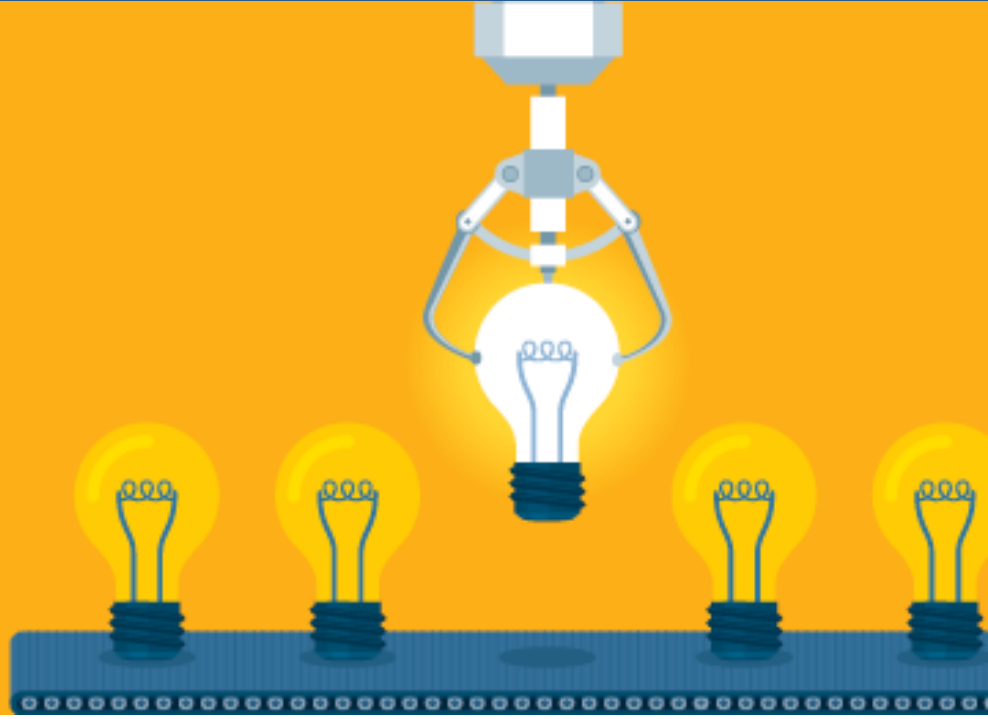
ASSOCIATION OF METROPOLITAN WATER AGENCIES

INNOVATION SERIES

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



Welcome

INNOVATIONS SERIES WEBINAR

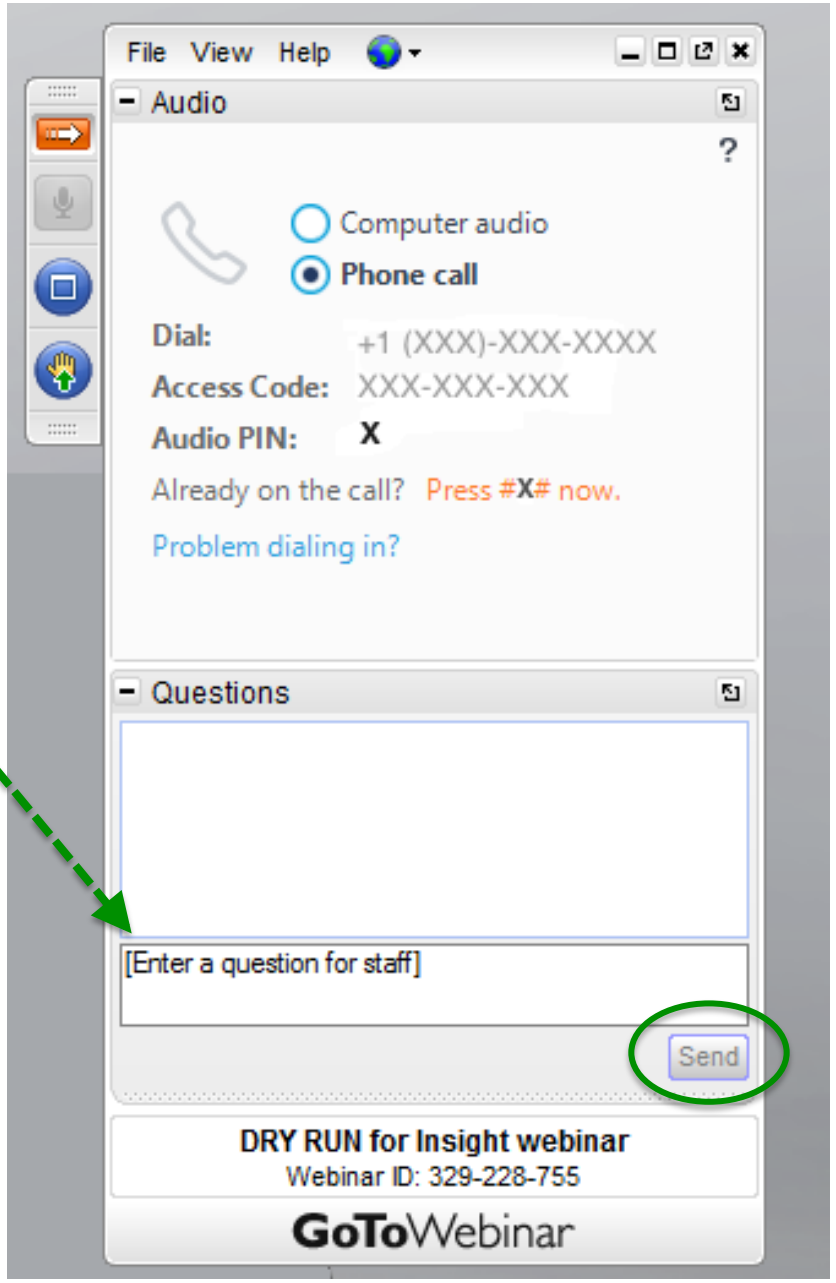
(All phone lines are muted for now)

