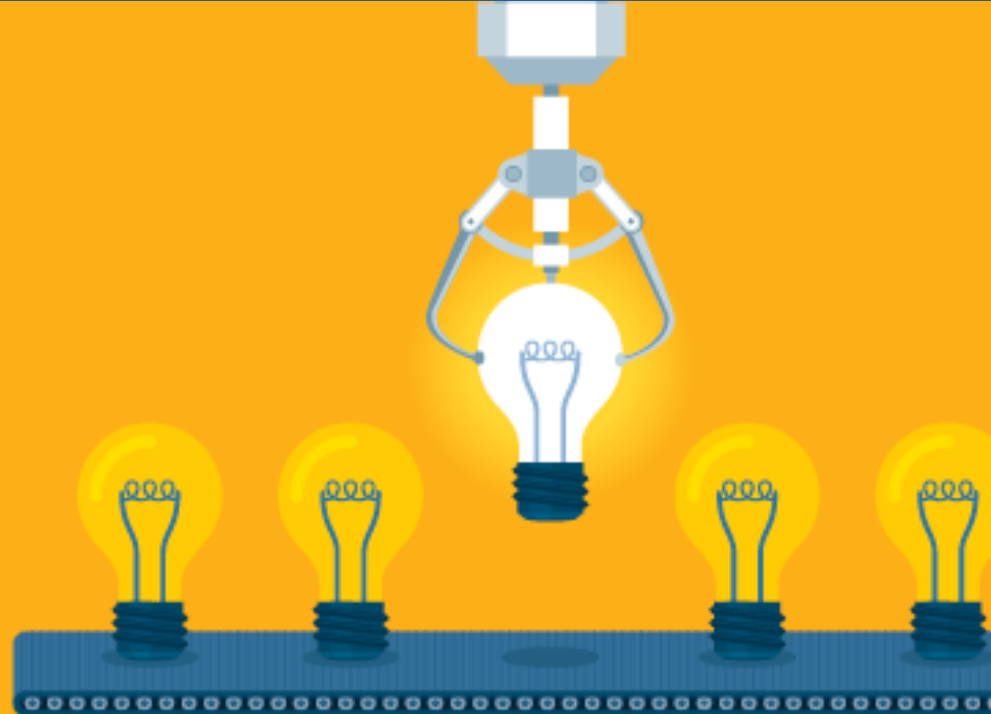




ASSOCIATION OF
METROPOLITAN WATER AGENCIES

INNOVATION SERIES

Tuesday, February
28 from 3-4 p.m. ET.



Welcome

INNOVATIONS SERIES WEBINAR

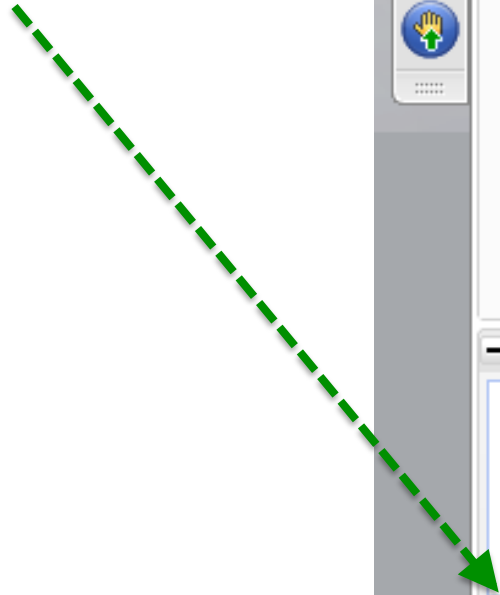
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Reminders

- Today's presentation is being recorded.
- Slides and recording will be available at www.amwa.net/amwa-innovation-series.
- We'll take questions after both speakers have presented.
- All lines are muted until discussion period.

How to Ask a Question

Type and send your question.



The screenshot displays the GoToWebinar interface. At the top, there is a menu bar with 'File', 'View', and 'Help'. Below this, the 'Audio' panel is visible, featuring a telephone icon and two radio buttons: 'Computer audio' (unselected) and 'Phone call' (selected). The 'Dial:' field contains '+1 (XXX)-XXX-XXXX', the 'Access Code:' field contains 'XXX-XXX-XXX', and the 'Audio PIN:' field contains 'X'. Below these fields, there is a prompt: 'Already on the call? Press #X# now.' and a link 'Problem dialing in?'. The 'Questions' panel is located below the 'Audio' panel, containing a large text input area with the placeholder text '[Enter a question for staff]'. A 'Send' button is positioned at the bottom right of the 'Questions' panel and is circled in green. At the bottom of the interface, there is a banner for 'DRY RUN for Insight webinar' with 'Webinar ID: 329-228-755' and the 'GoToWebinar' logo.

Agenda

- Diane VanDe Hei, CEO
Association of Metropolitan Water Agencies
- John Stomp, PE, COO, Albuquerque Bernalillo
County Water Utility Authority
- Alison Adams, PhD, PE, CTO, Tampa Bay Water
- Q&A
- Open Discussion

Diane VanDe Hei
CEO

Association of Metropolitan Water Agencies

Poll Question #1



Water 2120: Securing Our Water Future

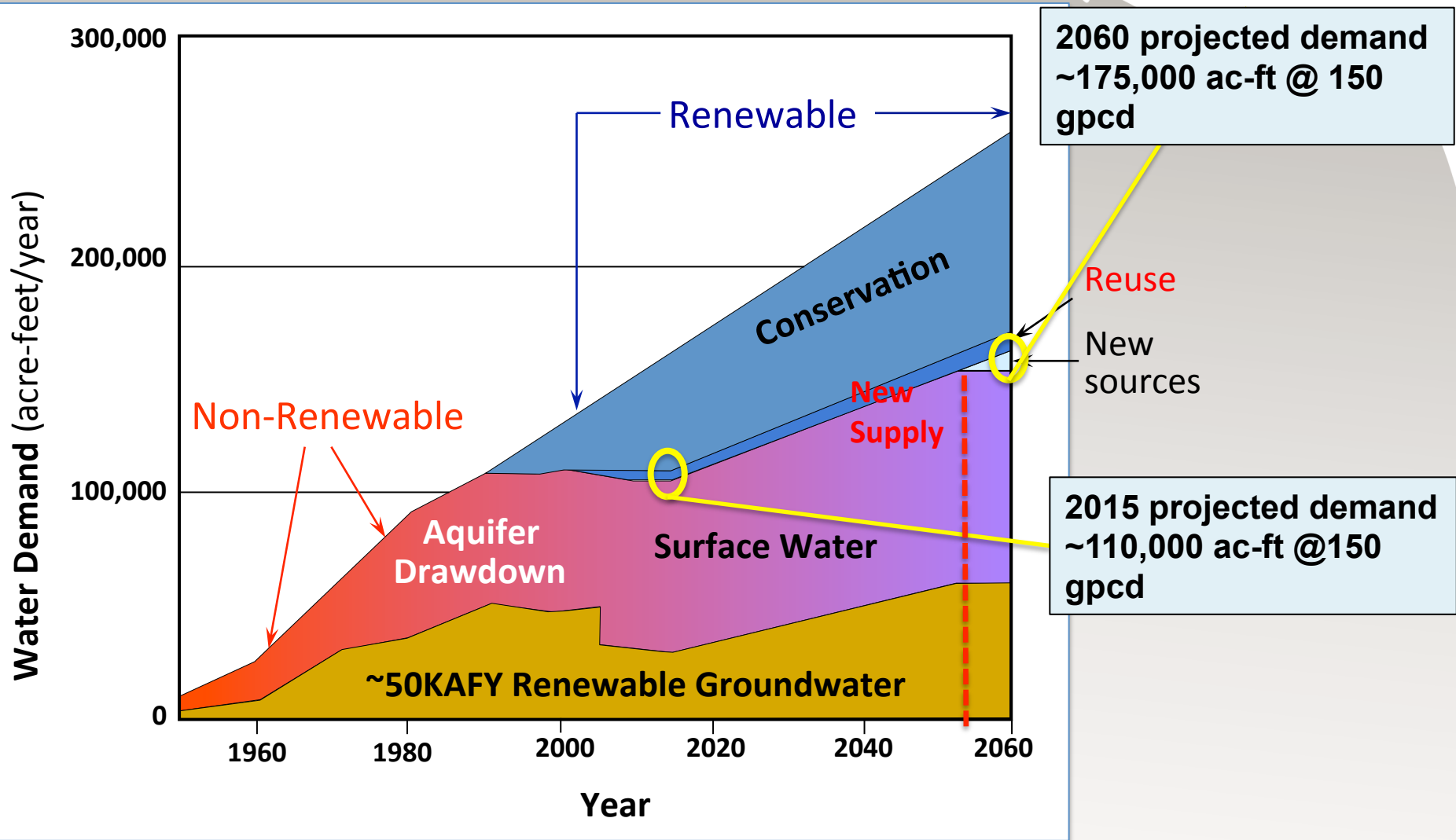
**AMWA WEBINAR INNOVATION SERIES
FEBRUARY 28, 2017**

Need for Updated Strategy

- 2007 Strategy policies/projects complete
- Need to update existing data
- Need to incorporate new technical information – aquifer rising, climate change, etc.
- Consider a 100-year planning horizon
- Strategy will be updated every 10 years if new information becomes available



