

Water Forward 2024

Preliminary Needs Analysis



Agenda

- Scenario planning refresher
- Goal of preliminary needs analysis
- Preliminary needs analysis methodology
 - Development of scenarios
 - Development of Water Forward Water Availability Model (WF WAM)
- Results
- Q&A

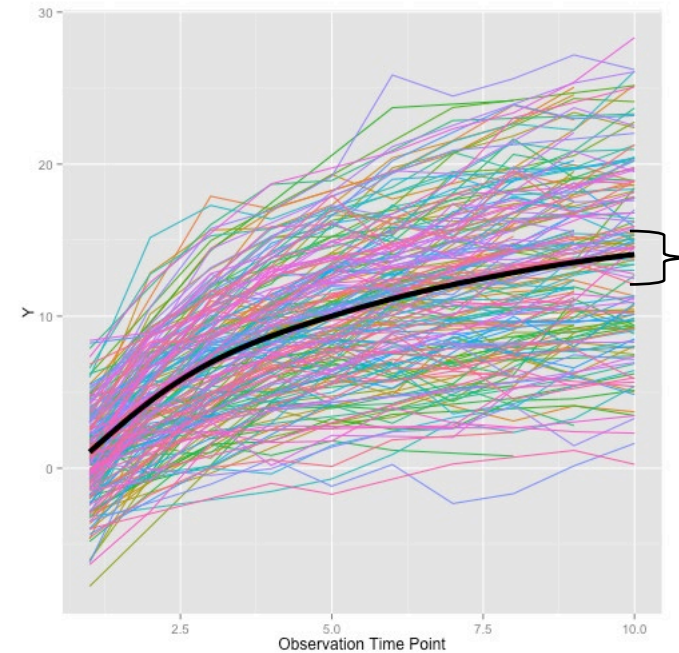
Scenario planning refresher



Planning for plausibility
vs. probability

- Uncertain parameters cannot be predicted or well understood using standard statistical methods

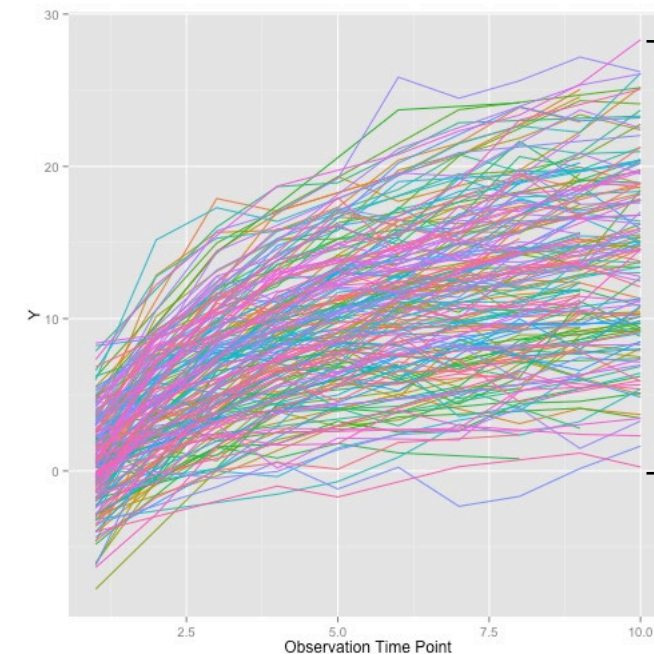
Predicting the most likely future or creating a plan that performs best on average



Strategies perform well against “most likely” future conditions

VS.

Finding robust strategies that perform well across a wide range of plausible futures, or scenarios



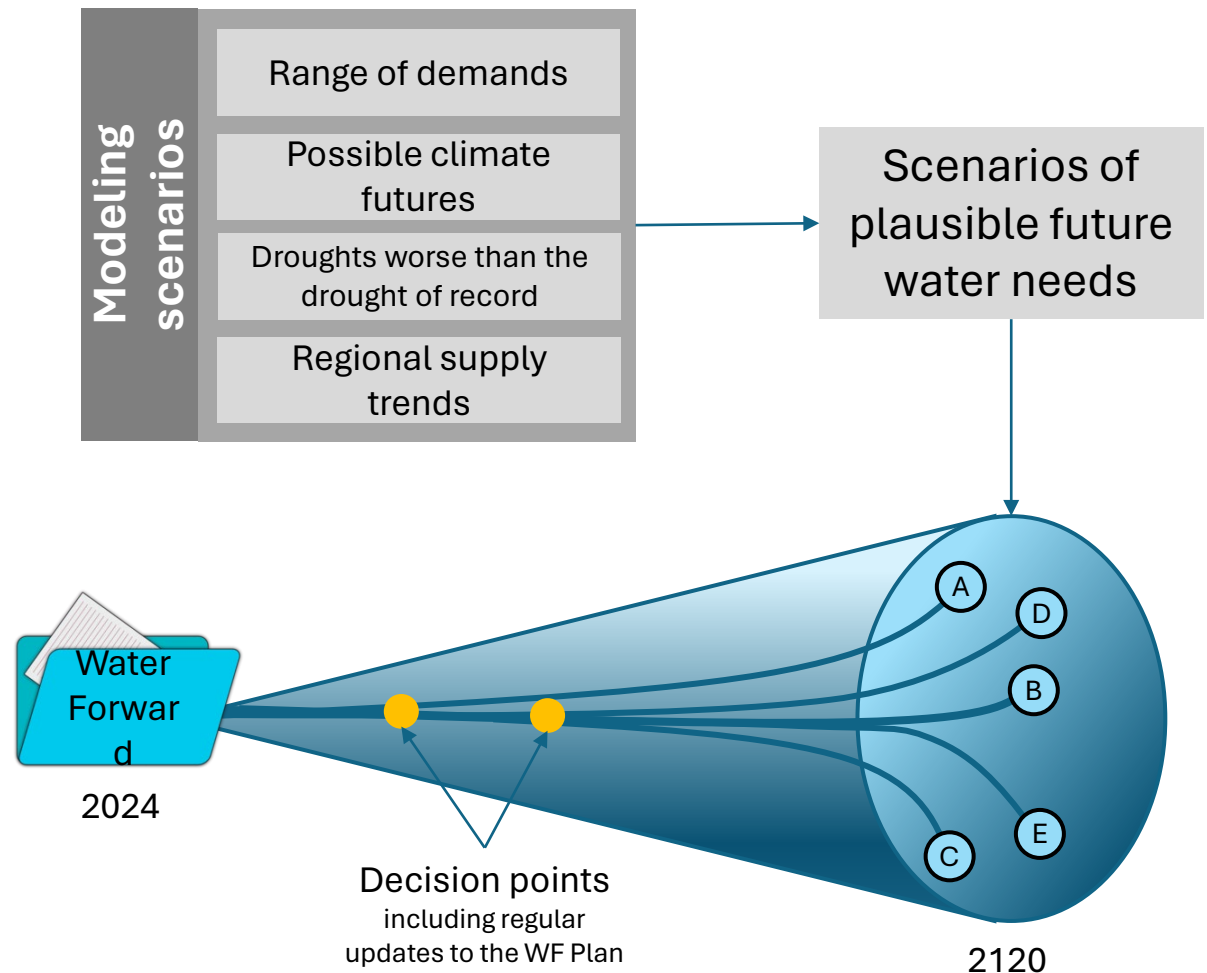
Strategies perform well across range of possible scenarios