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.



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

ASSOCIATION OF METROPOLITAN WATER AGENCIES

Diane VanDe Hei
CEO
Association of Metropolitan Water Agencies

Poll Question #1

Albuquerque Bernalillo County
Water Utility Authority

WATER 2120
SECURING OUR WATER FUTURE

Water 2120: Securing Our Water Future

AMWA WEBINAR INNOVATION SERIES
FEBRUARY 28, 2017

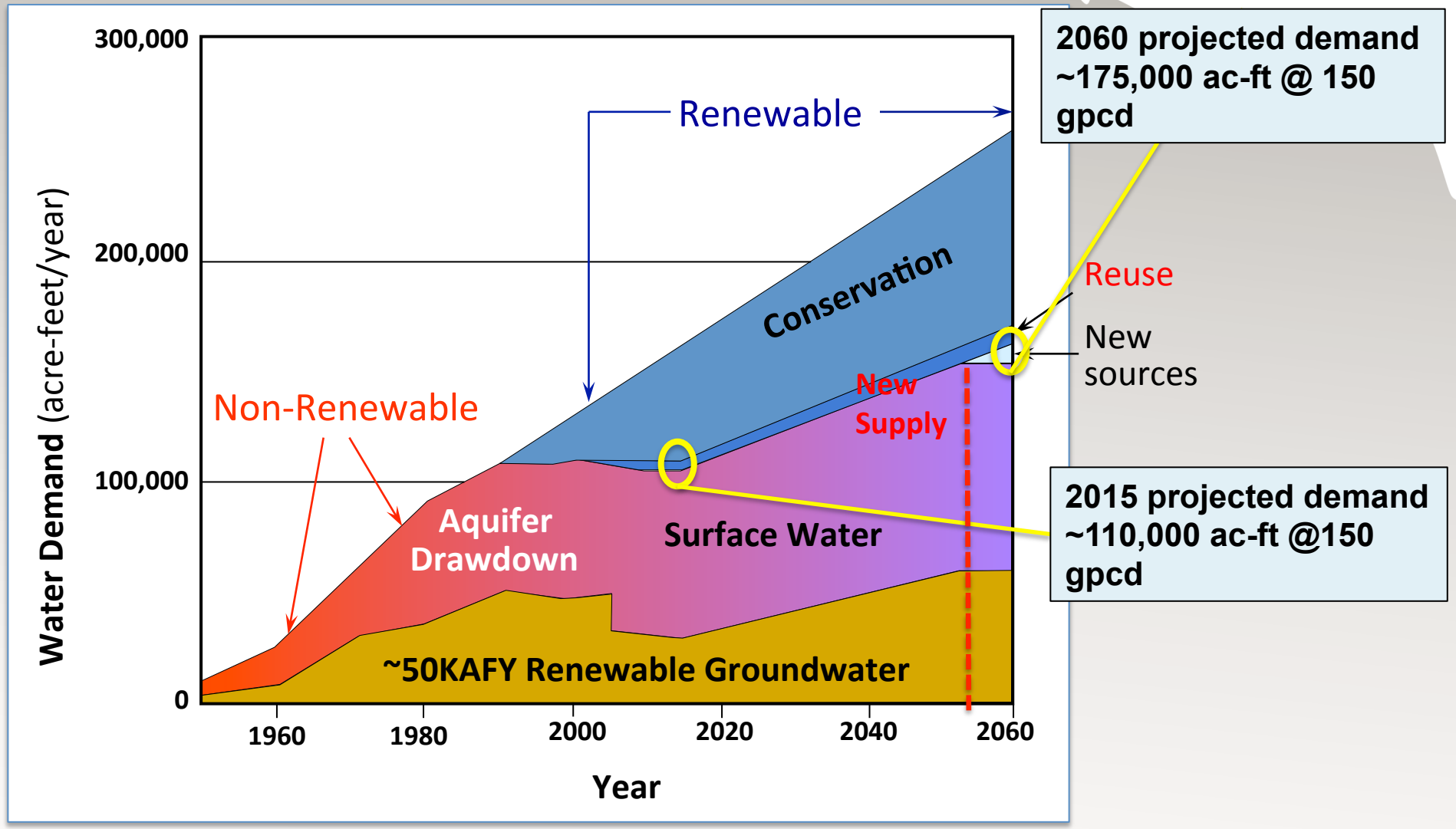
Need for Updated Strategy

Albuquerque Bernalillo County Water Utility Authority

- 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

Albuquerque Bernalillo County Water Utility Authority