The 2007 WRMS



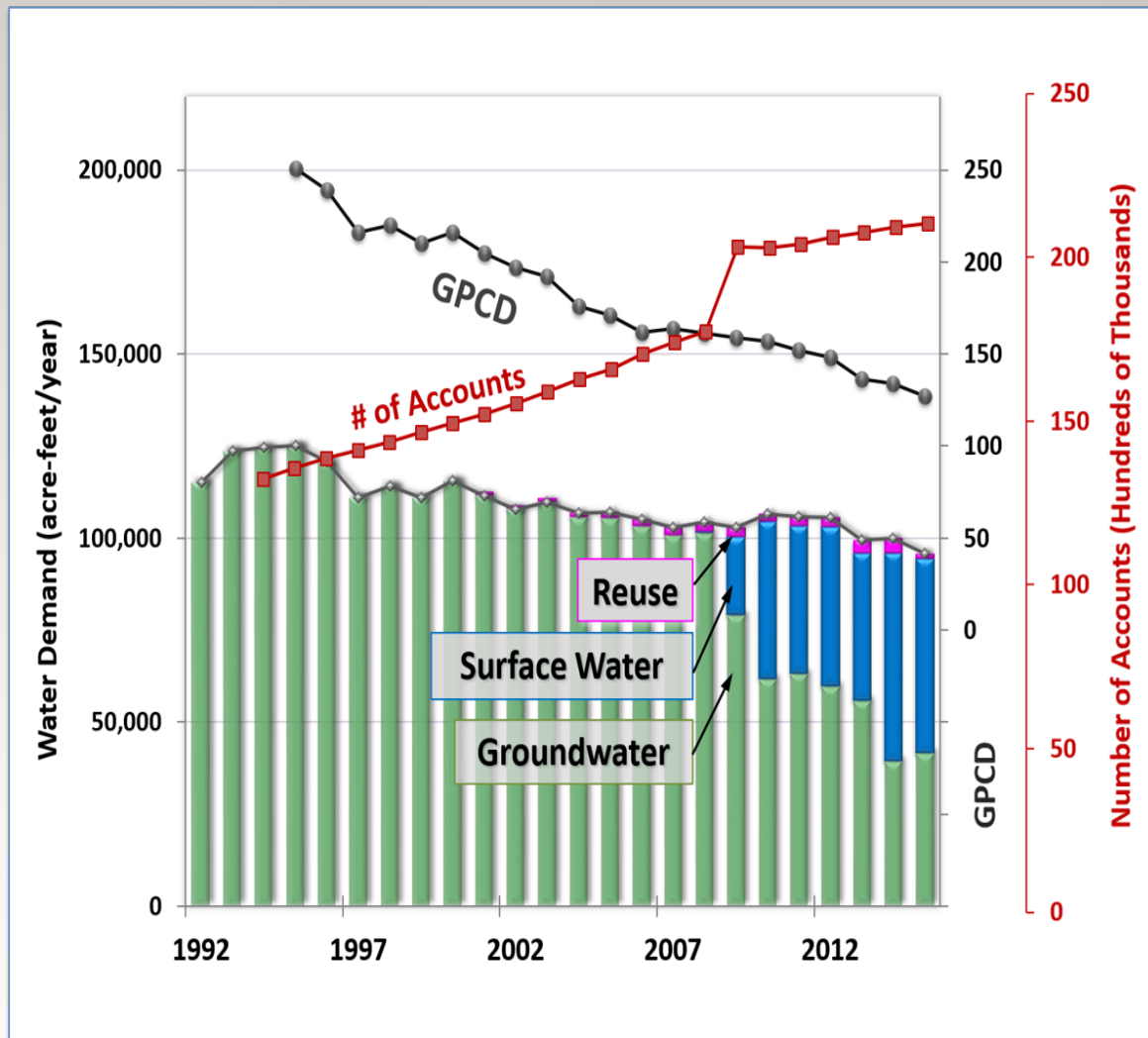
2015 actual demand ~95,000 ac-ft

2007 WRMS Status Report

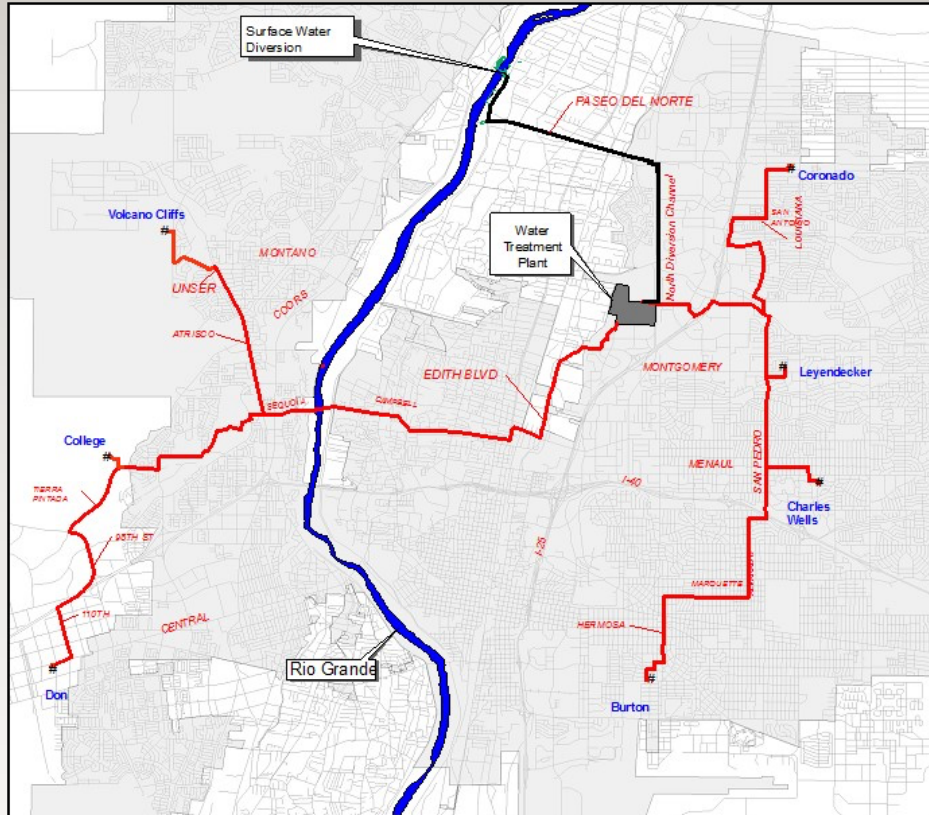


- Accomplishments
 - Water conservation has decreased demand significantly since 1995, even while population has grown
 - The Drinking Water Project has been implemented
 - Reuse is being implemented
 - ASR is being implemented
 - Groundwater monitoring network was established
- Results
 - Aquifer levels are rising due to decreased groundwater pumping (water supply is increasing)
 - Consumptive use has declined
 - River depletions from groundwater pumping are declining
 - Overall supply resiliency has increased

Water Usage is Decreasing Even as the System has Grown



Drinking Water Project Implemented



Multiple Benefits

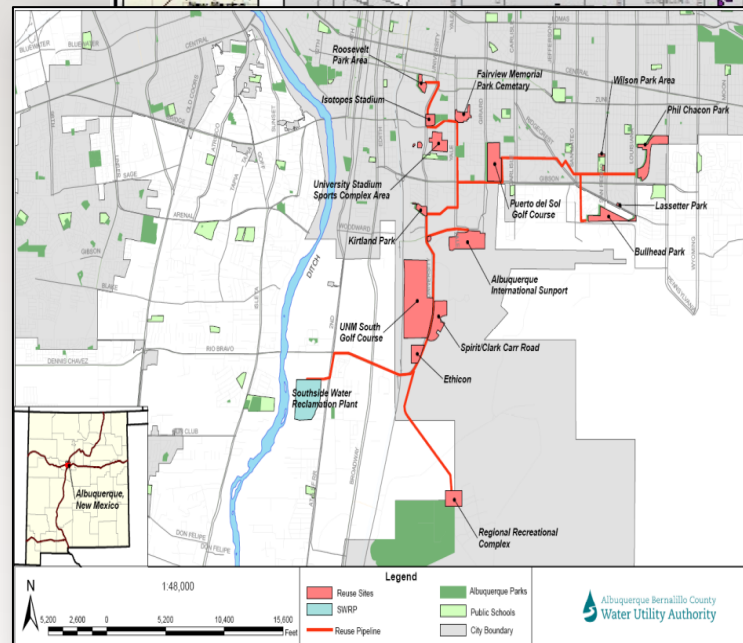
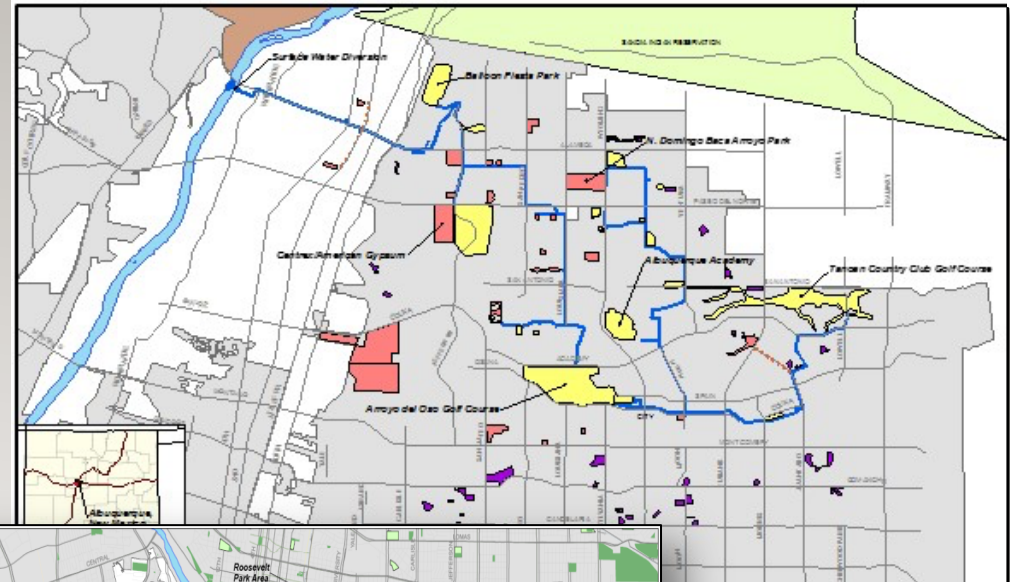
- Co-locate wells near transmission pipelines for ASR
- New infrastructure can move supply throughout the system
- Reduced need for arsenic treatment



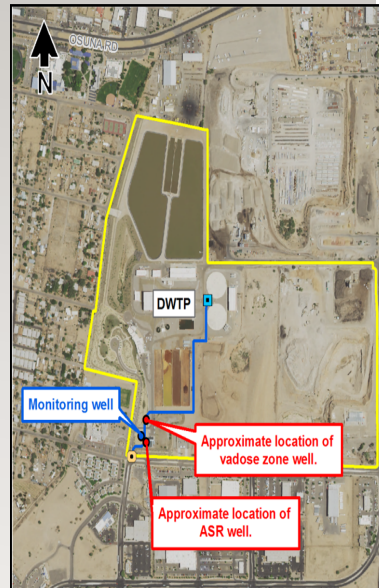
Reuse Continues to be Implemented

Current projects and supply

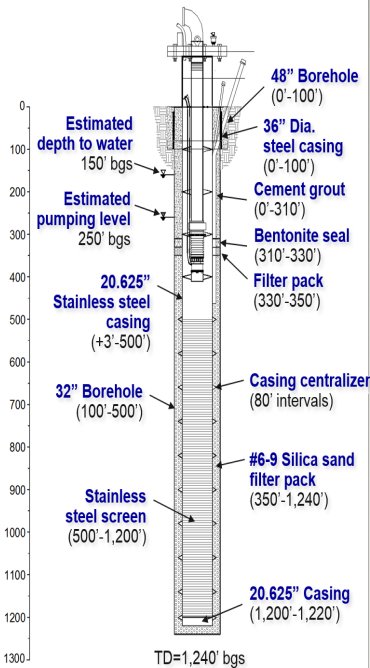
- Industrial recycling
~30 ac-ft/yr
- North I-25 non-potable project ~ 2,500 ac-ft/yr
- Southside effluent reuse
~1,300 ac-ft/yr



