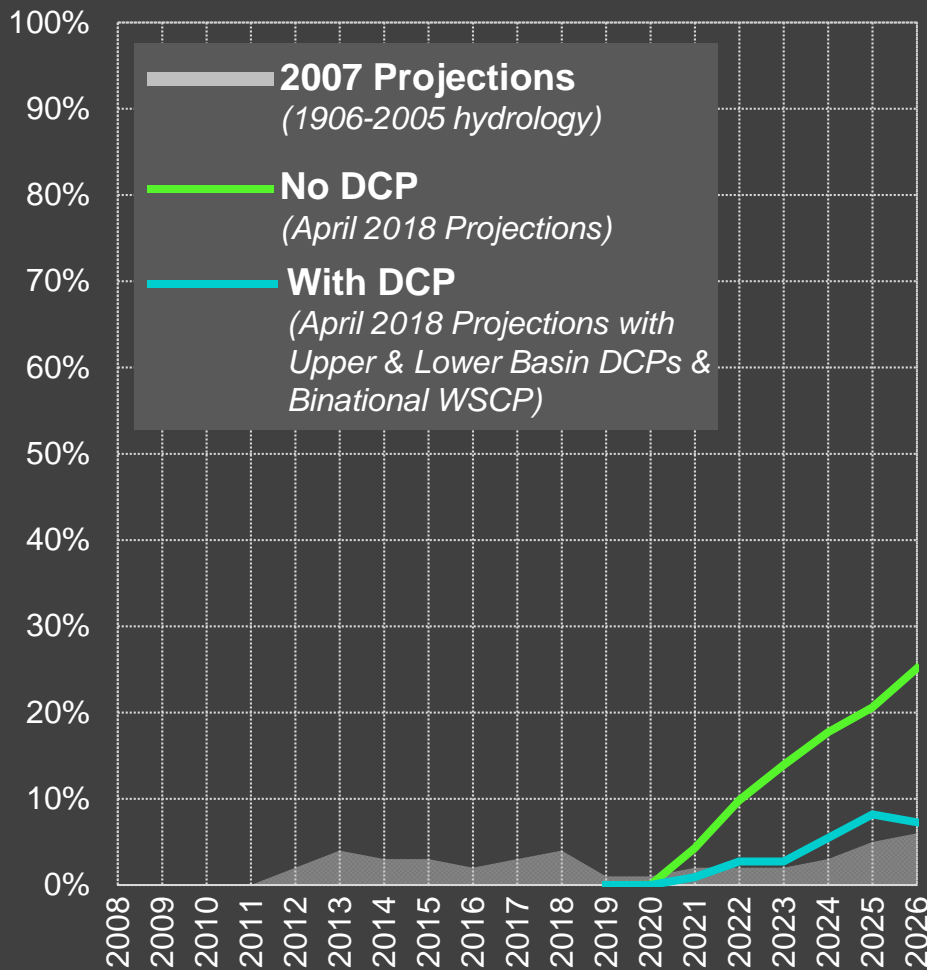
## Assumptions

- Stress Test Hydrology (1988-2015)
- USBR's April 2018 DCP CRSS Model
- 2019 through 2026
- Slice Size = # of occurrences
- "A Little" < 30%
- "A Lot" >= 30%

