



ARIZONA
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COMMITTEE

Modeling and Analysis Work Group #6

Initial Conditions
Scenarios Review

October 5, 2021

Meeting Logistics Summary

- Roll Call
 - Members will unmute and acknowledge their attendance when their name is called.
- Modeling and Analysis Workgroup Members
 - Use the WebEx “raise hand” feature to request to speak or ask questions.
 - Wait to be recognized before speaking to ensure clear communication and remain muted when not speaking.
- Livestream Attendees
 - Electronic public comment forms are available at cap-az.com/ARC for anyone wishing to submit a comment or question during the meeting.
 - All submissions will be addressed during the Call to the Public at the end of the meeting, unless relevant to a specific topic in the presentation.
- Modeling and Analysis Workgroup and ARC Information
 - Meeting materials have been posted on the ADWR and CAP ARC pages: cap-az.com/ARC or new.azwater.gov/ARC.

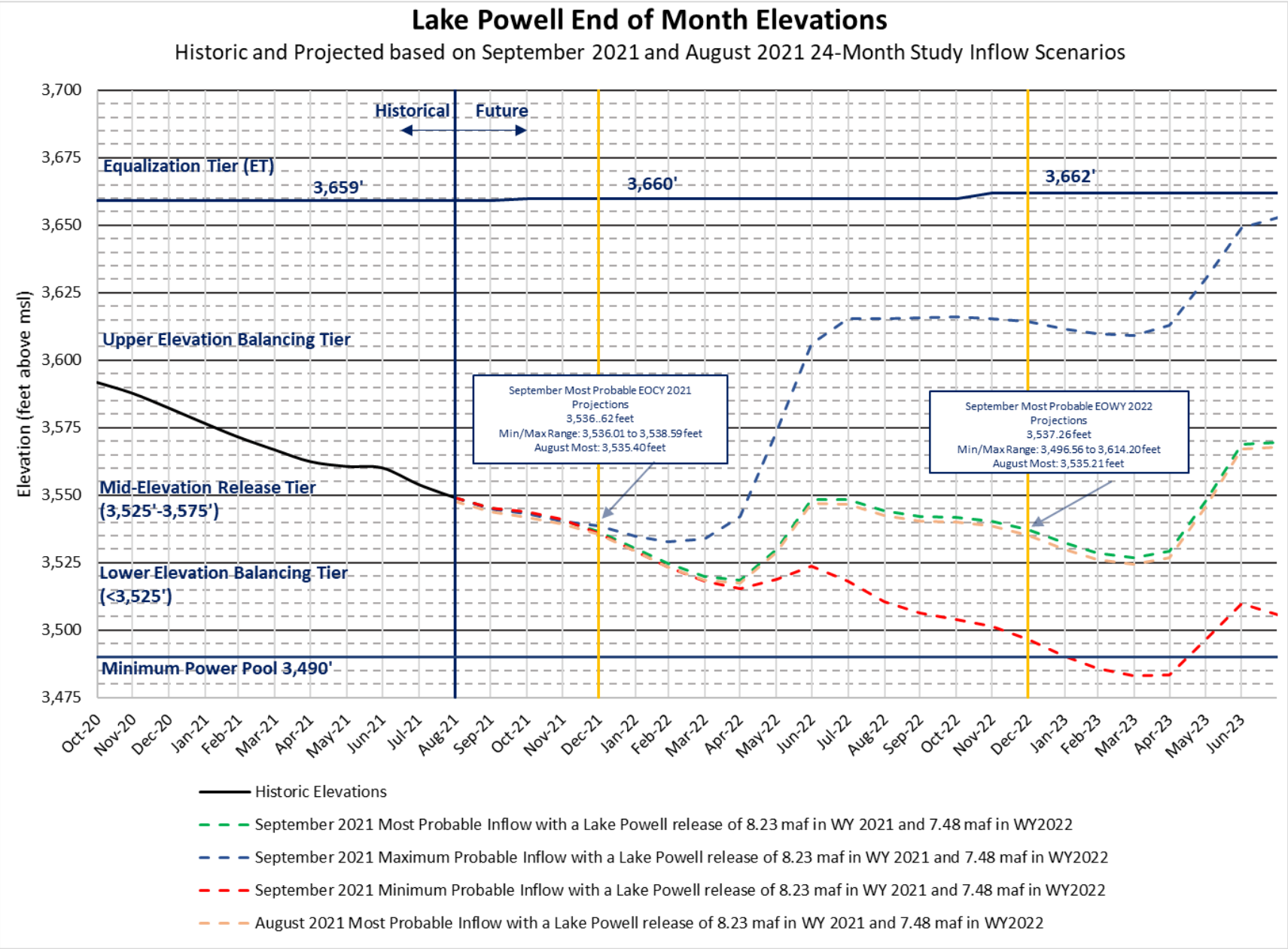


MAWG #6 - Meeting Agenda

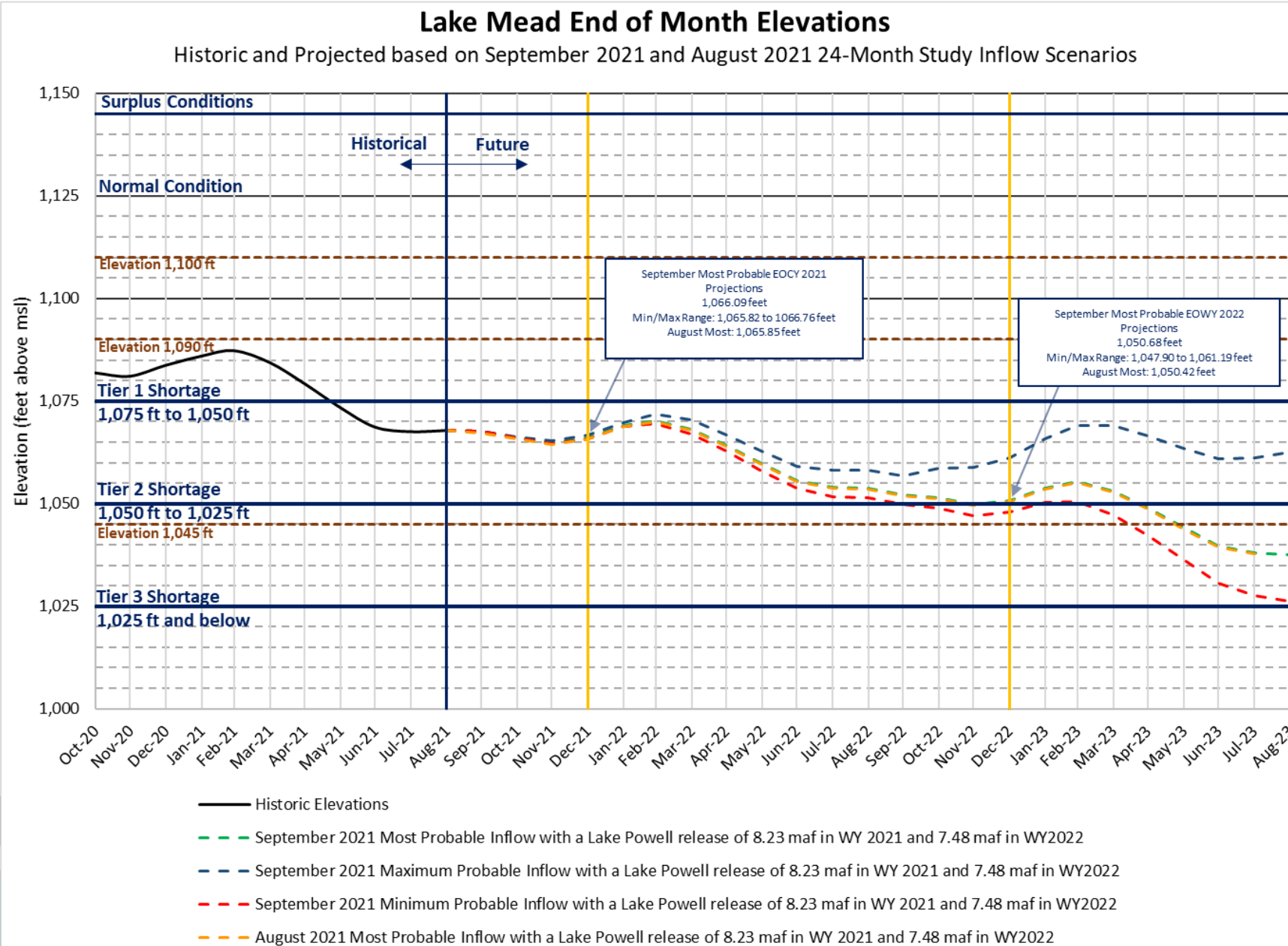
- Welcome and Introductions
- Review of Colorado River Hydrology and Projections
- Summary of MAWG #5 Meeting
- Review of Initial Conditions Scenarios – Component and Modeling Processes
- Summary of Initial Conditions Scenarios Results
- Next Steps
- Call to the Public



Colorado River Conditions – Lake Powell



Colorado River Conditions – Lake Mead



Colorado River Conditions – 5 Year Projected Operating Conditions

Lower Basin – Lake Mead

Percent of Traces with Event or System Condition

Results from August 2021 CRSS **without Upper Basin Drought Response Operations** (values in percent)

Event or System Condition	2022	2023	2024	2025	2026
Surplus Condition – any amount (Mead $\geq$ 1,145 ft)	0	0	0	0	0
Surplus – Flood Control	0	0	0	0	0
Normal or ICS Surplus Condition (Mead $<$ 1,145 and $>$ 1,075 ft)	0	3	3	0	9
Recovery of DCP ICS / Mexico's Water Savings (Mead $>/\geq$ 1,110 ft)	0	0	0	0	0
DCP Contribution / Mexico's Water Savings (Mead $\leq$ 1,090 and $>$ 1,075 ft)	0	3	3	0	3
Shortage Condition – any amount (Mead $\leq$ 1,075 ft)	100	97	97	100	91
<i>Shortage / Reduction – 1st level (Mead $\leq$ 1,075 and $\geq$ 1,050)</i>	100	75	28	22	16
DCP Contribution / Mexico's Water Savings (Mead $\leq$ 1,075 and $>$ 1,050 ft)	100	75	28	22	16
<i>Shortage / Reduction – 2nd level (Mead $<$ 1,050 and $\geq$ 1,025)</i>	0	22	66	38	34
DCP Contribution / Mexico's Water Savings (Mead $\leq$ 1,050 and $>$ 1,045 ft)	0	16	3	6	3
DCP Contribution / Mexico's Water Savings (Mead $\leq$ 1,045 and $>$ 1,040 ft)	0	6	13	6	3
DCP Contribution / Mexico's Water Savings (Mead $\leq$ 1,040 and $>$ 1,035 ft)	0	0	13	9	3
DCP Contribution / Mexico's Water Savings (Mead $\leq$ 1,035 and $>$ 1,030 ft)	0	0	13	9	3
DCP Contribution / Mexico's Water Savings (Mead $\leq$ 1,030 and $\geq$ 1,025 ft)	0	0	25	6	22
<i>Shortage / Reduction – 3rd level (Mead $<$ 1,025)</i>	0	0	3	41	41
DCP Contribution / Mexico's Water Savings (Mead $</\leq$ 1,025 ft)	0	0	3	41	41

Notes:

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

² Reservoir initial conditions on December 31, 2021 were simulated using the August 2021 Most Probable 24 Month Study.

³ Stress Test Hydrology uses 32 hydrologic inflow sequences that resamples the observed natural flow record from 1988-2019 for 32 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.

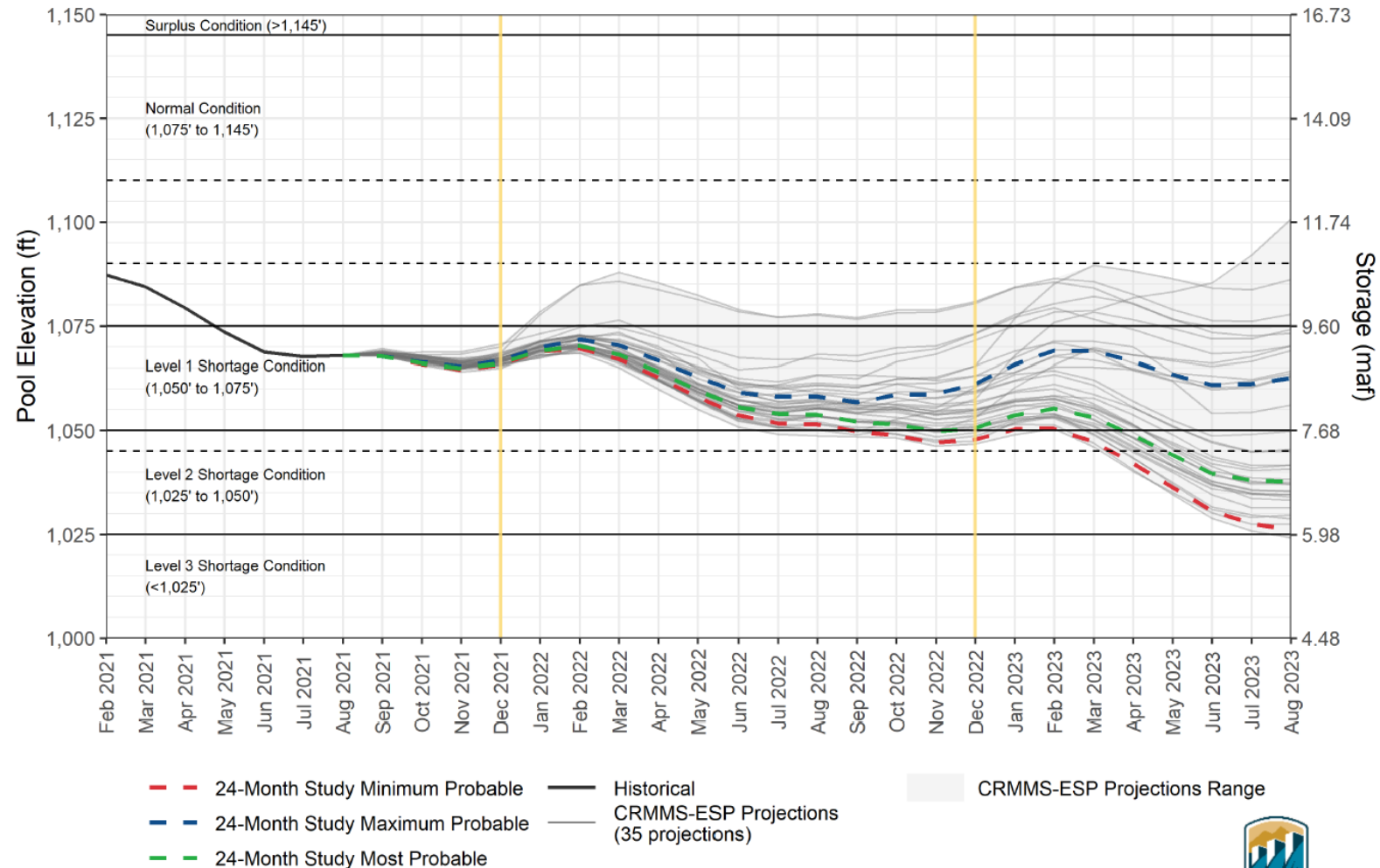
⁵ Percentages shown may not sum to 100% due to rounding to the nearest percent.



Colorado River Conditions – Colorado River Mid-Term Modeling System (CRMMS)

Lake Mead End-of-Month Elevations

Projections from the September 2021 Colorado River Mid-Term Modeling System (CRMMS)



MAWG #5 Summary – Initial Conditions (IC) Scenario Development Exercise

- Pre-meeting scenario exploration and development exercise generated six “themes” to guide scenario development
- MAWG #5 conducted on May 13, 2021
- Members selected key components to generate six unique scenarios:
 - Hydrology
 - Upper Basin Demands
 - Arizona On-River Demands
 - CAP Utilization
- One MAWG scenario was refined at the ARC #3 Meeting
- Modeling conducted over 3 scales: Basin, AZ On-River and CAP

Scenario Components (Highlight Selection)					
Colorado River Hydrology	Upper Basin Demands	Arizona On-River Uses	Long-term Contract Utilization	Growth in Long-term Contract Use	Response to Shortage Conditions
Observed 113 Direct natural flow hydrology traces from 1906-2018 (Median Annual Inflow = 14.50 MAF)	1999 Schedule Schedule prepared by UCRB to represent future Upper Basin development (2030 Consumptive Use = 5.03 MAF)	0.1% Growth Trend Future growth in AZ on-river uses based on 0.1% trend (starting from 2015-2019 average) (2030 Consumptive Use = 1.112 MAF)	Slow All current long-term contracts and future NIA reallocations are fully utilized by 2055	Slow 0.5% increase in volume of long-term contracts being used to meet annual demands	No Response No change in annual demand or Long-Term Storage Credit accrual volume anticipated under any DCP tier
Fluvial-removed 88 Non-pluvial hydrology traces from 1931-2018 (Median Annual Inflow = 13.66 MAF)	2007 UCRC Schedule Schedule prepared by UCRB to represent full buildout of Upper Basin projects (2030 Consumptive Use = 5.33 MAF)	0.2% Growth Trend Future growth in AZ on-river uses based on 0.2% trend (starting from 2015-2019 average) (2030 Consumptive Use = 1.132 MAF)	Medium All current long-term contracts and future NIA reallocations are fully utilized by 2045	Medium 1.5% increase in volume of long-term contracts being used to meet annual demands	Moderate Response Progressive reductions in annual demand and Long-Term Storage Credit accrual by DCP tier
Stress-test 31 traces from 1988-2018 including the drought from 2000 to present (Median Annual Inflow = 12.72 MAF)	Basin Study Current Projected Upper Basin demands projected into the future based on current use from the Basin Study (2021) (2030 Consumptive Use = 5.13 MAF)	0.1% Declining Trend Future decline in AZ on-river uses based on 0.1% trend (starting from 2015-2019 average) (2030 Consumptive Use = 1.026 MAF)	Fast All current long-term contracts and future NIA reallocations are fully utilized by 2035	Fast 2.5% increase in volume of long-term contracts being used to meet annual demands	Aggressive Response Progressive reductions in annual demand and Long-Term Storage Credit accrual by DCP tier
Paleo Resampled 1,244 historical traces derived from tree-ring analyses (Median Annual Inflow = 14.83 MAF)	2016 UCRC Schedule Schedule prepared by UCRB updated from 2007 to reflect updated project development buildout plans in Upper Basin (2030 Consumptive Use = 5.01 MAF)				
Downscaled GCM-Projected 112 synthetic traces produced from modeled climate datasets (Median Annual Inflow = 12.73 MAF)	Interim Guidelines Period Trend Extended Upper Basin demands projected into the future based on uses from the Interim Guidelines period (2007-present) (2030 Consumptive Use = 4.46 MAF)				
Paleo-conditioned 500+ traces that combine tree-ring hydrology length of record with statistics associated with the gauged record (Median Annual Inflow = 14.58 MAF)	Average 2008-2018 Upper Basin demands based on average use from 2008-2020 period (2030 Consumptive Use = 3.92 MAF)				

MAWG Framing Questions.docx

Modeling and Analysis Work Group (MAWG) Scenario Development Exercise Preparation

In preparation for the MAWG scenario development exercise at the May 13th MAWG Meeting #5, we are providing a preview of the exercise and asking participants to submit their responses to several framing questions. Please submit your responses to Mohammed Mahmoud (mmahmoud@cap-az.com) by COB on May 11th in the document provided (MAWG Framing Question Response.docx)

PREVIEW OF MAY 13th Meeting:

Prior to the May 13th meeting, we are seeking your responses to the framing questions outlined below. summaries will inform the discussions.

We will begin the meeting with MAWG participants only to develop themes and scenarios. The MAWG will first review the submitted responses to the framing questions and discuss themes derived from the responses to the framing questions. The participants will then be randomly assigned to three smaller groups to define scenarios based on the themes. Following the breakout sessions, participants will come back together and the meeting will be live-streamed to the public as the small group reports out on their discussions. A summary of the MAWG's efforts will be shared with the ARC at the ARC's May 26th meeting.

Scenario Development Process Background:

Beginning with the July 30th, 2020 MAWG meeting, the MAWG identified the key issues of depth, duration, frequency and timing of reductions to Arizona Colorado River water supply and the resulting impacts to Arizona's On-River priorities and to CAP priority pools.

At the November 10th, 2020 meeting we outlined initial conditions scenarios; a range of hydrologic conditions and demand schedules to represent baseline future conditions, with operating rules held constant. Initial conditions scenarios provide a baseline for comparison to proposed operating scenarios. The MAWG will conduct its analysis based on the existing modeling structures and components at the Basin, On-River and CAP scales.