ASR is Being Implemented

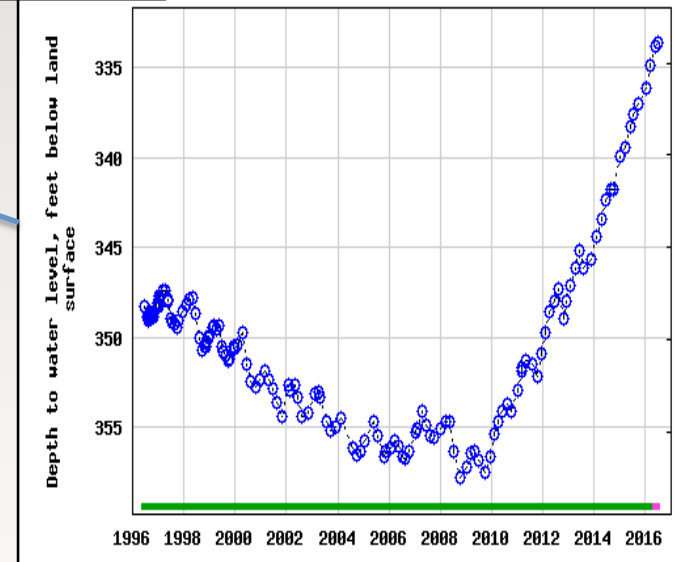
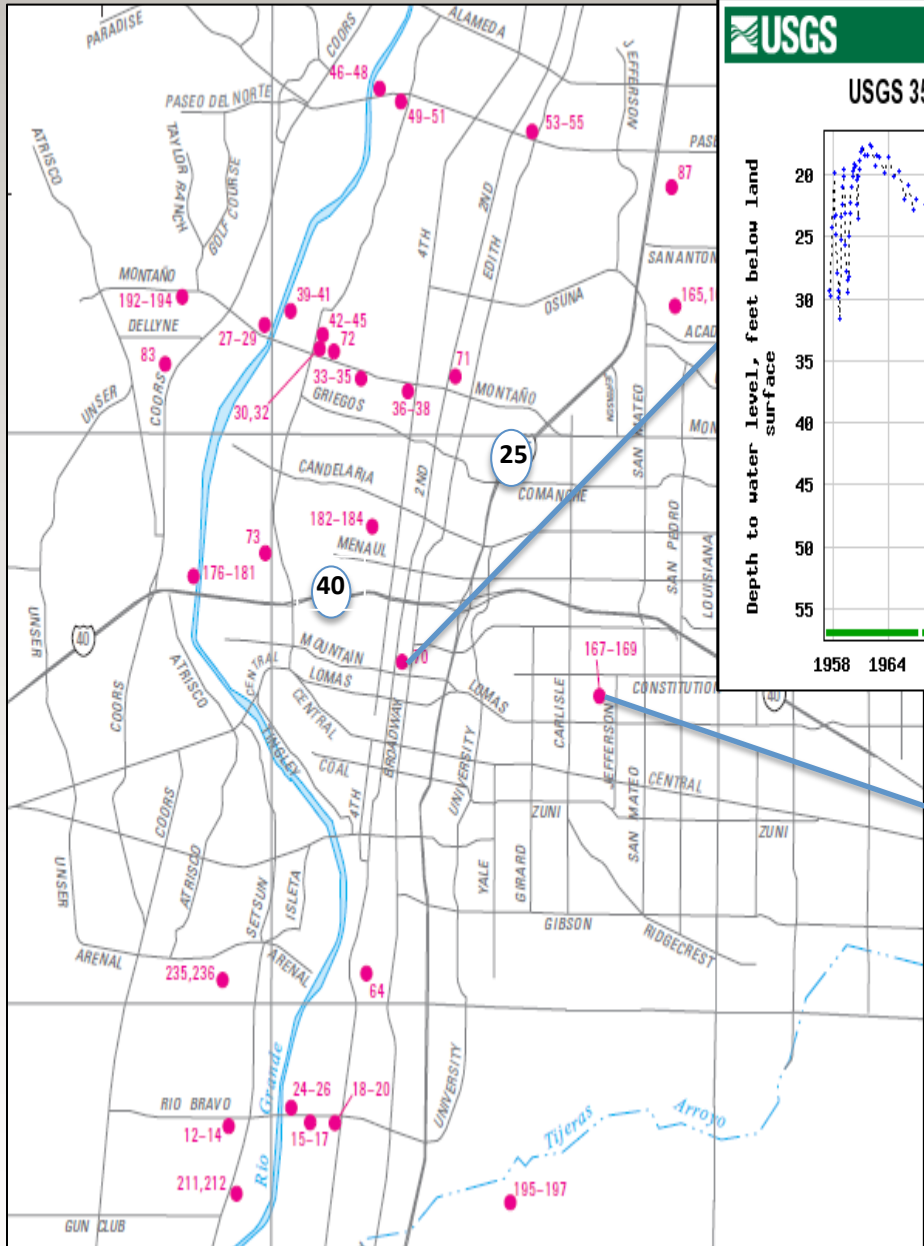
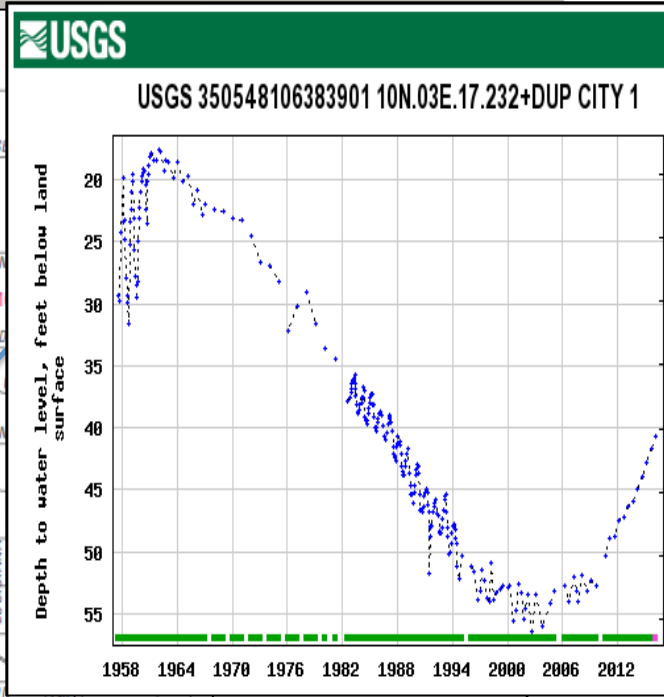


Injection Well Design



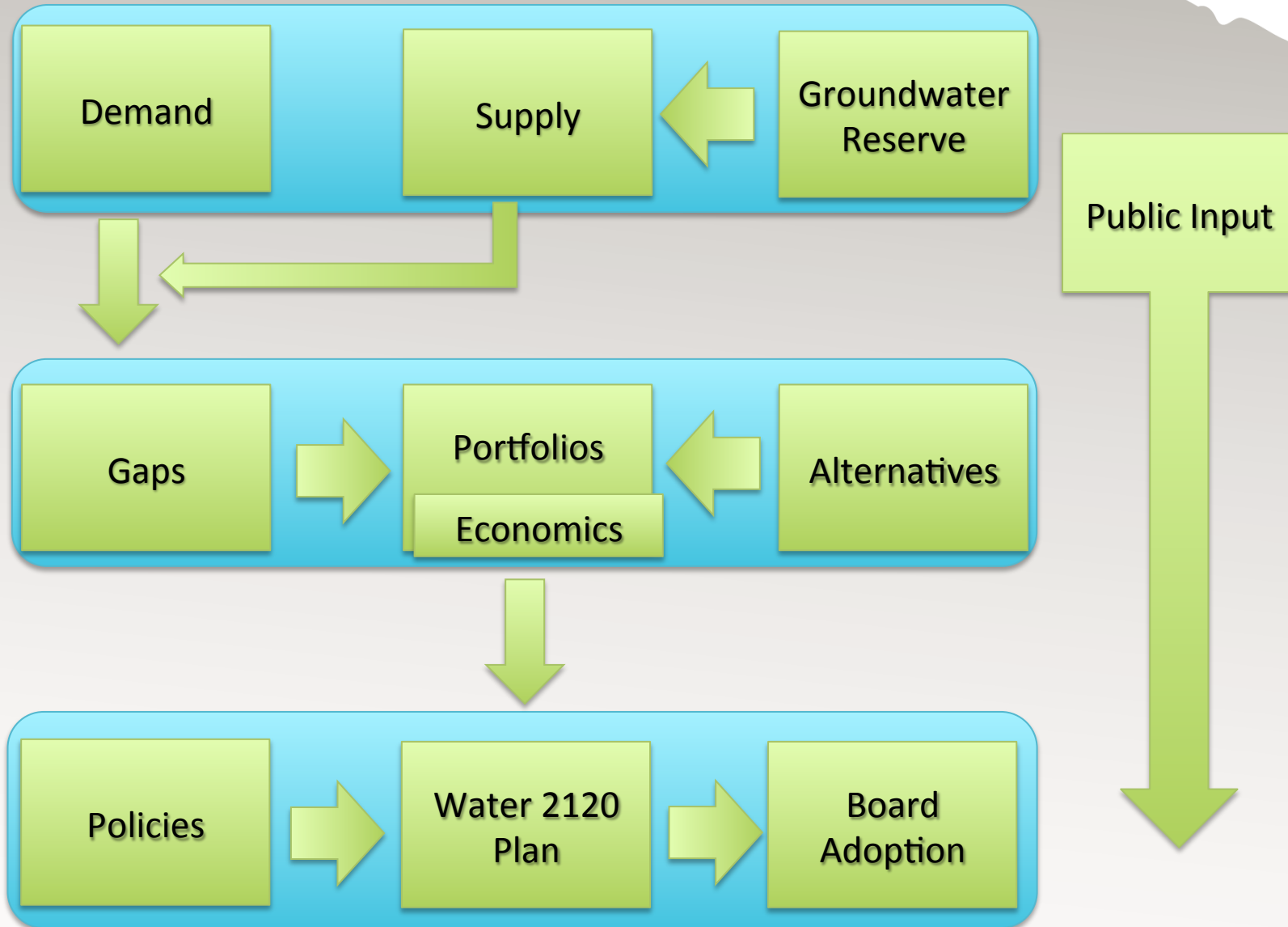
- Bear Canyon is operational, using North I-25 non-potable water
- Demonstration project for large-scale ASR – permit submitted