Scenario planning refresher

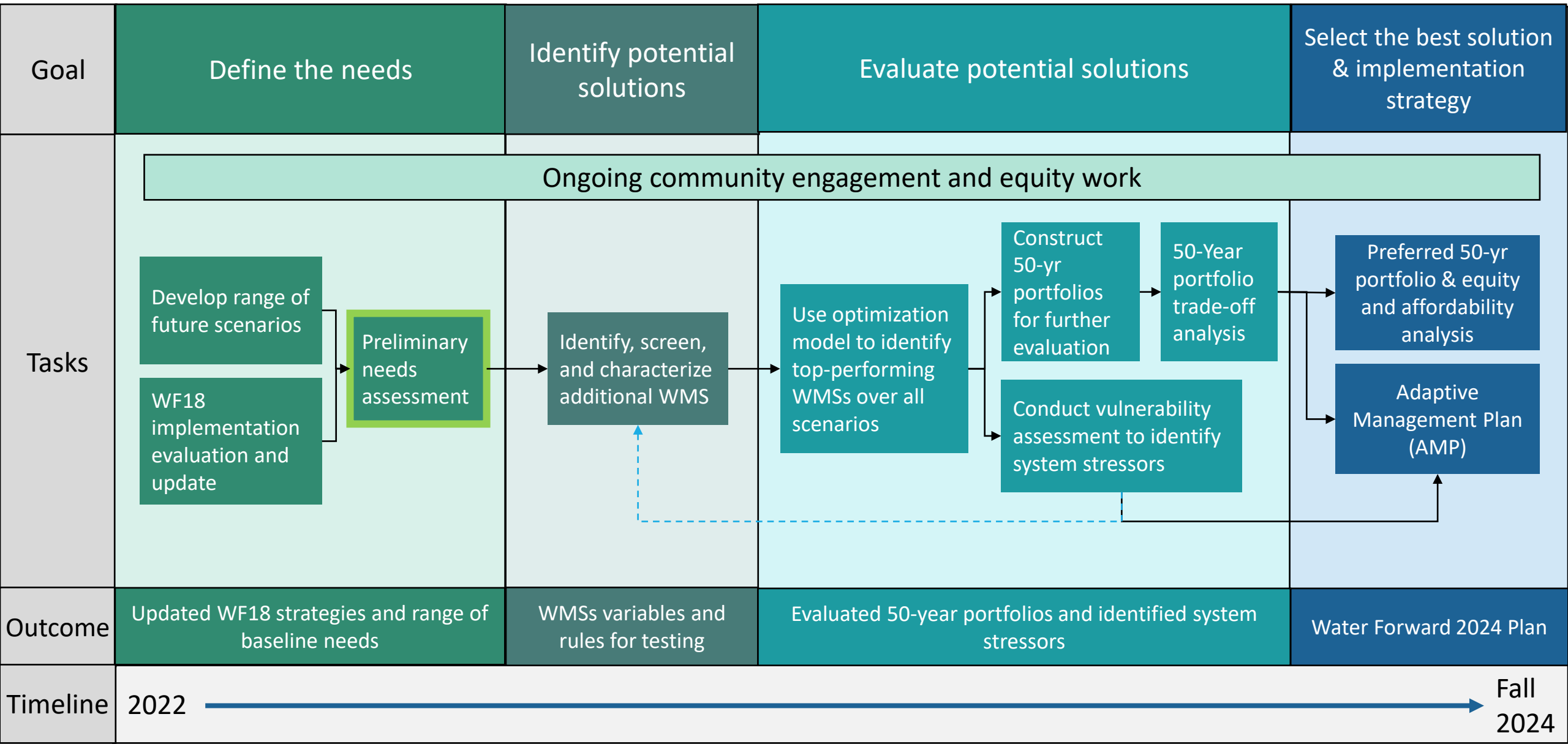


Planning for Uncertainty in WF24

- Develop a range of plausible future scenarios
- Find common near-term water management strategies (WMSs) that perform well over many scenarios
- For long-term (WMSs), develop an adaptive management plan with key decision points
- Continue to update the plan, re-evaluate, and adapt