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MAWG Initial Conditions (IC) Scenarios Overview

- Purpose of IC Scenarios
 - Provide frame of reference for comparison of future proposed operating rules (post – '26)
 - Recognize additional scenarios are likely to be developed in the future
- IC Scenarios Summary
 - ADWR – CAWCD operated CRSS & JSAM, conducted QA/QC and verified results
 - Operated with 4 discreet CRSS hydrologies
 - Observed that hydrology is the principal driver of impacts to Arizona & CAP
 - Did not evaluate alternative Colorado River operating rules
- Reclamation is in the process of developing additional CRSS hydrologies for consideration in 2022



Key Modeling Assumptions

- CRSS “as delivered” April 2021 version
 - ‘07 Guidelines + DCP operating rules extended for the modeling period
 - As delivered ICS and conservation assumptions
- IC Scenarios 1 – 6 modify CRSS Equalization Line
 - EQ Line fixed at 3652’ post-2026 operations
- JSAM application of Arizona On-River demands per IC Scenarios 1 – 6 conditions
- JSAM CAP impacts limited to Tier 3 volumes when Mead < 1,025’



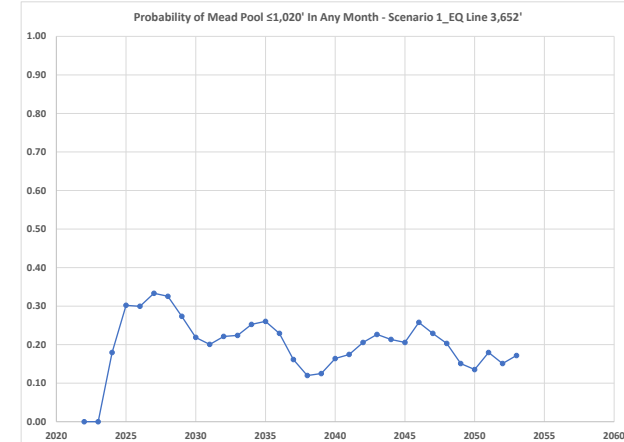
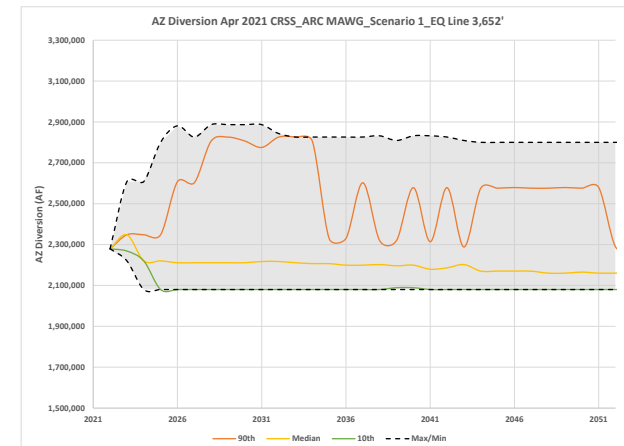
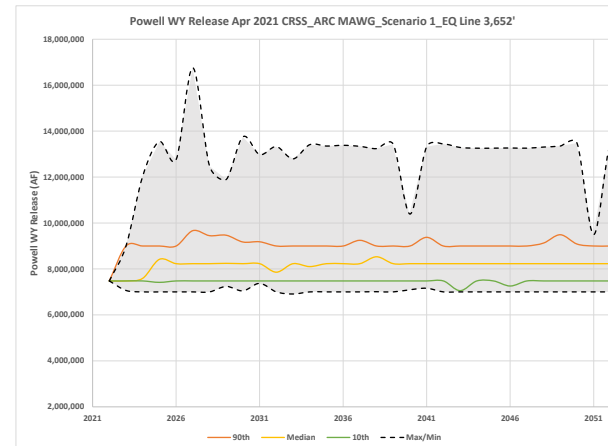
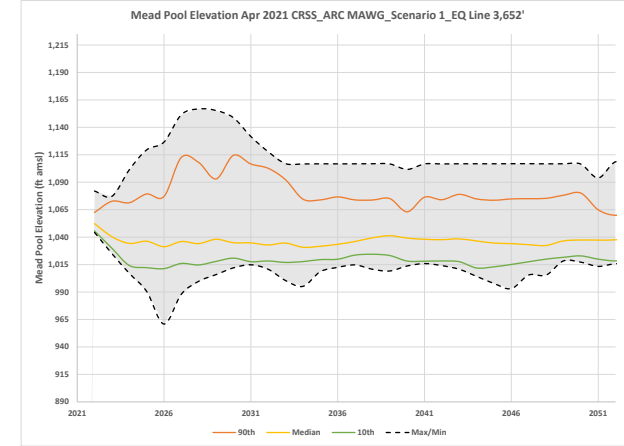
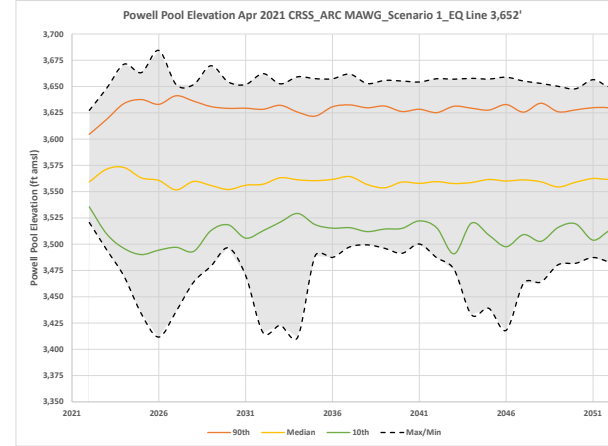
Summary of Visualizations Shared Today

- Traditional CRSS Outputs for Lake Powell, Lake Mead, and key risks (Mead $< 1,020'$) in appendix
- Heat Maps
- Violin Chart
- Histograms and Probability Distributions
- Data supporting the visualizations are available upon request

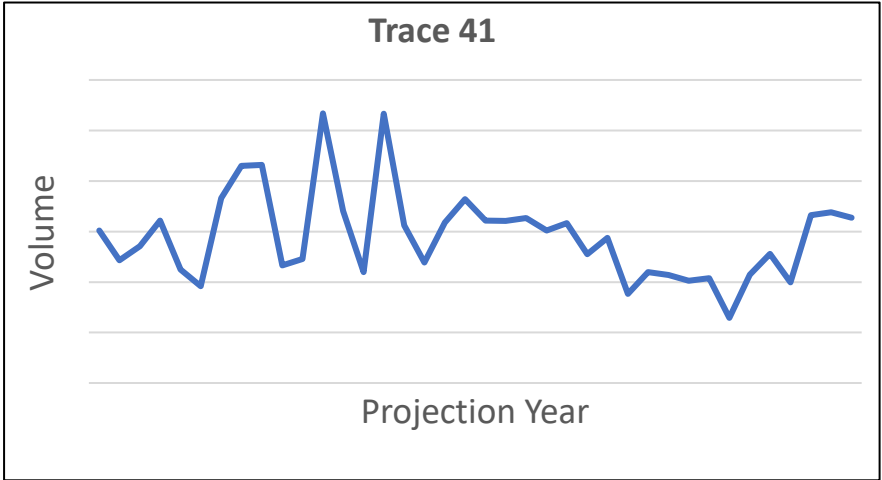
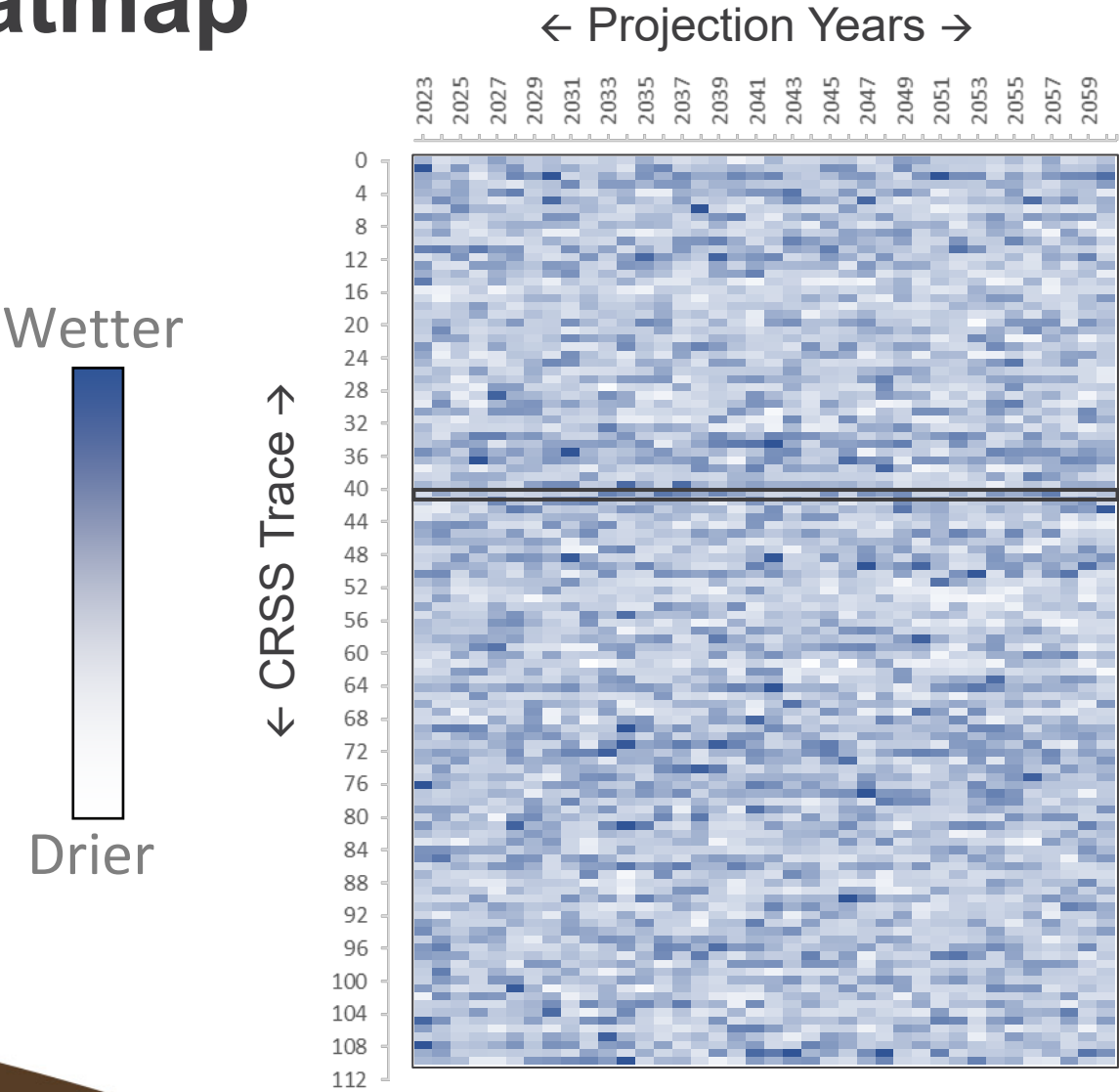


Appendix Content

- IC 1 – 6
- Lake Powell EOY Elevations
- Lake Powell Releases
- Lake Mead EOY Elevations
- Arizona Available Supply
- Probability Mead < 1,020'
- Full distributions



The Heatmap



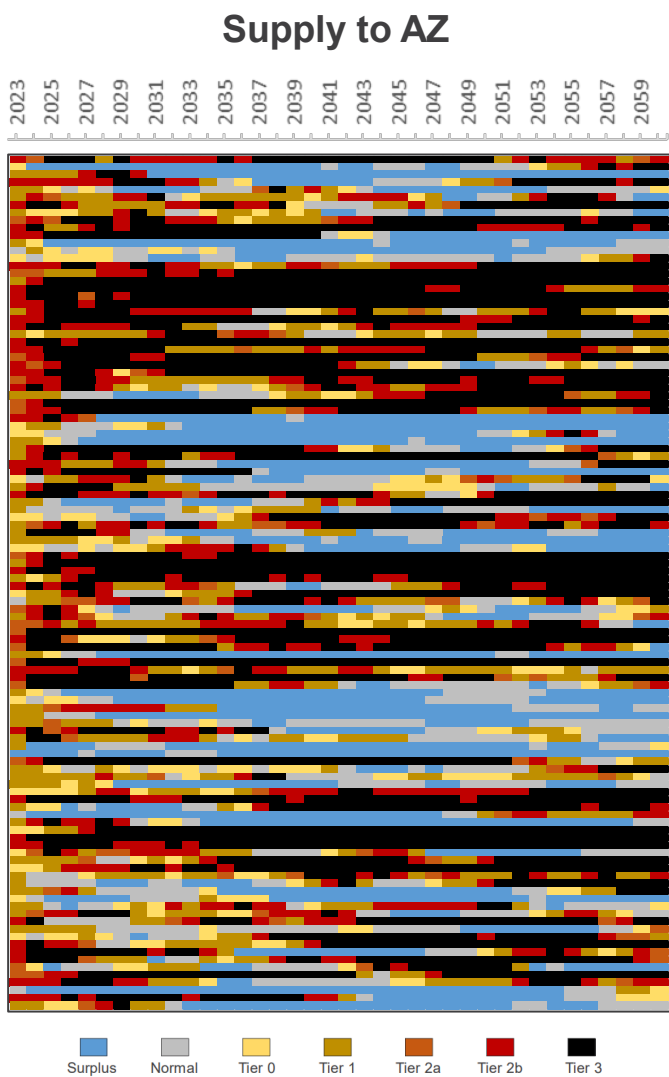
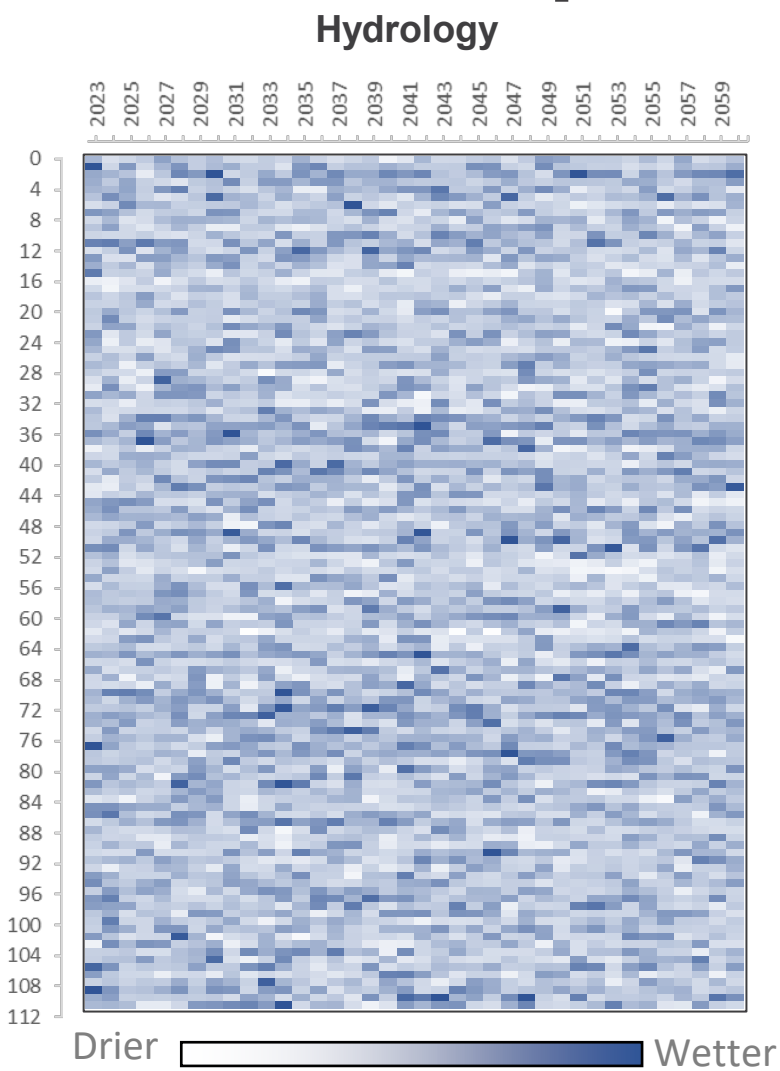
38 Projection Years x 112 Traces
= 4,256 data points

**Using Downscaled GCM (CMIP3) as Example*



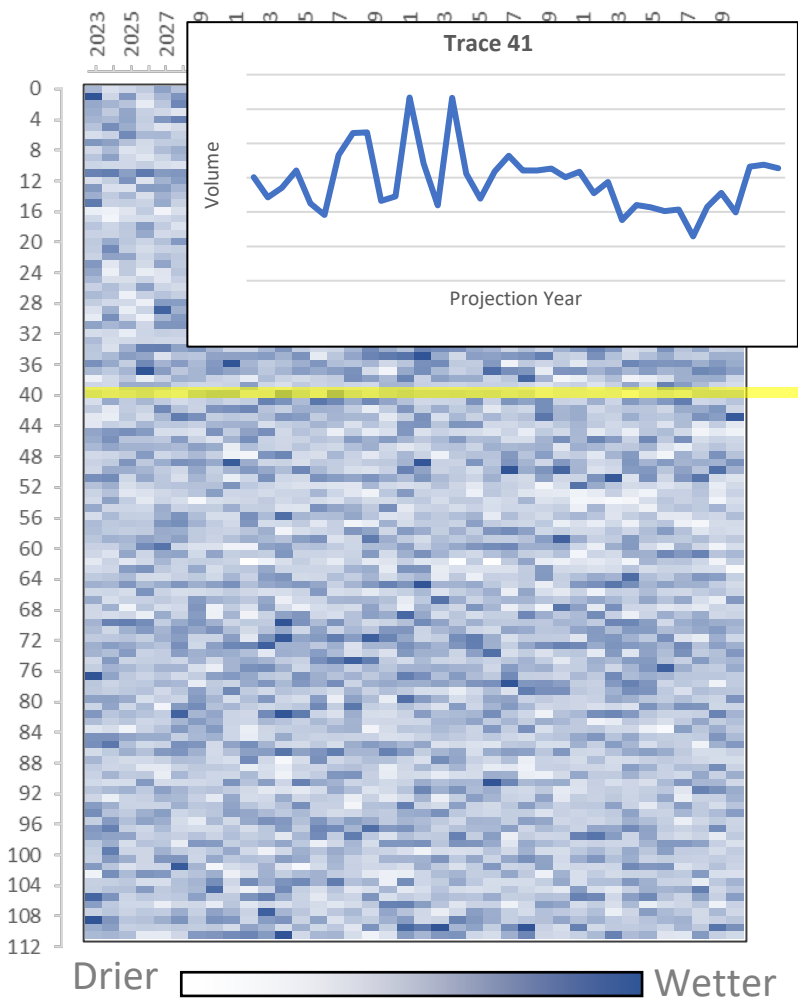
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The Heatmap