2015 actual demand ~95,000 ac-ft

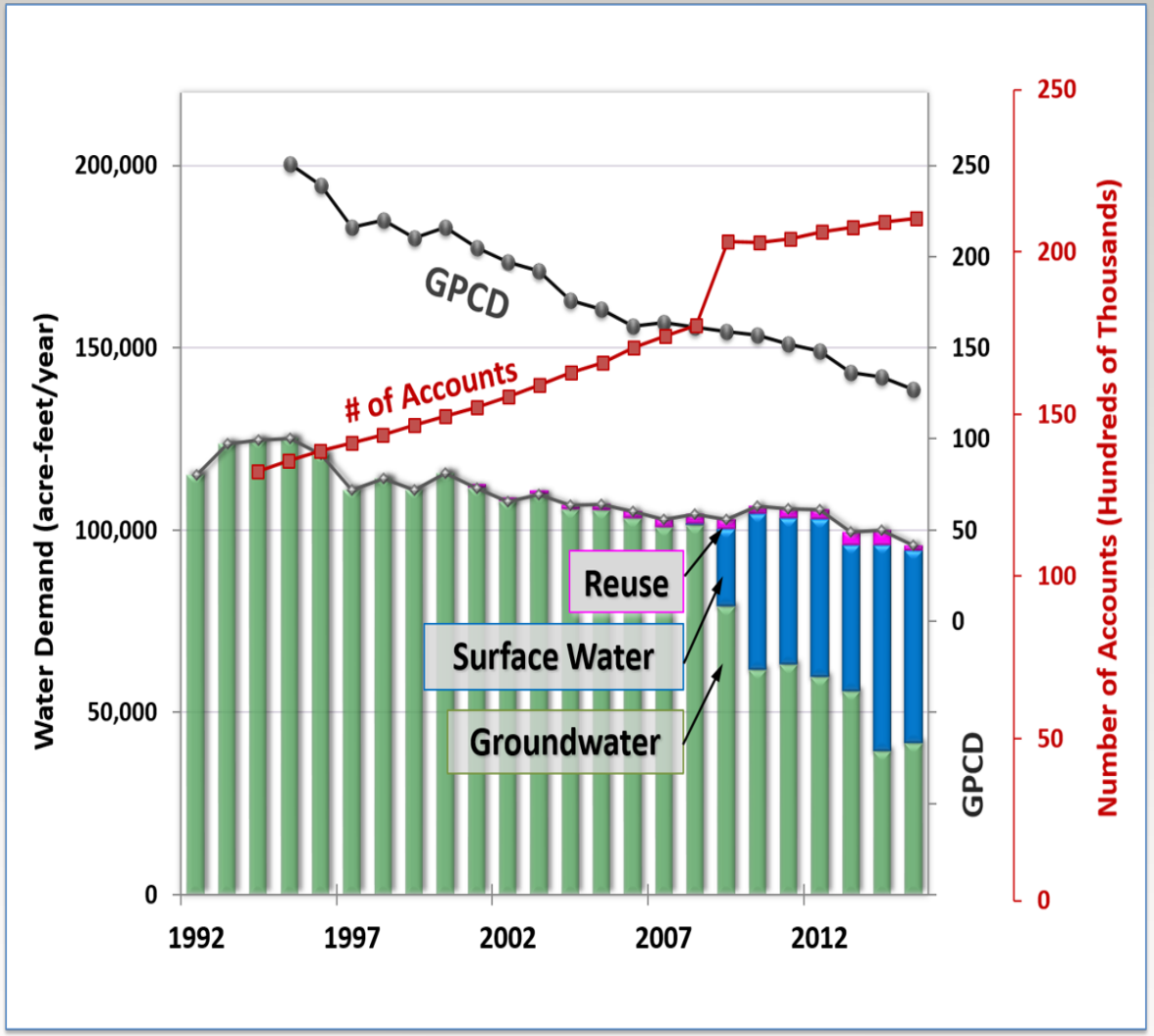
2007 WRMS Status Report

Albuquerque Bernalillo County Water Utility Authority

- 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

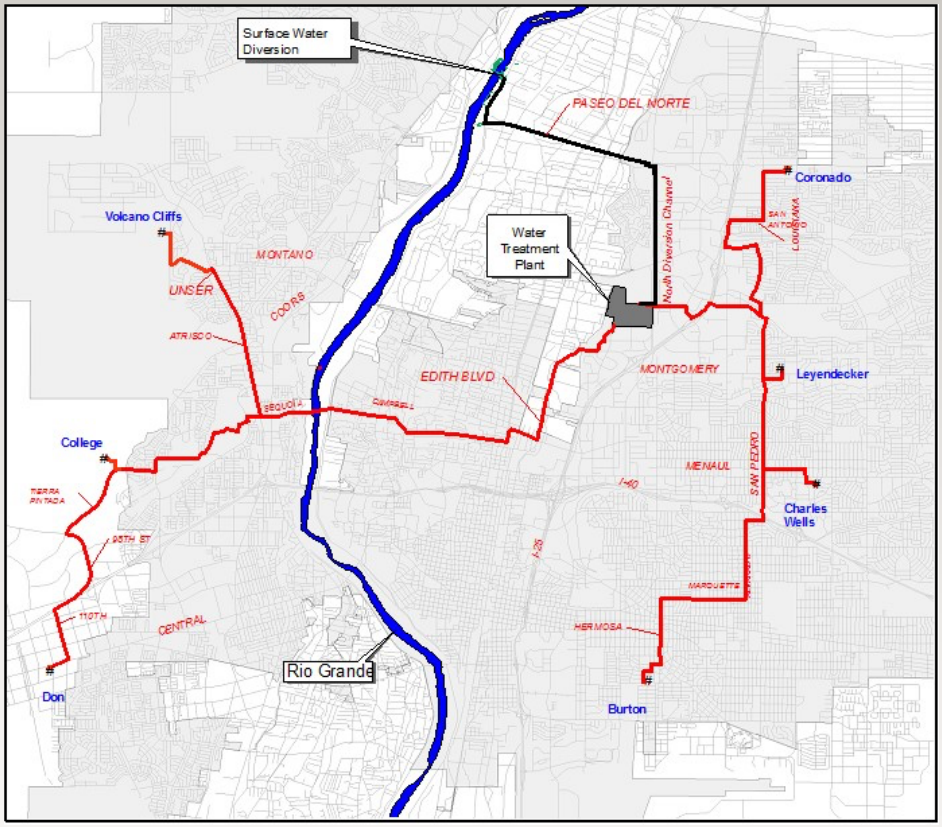
Water Usage is Decreasing Even as the System has Grown