WF24 scenario planning methodology overview



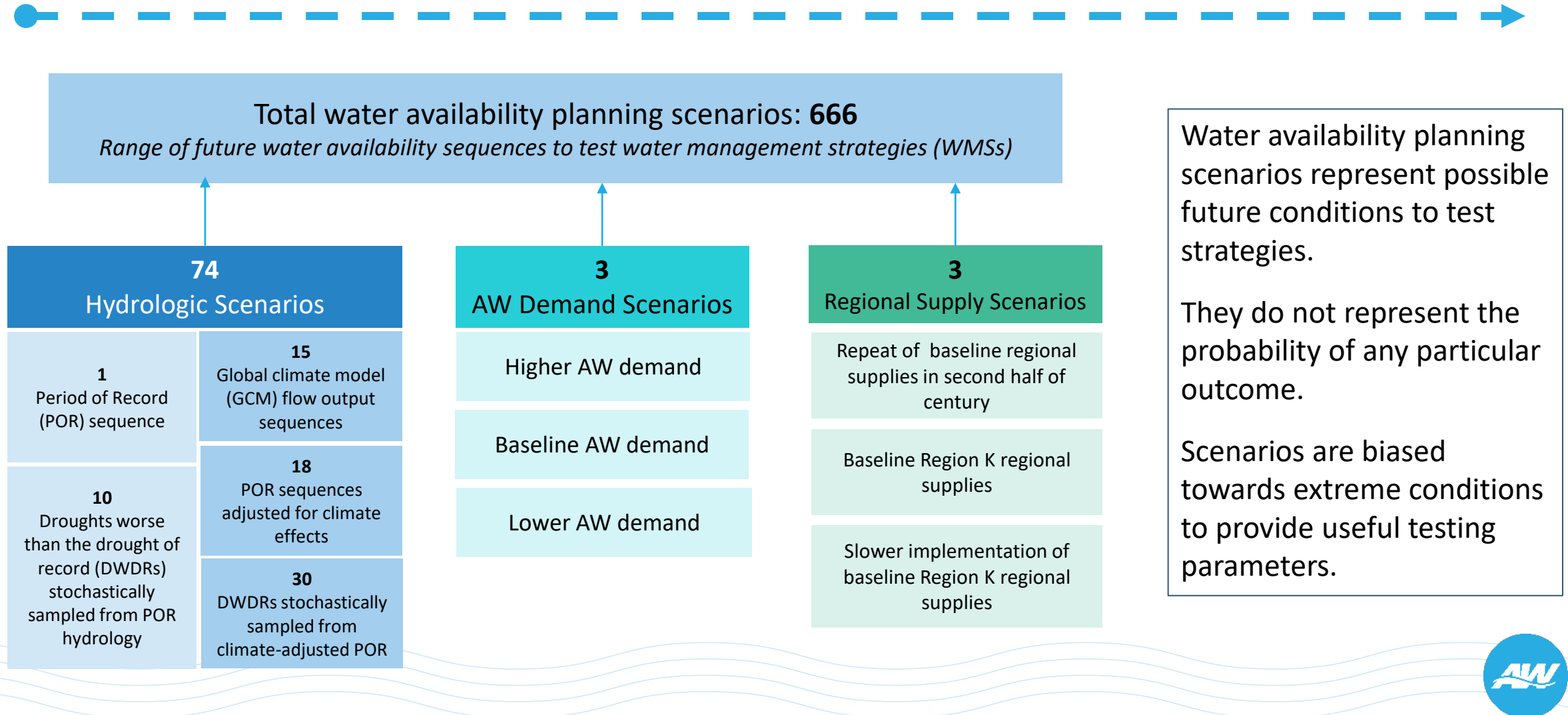
Goal of Preliminary Needs Analysis



- Evaluate planning scenario severity
- Determine plausible scenarios for future drought
- Define a range possible unmet Austin demands to drive water management strategy development and evaluation



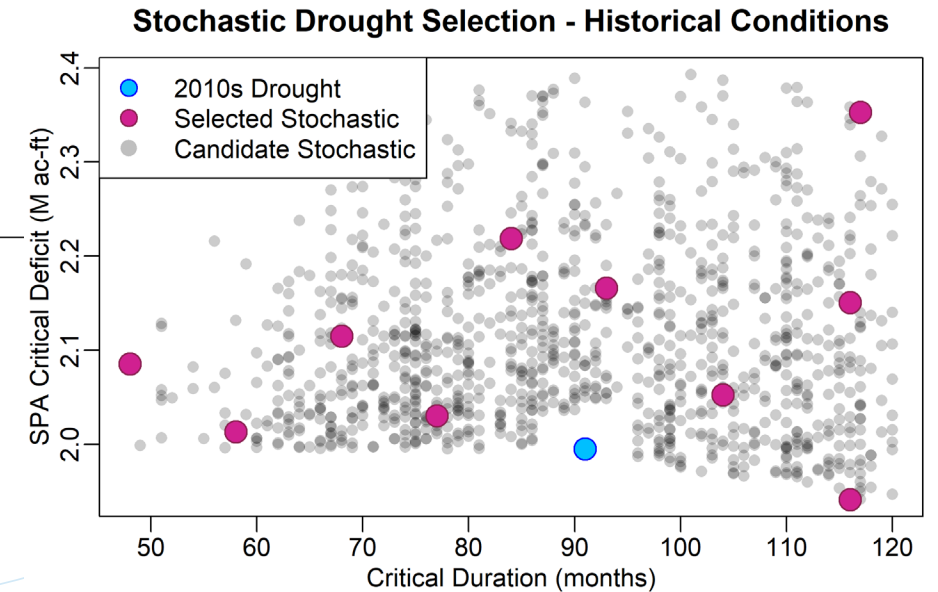
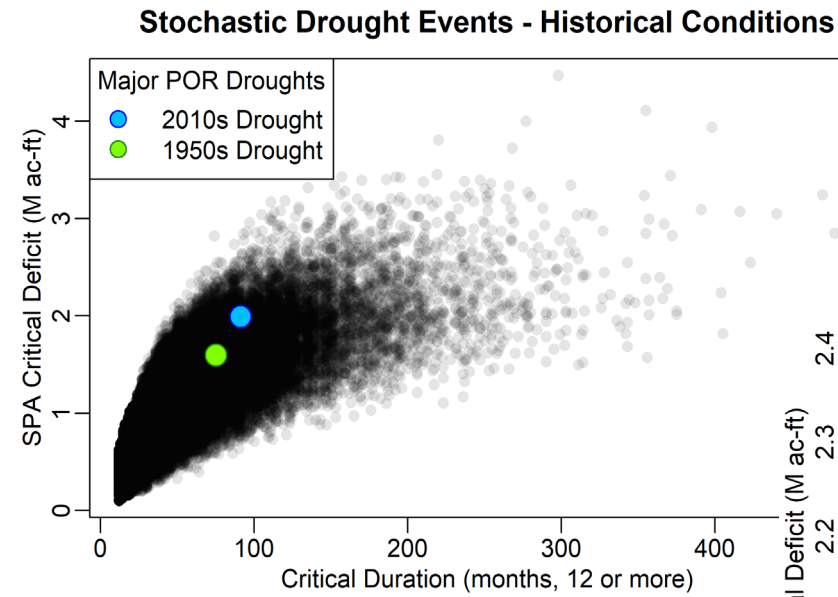
Preliminary Needs Methodology: Overview of planning scenarios



Preliminary Needs Methodology: Climate & Hydrology Scenario Inputs



74 Hydrologic Scenarios	
1 Period of Record (POR) sequence	15 Global climate model (GCM) flow output sequences
10 Droughts worse than the drought of record (DWDRs) stochastically sampled from POR hydrology	18 POR sequences adjusted for climate effects
	30 DWDRs stochastically sampled from climate-adjusted POR



Preliminary Needs Methodology:

Regional Supply Pathway Scenario Inputs



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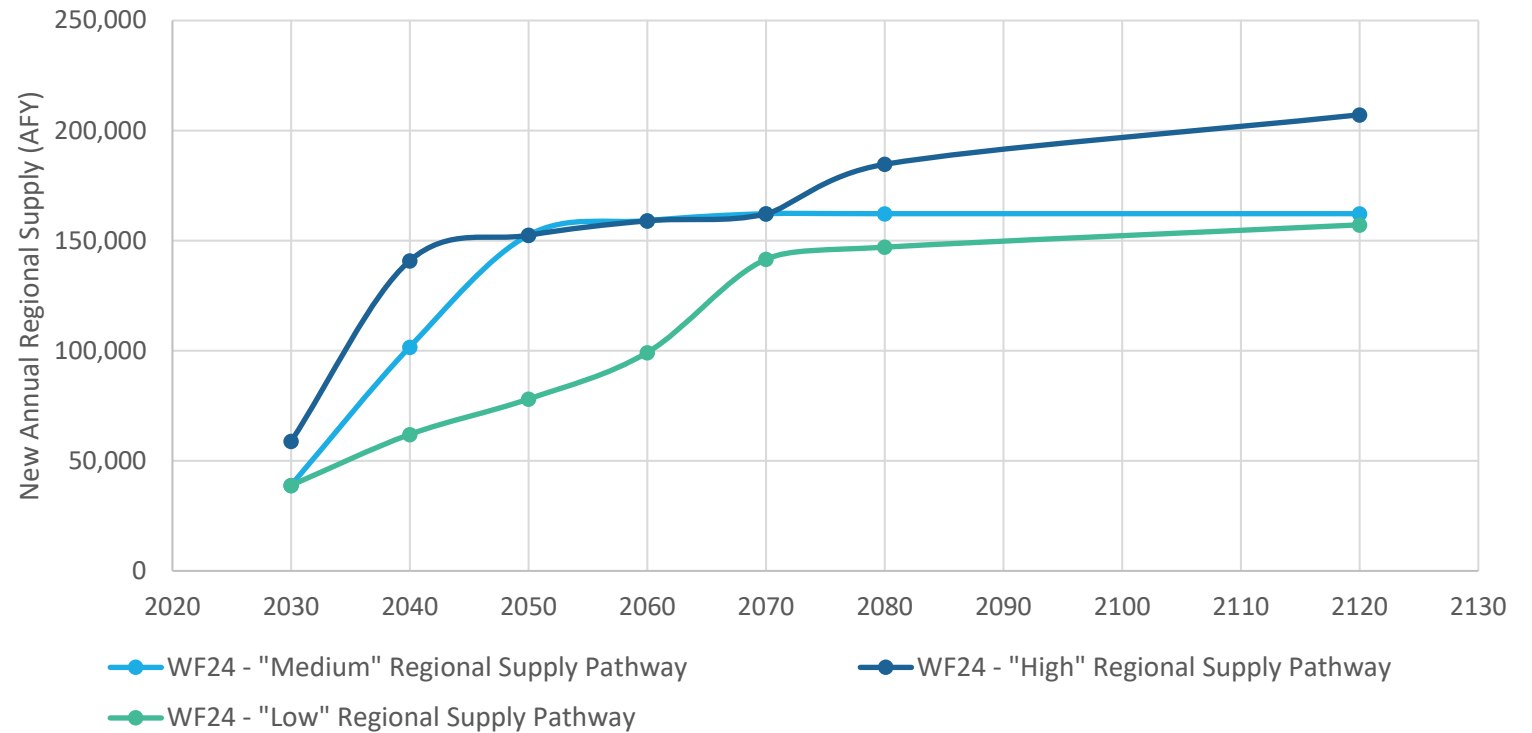
Regional Supply Scenarios

Repeat of baseline regional supplies in second half of century ("High")

Baseline Region K regional supplies ("Medium")

Slower implementation of baseline Region K regional supplies (Low")

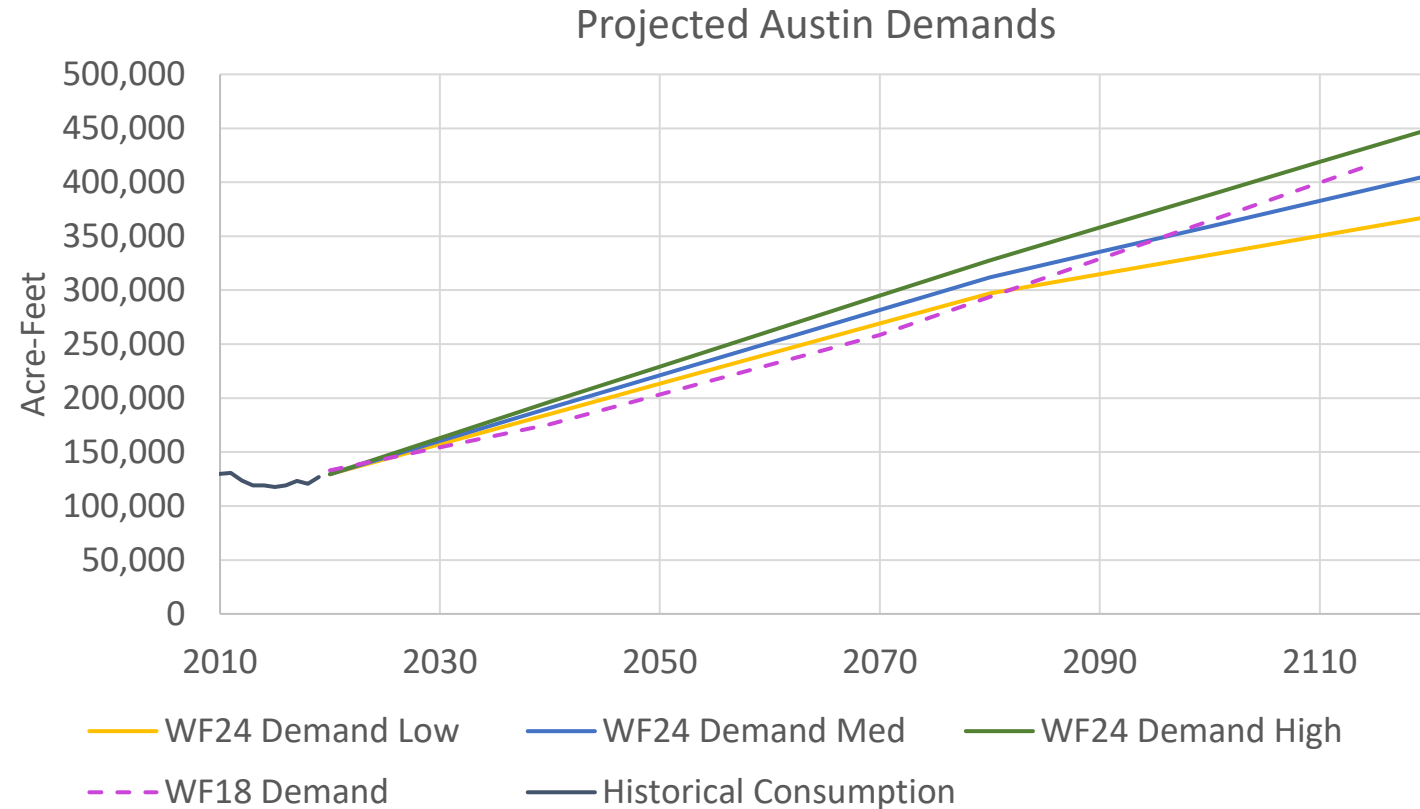
Regional Supply Pathways – Based on Region K