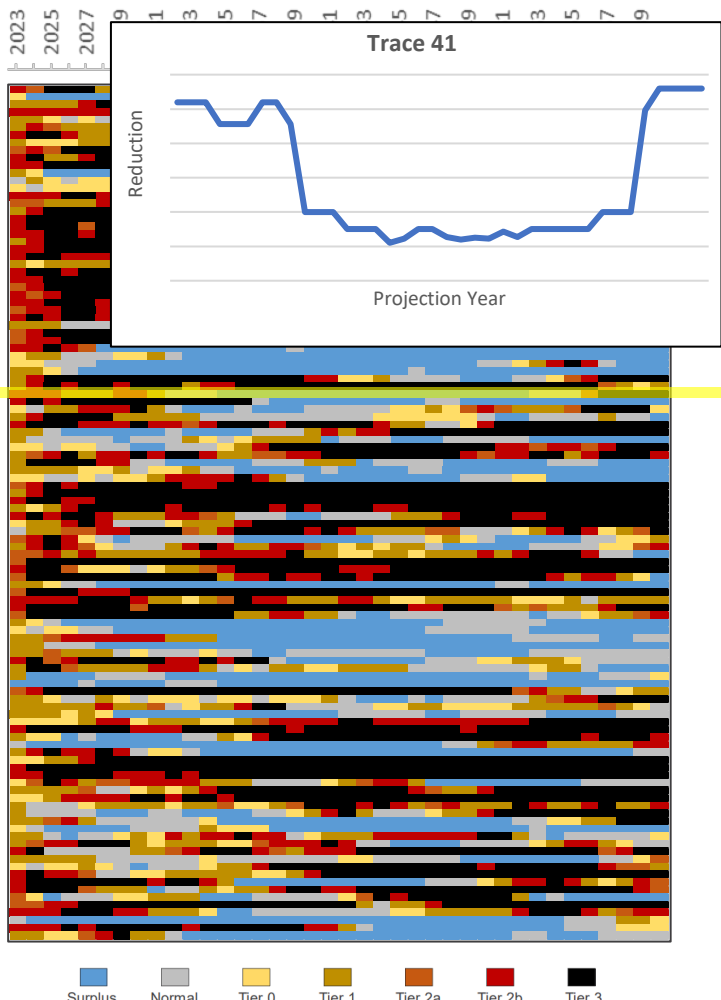


The Heatmap

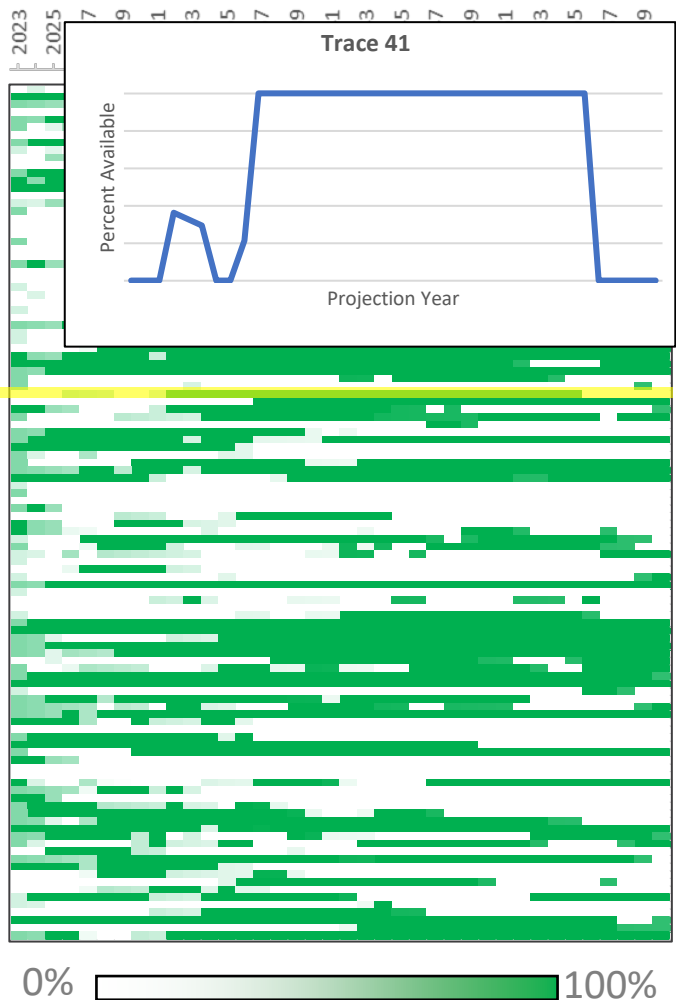
Hydrology



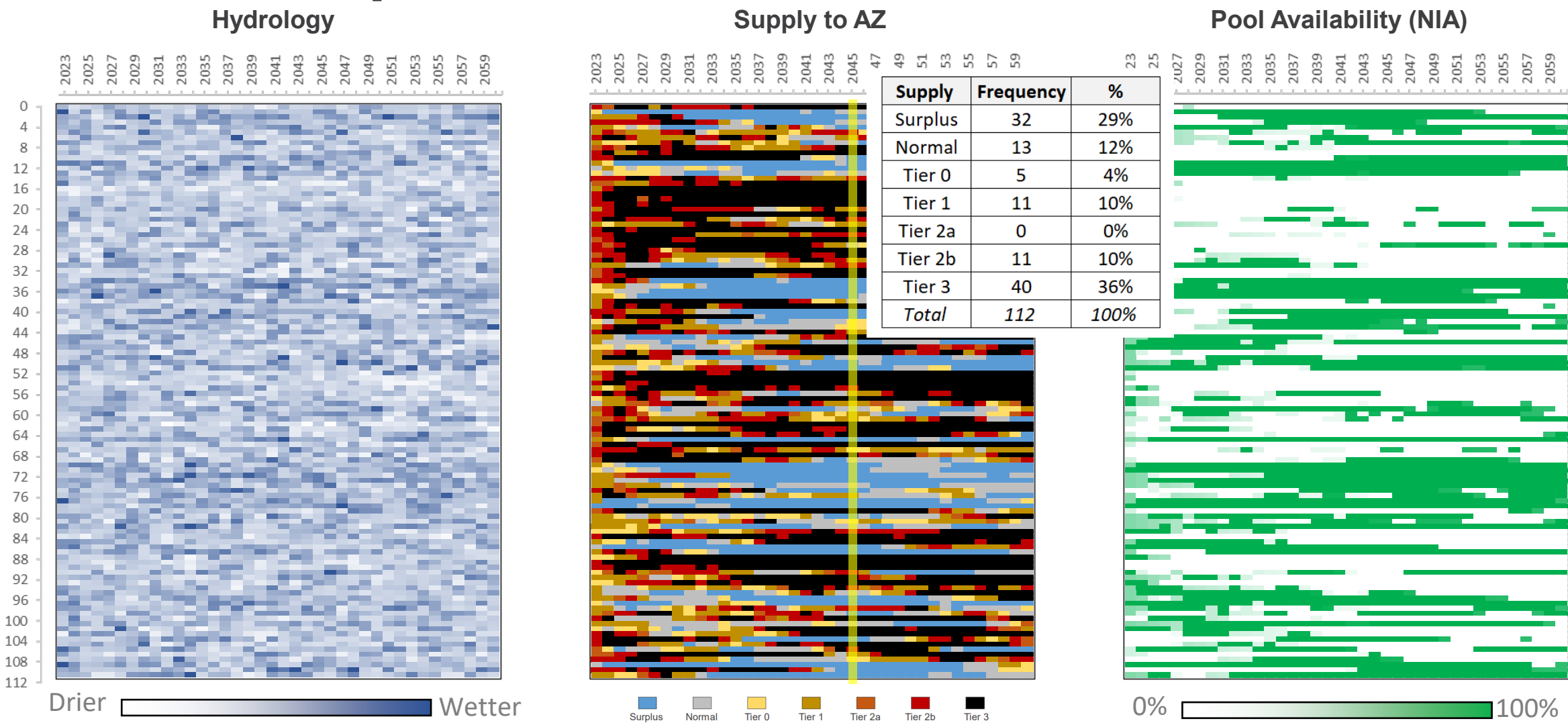
Supply to AZ



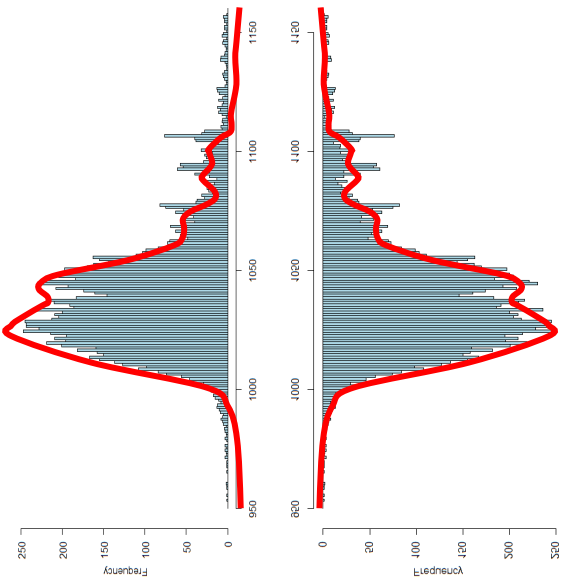
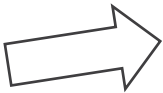
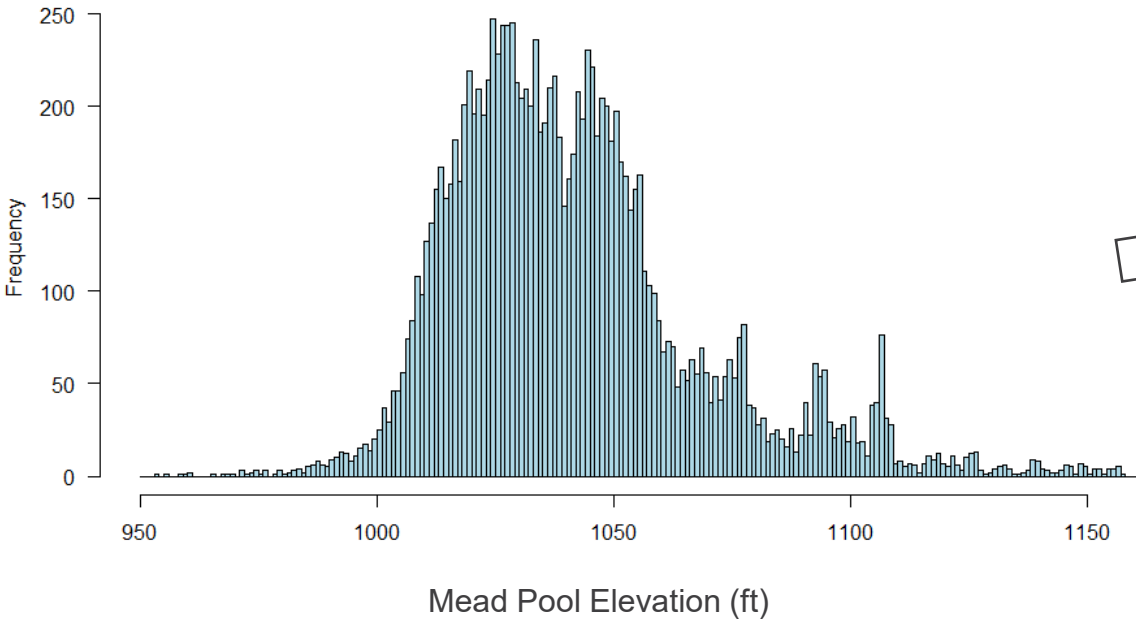
Pool Availability (NIA)



The Heatmap

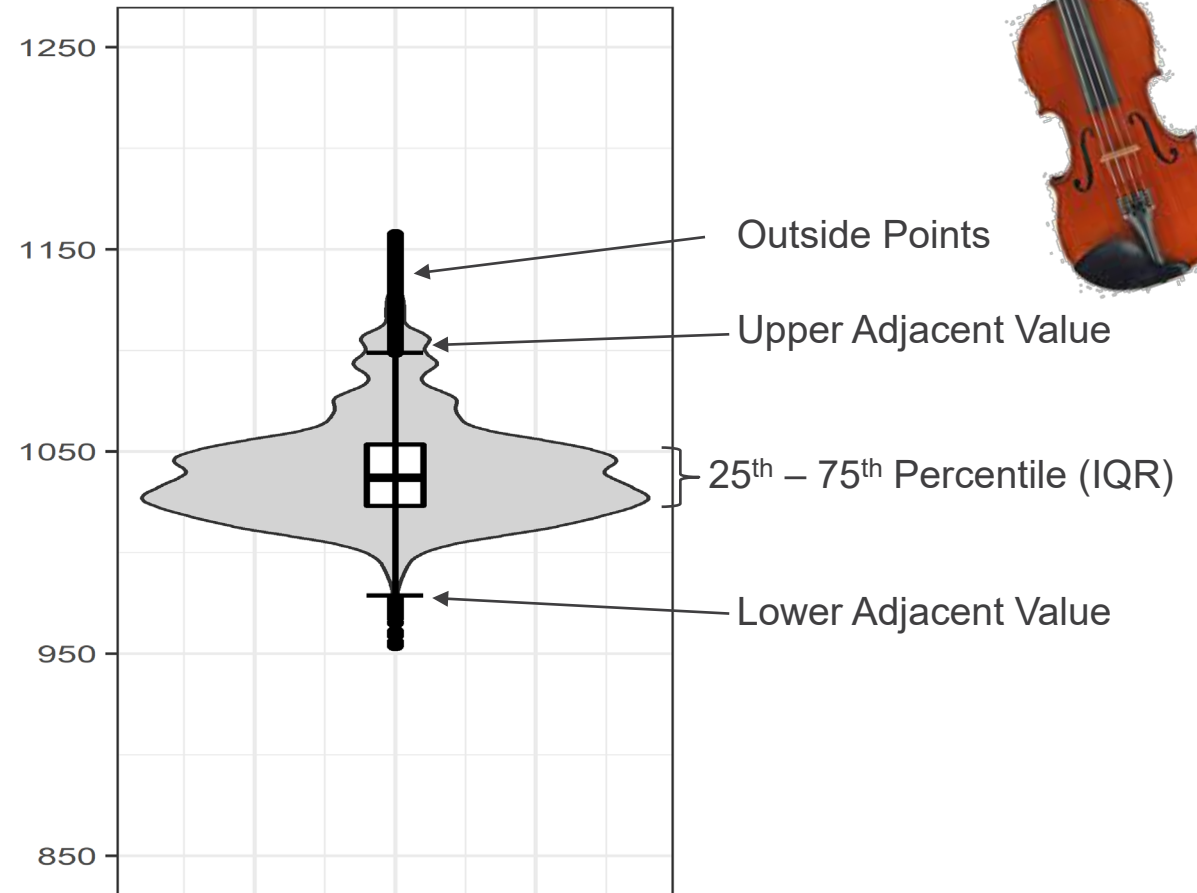
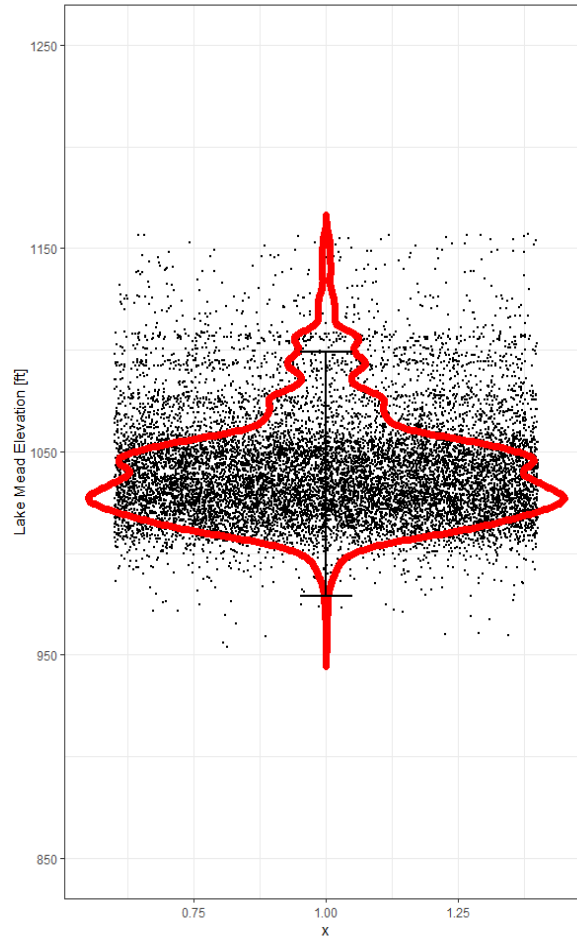


The Violin Chart



The Violin Chart

- Dots = Individual Lake Mead Projections
- X-axis represents frequency



MAWG Initial Conditions Scenarios Summary

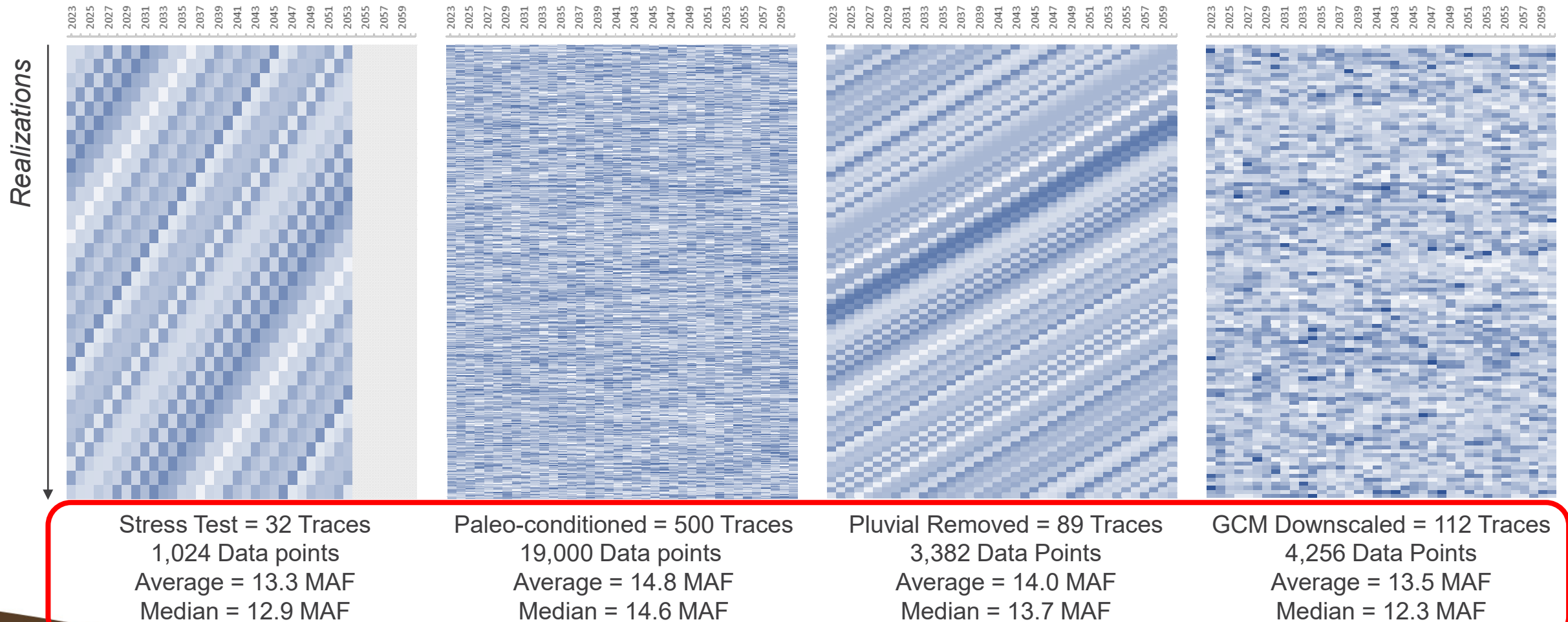
Scenario	Hydrology	Upper Basin Demand	Arizona On-River Demand	CAP Utilization
IC #1	Stress Test	Guidelines Period UB Use Extended	0.1% Growth	Medium
IC #2	Paleo-Conditioned	2016 UCRC Upper Basin Growth	0.2% Growth	Medium
IC #3	Pluvial-Removed	Guidelines Period UB Use Extended	0.1% Growth	Medium
IC #4	Downscaled GCM	2016 UCRC Upper Basin Growth	0.2% Growth	Fast
IC #5	Pluvial-Removed	Upper Basin Guidelines Period Average	On-River Guideline Average	Medium
IC #6	Stress Test	2012 Basin Study Current Trends Growth	0.2% Growth	Fast

**All scenarios assume Lake Powell equalization line is capped at 3,652 ft starting in 2027*



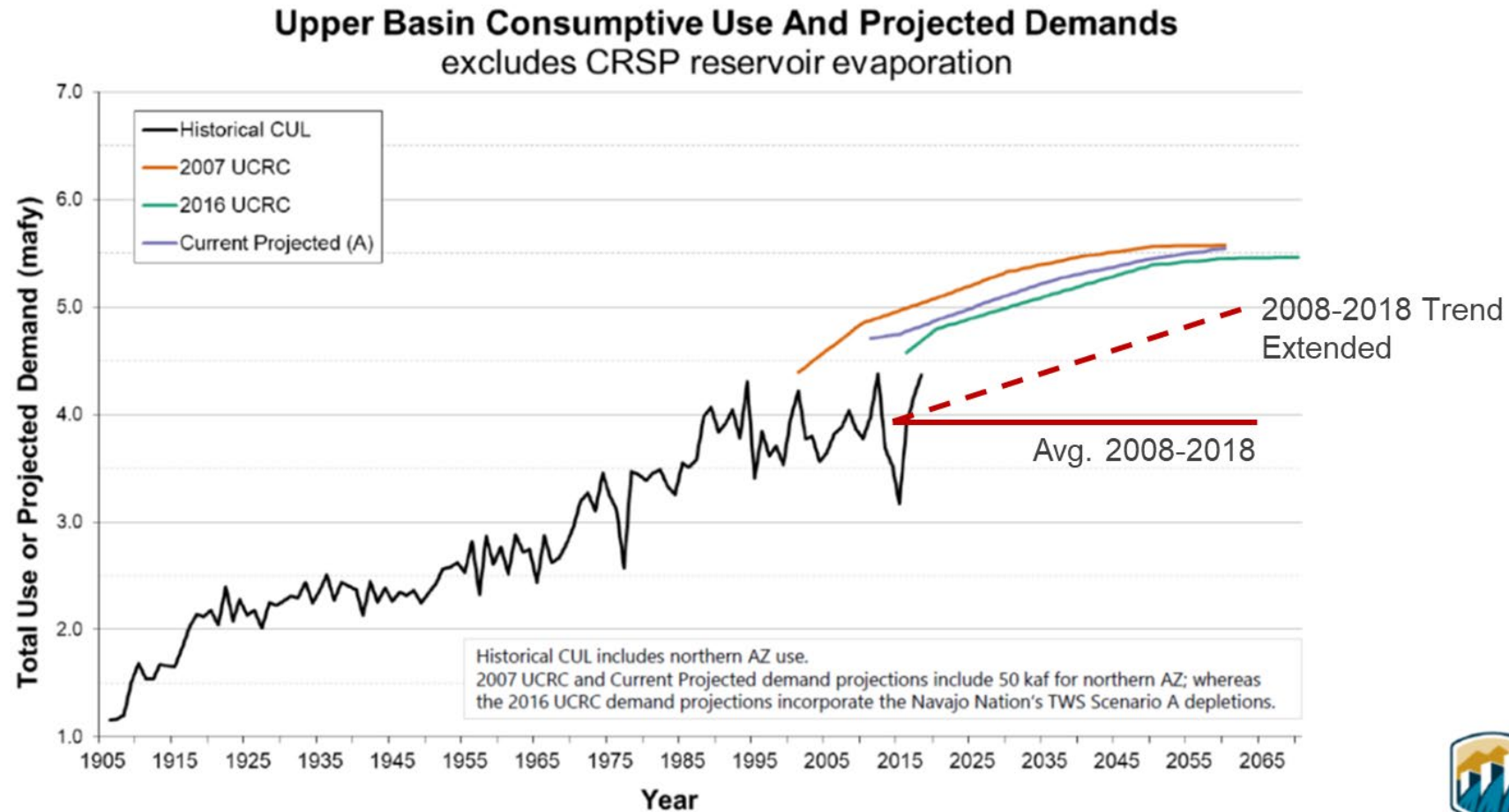
4 Discreet CRSS Hydrologies

**Natural Flow at Lees Ferry*



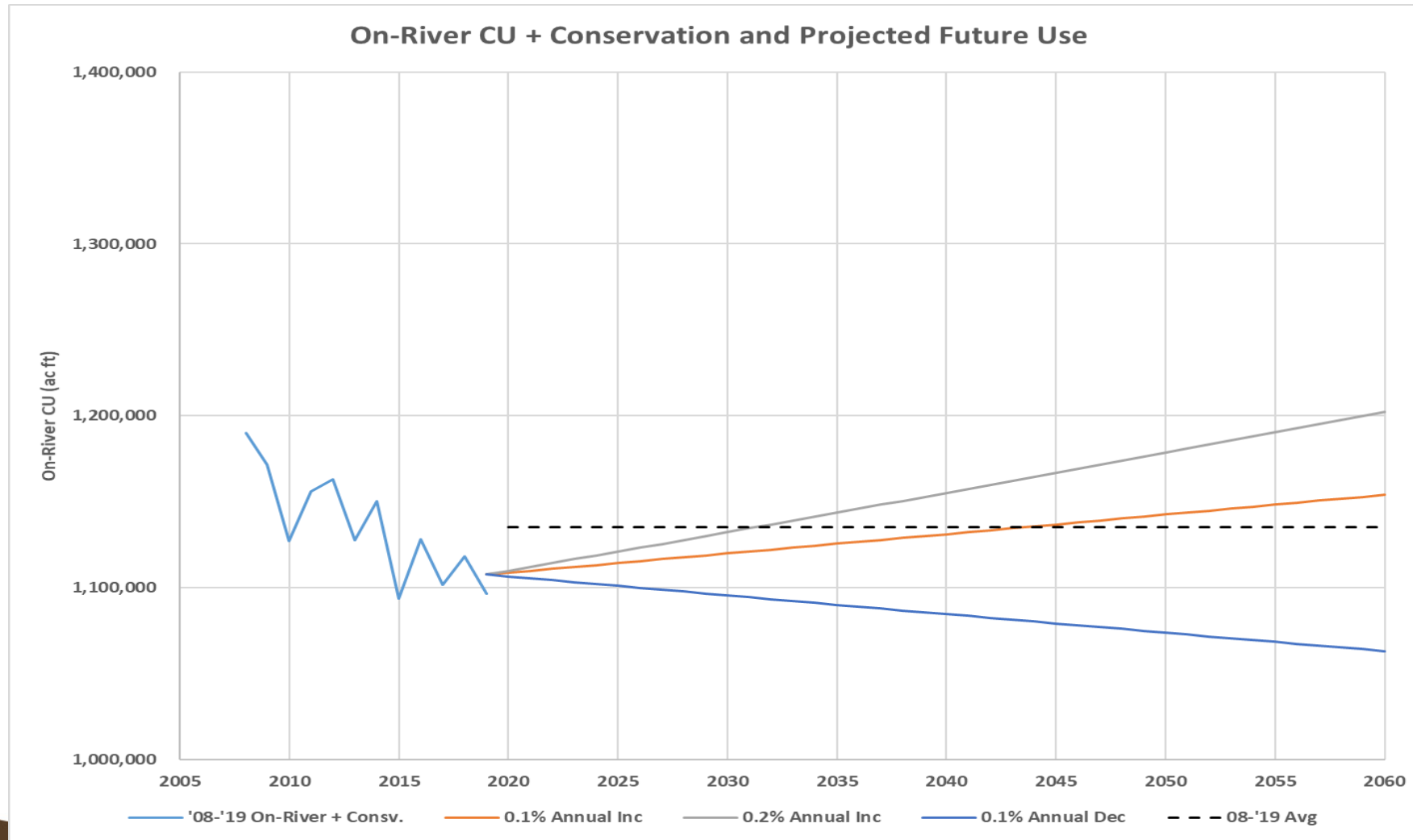
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Upper Basin Demands