The Aquifer is Rising

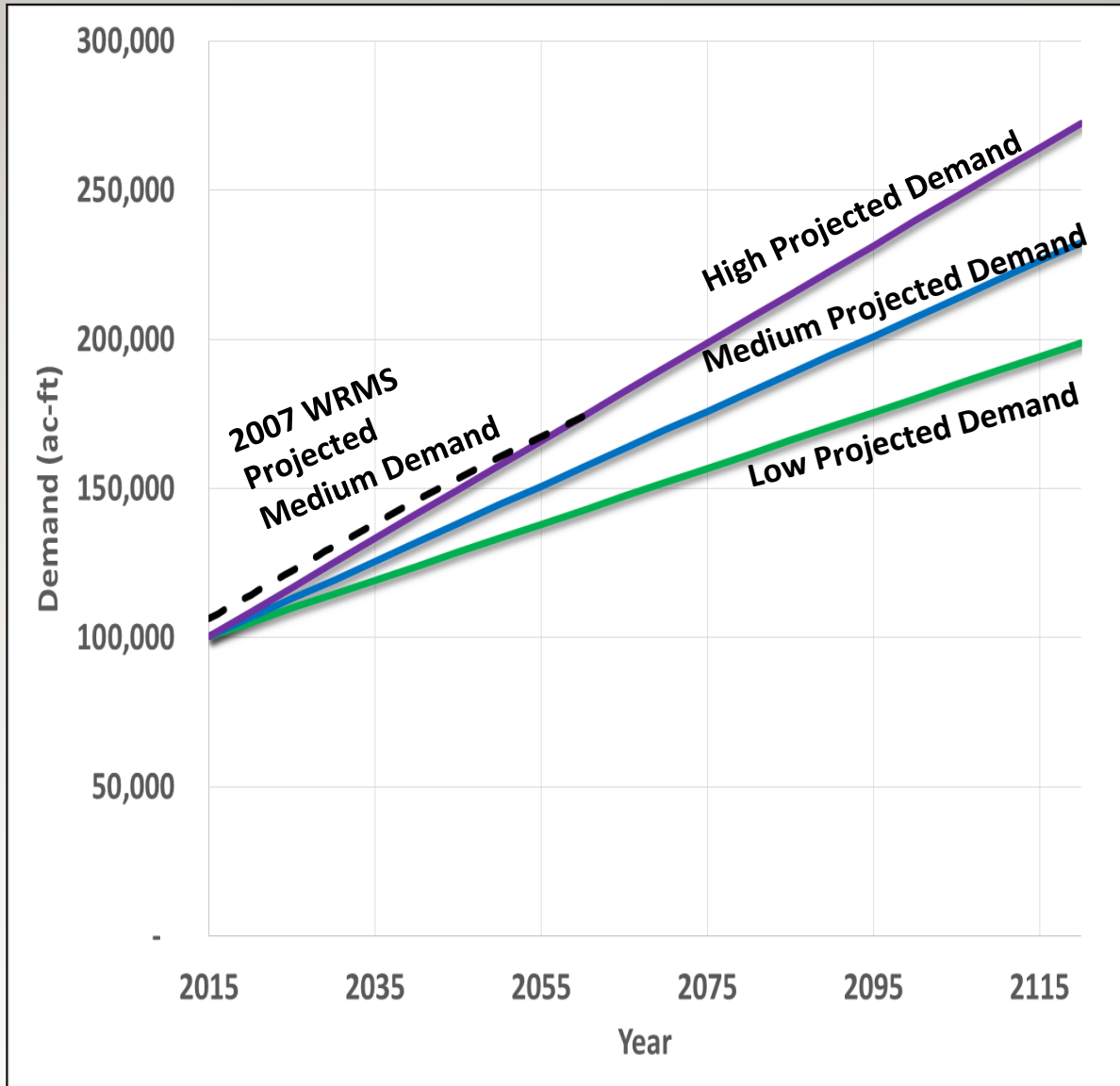


Road Map for the Process

Framework for the Future

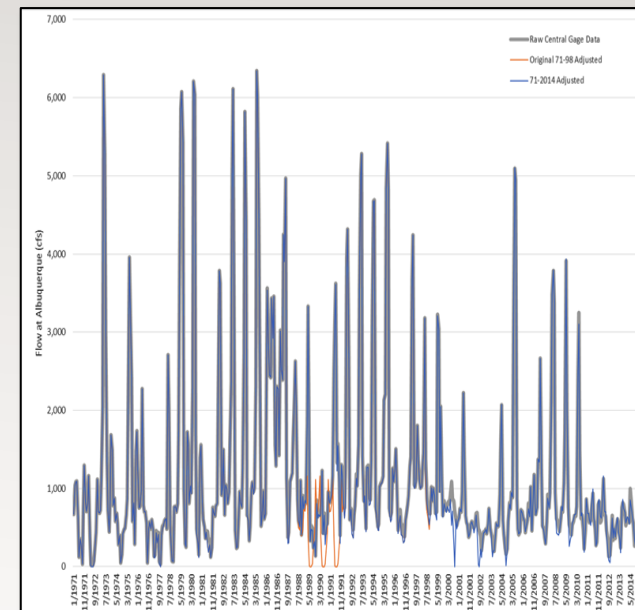
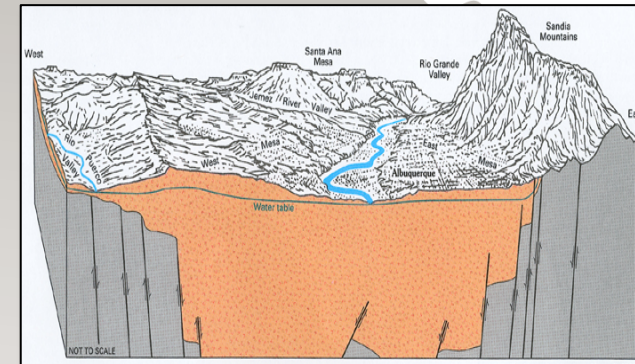


Range of Projected Demand

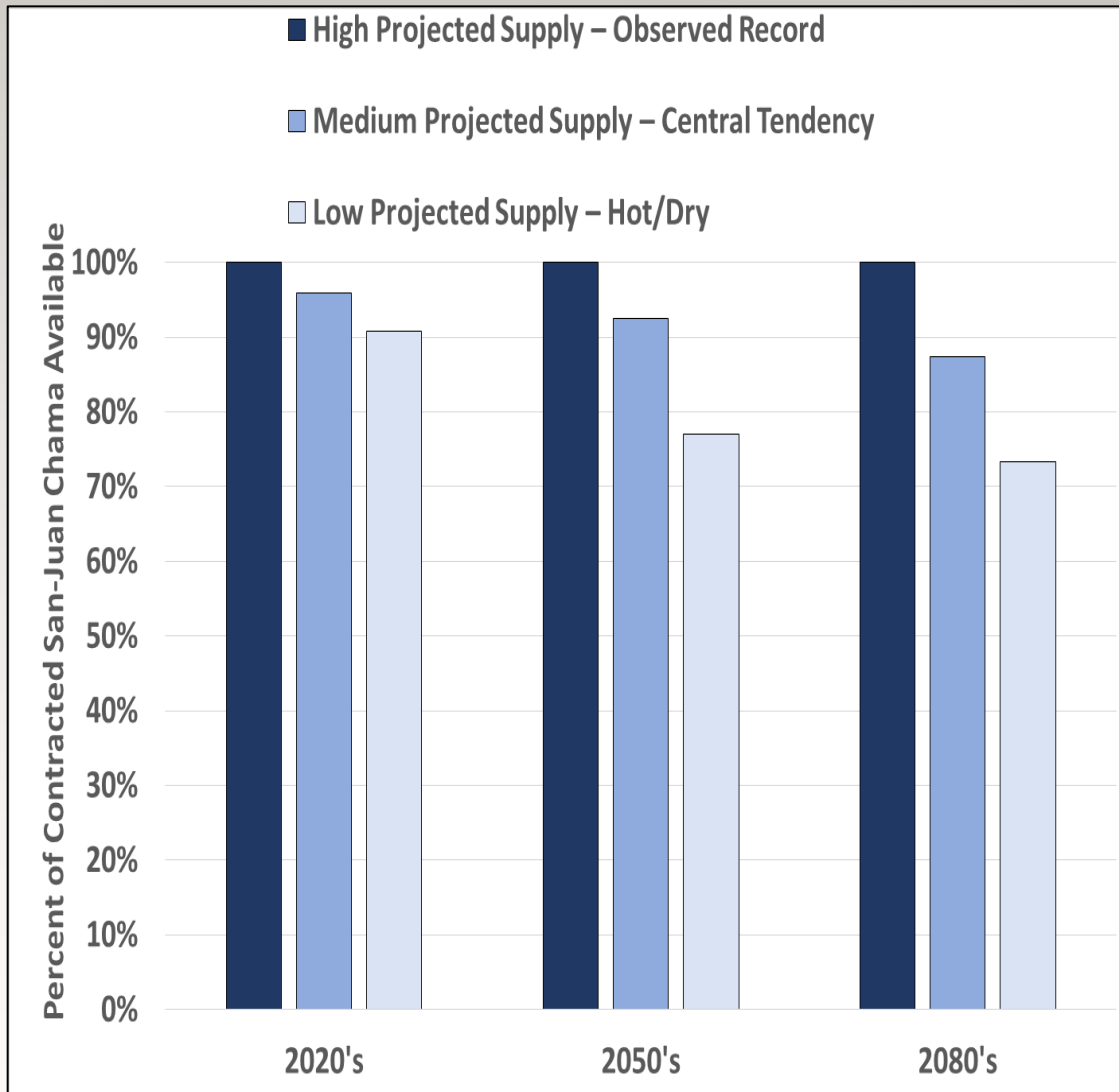


New Information on Supply

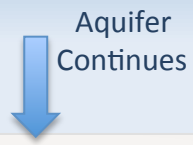
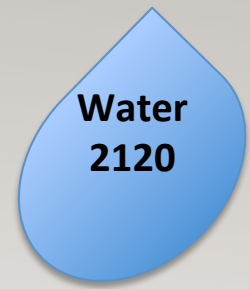
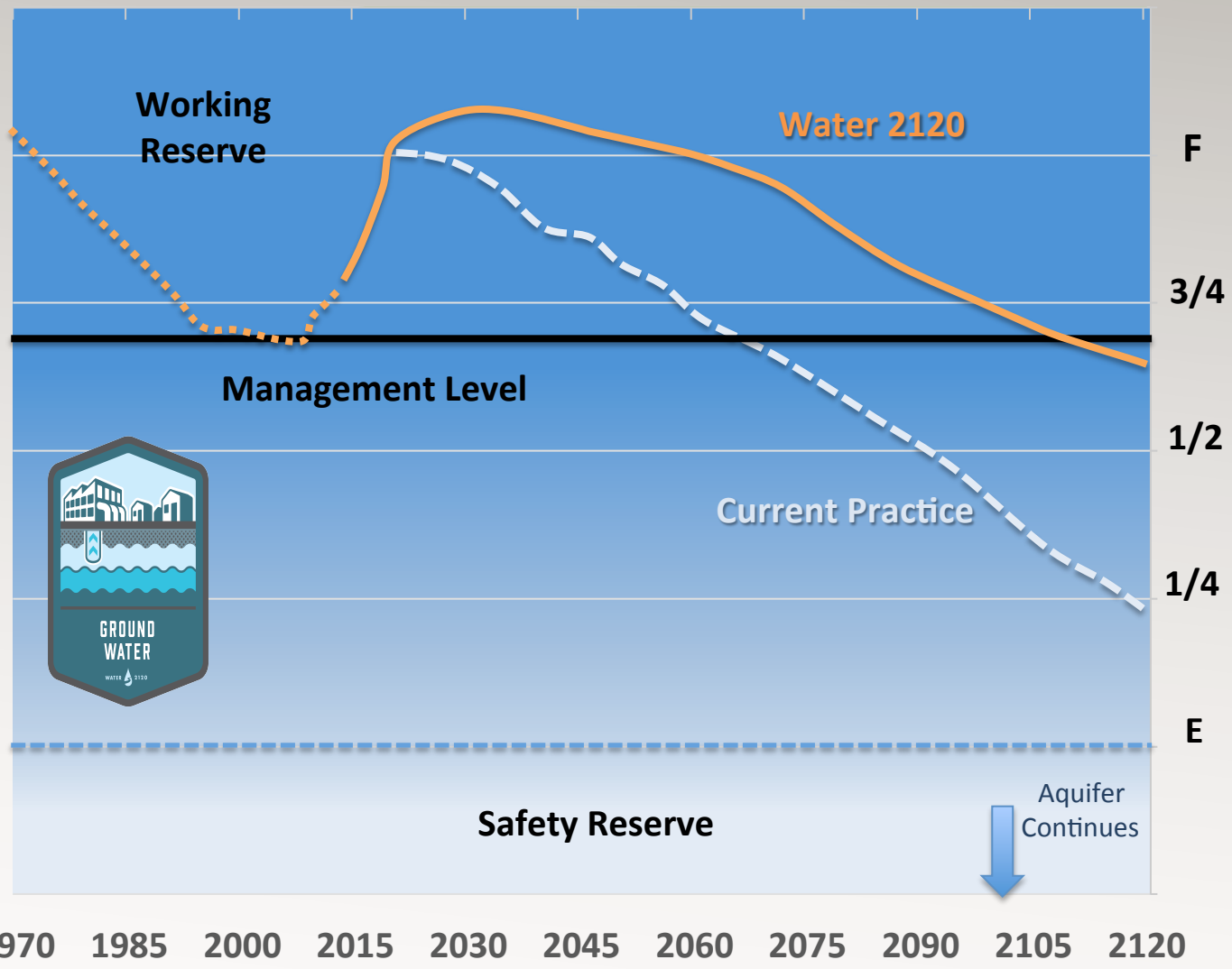
- Groundwater levels are known with relatively high certainty
- Surface water - we have developed time series of flow for low, medium, and high surface water supply – highly variable
- We considered the observed record, as well as potential climate variability