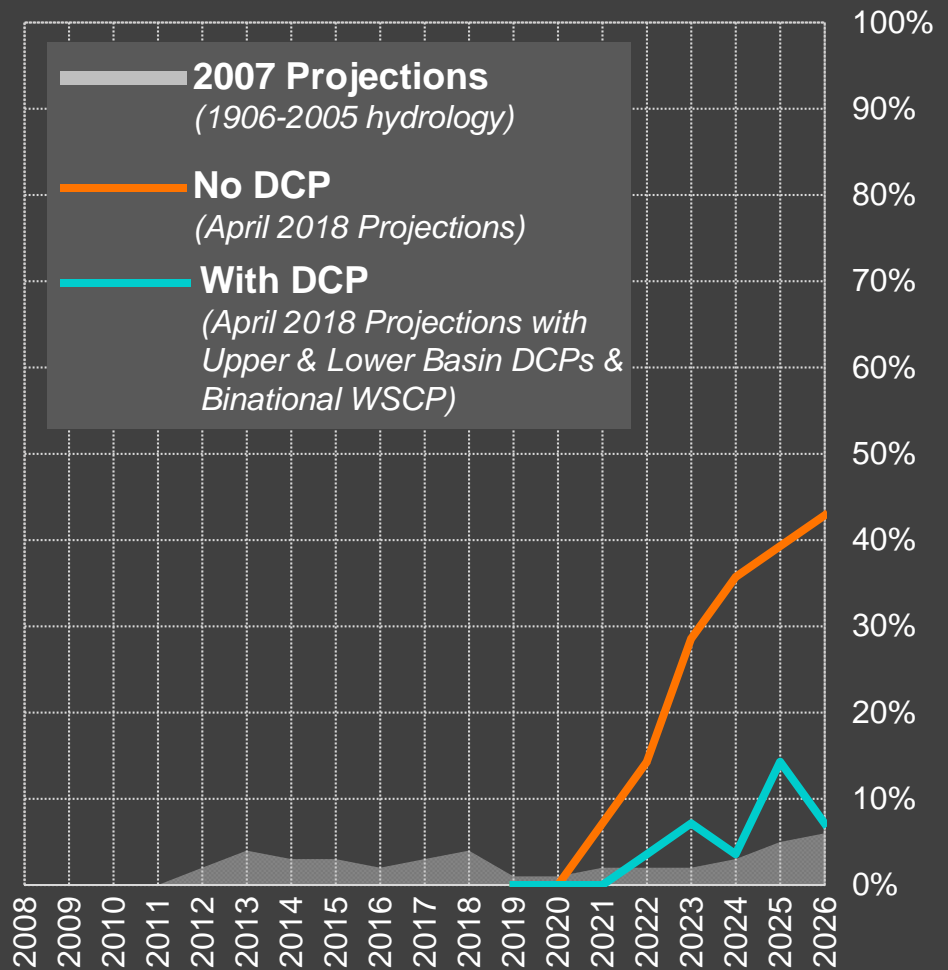
# Risk of Lake Mead < 1,020'

5.7 maf  
22%  
1,020'

Full Hydrology (1906-2015)



Stress Test Hydrology (1988-2015)



# Summary

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- On average, LBDTCP results in a lower available supply to CAP
- The impacts to CAP priority pools vary by time and depth of shortage, which are influenced by Colorado River hydrology
- Through 2026, all priorities could be affected, but the NIA priority supplies are particularly heavily impacted by the incremental reductions of the LBDTCP
- LBDTCP reduces the risks of falling below critically low Lake Mead elevations through reductions in demands by AZ, CA, NV, and Mexico



# Questions?

To submit a handwritten question:

1. Get a blue card from ADWR or CAP staff
2. Complete and return to ADWR or CAP staff prior to break

To submit a question via text:

1. Text AZDCP to 22333
2. Reply to the automated text with your question

To submit a question online:

1. Go to [PolLEV.com/AZDCP](http://PolLEV.com/AZDCP)
2. Enter your name and submit your question (questions are anonymous)



# Next Steps within Arizona

- **Follow-up Meeting (July 10<sup>th</sup>) to address questions arising from this briefing and to delve deeper into modeling, analyses, and LBDCP terms and operations**
- **Convening a Steering Committee of Arizona water users, stakeholders, and legislative leaders to discuss and recommend how to adopt and implement the LBDCP in a way that is acceptable to Arizona water users.**
  - **Representatives will be invited jointly by ADWR and CAWCD**
  - **Public will be invited to attend meetings and to contribute to the process**
  - **First meeting is tentatively scheduled for July 26<sup>th</sup>**
  - **Notice of meetings will be provided on ADWR and CAWCD websites**



# Next Steps

- **Complete the Arizona Steering Committee process**
- **Basin States resolve remaining issues to finalize agreement documents**
- **Arizona legislation to authorize ADWR Director to agree to LBDCP agreements**
- **Other necessary parties obtain appropriate authorizations**
- **Federal legislation directing the Secretary to implement LBDCP**



# Conclusion

- Risks to the Colorado River System have increased, and the risk of Lake Mead falling to critical elevations is real.
- At critical elevations there is greater uncertainty for Arizona's water users.
- The tools in the 2007 Interim Guidelines are insufficient to address these risks.
- The LBDCP significantly reduces these risks of falling below critically low elevations in Lake Mead.
- The LBDCP requires contributions from water users in AZ, CA, NV, and Mexico and incentivizes additional conservation.
- The LBDCP could impact all CAP priorities, with the most significant impacts to the NIA Pool users.
- The Arizona Steering Committee will discuss and recommend how to adopt and implement the LBDCP in a way that is acceptable to Arizona water users.





# Stay Informed

For more information after today's briefing:

[www.azwater.gov](http://www.azwater.gov)

or

[www.cap-az.com/AZDCP](http://www.cap-az.com/AZDCP)