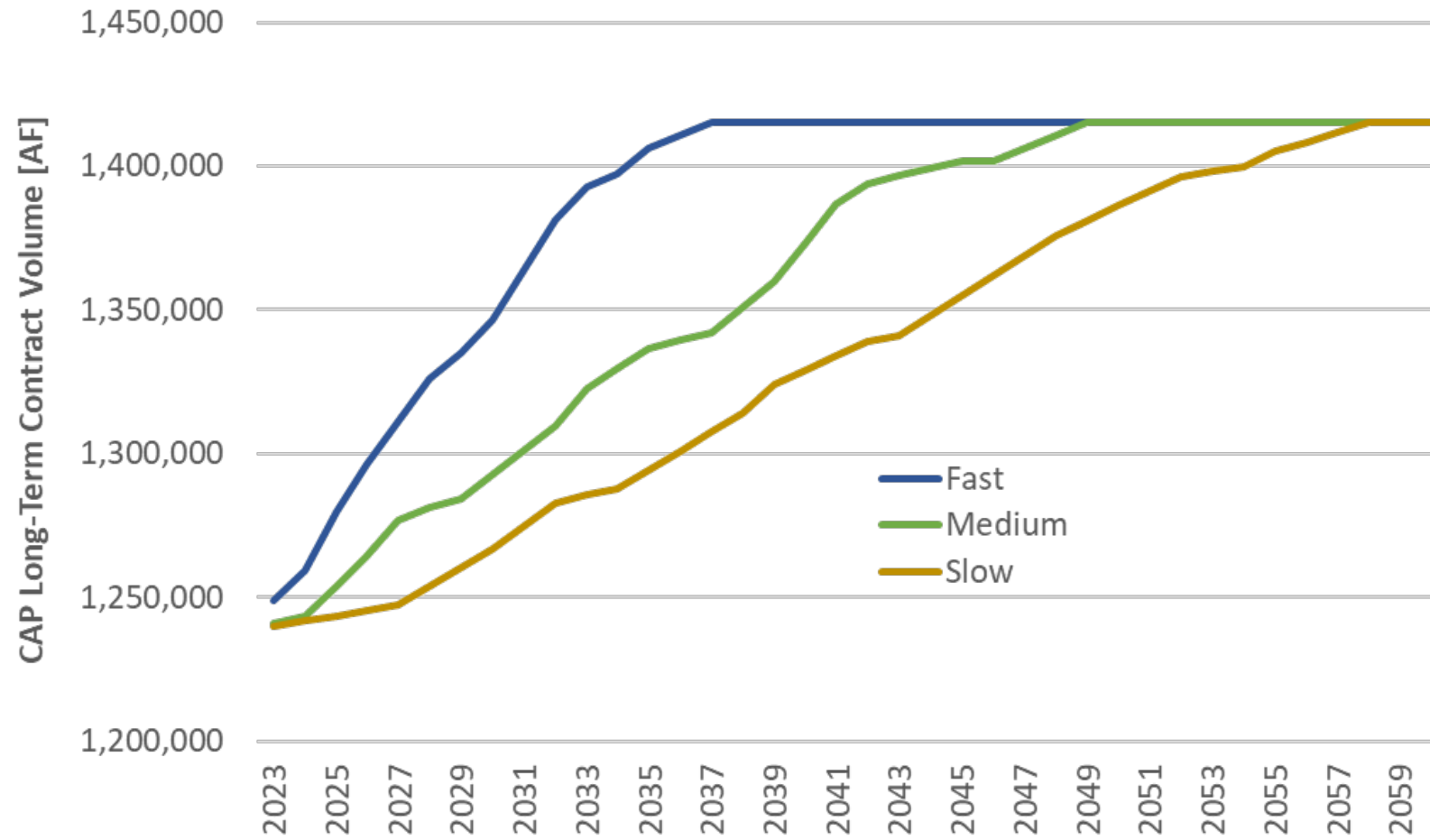


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Arizona On-River Demands



CAP Utilization



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MAWG Initial Conditions Scenarios Range of Components

Scenario	Hydrology	Upper Basin Demand	Arizona On-River Demand	CAP Utilization	Overall Ranking
IC #1					
IC #2					
IC #3					
IC #4					
IC #5					
IC #6					

**All scenarios assume Lake Powell equalization line is capped at 3,652 ft starting in 2027*

Estimated Impact to Arizona / CAP



Break



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MAWG Initial Conditions Scenarios Summary

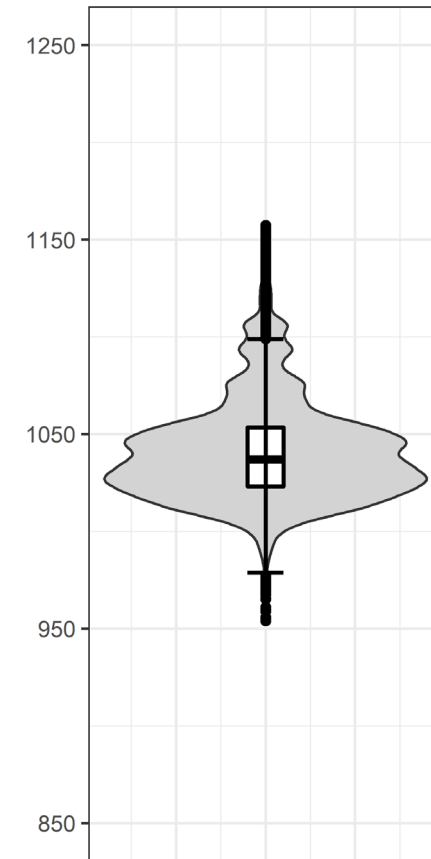
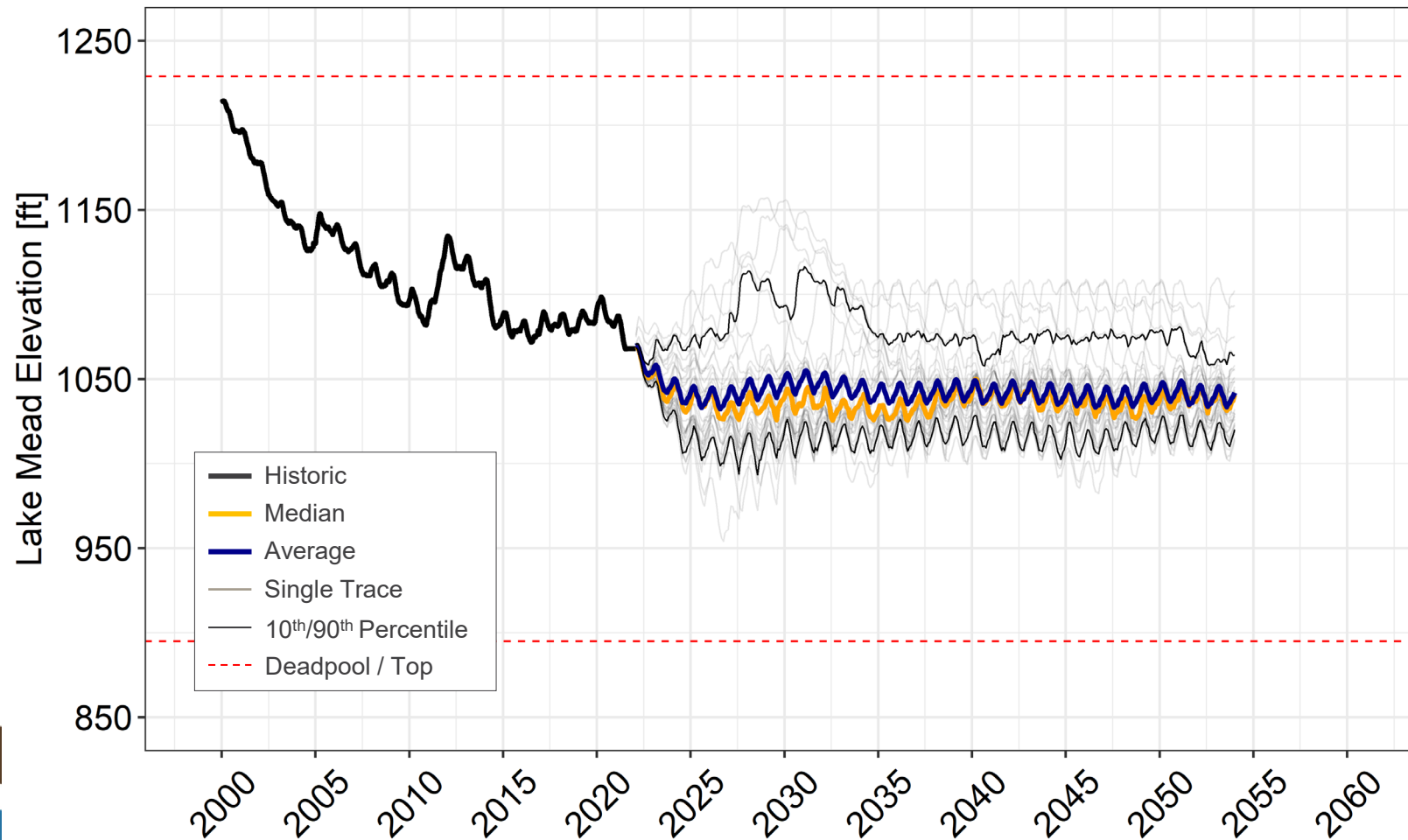
Scenario	Hydrology	Upper Basin Demand	Arizona On-River Demand	CAP Utilization
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IC #4	Downscaled GCM	2016 UCRC Upper Basin Growth	0.2% Growth	Fast
IC #5	Pluvial-Removed	Upper Basin Guidelines Period Average	On-River Guideline Average	Medium
IC #6	Stress Test	2012 Basin Study Current Trends Growth	0.2% Growth	Fast

**All scenarios assume Lake Powell equalization line is capped at 3,652 ft starting in 2027*



Initial Conditions Scenario - 1

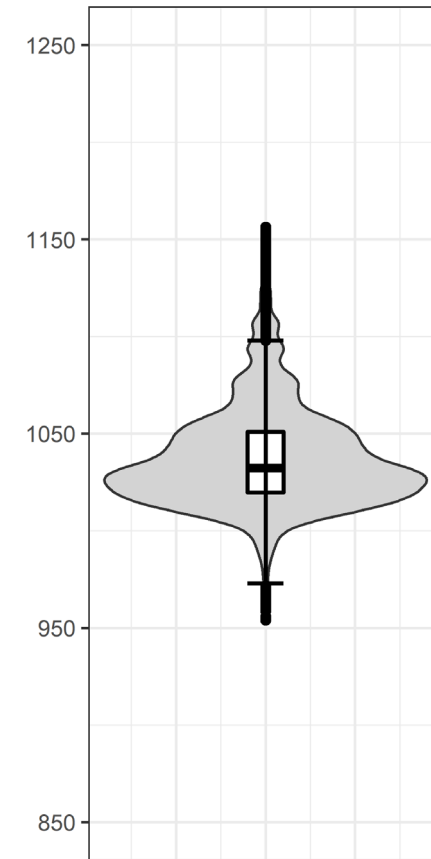
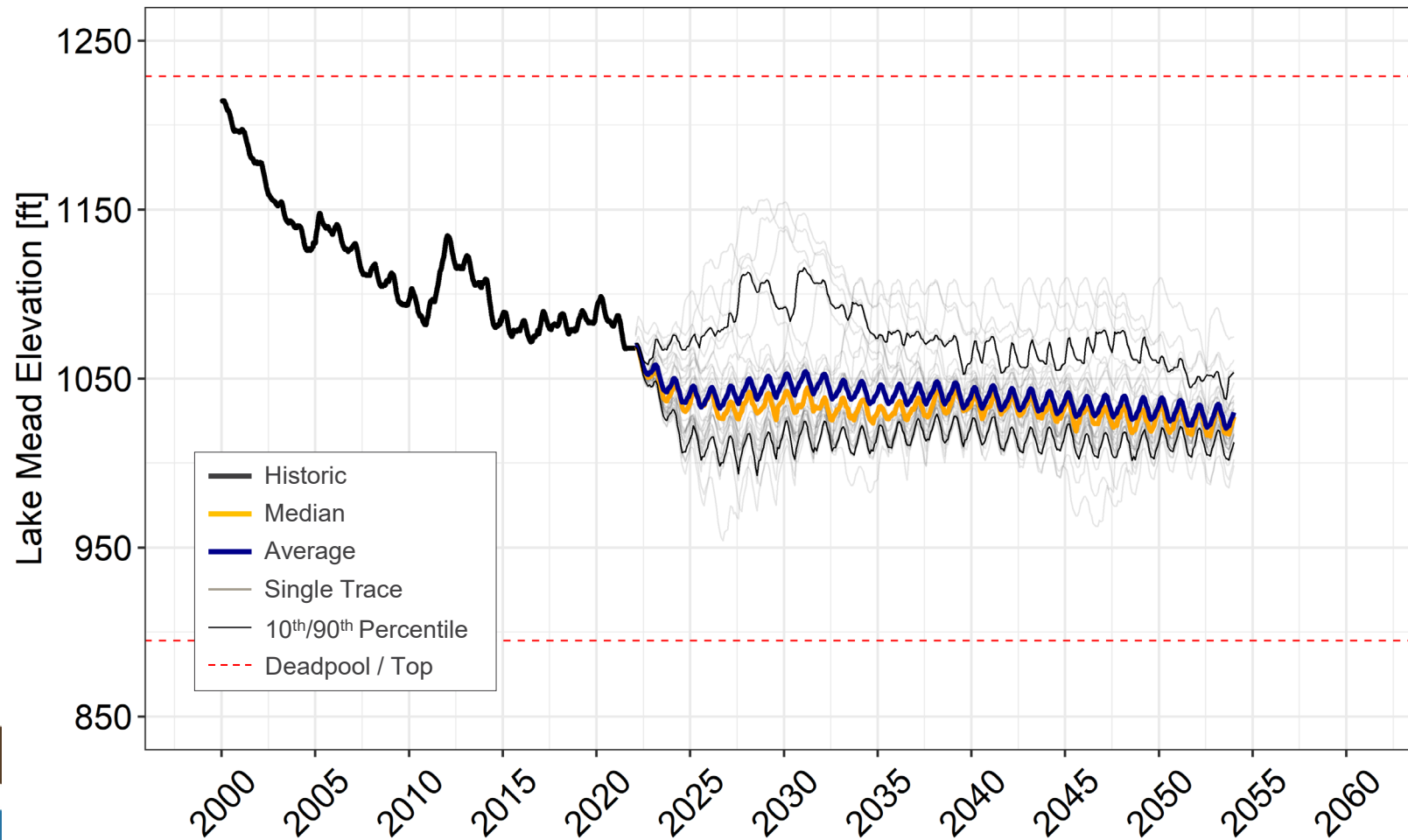
Hydrology:	Stress Test
UB Demand:	Guidelines Period Extended



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Initial Conditions Scenario - 6

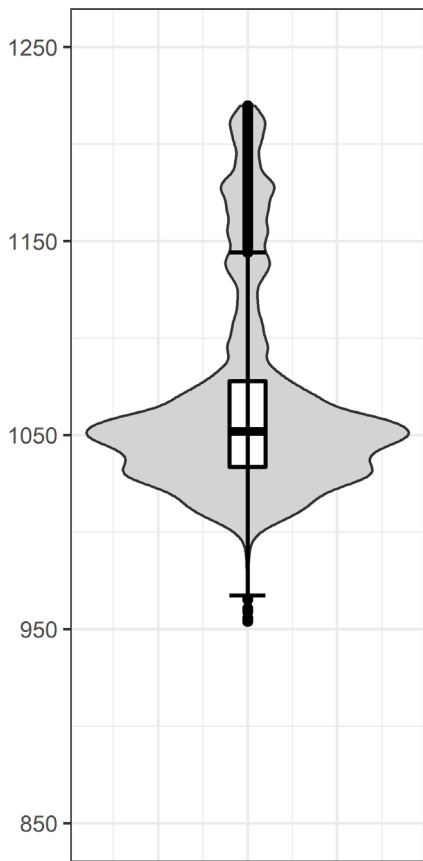
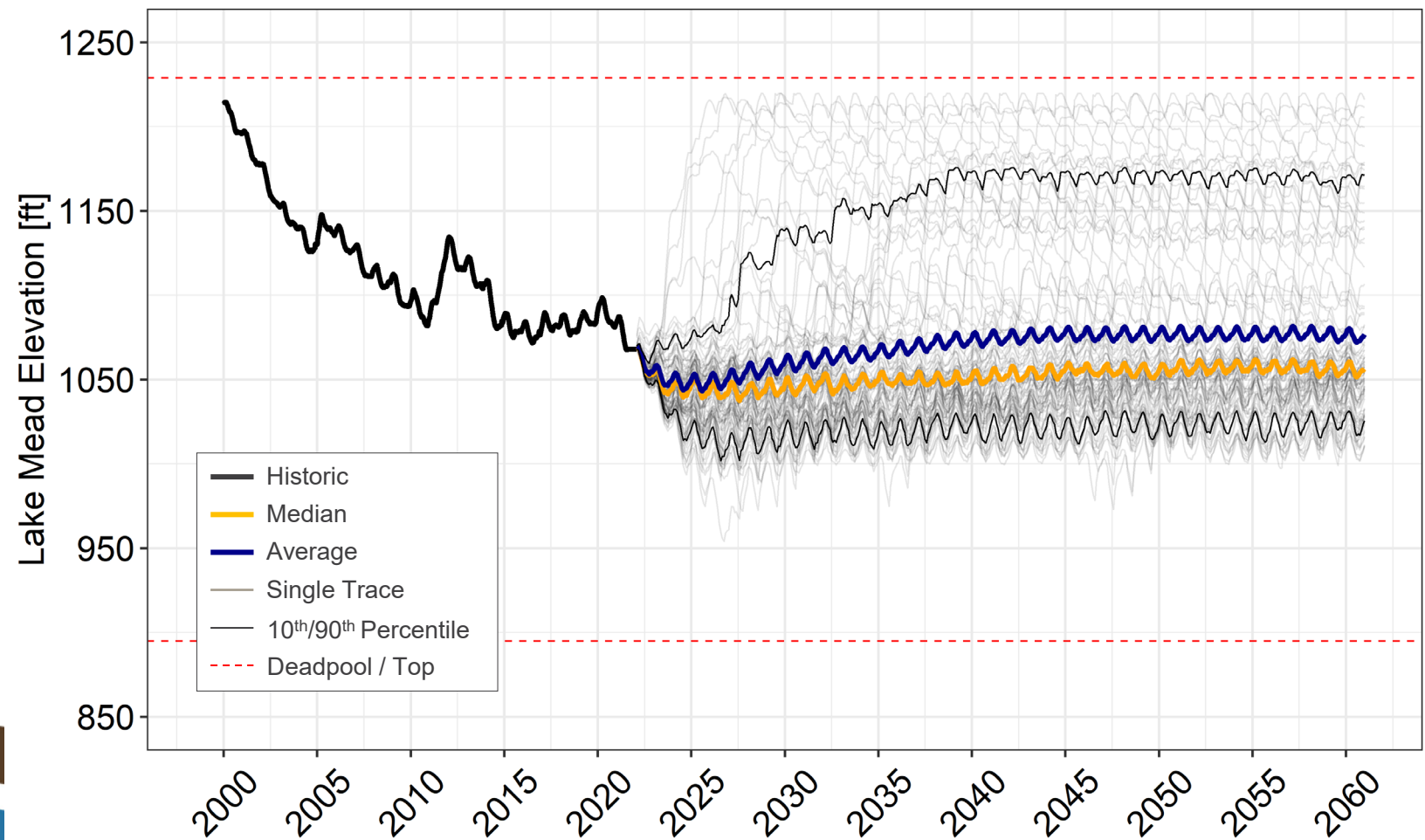
Hydrology:	Stress Test
UB Demand:	2012 Basin Study



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Initial Conditions Scenario - 3