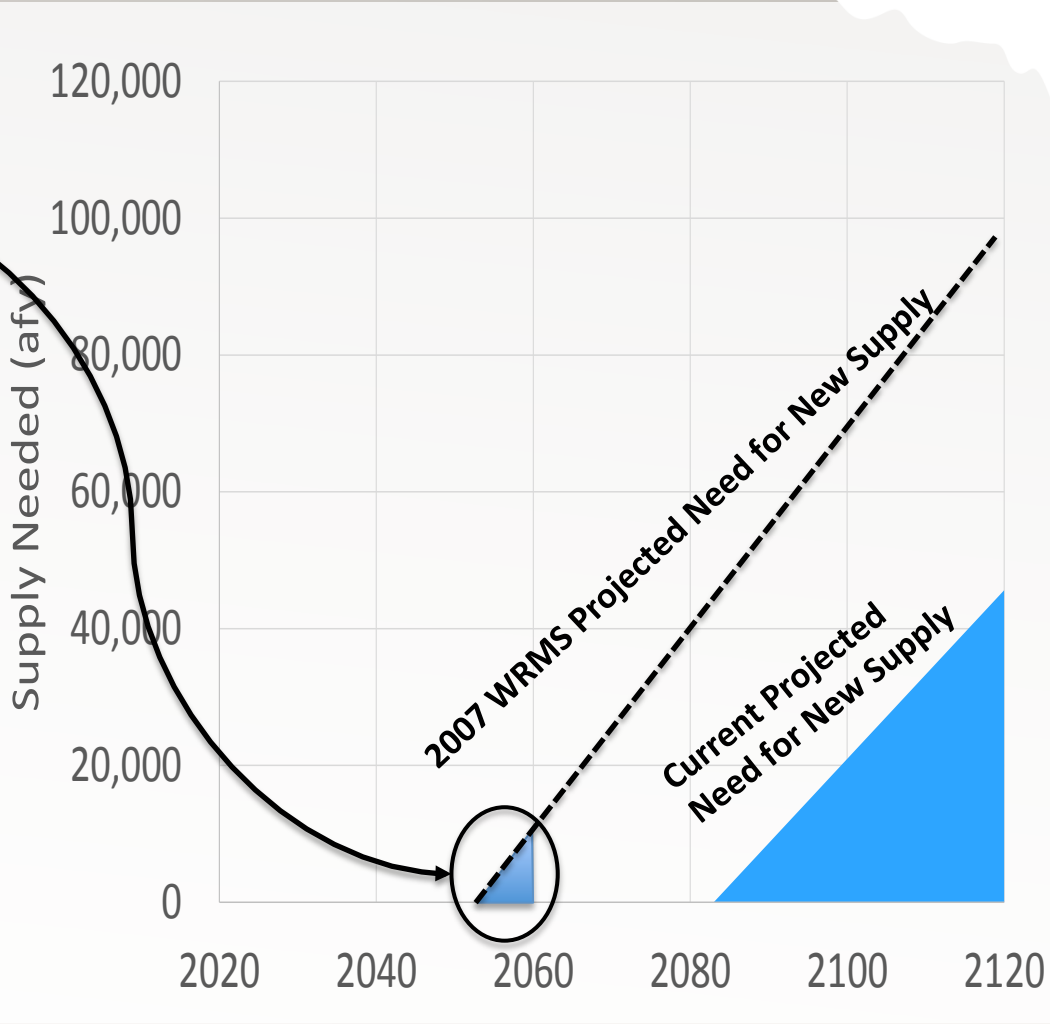
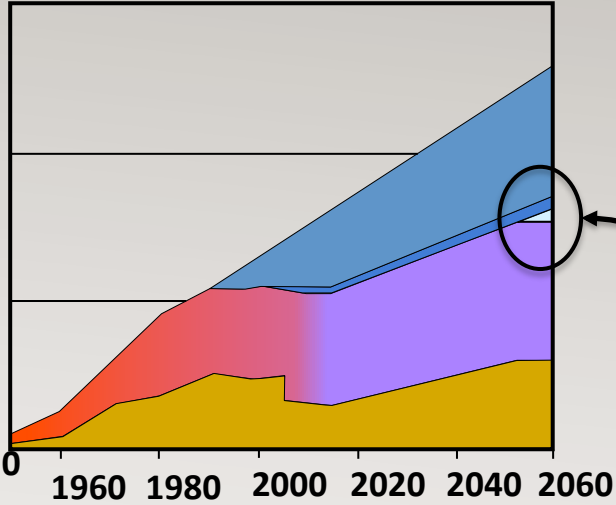
Supply Projections Include Historical and Climate Change



Groundwater Reserve Management

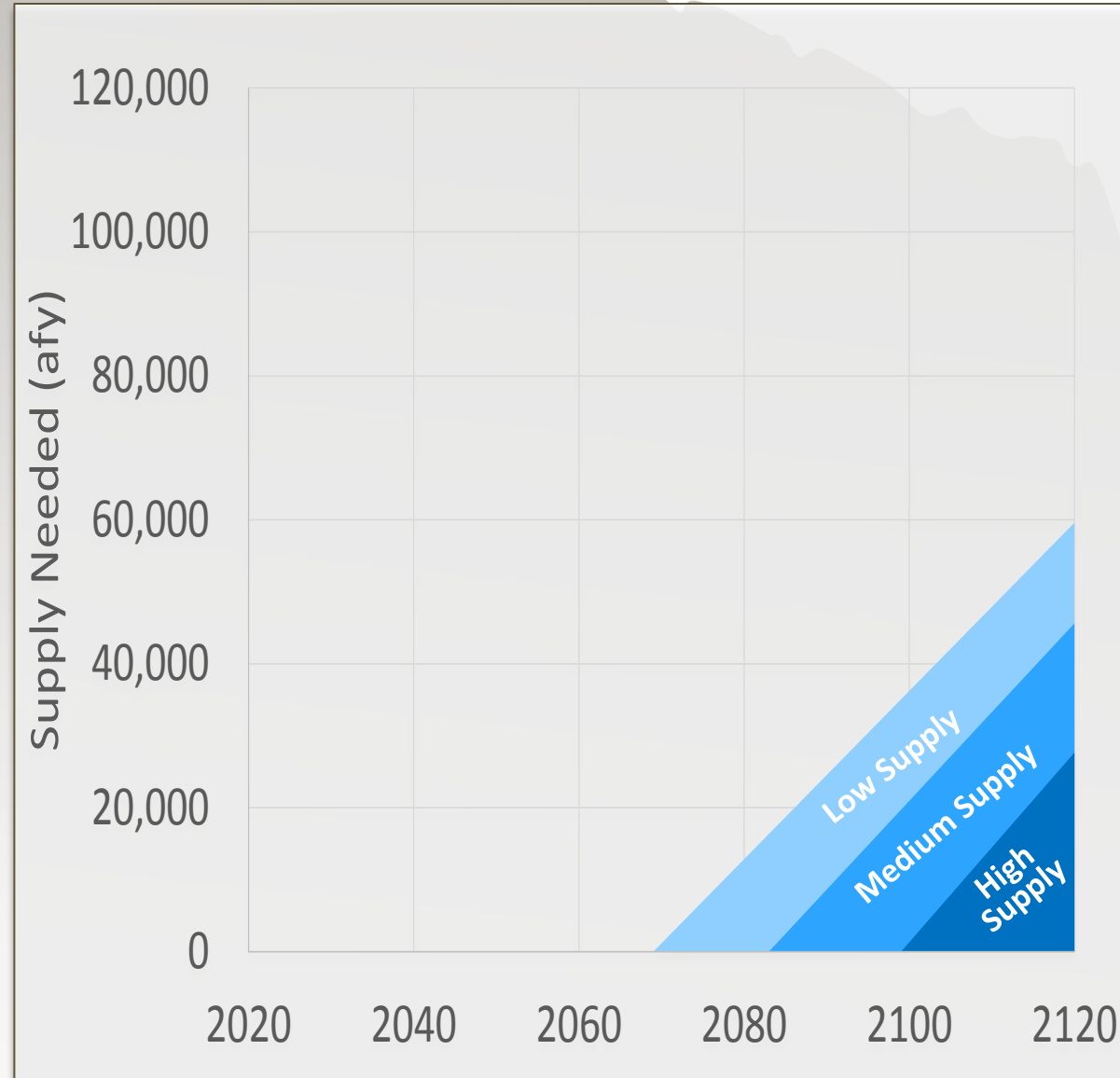
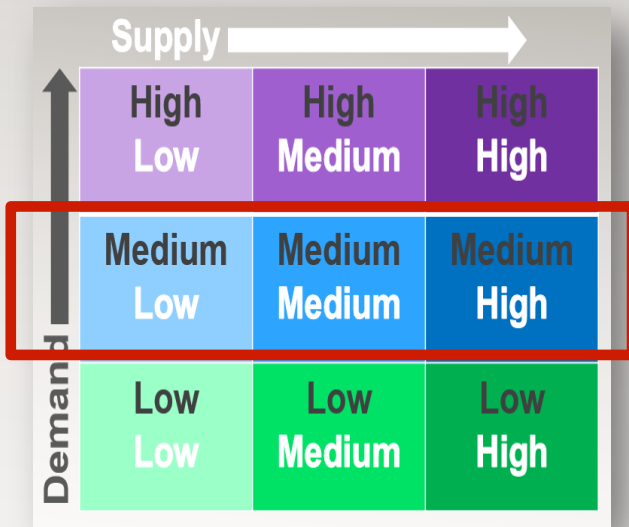


Current Projected Supply Need



	Supply →		
Demand ↑	High Low	High Medium	High High
	Medium Low	Medium Medium	Medium High
	Low Low	Low Medium	Low High