Preliminary Needs Methodology: Demand Scenario Inputs



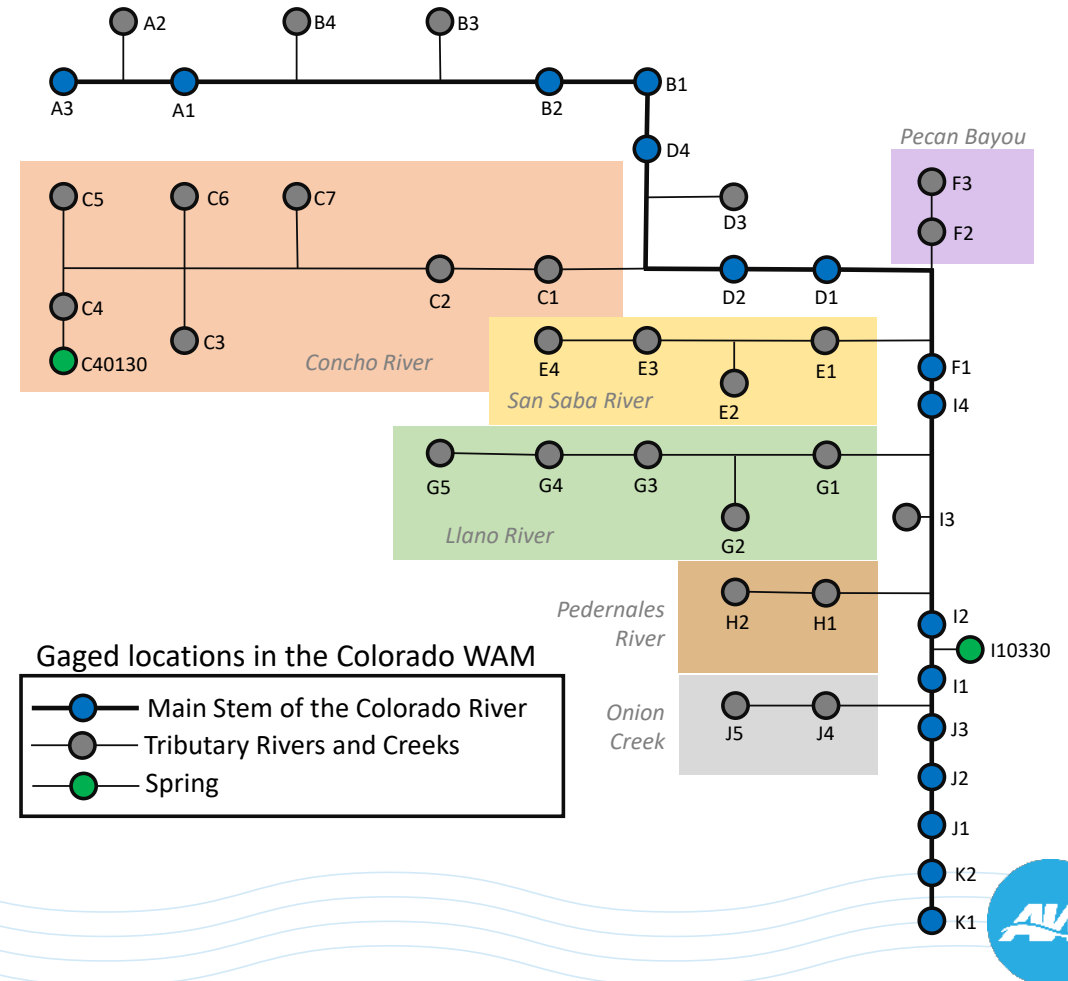
3 AW Demand Scenarios
Higher AW demand
Baseline AW demand
Lower AW demand



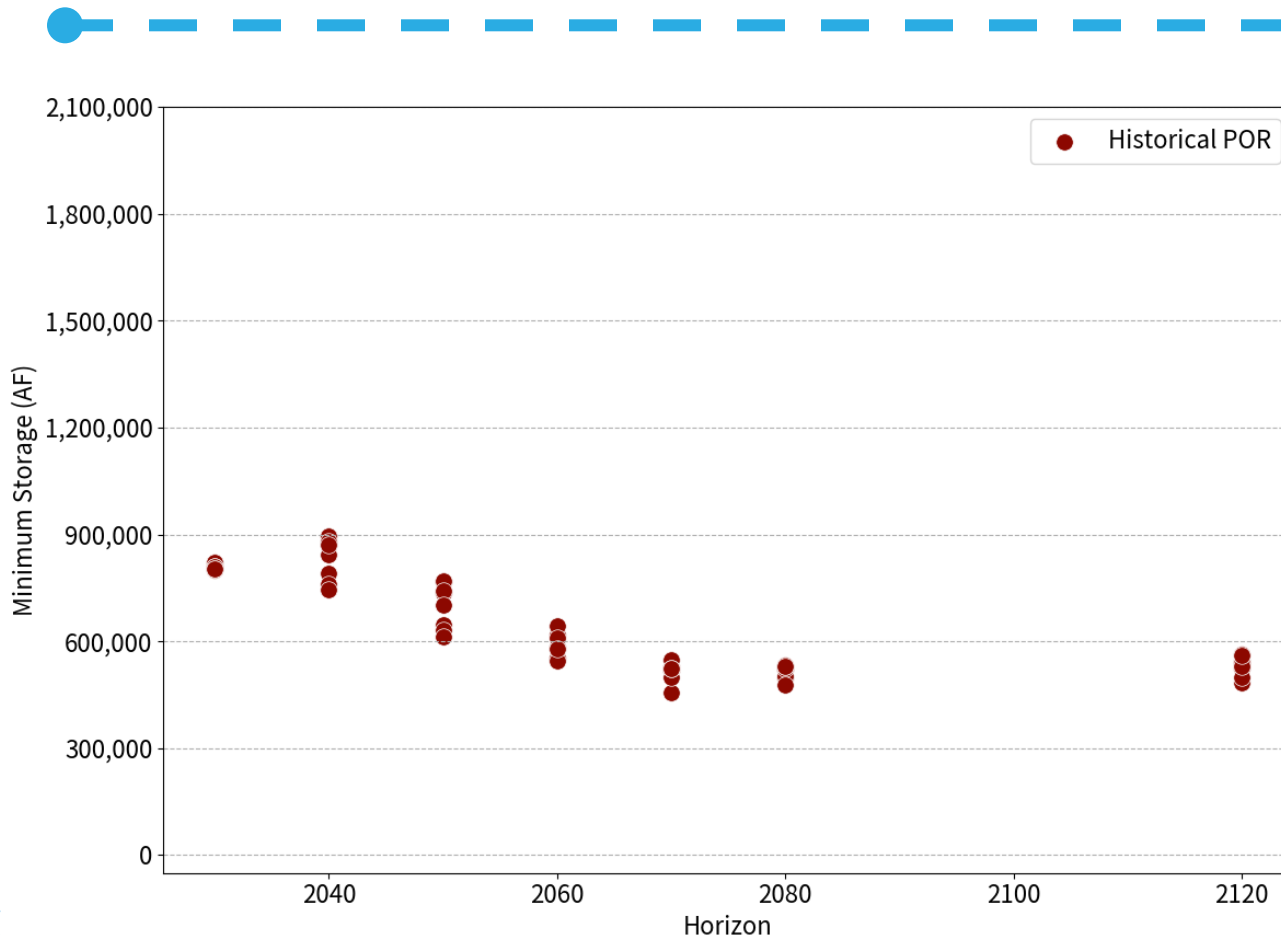
Preliminary Needs Methodology:

Development of WF WAM

- The WF WAM is used to simulate water availability for surface water rights across the entire basin, including Austin.
- Scenarios using different hydrology, demands, and regional supply pathways are brought together in the WF WAM.
- Simulation results used as the quantitative basis for the Preliminary Needs Analysis for several of key measures.