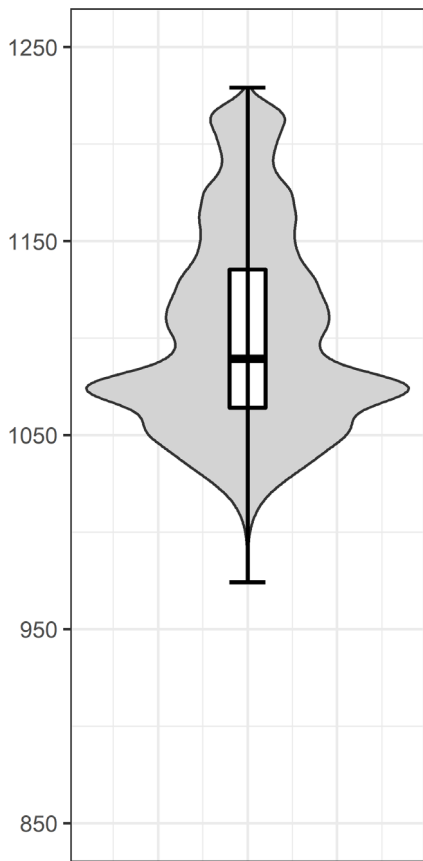
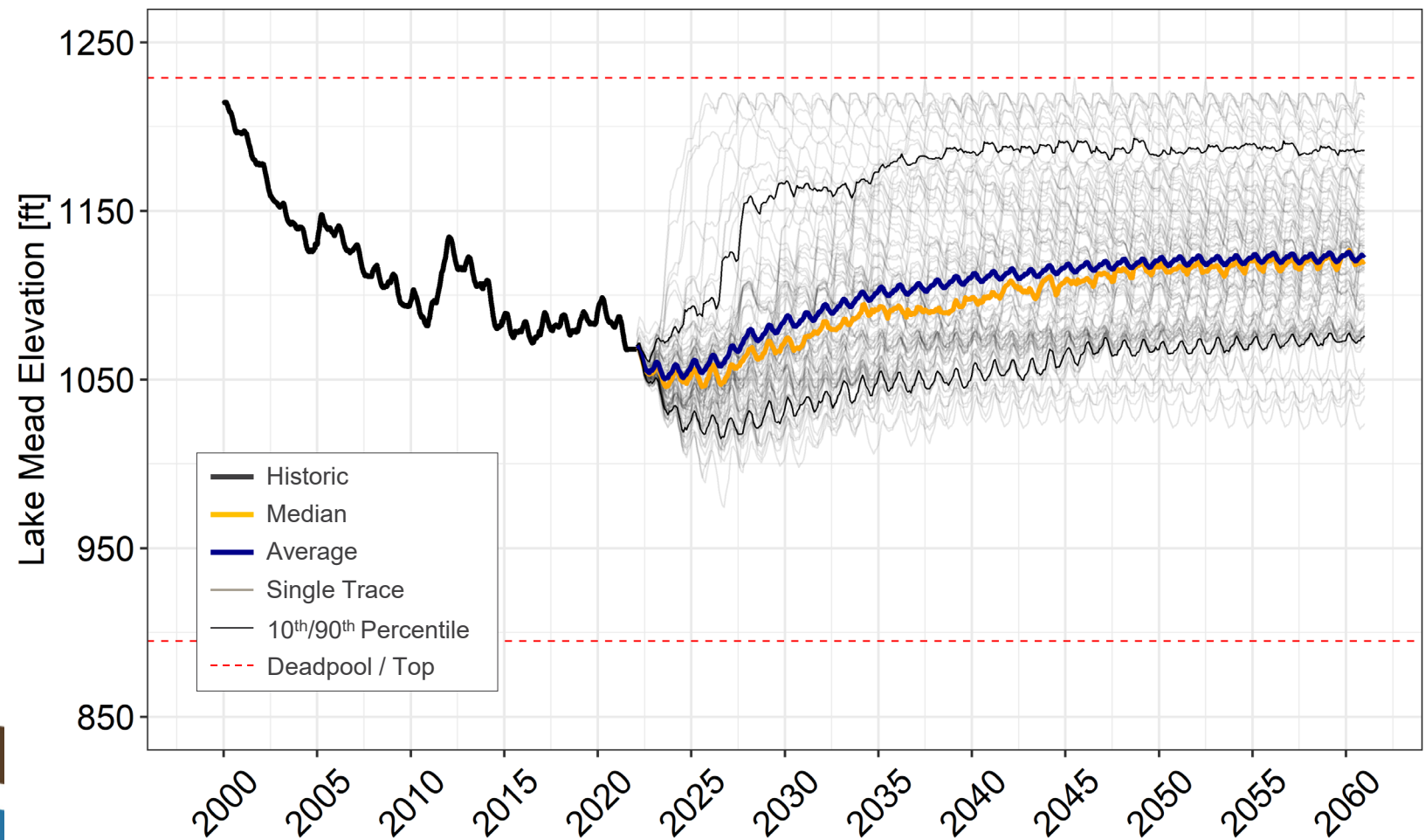
Hydrology:	Pluvial Removed
UB Demand:	Guidelines Period Extended



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Initial Conditions Scenario - 5

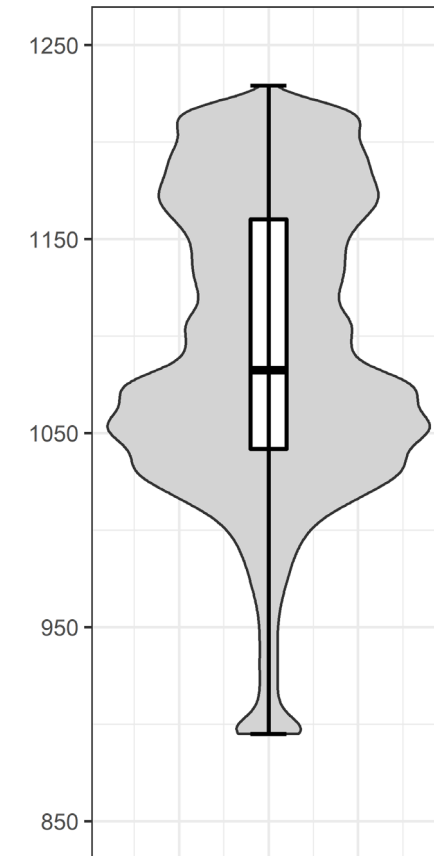
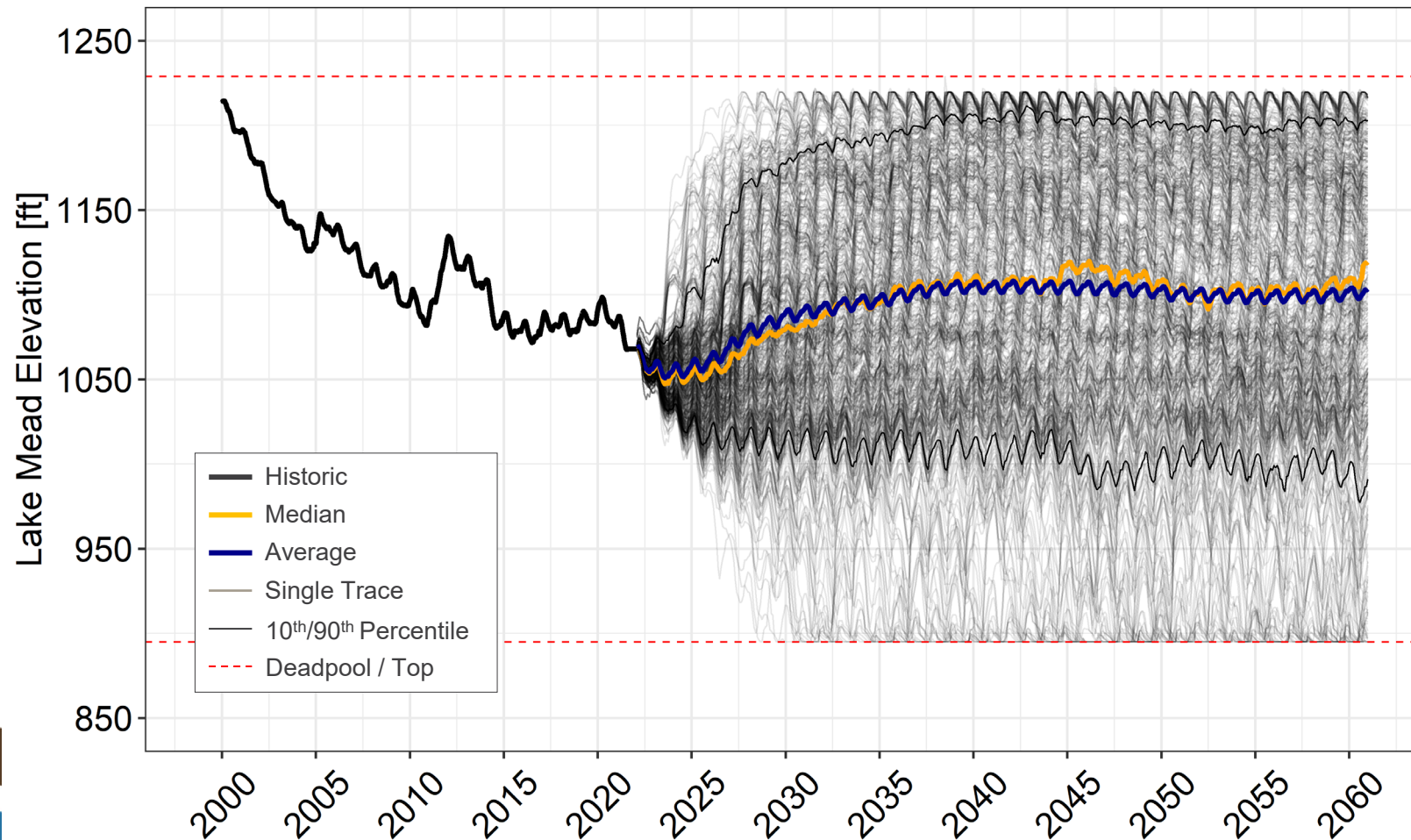
Hydrology:	Pluvial Removed
UB Demand:	Guideline Period Average



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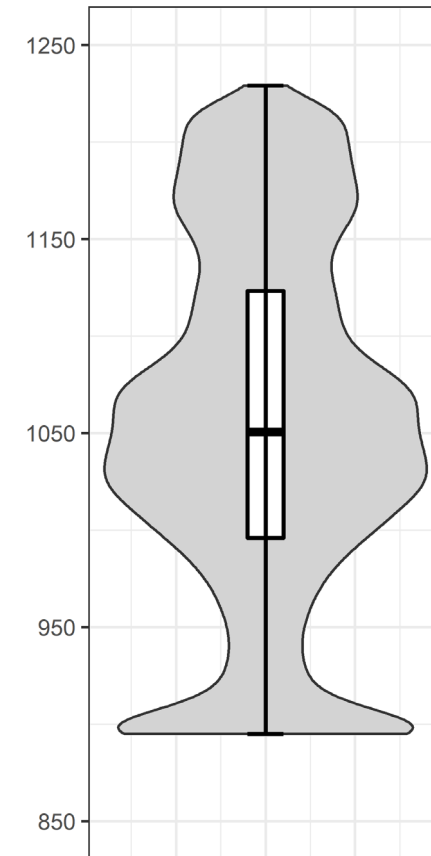
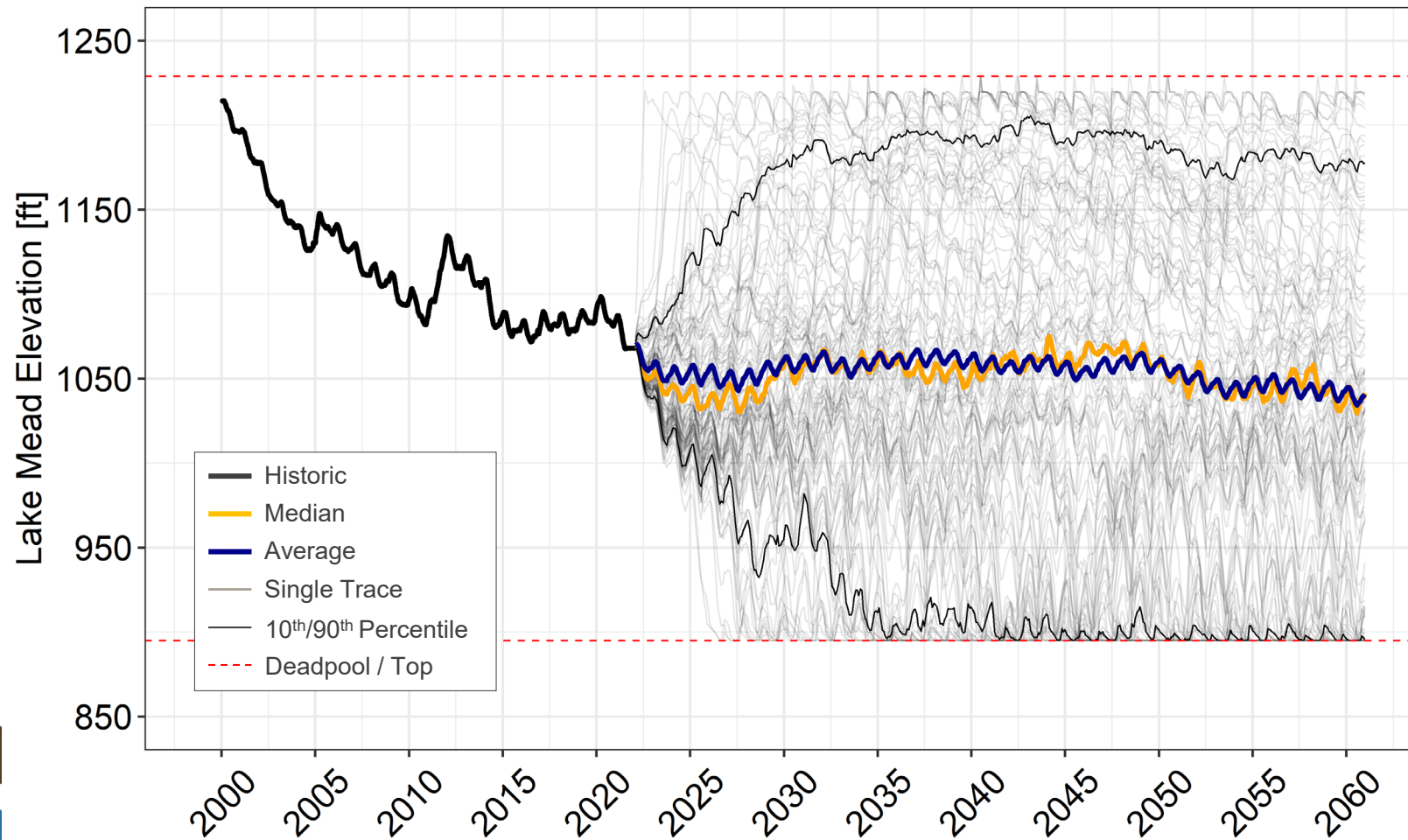
Initial Conditions Scenario - 2

Hydrology:	Paleo Conditioned
UB Demand:	2016 UCRC



Initial Conditions Scenario - 4

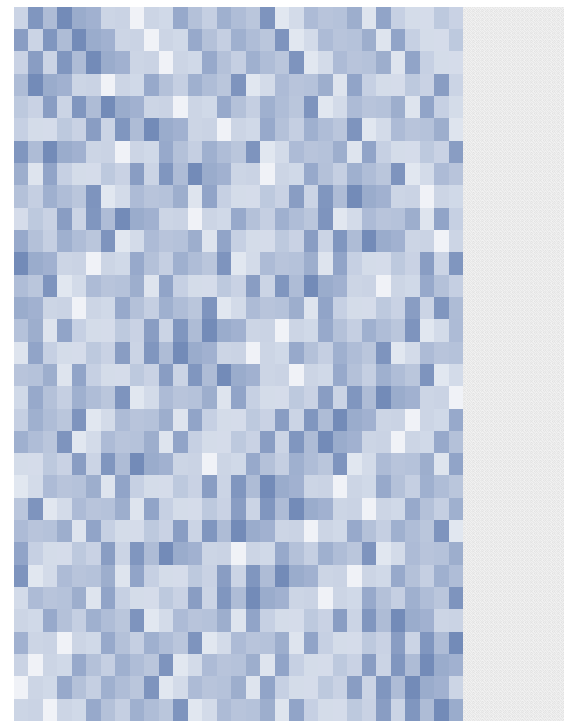
Hydrology:	Downscaled GCM (CMIP3)
UB Demand:	2016 UCRC



Initial Conditions Scenario - 1

Hydrology:	Stress Test
UB Demand:	Guidelines Period Extended
AZ On-River:	0.1% Growth
CAP Utilization:	Medium

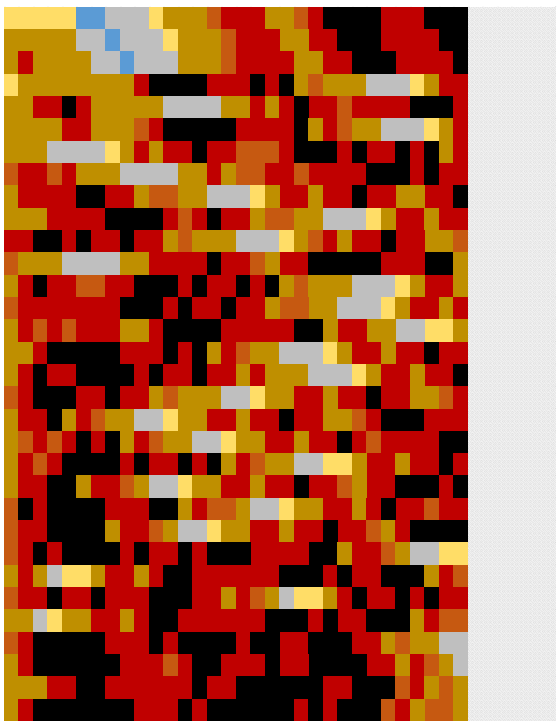
Hydrology (sorted)



Drier Wetter

n = 32
Average = 13.3 MAF
Median = 12.9 MAF

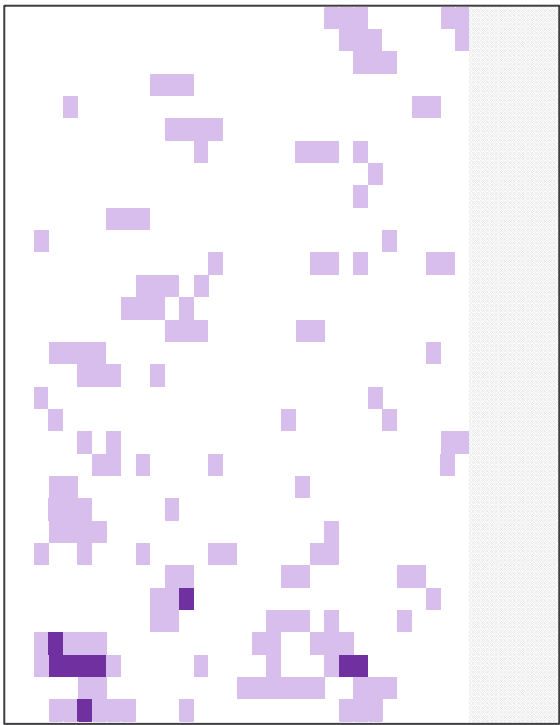
Supply to AZ



Surplus Normal Tier 0 Tier 1
Tier 2a Tier 2b Tier 3

Average = 2.24 MAF
Median = 2.16 MAF

Lake Mead Elevation



= Mead Elevation <= 1,020 ft – 15% of Data Points
 = Mead Elevation <= 1,000 ft – 1% of Data Points

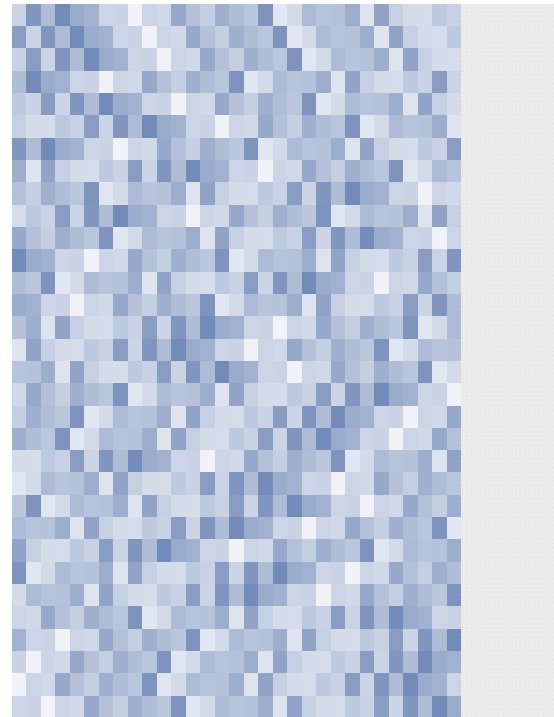


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Initial Conditions Scenario - 6

Hydrology:	Stress Test
UB Demand:	2012 Basin Study
AZ On-River:	0.2% Growth
CAP Utilization:	Fast

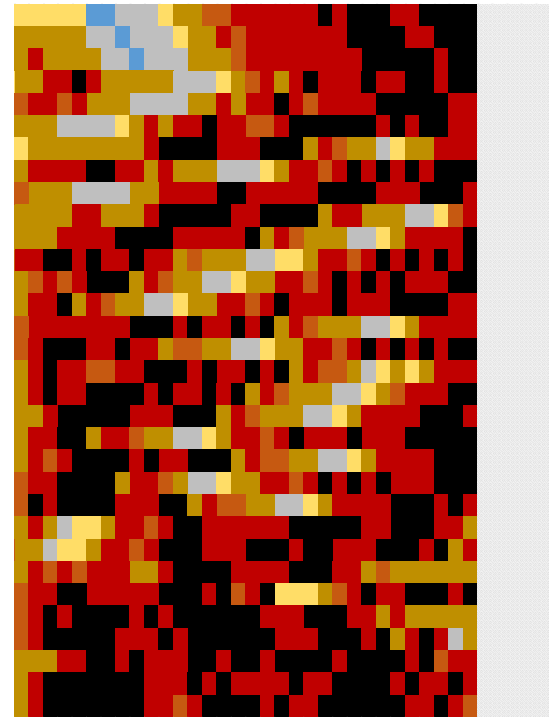
Hydrology (sorted)



Drier Wetter

n = 32
Average = 13.3 MAF
Median = 12.9 MAF

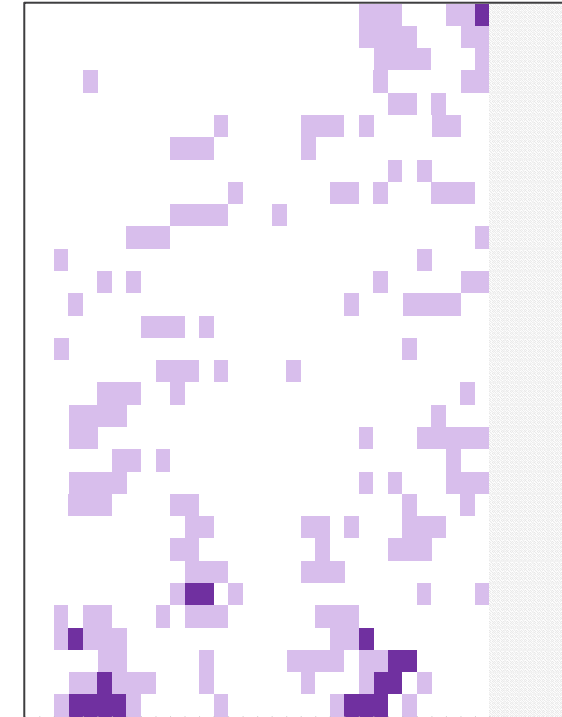
Supply to AZ



Surplus Normal Tier 0 Tier 1
 Tier 2a Tier 2b Tier 3

Average = 2.31 MAF
Median = 2.16 MAF

Lake Mead Elevation



= Mead Elevation ≤ 1,020 ft – **19% of Data Points**
 = Mead Elevation ≤ 1,000 ft – **2% of Data Points**