Range of Projected Supply Need: *Medium Demand*



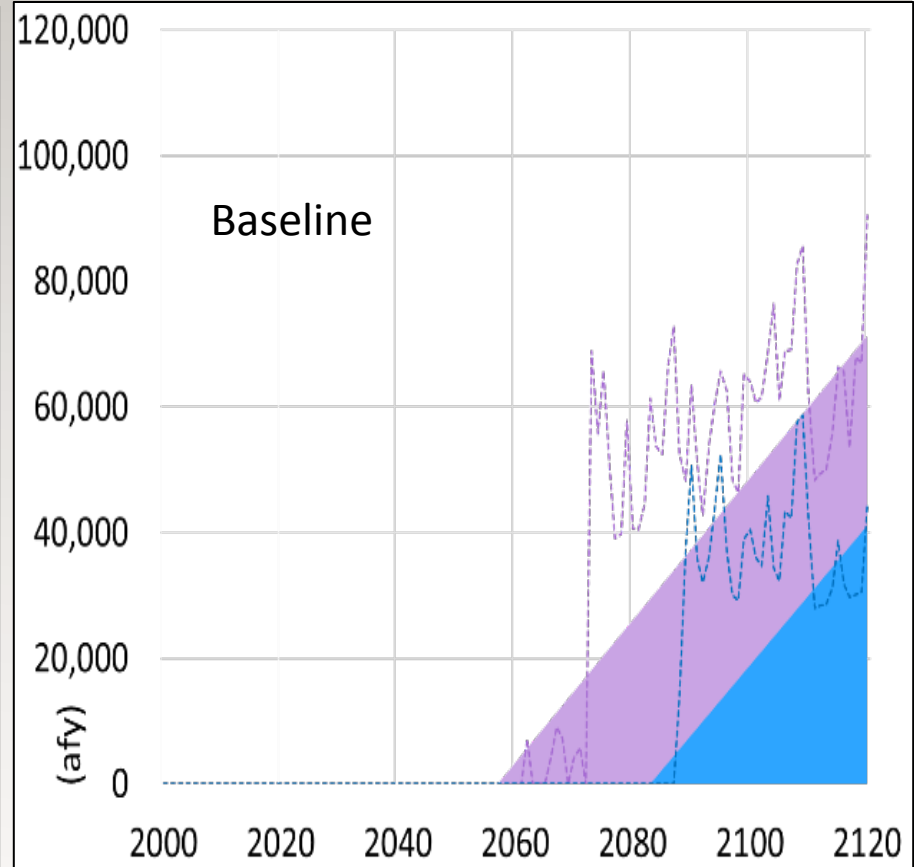
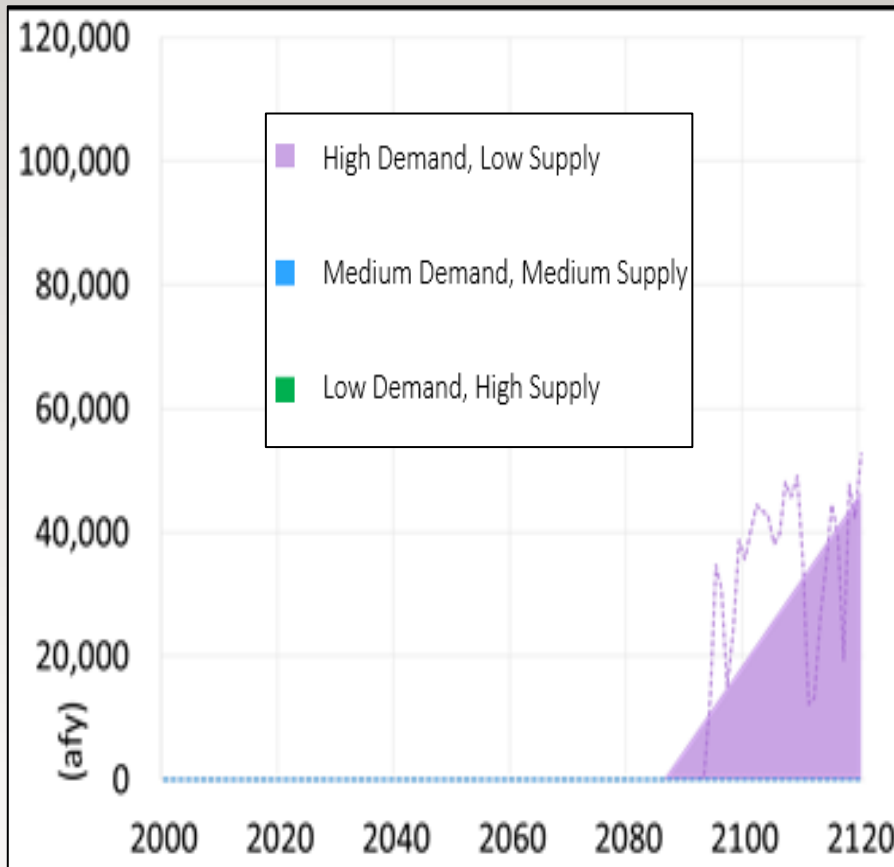
Meeting the Demand

Portfolio 1

- Existing supplies (groundwater and surface water)
- Conservation – 110 GPCD in 20 years
- Reuse – includes ASR and/or new storage
- Connect North I-25 Nonpotable to Southside Reuse
- Storm water capture
- Indirect potable reuse
- Watershed management

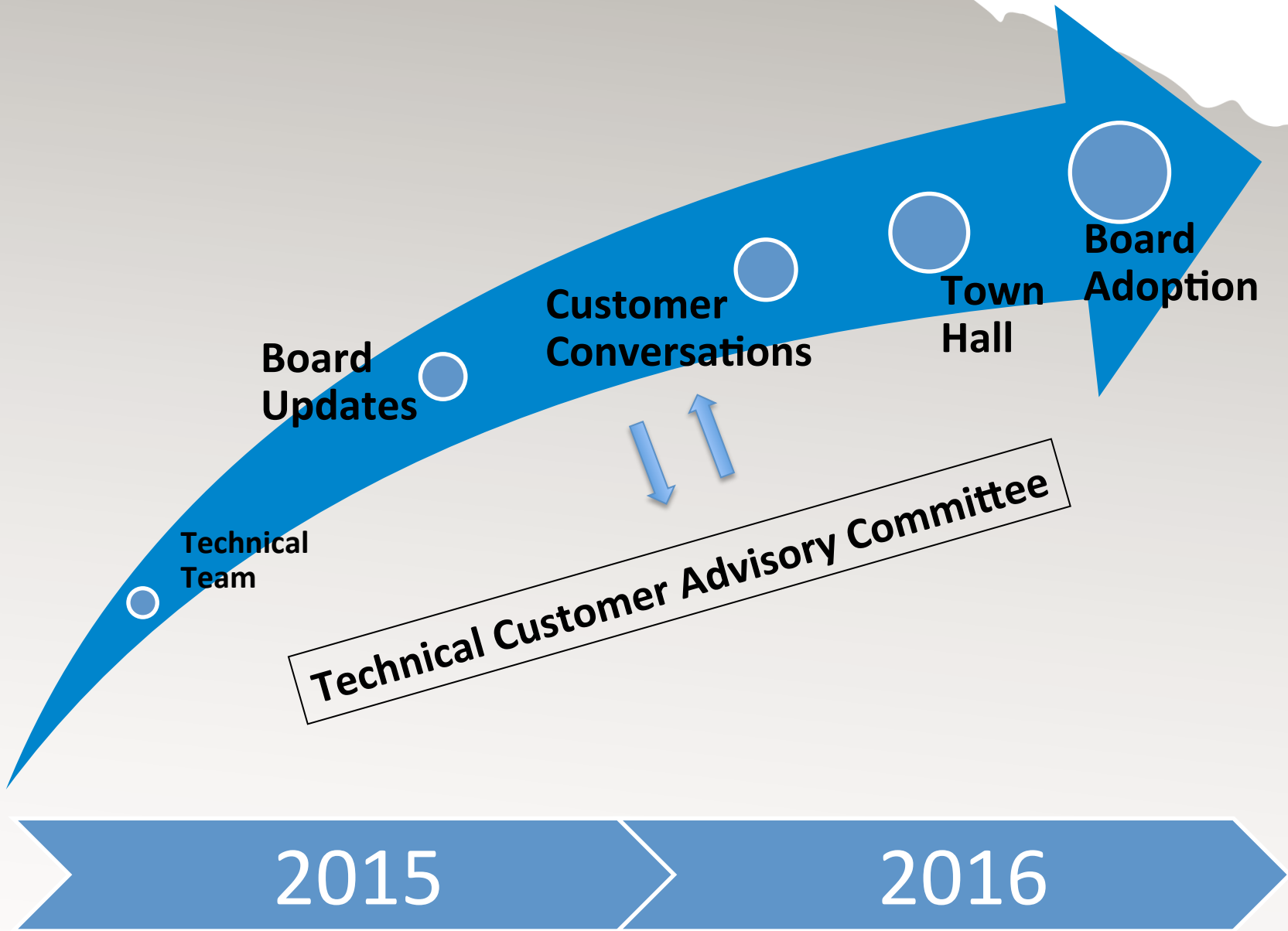
Portfolio 1 Performance

Supply Gaps



Example Results – Do Not Quote or Cite

Questions?





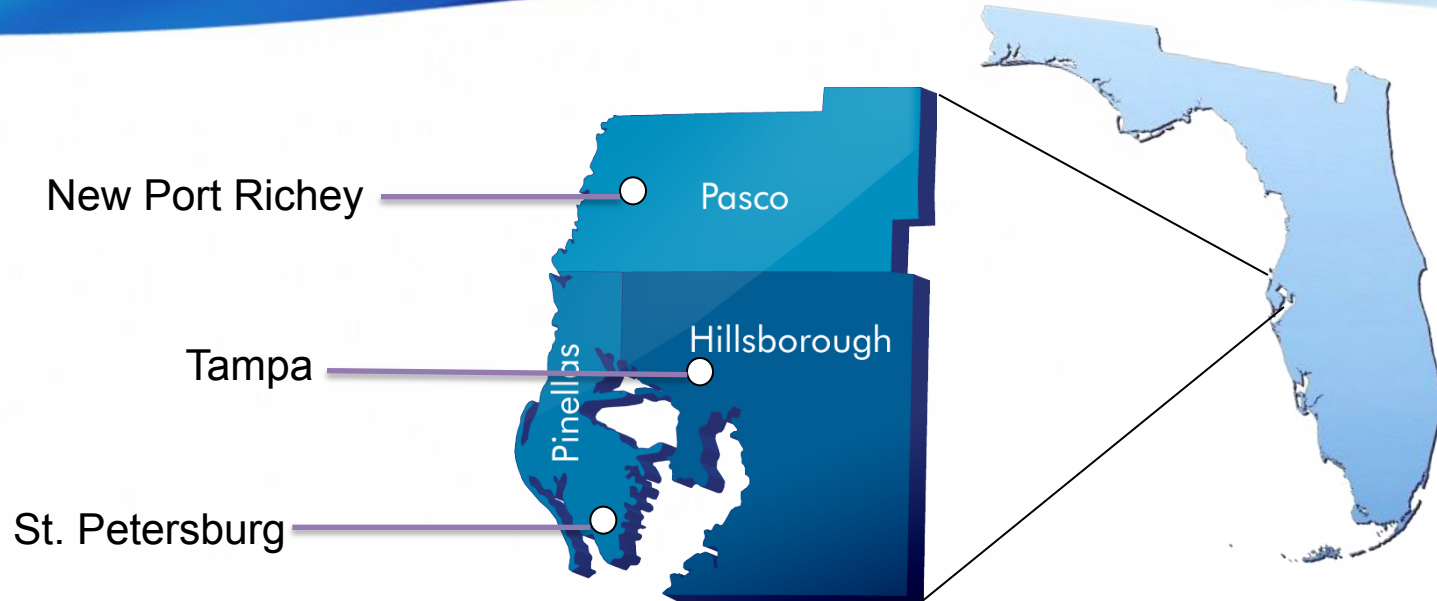
Building Resiliency Through Innovation at Tampa Bay Water

AMWA Innovation Series
February 28, 2017

Purpose and Agenda

- **Purpose – Describe approaches at Tampa Bay Water to build resiliency through innovation**
- **Agenda**
 - **Background**
 - **Agency's Challenges**
 - **Roles Innovation Plays**
 - **Case Examples**
 - **Summary**