Albuquerque Bernalillo County
Water Utility Authority



Drinking Water Project Implemented

Albuquerque Bernalillo County Water Utility Authority



Multiple Benefits

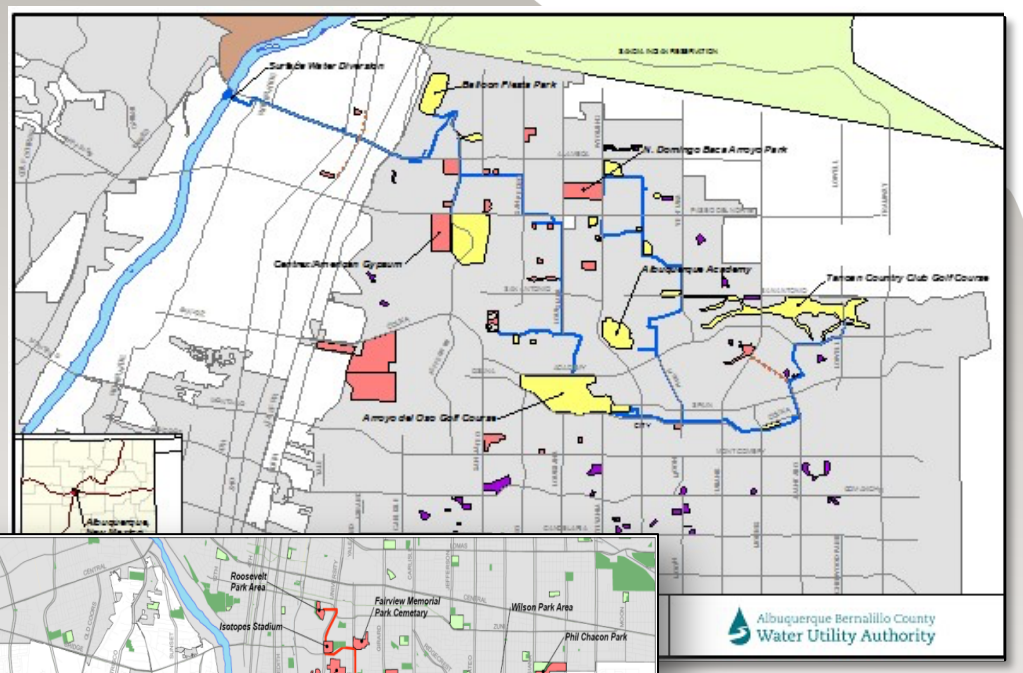
- Co-locate wells near transmission pipelines for ASR
- New infrastructure can move supply throughout the system
- Reduced need for arsenic treatment