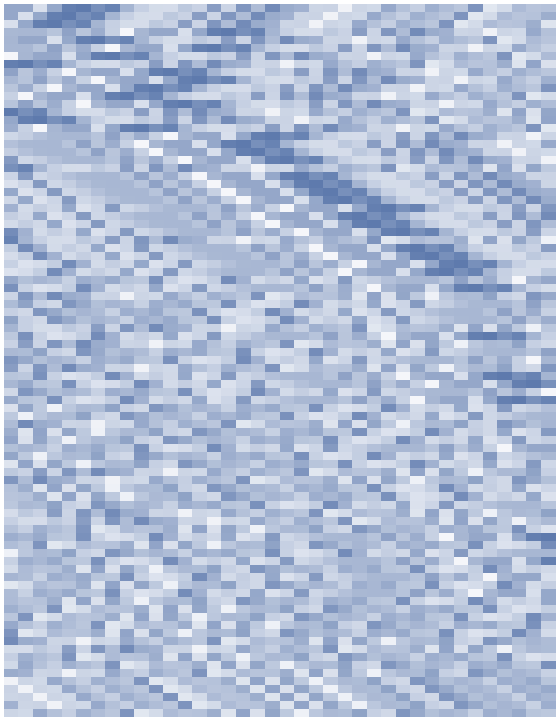


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Initial Conditions Scenario - 3

Hydrology:	Pluvial Removed
UB Demand:	Guidelines Period Extended
AZ On-River:	0.1% Growth
CAP Utilization:	Medium

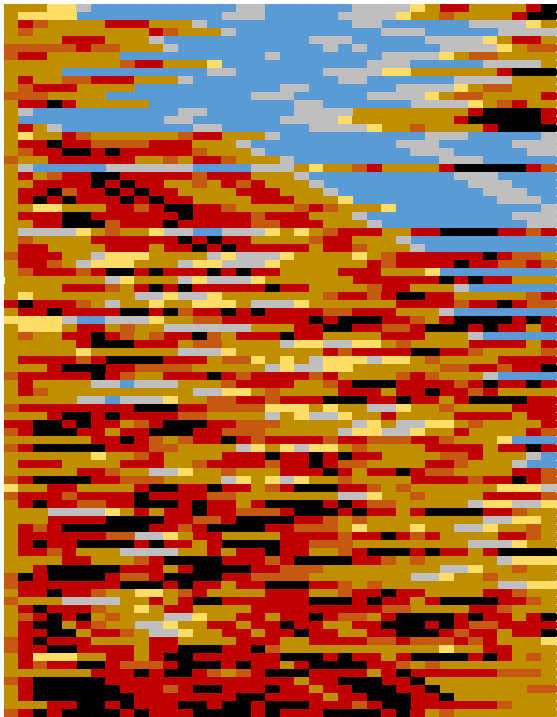
Hydrology (sorted)



Drier  Wetter

n = 89
Average = 14.0 MAF
Median = 13.7 MAF

Supply to AZ



   
Surplus Normal Tier 0 Tier 1
  
Tier 2a Tier 2b Tier 3

Average = 2.37 MAF
Median = 2.29 MAF

Lake Mead Elevation



 = Mead Elevation <= 1,020 ft – 8% of Data Points
 = Mead Elevation <= 1,000 ft – <1% of Data Points

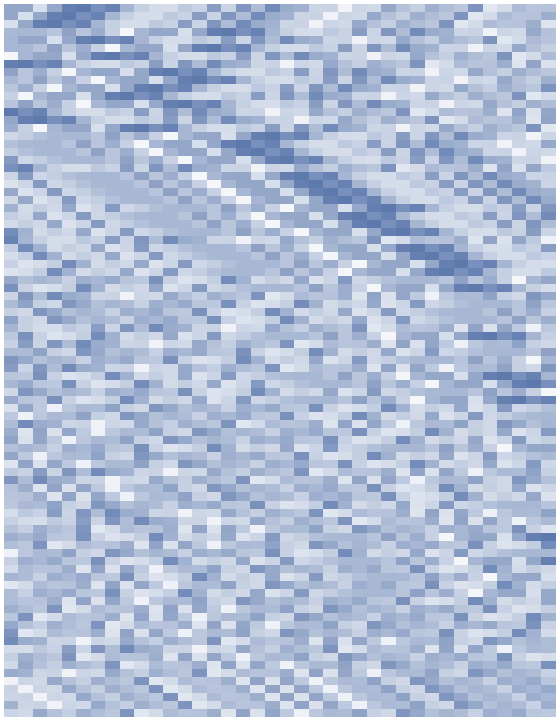


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Initial Conditions Scenario - 5

Hydrology:	Pluvial Removed
UB Demand:	Guideline Period Average
AZ On-River:	Guideline Period Average
CAP Utilization:	Medium

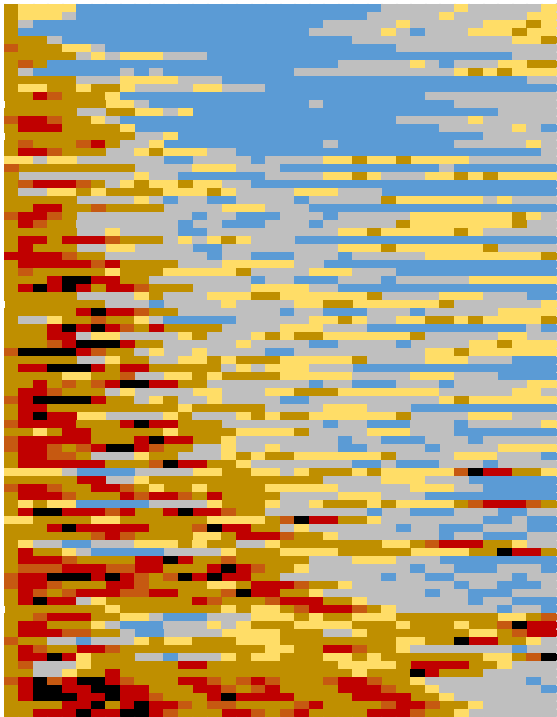
Hydrology (sorted)



Drier  Wetter

n = 112
Average = 13.5 MAF
Median = 12.3 MAF

Supply to AZ



   
Surplus Normal Tier 0 Tier 1
  
Tier 2a Tier 2b Tier 3

Average = 2.41 MAF
Median = 2.29 MAF

Lake Mead Elevation



 = Mead Elevation <= 1,020 ft – 1% of Data Points
 = Mead Elevation <= 1,000 ft – <1% of Data Points

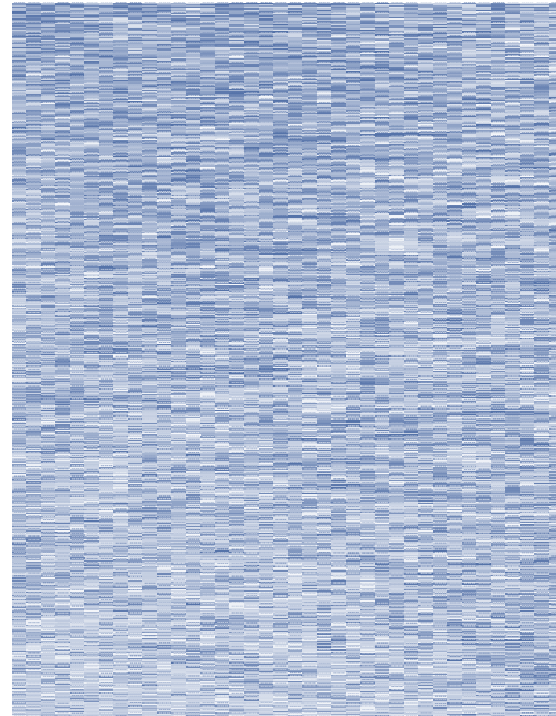


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Initial Conditions Scenario - 2

Hydrology:	Paleo Conditioned
UB Demand:	2016 UCRC
AZ On-River:	0.2% Growth
CAP Utilization:	Medium

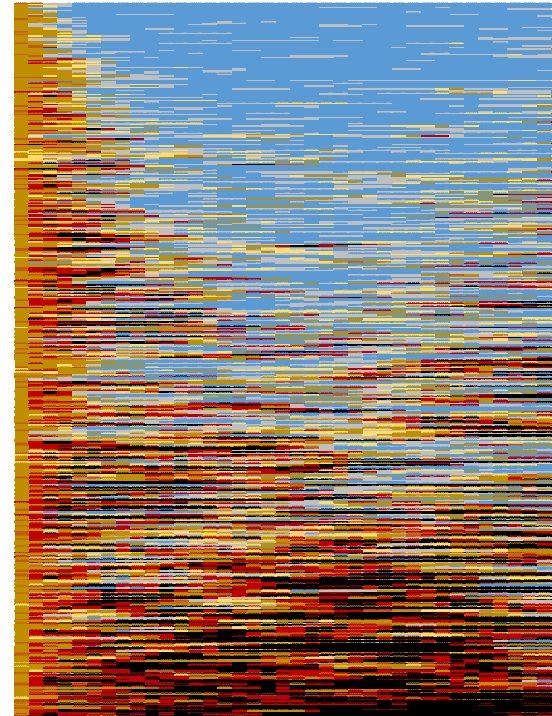
Hydrology (sorted)



Drier  Wetter

n = 500
Average = 14.8 MAF
Median = 14.6 MAF

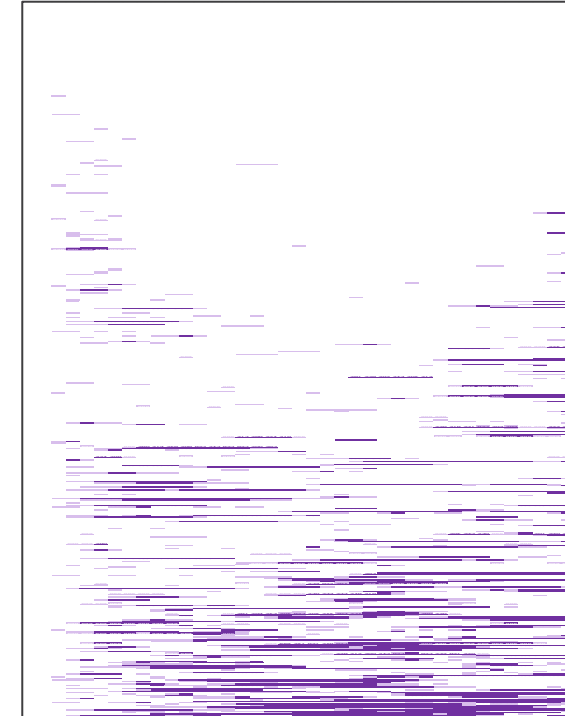
Supply to AZ



 Surplus
 Normal
 Tier 0
 Tier 2a
 Tier 2b
 Tier 3

Average = 2.55 MAF
Median = 2.61 MAF

Lake Mead Elevation



 = Mead Elevation <= 1,020 ft – **12% of Data Points**
 = Mead Elevation <= 1,000 ft – **7% of Data Points**

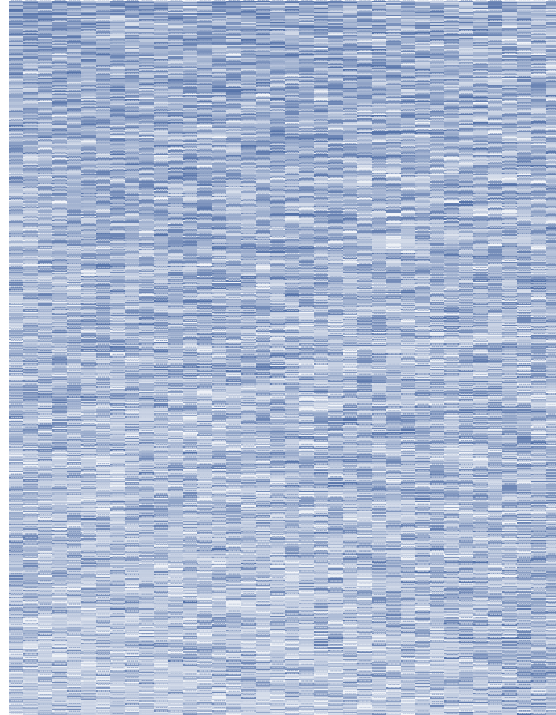


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Initial Conditions Scenario - 2

Hydrology:	Paleo Conditioned
UB Demand:	2016 UCRC
AZ On-River:	0.2% Growth
CAP Utilization:	Medium

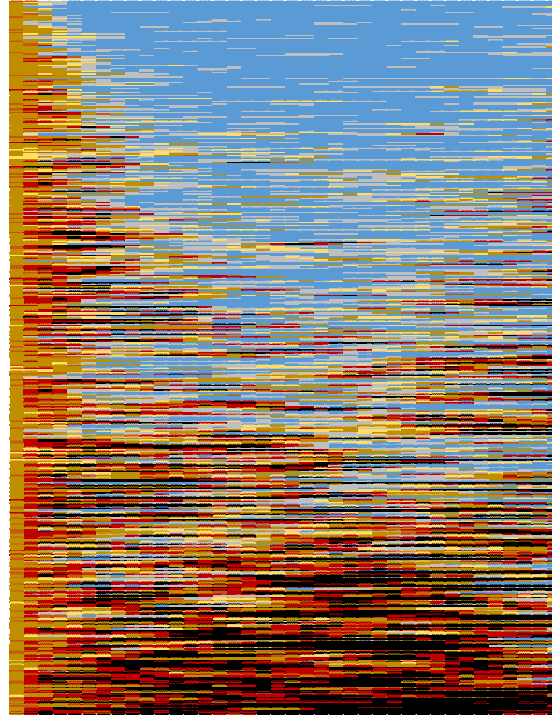
Hydrology (sorted)



Drier  Wetter

n = 500
Average = 14.8 MAF
Median = 14.6 MAF

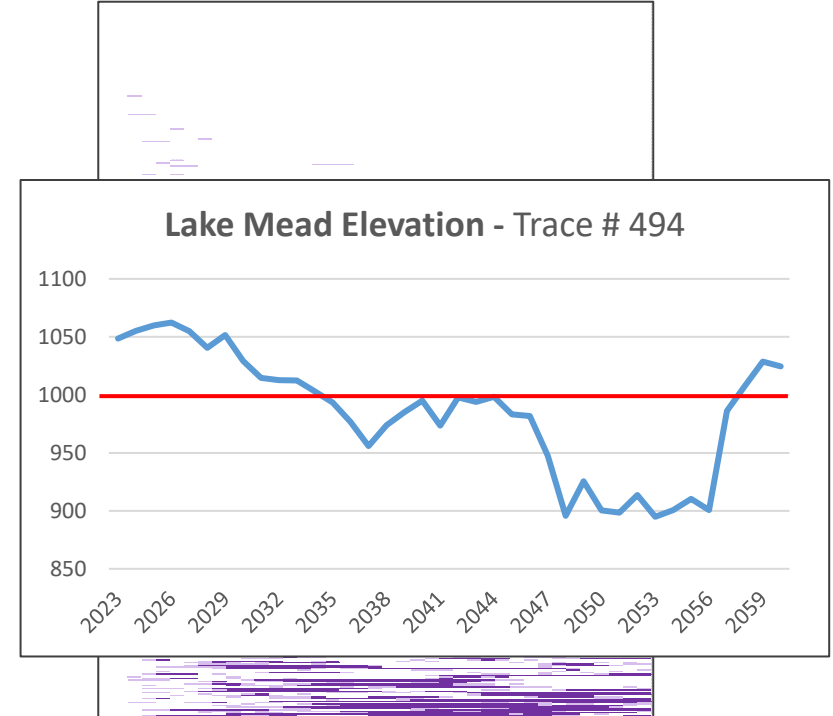
Supply to AZ



 Surplus
 Normal
 Tier 0
 Tier 2a
 Tier 2b
 Tier 3

Average = 2.55 MAF
Median = 2.61 MAF

Lake Mead Elevation



 = Mead Elevation <= 1,020 ft – **12% of Data Points**
 = Mead Elevation <= 1,000 ft – **7% of Data Points**

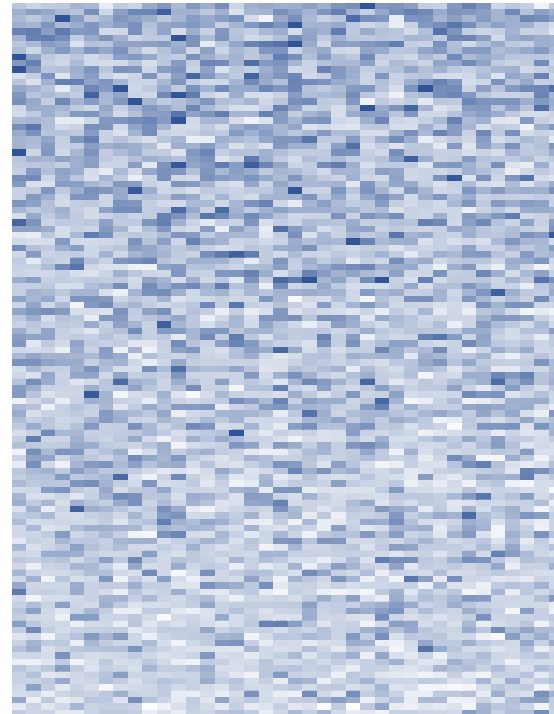


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Initial Conditions Scenario - 4

Hydrology:	Downscaled GCM (CMIP3)
UB Demand:	2016 UCRC
AZ On-River:	0.2% Growth
CAP Utilization:	Fast

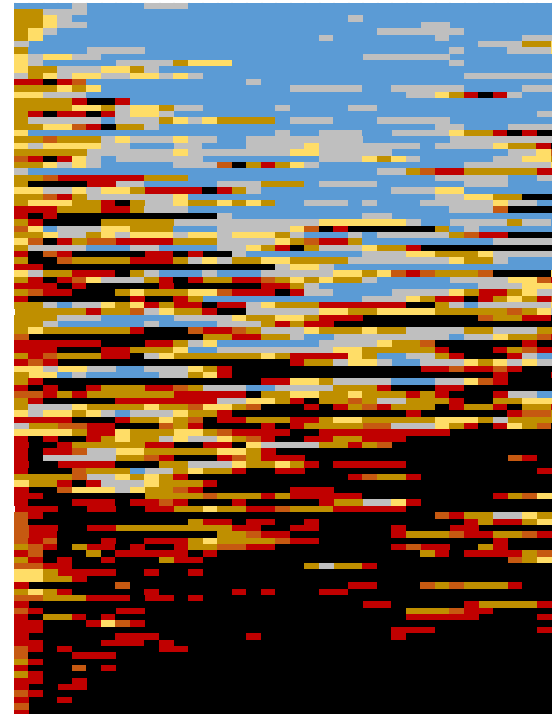
Hydrology (sorted)



Drier Wetter

n = 112
Average = 13.5 MAF
Median = 12.3 MAF

Supply to AZ



Surplus
 Normal
 Tier 0
 Tier 1
 Tier 2a
 Tier 2b
 Tier 3

Average = 2.41 MAF
Median = 2.29 MAF

Lake Mead Elevation



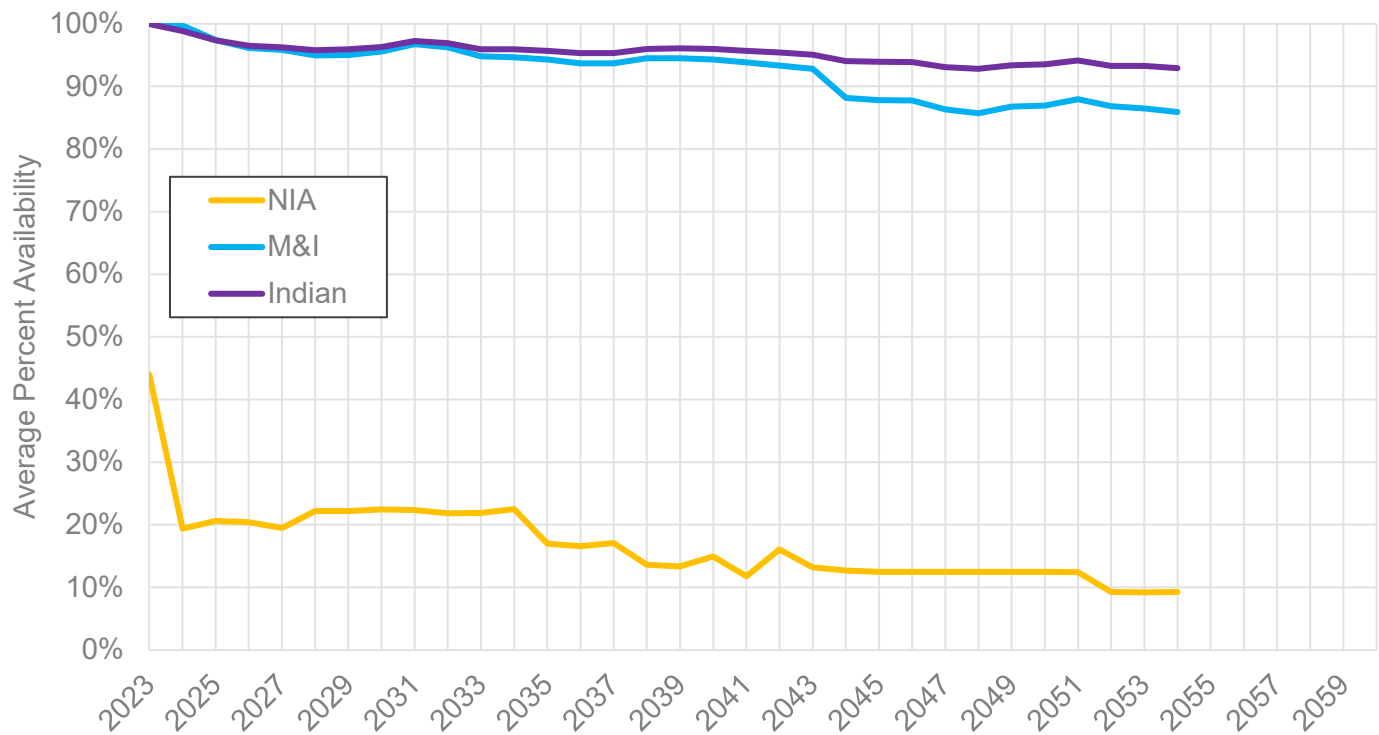
= Mead Elevation <= 1,020 ft – **33% of Data Points**
 = Mead Elevation <= 1,000 ft – **25% of Data Points**



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Initial Conditions Scenario - 1