Who We Are

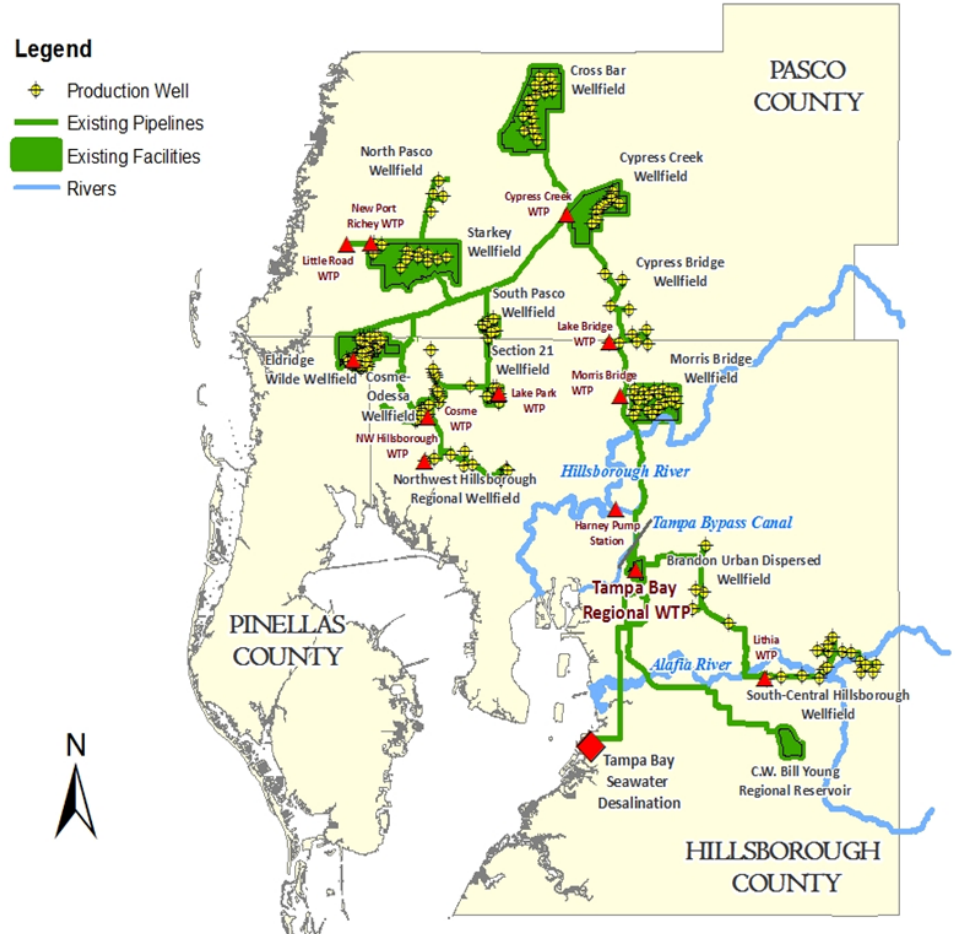


Tampa Bay Water Service Area Facts

- **Exclusive wholesale water provider for six Member Governments – serving 2.4 million residents**
- **Diverse water supply system, groundwater, surface water and desalinated seawater**
- **Regional water demand – 236 MGD**

Tampa Bay Water's Diverse Integrated System

- 13 groundwater wellfield (permitted 121 mgd annual average)
- 120 mgd capacity surface water treatment plant (two river intakes)
- 15.5 BG off-stream reservoir
- 25 mgd capacity desalination plant



Today's Challenges for Tampa Bay Water

- **Meeting short-term and long-term water demands**
- **Operating a very diverse portfolio of supplies**
- **Climate change**
- **Achieving environmental recovery**
- **Asset Management and Renewal & Replacement**
- **Doing all this without increasing rates!!!!**

What do we do to overcome these challenges

- **Multi-time scales decision support tools**
 - Demand forecasting and supply planning
- **Optimized Regional Operations Plan – optimizes production to achieve environmental recovery**
- **Incorporating climate change into decision making**
- **Implementing an Asset Management program**
- **Our fixed and variable rate structure**

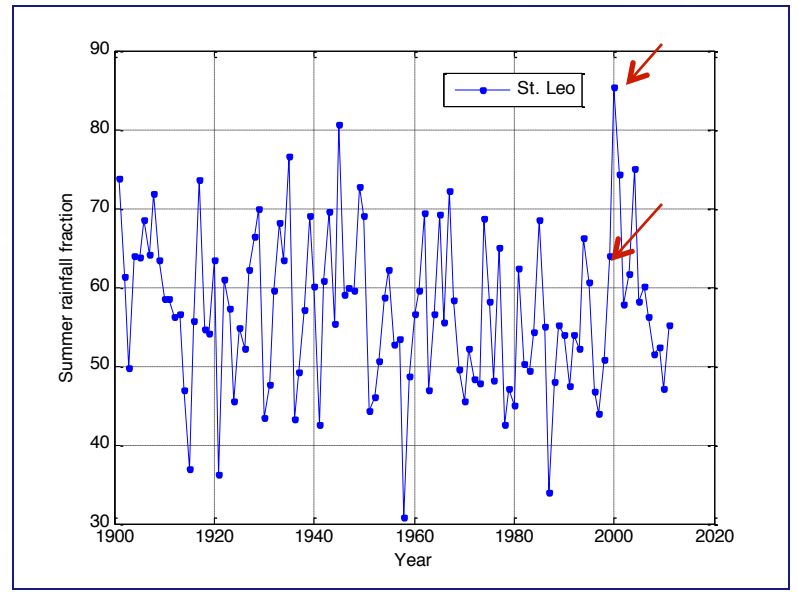
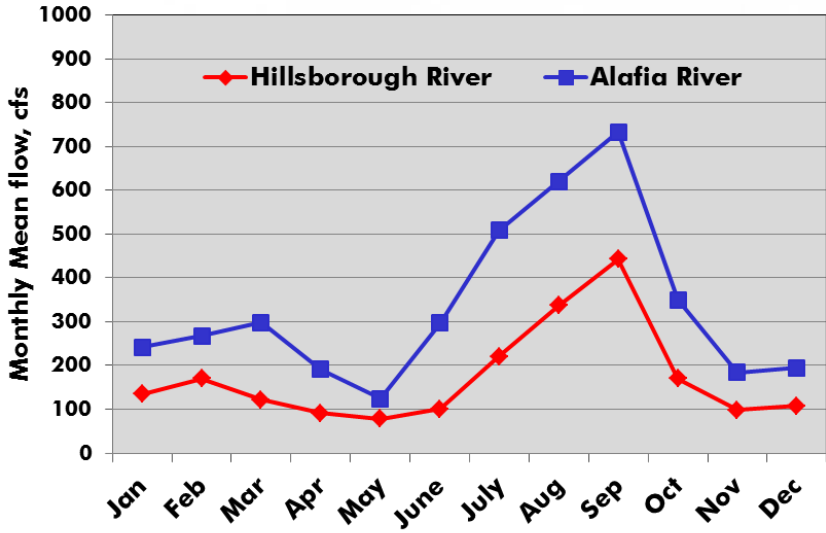
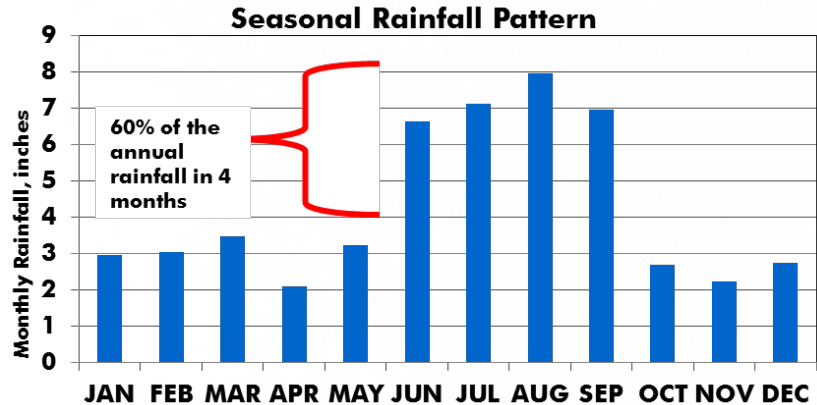
How does the Agency use innovation to accomplish this

- **Building in-house expertise in modeling and data analysis**
- **Building multi-disciplinary working teams**
- **Building collaborative relationships with research and professional partners**
- **Investing in computational capabilities**
- **Investing in SCADA and advanced hydrologic data collection networks**
- **We recover all expenses except chemical and electric through fixed charges to members**

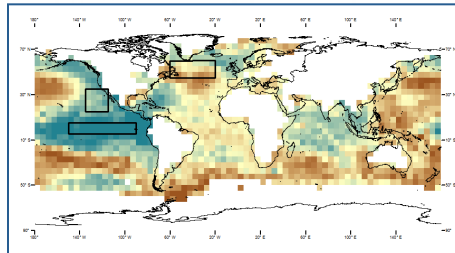
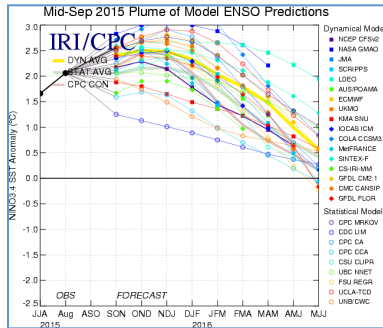
Case Study Examples

- **Seasonal Surface Water Forecasts incorporating climate variability**
- **Incorporating climate change into long-term hydrologic investigations**
- **Internal and external collaborations**

Why Climate Variability is Important



Seasonal Outlook Models and Analysis Developed by Staff to improve reliability



Tampa Bay Climate Outlook: October 6, 2015

El Niño Advisory:

El Niño in place!

Climate Outlook

Some of the Niño indices continue to warm up during the month of September with the latest weekly data showing +2.3°C in Niño-3.4, +2.1°C in Niño-4, and +2.7°C in Niño-1.2. Models continue to indicate the existence of an El Niño through at least Spring 2016 (Figure 1). The state of ENSO is now -100% for El Niño through winter. Current conditions are indicators of what the upcoming fall winter would look like.

October-December

- 0% La Niña
- 0% Neutral
- 100% El Niño

Link Back

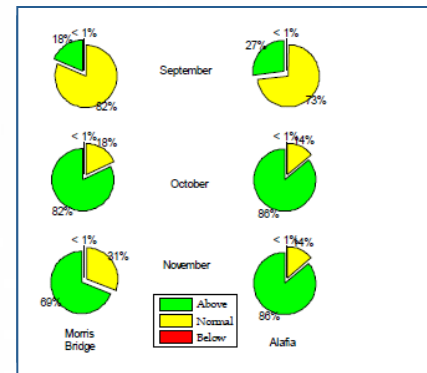
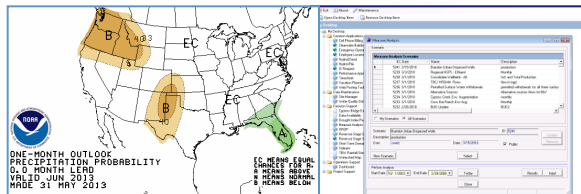
Last month, rainfall in Tampa Bay was 4.4 inches (2.7 below average). Plant City was 3.42 inches, Cypress Creek had 3.7 inches both below 25th percentile, consistent with the larger area (Figure 1). Flows were 355 mgd and 351 mgd, respectively, at Alafia and Hillsborough Rivers, corresponding to 28th and 58th percentile of historical flows, respectively, continuing to provide significant flow even though rainfall was below normal.