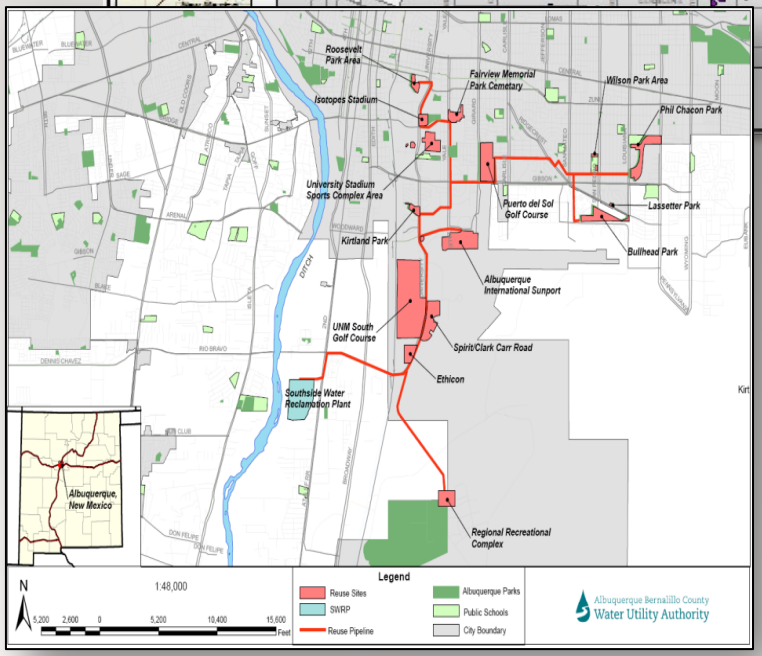
Reuse Continues to be Implemented

Albuquerque Bernalillo County Water Utility Authority

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**

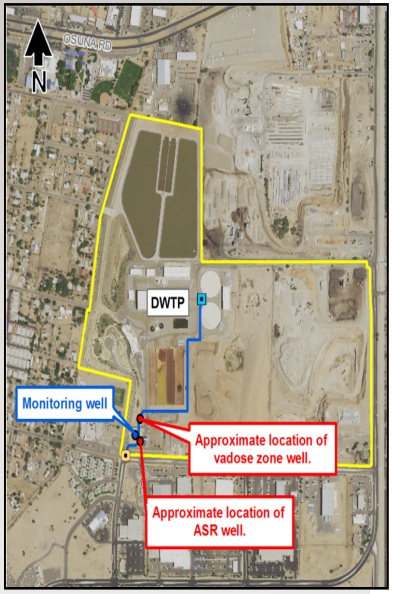


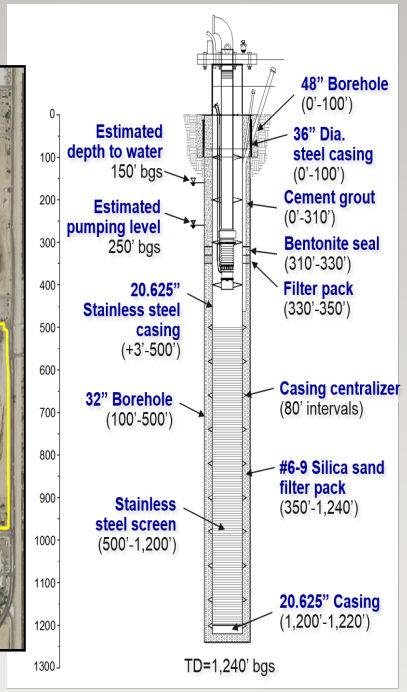


ASR is Being Implemented

Albuquerque Bernalillo County Water Utility Authority