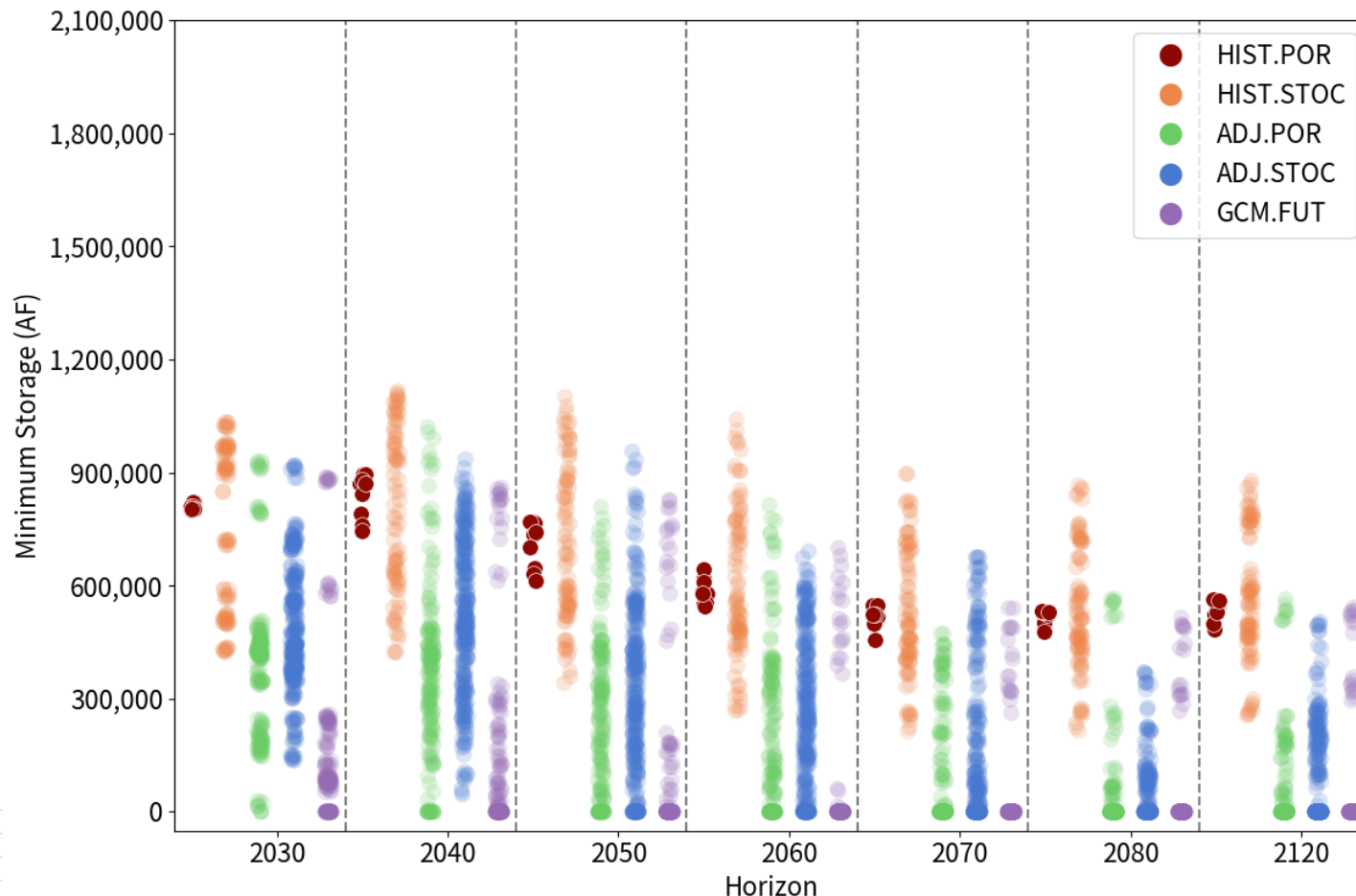


Preliminary Need Analysis: Period of Record Results



- When looking at POR hydrology, no scenarios showed lake levels dropping below 300,000 AF
 - Just POR hydrology, but all COA demand scenarios and all regional supply pathway scenarios
- These results do not include any additional Austin water management strategies

Preliminary Need Analysis: All Scenario Results

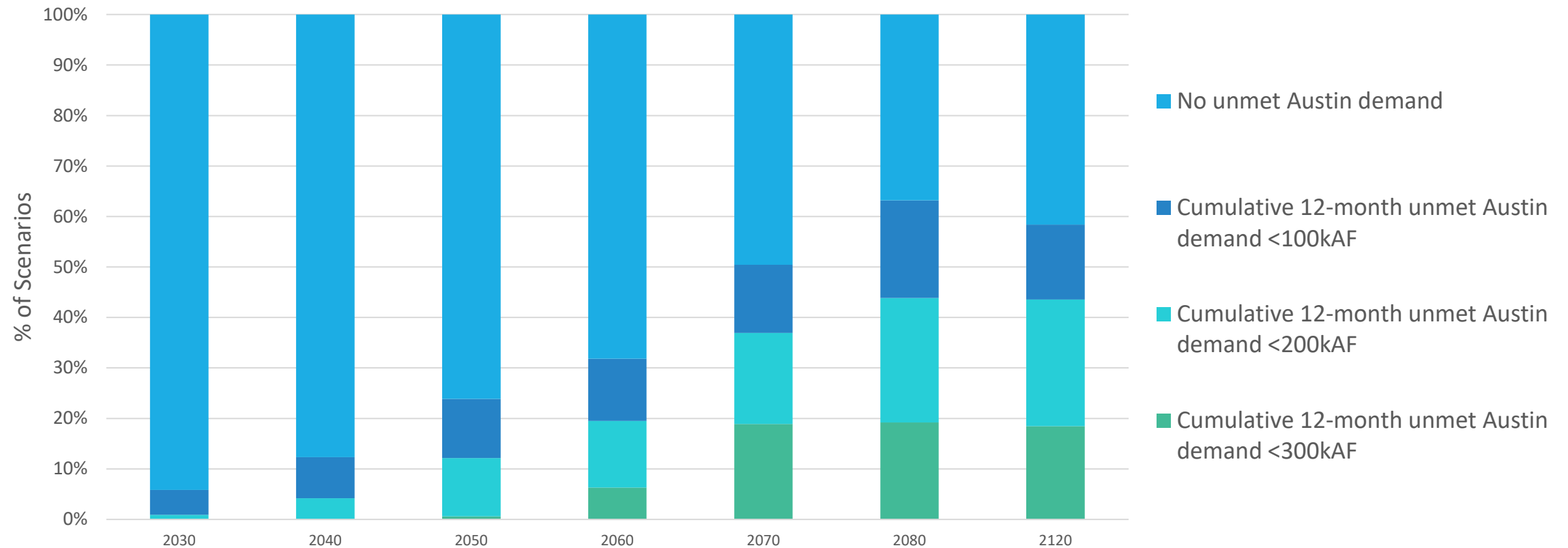


- When considering all hydrologies, lake levels do drop to empty in certain scenarios
- These results do not include any additional Austin water management strategies
- Scenarios are intentionally selected to create stressor scenarios to evaluate the performance of water management**