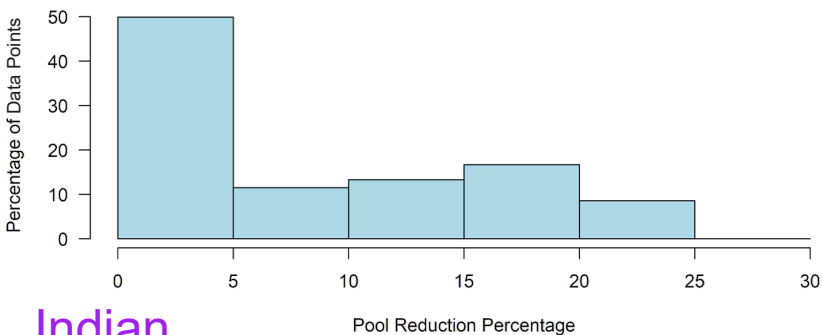
Average Pool Availability



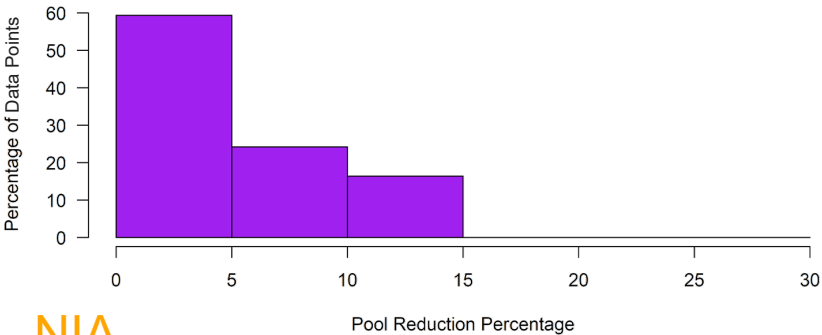
Hydrology:	Stress Test
UB Demand:	Guidelines Period Extended
AZ On-River:	0.1% Growth
CAP Utilization:	Medium

Distribution of Pool Reductions

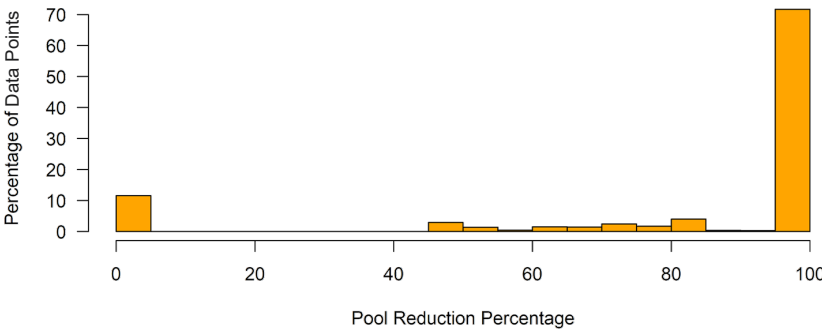
M&I



Indian



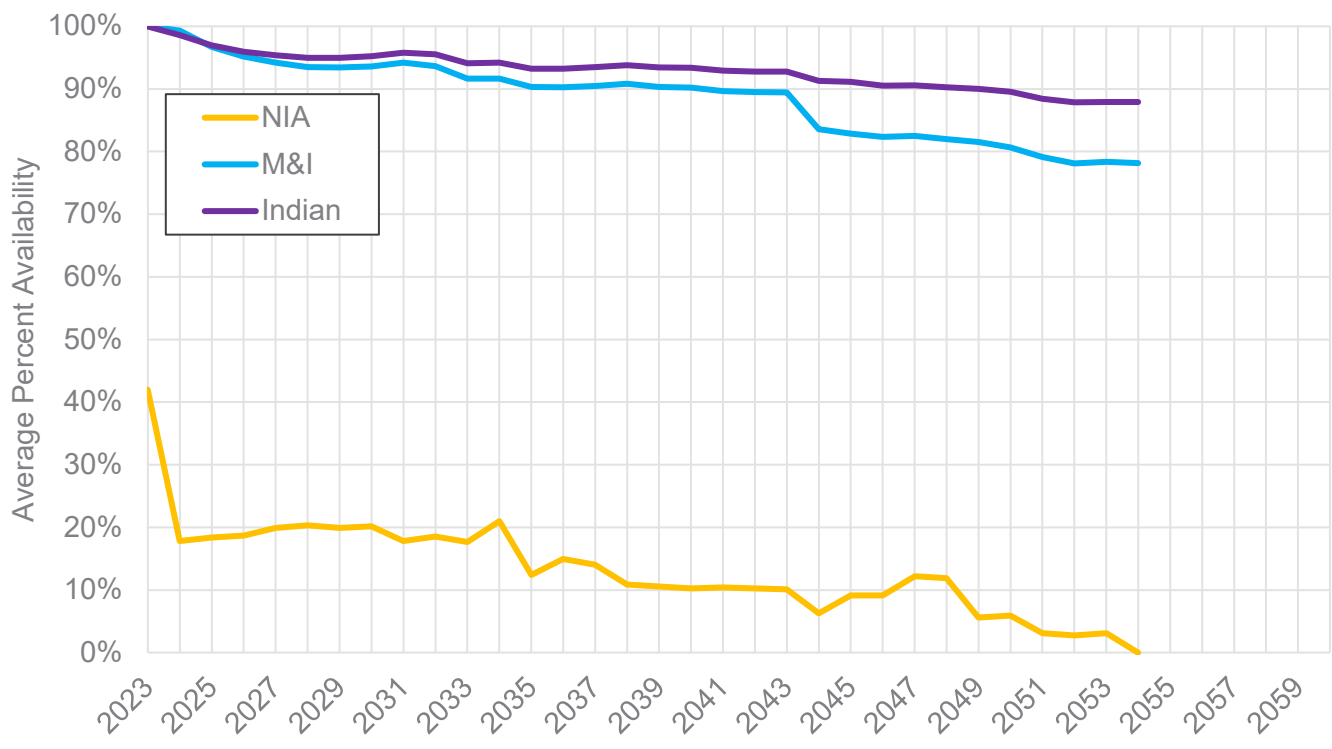
NIA



* Note difference in scales for histograms

Initial Conditions Scenario - 6

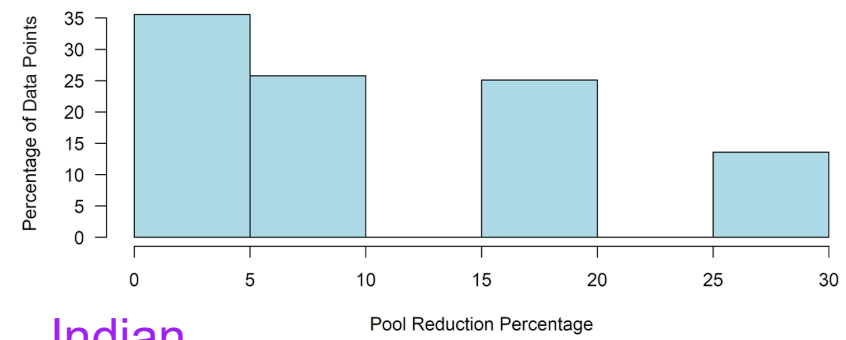
Average Pool Availability



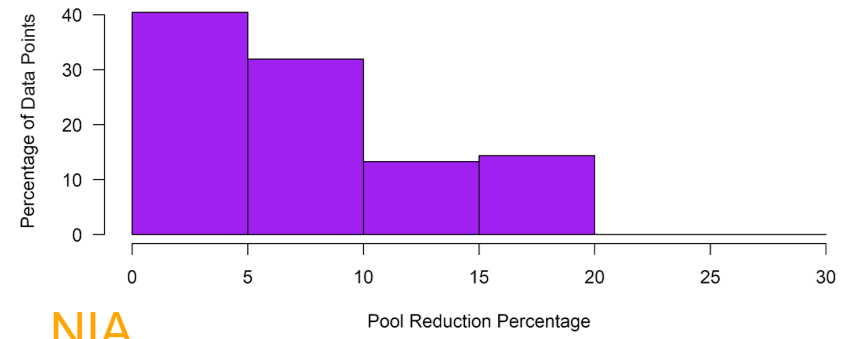
Hydrology:	Stress Test
UB Demand:	2012 Basin Study
AZ On-River:	0.2% Growth
CAP Utilization:	Fast

Distribution of Pool Reductions

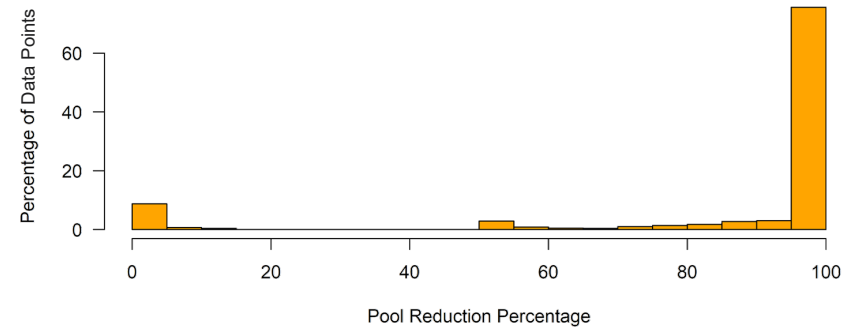
M&I



Indian



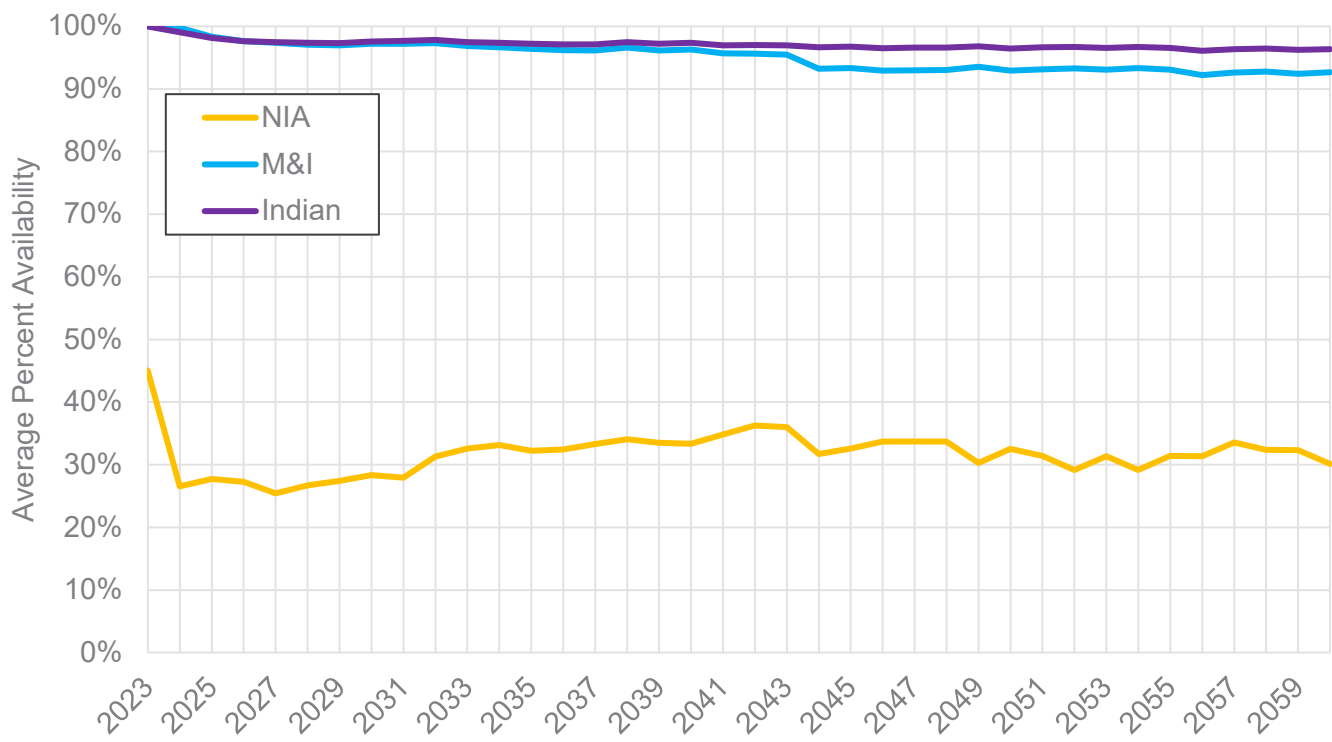
NIA



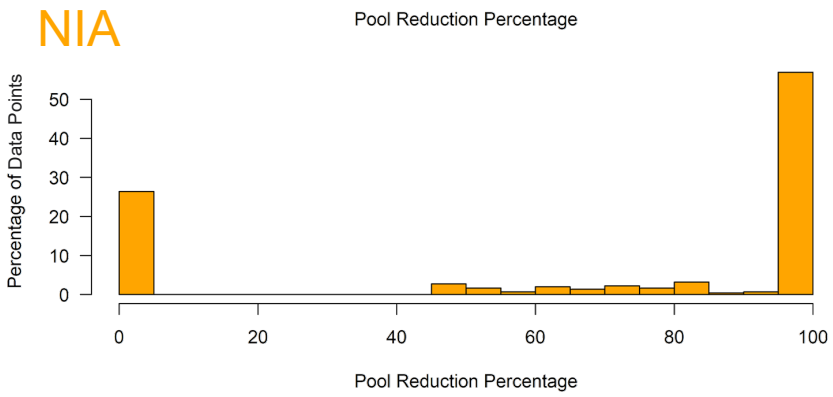
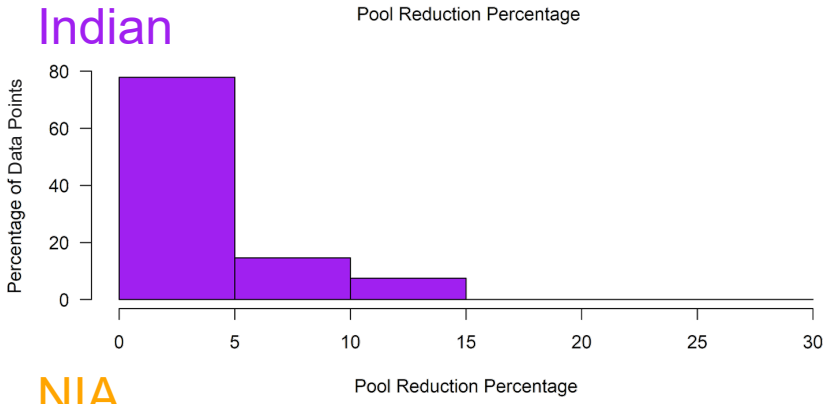
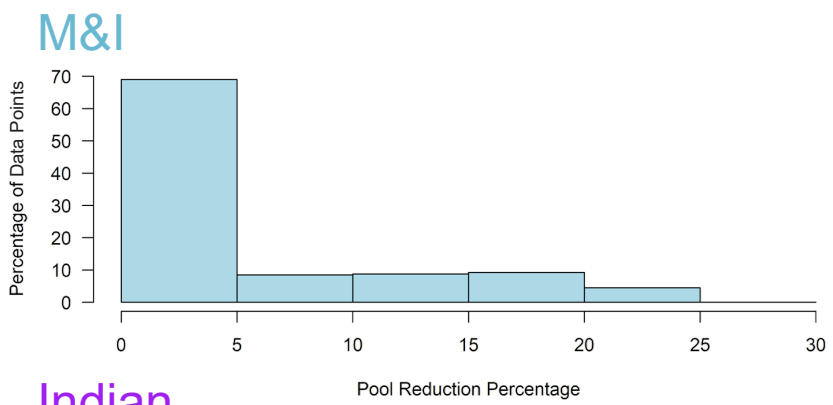
* Note difference in scales for histograms

Initial Conditions Scenario - 3

Average Pool Availability



Distribution of Pool Reductions

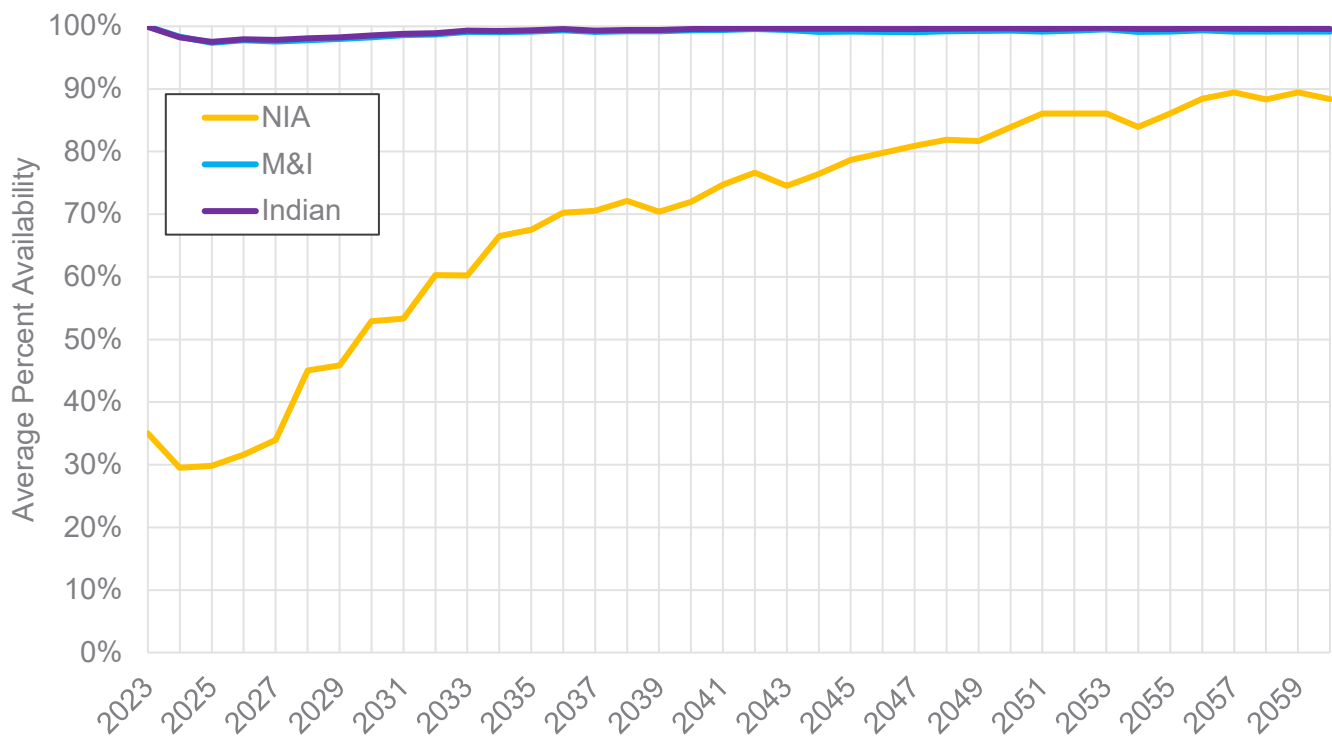


* Note difference in scales for histograms

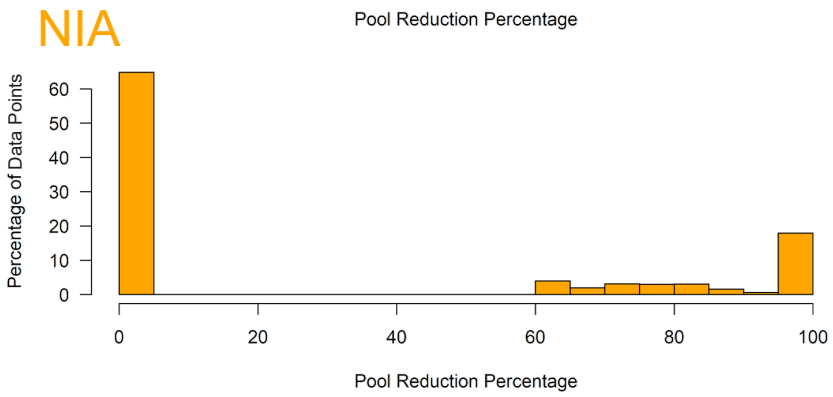
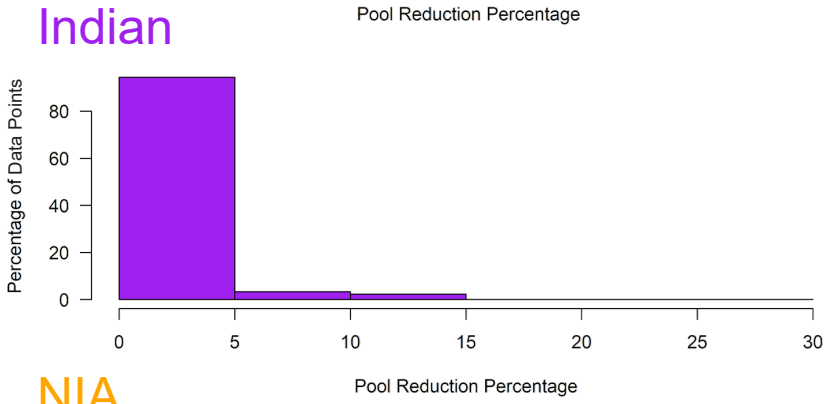
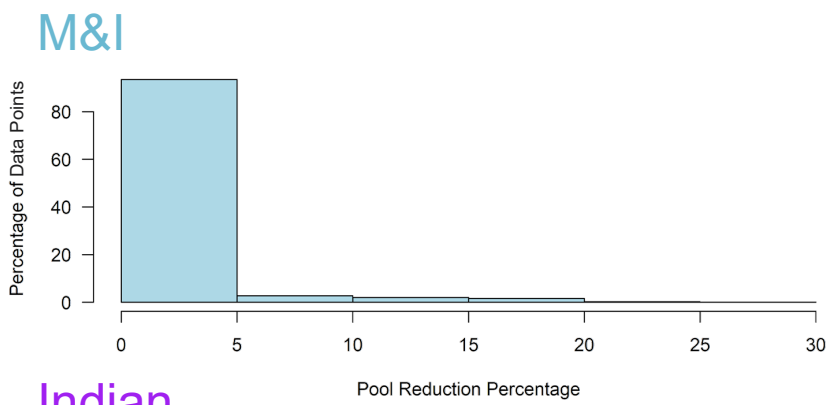
Hydrology:	Pluvial Removed
UB Demand:	Guidelines Period Extended
AZ On-River:	0.1% Growth
CAP Utilization:	Medium