Injection Well Design



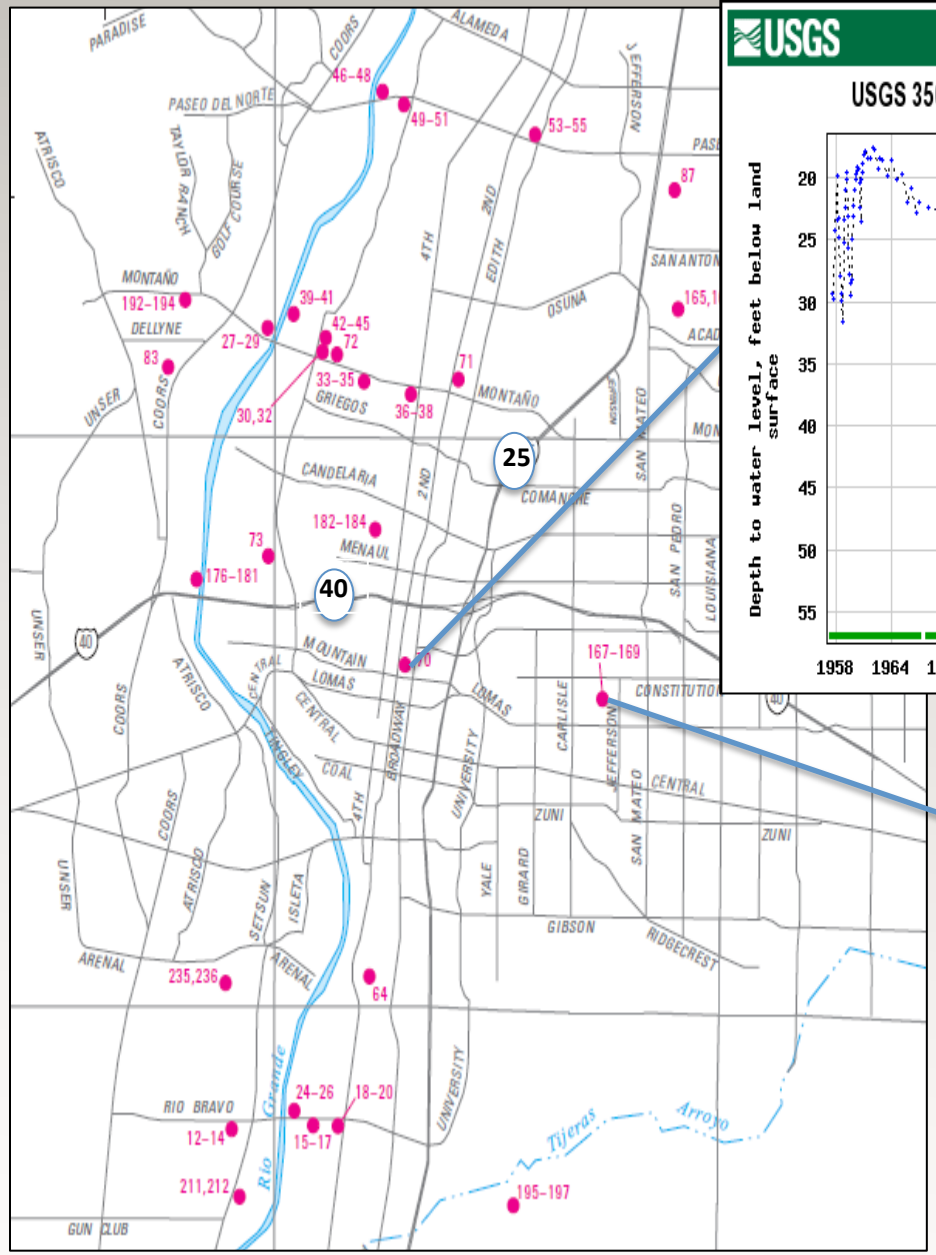


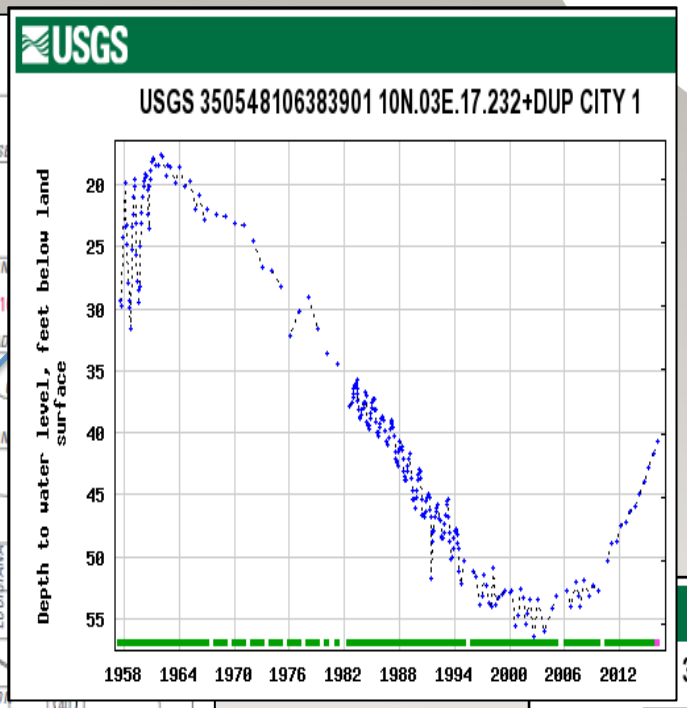
AQUIFER STORAGE & RECOVERY

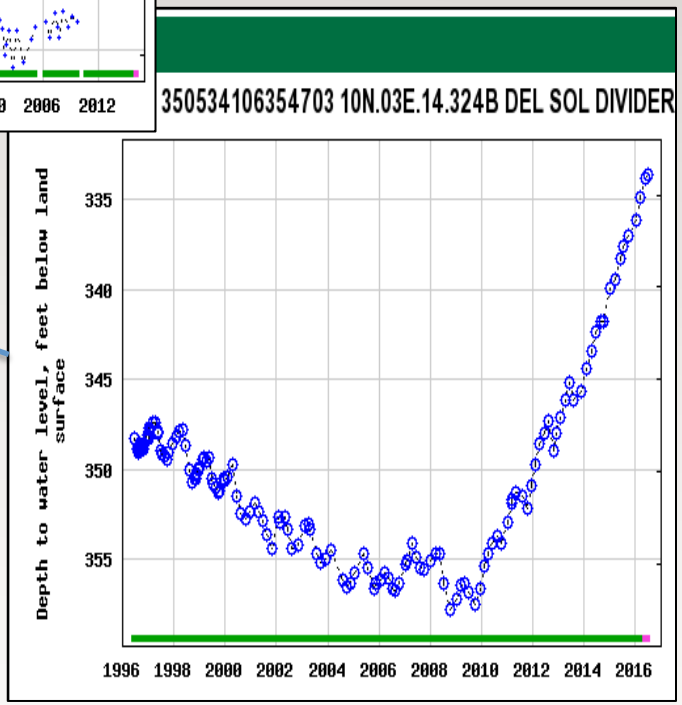
- Bear Canyon is operational, using North I-25 non-potable water
- Demonstration project for large-scale ASR – permit submitted