Preliminary Need Analysis: Results



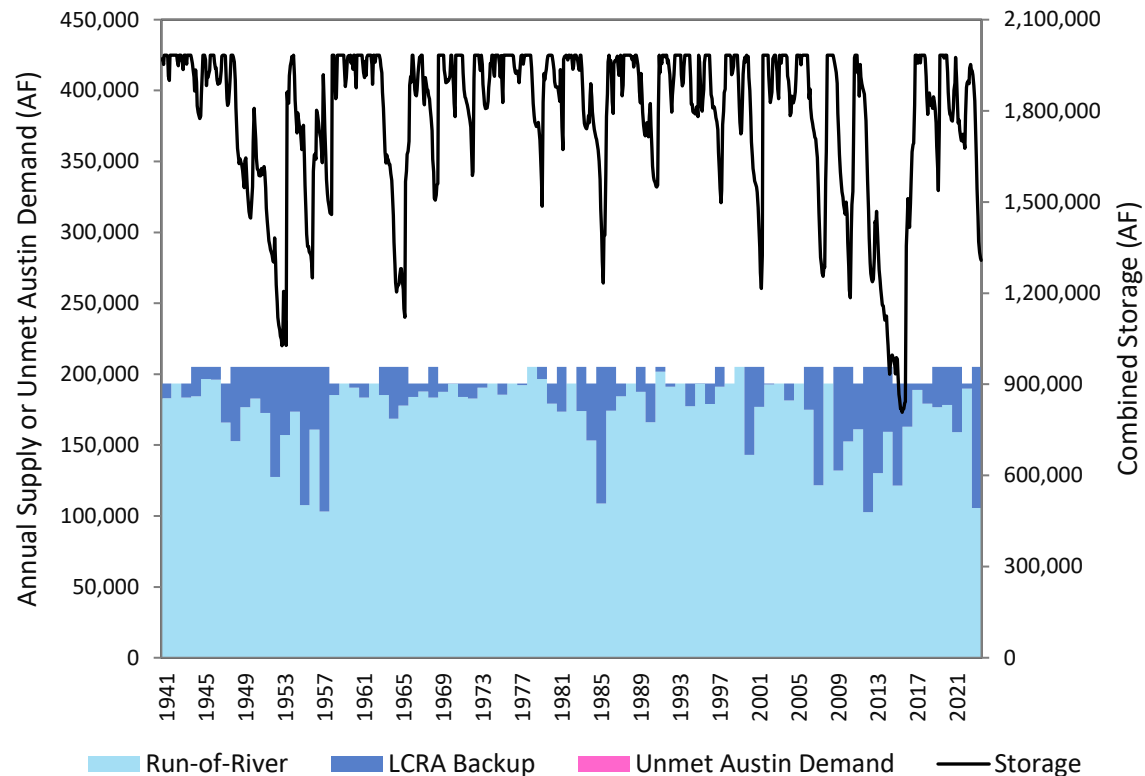
Breakdown of unmet Austin demand due to zero lake storage, by volume and planning horizon