Initial Conditions Scenario - 5

Average Pool Availability



Distribution of Pool Reductions

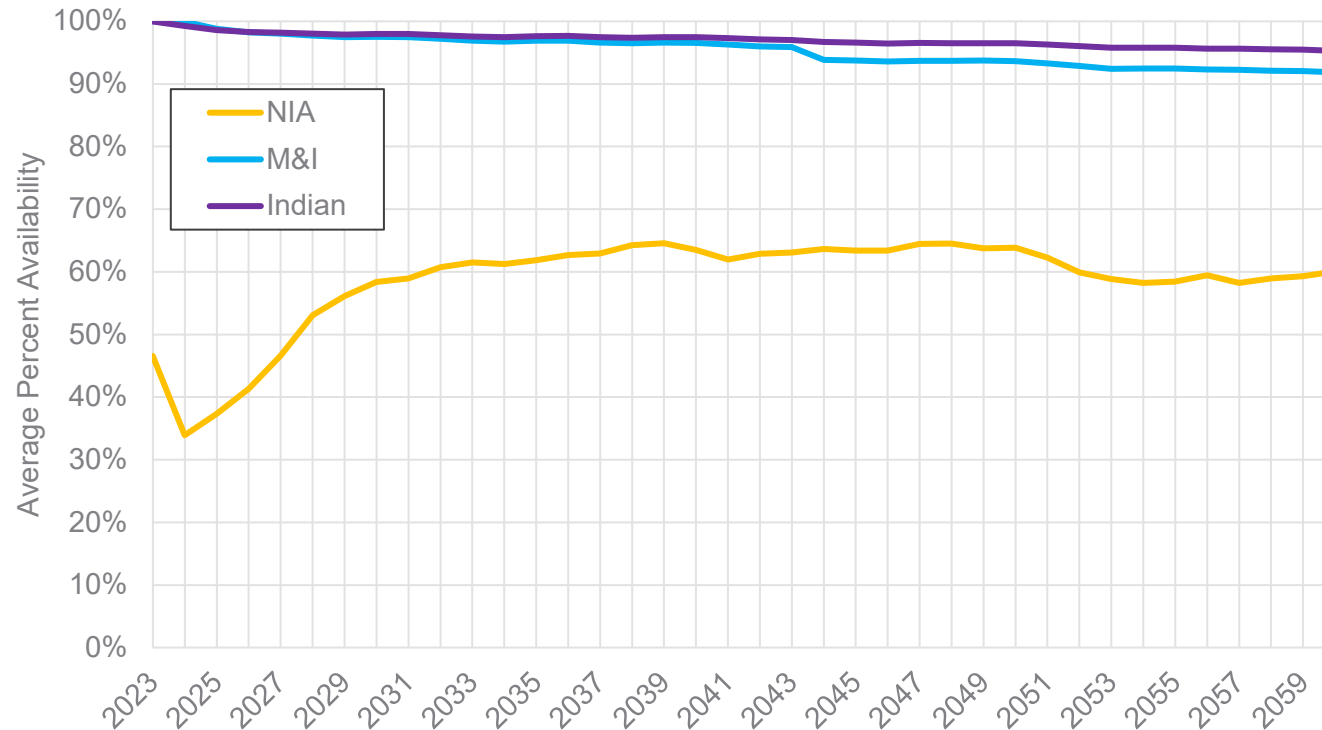


Hydrology:	Pluvial Removed
UB Demand:	Guideline Period Average
AZ On-River:	Guideline Period Average
CAP Utilization:	Medium

* Note difference in scales for histograms

Initial Conditions Scenario - 2

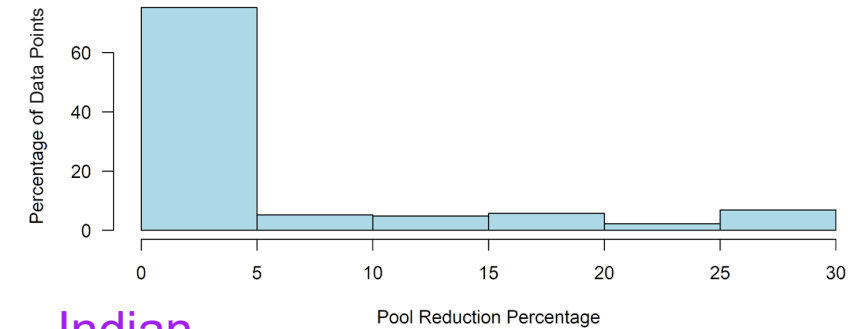
Average Pool Availability



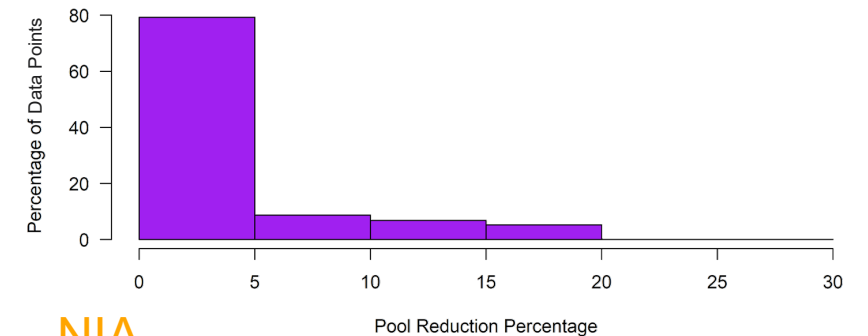
Hydrology:	Paleo Conditioned
UB Demand:	2016 UCRC
AZ On-River:	0.2% Growth
CAP Utilization:	Medium

Distribution of Pool Reductions

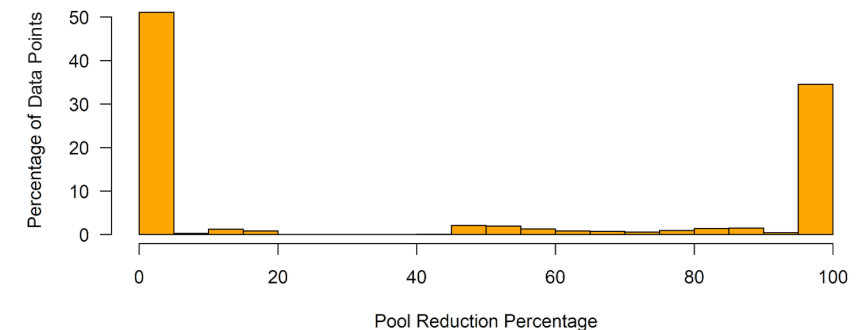
M&I



Indian



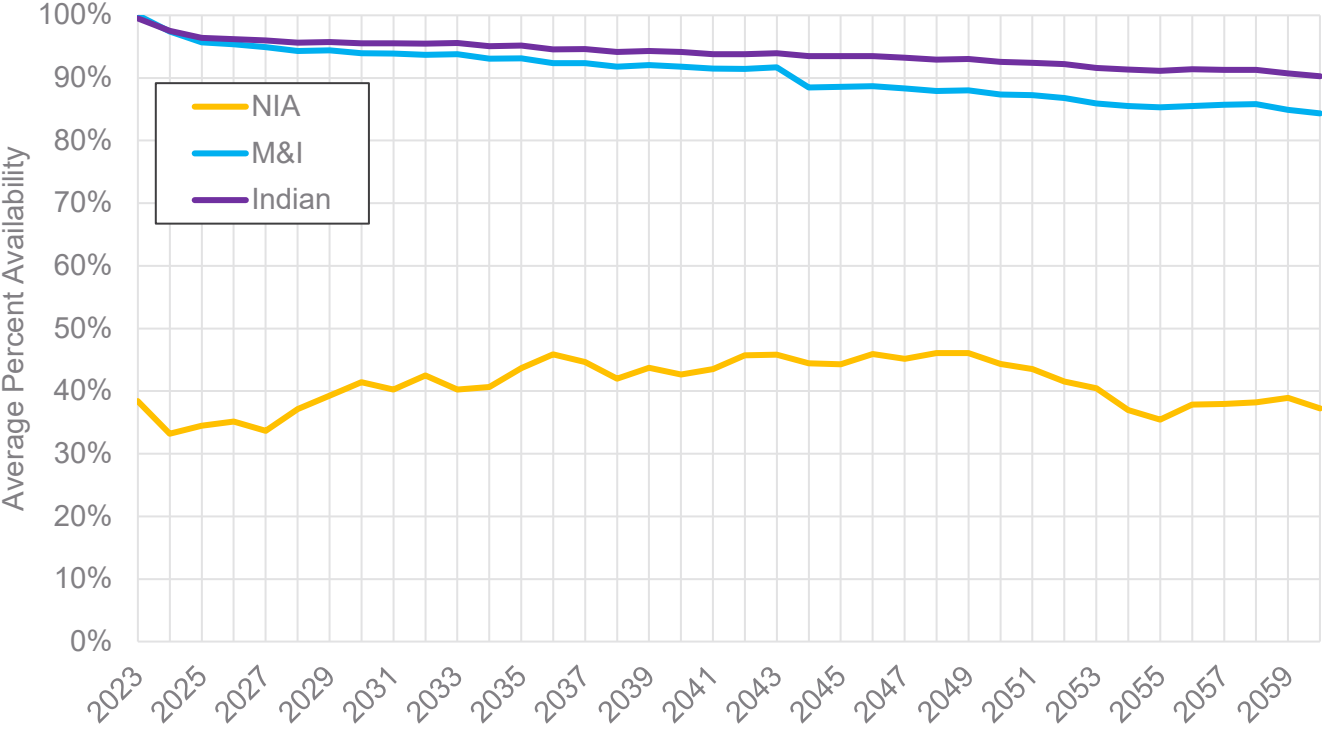
NIA



* Note difference in scales for histograms

Initial Conditions Scenario - 4

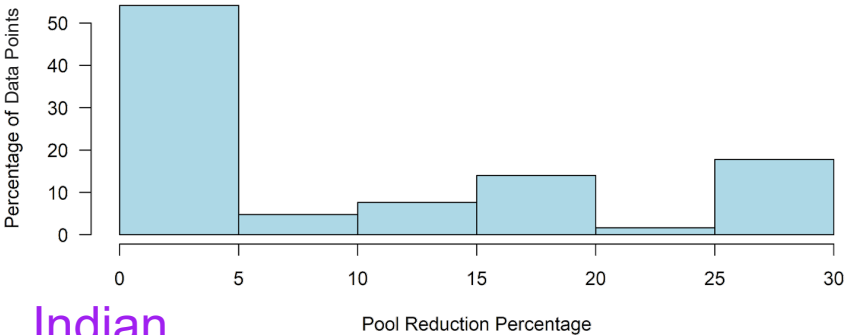
Average Pool Availability



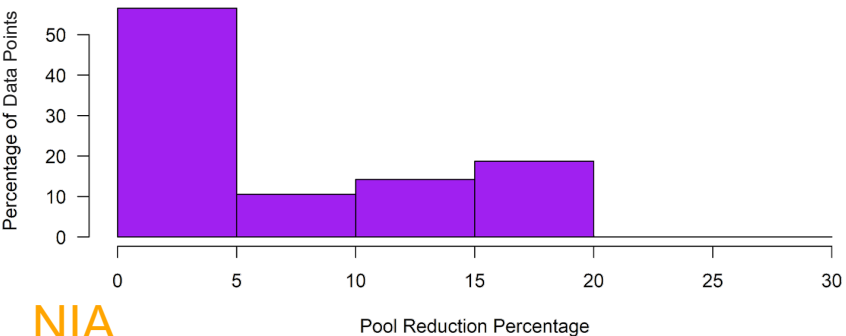
Hydrology:	Downscaled GCM (CMIP3)
UB Demand:	2016 UCRC
AZ On-River:	0.2% Growth
CAP Utilization:	Fast

Distribution of Pool Reductions

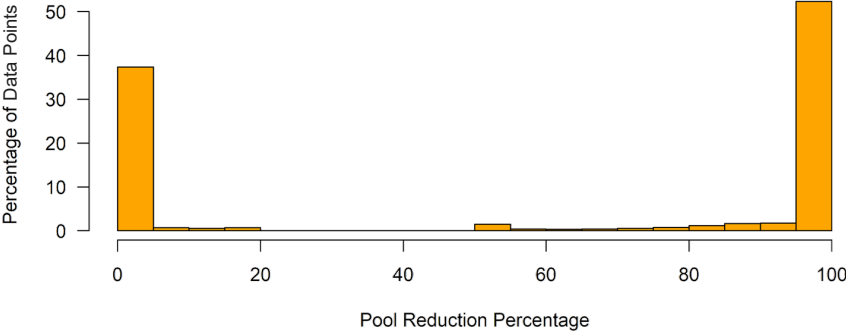
M&I



Indian



NIA

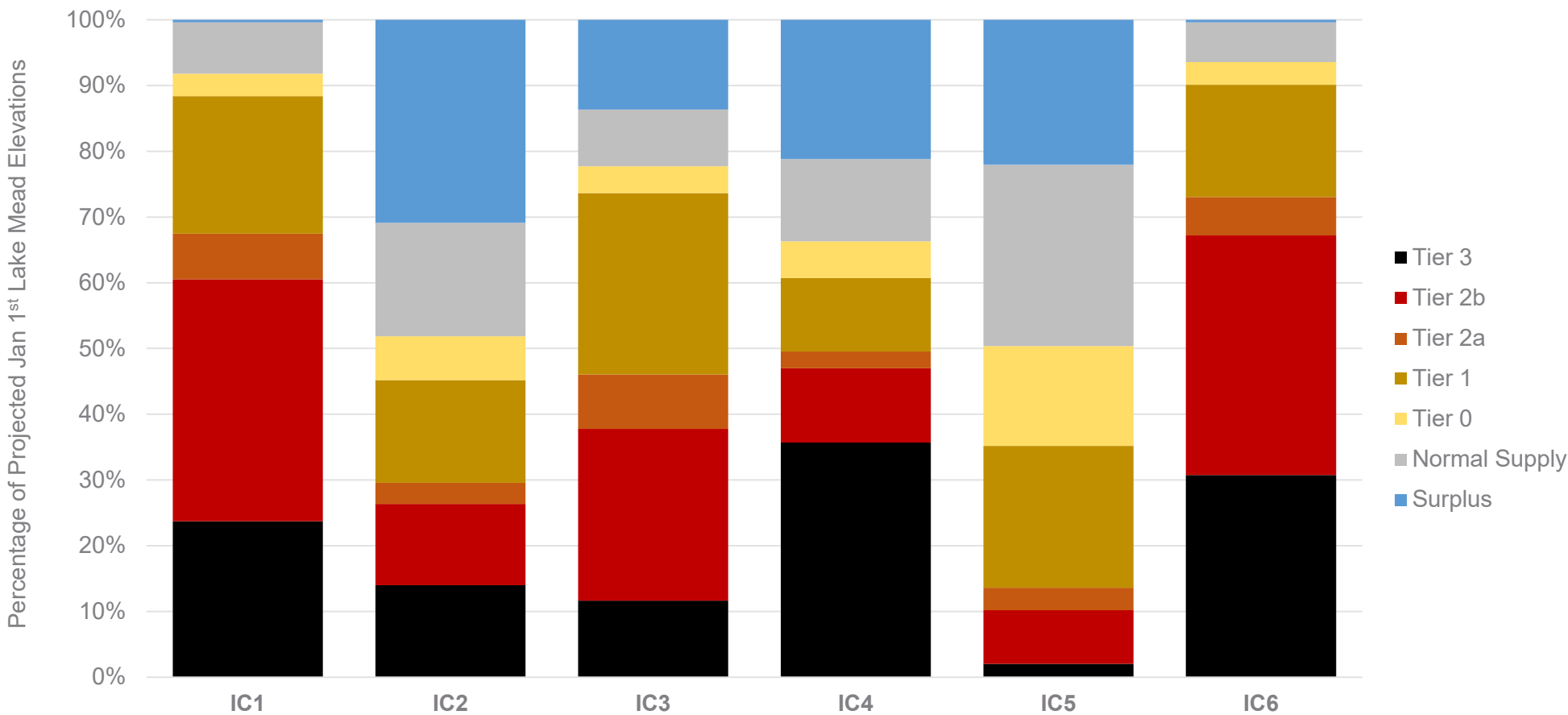


* Note difference in scales for histograms

Tier Occurrence

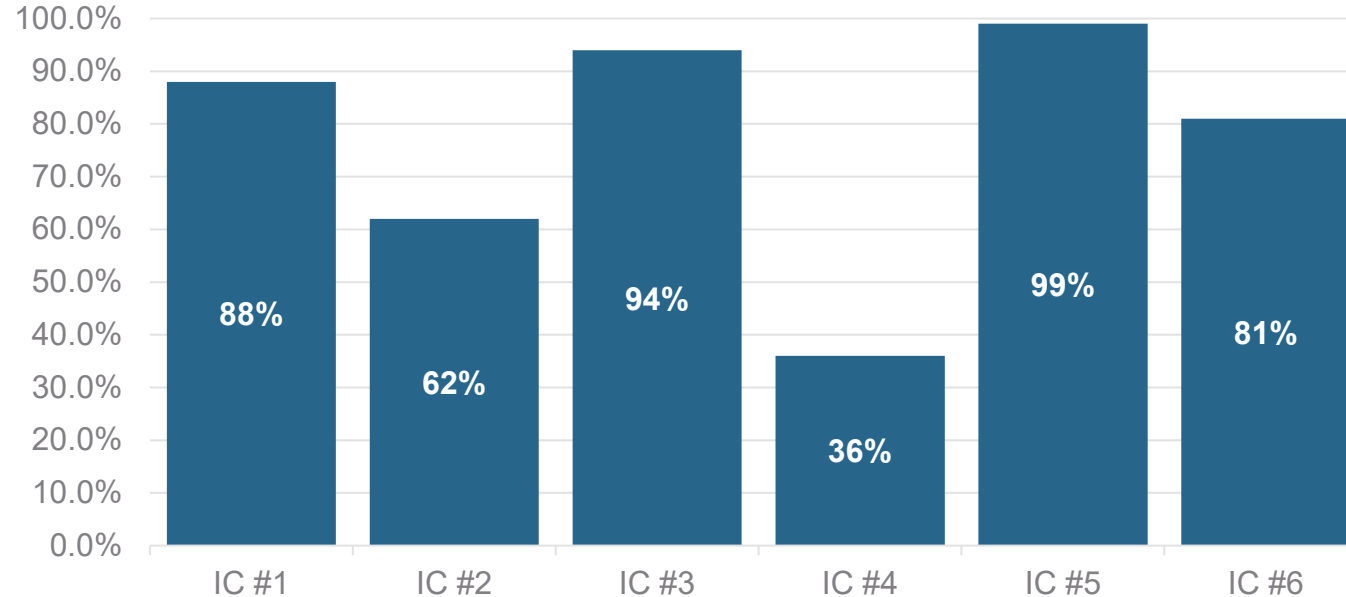
Scenario	Hydrology	Upper Basin Demand	Arizona On-River Demand	CAP Utilization
IC #1	Stress Test	Guidelines Period UB Use Extended	0.1% Growth	Medium
IC #2	Paleo-Conditioned	2016 UCRC Upper Basin Growth	0.2% Growth	Medium
IC #3	Pluvial-Removed	Guidelines Period UB Use Extended	0.1% Growth	Medium
IC #4	Downscaled GCM	2016 UCRC Upper Basin Growth	0.2% Growth	Fast
IC #5	Pluvial-Removed	Upper Basin Guidelines Period Average	On-River Guideline Average	Medium
IC #6	Stress Test	2012 Basin Study Current Trends Growth	0.2% Growth	Fast

Tier Occurrence During Projection Period



Lake Mead

Probability of Reaching End of Projection Without Mead Dropping Below 1,000 ft



Scenario	Hydrology	Upper Basin Demand	Arizona On-River Demand	CAP Utilization
IC #1	Stress Test	Guidelines Period UB Use Extended	0.1% Growth	Medium
IC #2	Paleo-Conditioned	2016 UCRC Upper Basin Growth	0.2% Growth	Medium
IC #3	Pluvial-Removed	Guidelines Period UB Use Extended	0.1% Growth	Medium
IC #4	Downscaled GCM	2016 UCRC Upper Basin Growth	0.2% Growth	Fast
IC #5	Pluvial-Removed	Upper Basin Guidelines Period Average	On-River Guideline Average	Medium
IC #6	Stress Test	2012 Basin Study Current Trends Growth	0.2% Growth	Fast



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Duration at or Below Mead Elevation 1,025

Consecutive Years at or Below 1,025 ft

Scenario	1 yr	2 - 3 yrs	4 - 5 yrs	6 - 7 yrs	8 - 9 yrs	10+ yrs	Average Duration
IC #1	48%	39%	12%	2%	0%	0%	2.0 yrs
IC #2	24%	25%	14%	10%	8%	19%	4.7 yrs
IC #3	49%	39%	11%	1%	0%	0%	1.9 yrs
IC #4	14%	18%	12%	9%	8%	39%	6.2 yrs
IC #5	68%	29%	3%	0%	0%	0%	1.4 yrs
IC #6	44%	40%	14%	3%	0%	0%	2.2 yrs

Scenario	Hydrology	Upper Basin Demand	Arizona On-River Demand	CAP Utilization
IC #1	Stress Test	Guidelines Period UB Use Extended	0.1% Growth	Medium
IC #2	Paleo-Conditioned	2016 UCRC Upper Basin Growth	0.2% Growth	Medium
IC #3	Pluvial-Removed	Guidelines Period UB Use Extended	0.1% Growth	Medium
IC #4	Downscaled GCM	2016 UCRC Upper Basin Growth	0.2% Growth	Fast
IC #5	Pluvial-Removed	Upper Basin Guidelines Period Average	On-River Guideline Average	Medium
IC #6	Stress Test	2012 Basin Study Current Trends Growth	0.2% Growth	Fast

Initial Conditions Scenarios Summary

- The IC Scenarios 1 – 6 capture a broad range of hydrologies and demands, illustrating a range of impacts to Arizona and CAP
- IC Scenarios 4 & 6 provide the deepest impacts to Arizona & CAP supplies
- IC Scenario 5 provides the lowest impacts to Arizona & CAP supplies, largely due to Upper Basin demand assumptions
- Anticipate additional CRSS hydrologies will emerge in 2022
- A key assumption for impacts to Arizona is limiting reductions to Tier 3 volumes when Mead < 1,025'

Scenario	Hydrology	Upper Basin Demand	Arizona On-River Demand	CAP Utilization	Overall Ranking
IC #1					
IC #2					
IC #3					
IC #4					
IC #5					
IC #6					

**All scenarios assume Lake Powell equalization line is capped at 3,652 ft starting in 2027*

Estimated Impact to Arizona / CAP



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MAWG Next Steps

- Report results to ARC at their next meeting
- ADWR/CAWCD will continue to coordinate with Reclamation and others on additional CRSS hydrologies
- Report on progress and updates to MAWG in late spring 2022



Call to the Public

- Submit questions or comments using the electronic public comment form at cap-az.com/ARC