Figure 1 September rainfall departures from normal.

Climate Outlook & Observation

ENSO Rainfall Contingency Table

Weather-based Rainfall Model



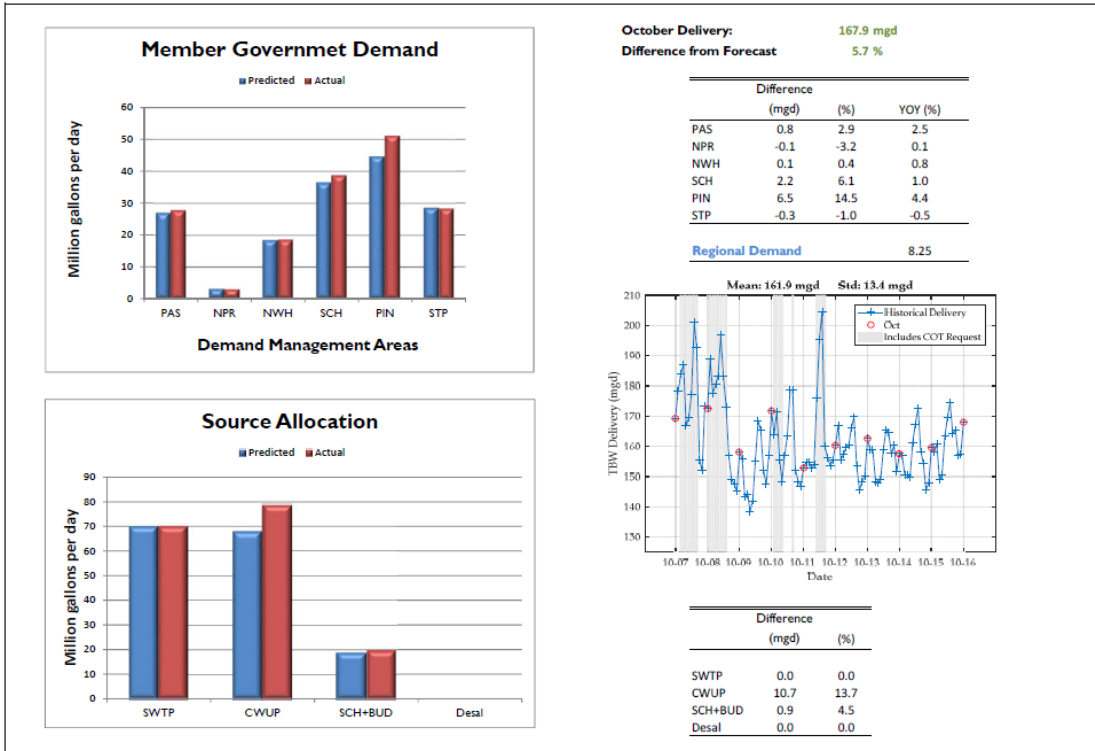
Rainfall/Runoff Model

Monthly Source Allocation Performance

Staff developed data analysis to track predictions and assess how well models perform

Improves our seasonal operations even under weather variability

Table 1. October Demand/Supply Allocation



Long-term Climate Projection Analysis Framework

Global Climate Models Scales and Process Are Too Large
(Historic simulations and Future projections)

Downscaling translates global climate model responses to finer spatial scales which are needed for local/regional hydrologic analysis

Dynamical Downscaling

Statistical Downscaling

Evaluation of climate information over Florida

Integrated Hydrologic Model

Tampa Bay Water's Model

Impact assessment

Findings for the Region Based on Research to Date

- Temperature Results
 - Projections are consistent
 - **2 - 3 °C increase** of daily max and min temperature for future (2039~2069)
- Precipitation Results
 - Results for rainfall have not been consistent
 - Future rainfall projections ranged from **22% less rainfall to 11% more rainfall**
- Water Supply Implications
 - Potentially less surface water available
 - Additional research currently underway

Building an Asset Management Program through internal collaboration

- Developed an Asset Management Plan
- Created 8 cross-functional teams
- Created Team Charters with milestones
- Developed specific projects for action
- Monitored and tracked progress – lots of meetings



RISE

RESILIENT INFRASTRUCTURE,
SYSTEMS & EMPLOYEES



Summary and Take Aways

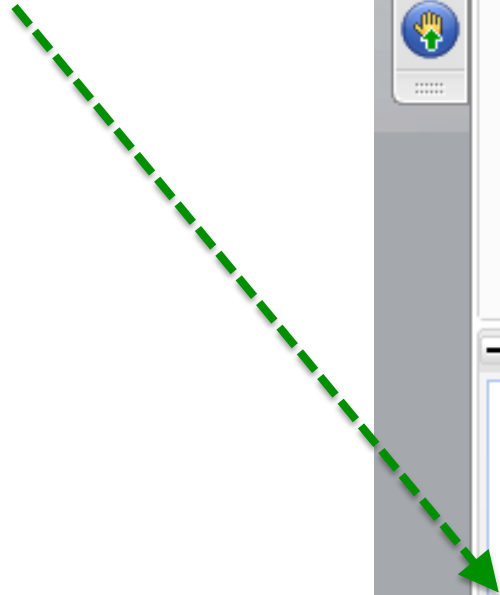
- **Resiliency needs to include organizational issues**
- **Innovation is a mix of technology and staff**
- **Invest in staff development and knowledge retention**
- **Collaboration is both internal and external**
- **Don't be afraid to push your comfort zone**

A landscape photograph of a sunset over a body of water. The sun is a bright yellow-orange orb just above the horizon, surrounded by a thick layer of orange and yellow clouds. The sky above is a clear, deep blue. In the foreground, there are several clumps of tall, thin reeds or grasses, their dark silhouettes reflected in the calm water. The overall mood is serene and contemplative.

Questions?

How to Ask a Question

Type and send your question.



The screenshot shows a software interface with a menu bar (File, View, Help) and a sidebar with icons for navigation, microphone, video, and hand. The main area is divided into two panels:

- Audio Panel:** Contains a telephone icon, radio buttons for "Computer audio" and "Phone call" (selected), and fields for "Dial: +1 (XXX)-XXX-XXXX", "Access Code: XXX-XXX-XXX", and "Audio PIN: X". It also includes the text "Already on the call? Press #X# now." and a link "Problem dialing in?".
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Questions?

Poll Question #2

Open Discussion

We would like to use this innovations series as a conduit for sharing about innovation generally within the water utility sector.

Question for discussion:

- *In what way(s) is your utility innovating? Please provide a specific example, or alternatively, let us know how innovating has proven to be challenging for your agency.*

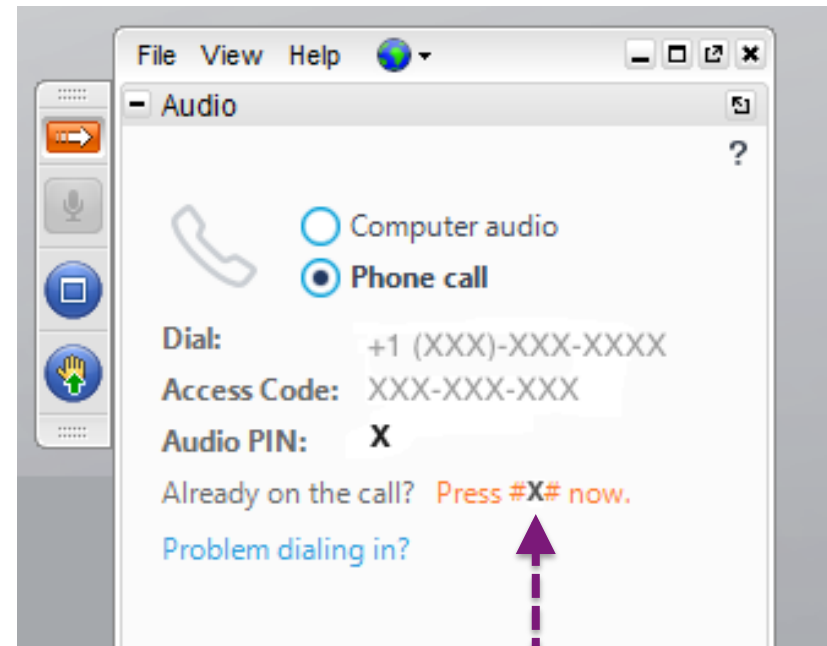
All lines will be unmuted. Please raise your hand to be recognized.

How to Raise Your Hand

Raise your hand 

Make sure your phone is unmuted.

We will unmute your audio connection and call on you.



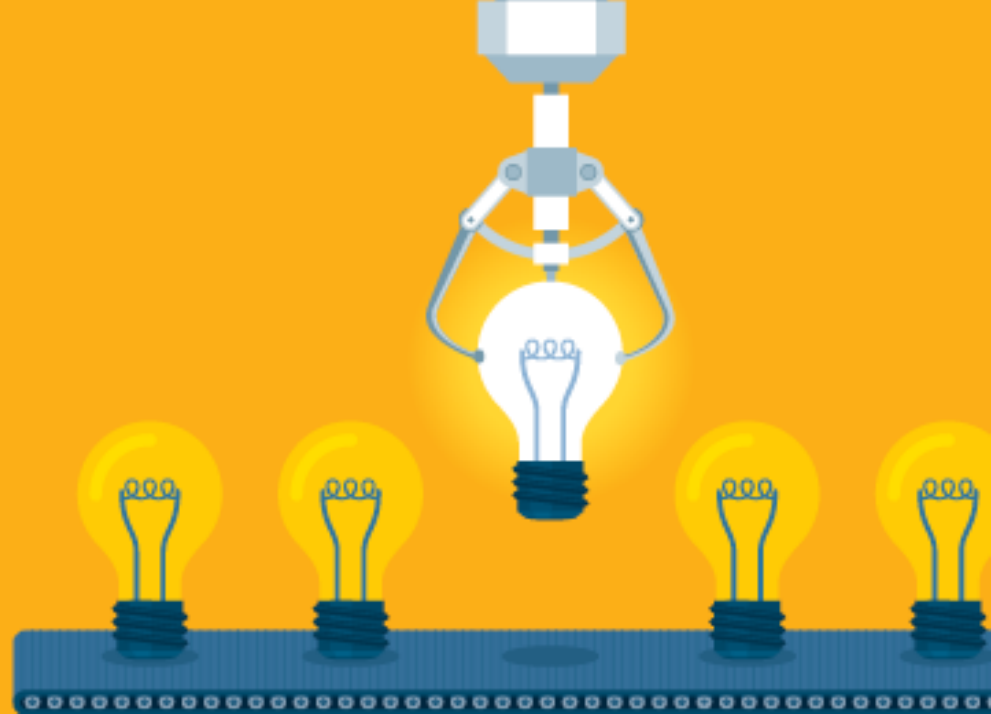
If you dialed in, enter your Audio PIN on your phone keypad if you did not when you logged in.



ASSOCIATION OF
METROPOLITAN WATER AGENCIES

INNOVATION SERIES

**Tuesday, February
28 from 3-4 p.m. ET.**



Thank you.

Contact AMWA with questions:

Erica Brown

202-331-2820

brown@amwa.net