Preliminary Need Analysis: Results Examples

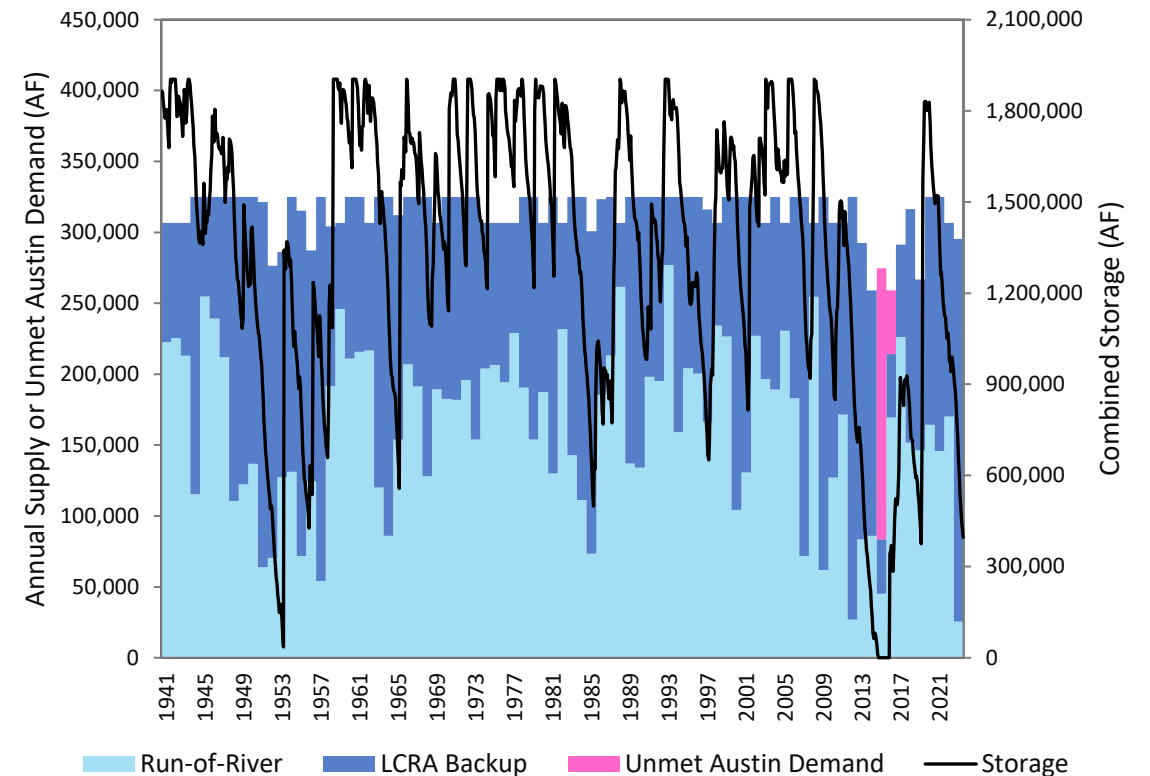


Example with no unmet demand



2030 Medium Demand and Supplies with Historical POR Hydrology

Example with unmet demand

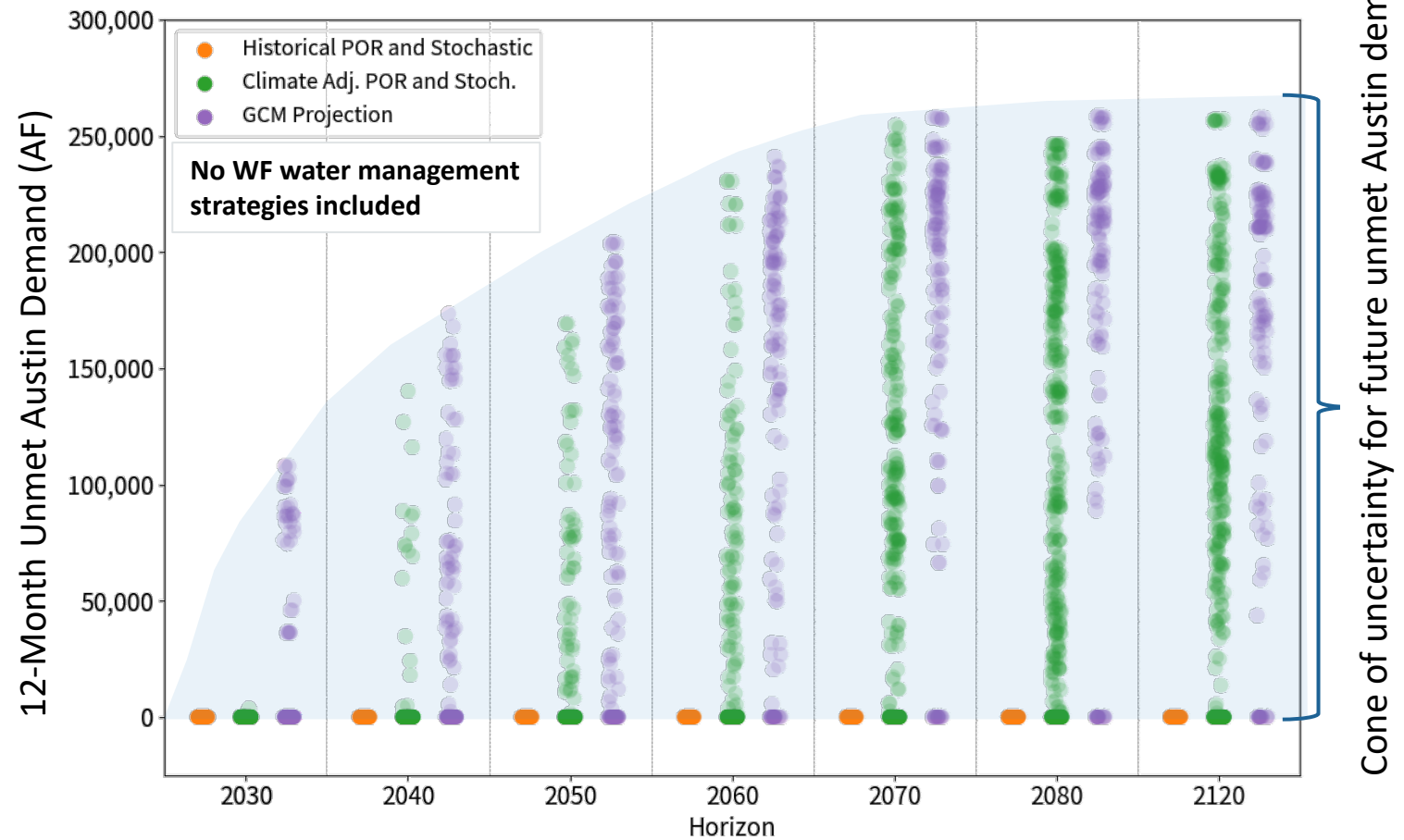


2120 Medium Demand and Supplies with Climate Adjusted POR Hydrology



Preliminary Need Analysis: Unmet Austin Demand

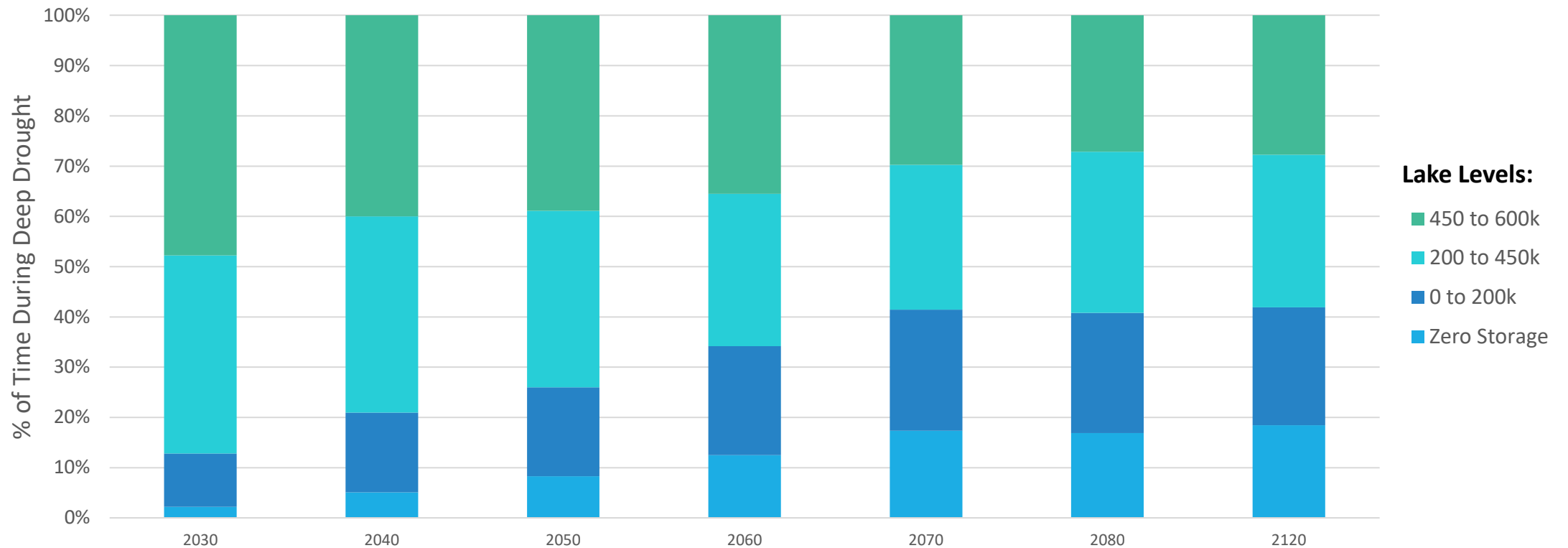
- As modeled in WF WAM, unmet Austin demand occurs when lake storage is 0 AF
- Examining unmet Austin demand helps us:
 - Understand do-nothing scenario consequences
 - Set a range of possible unmet demands for development and evaluation of WMSs
 - Refine our metrics – these will also consider conditions when lake storage is above 0 AF (other times of “need”)
- Optimization and evaluation metrics will examine consequences of shortages when lake levels > 0 (additional “needs”)



Preliminary Need Analysis: Results



Breakdown of low lake storage volumes, by magnitude and planning horizon, during deep drought events when lake storage is at or below 600k AF



Preliminary Need Analysis: Summary

- ◆ Provides range of unmet Austin demand to inform water management strategy development and evaluation.
- ◆ The preliminary needs help to refine the WMS performance metrics which will be used to create portfolios that meet acceptable levels of risk.
- ◆ Results including uncertainty are more difficult to interpret but by planning against a range of futures, preferred portfolios will lead to resilient and adaptable WMS.





Questions?