The Aquifer is Rising

Albuquerque Bernalillo County
Water Utility Authority



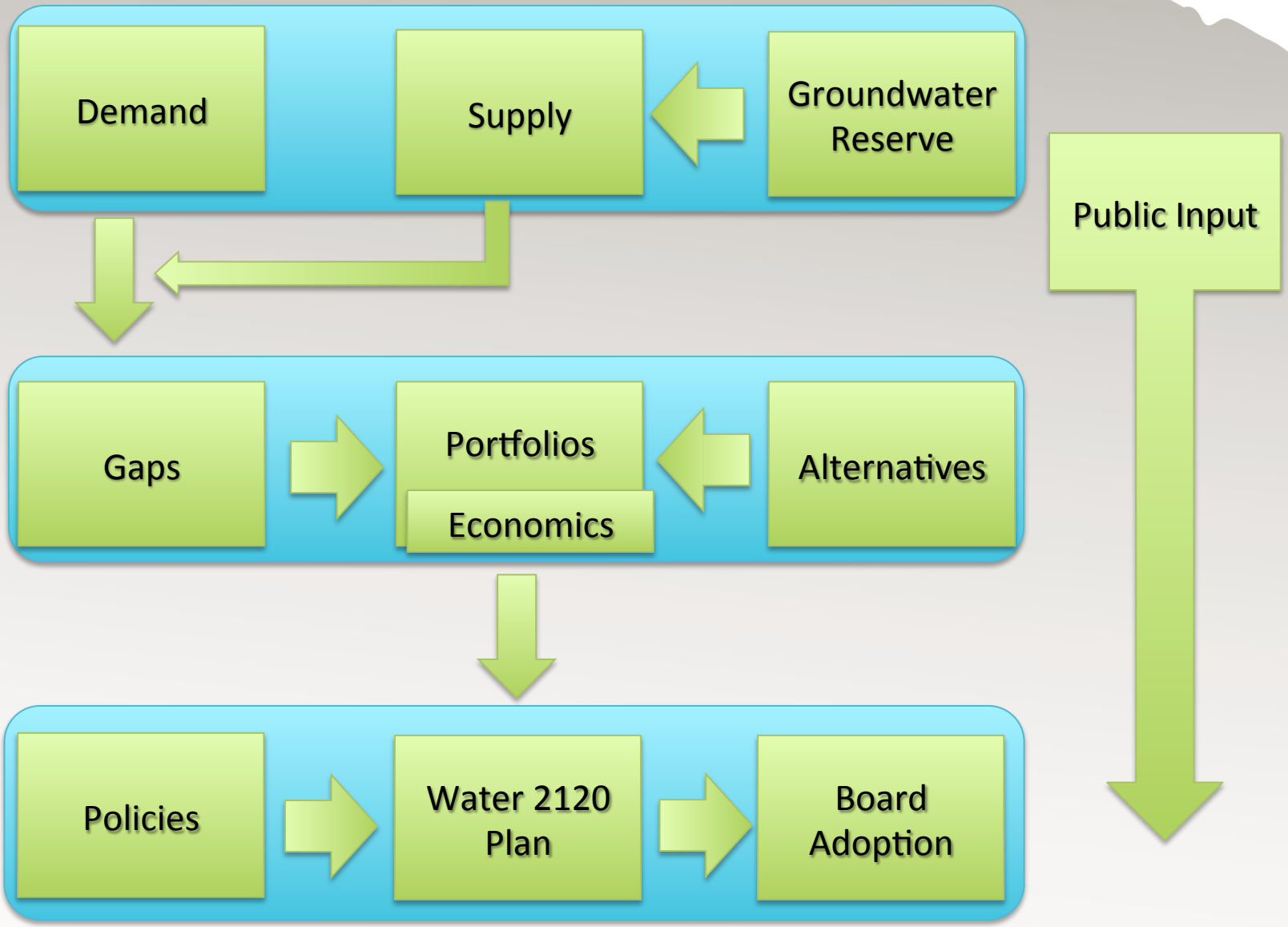




Road Map for the Process

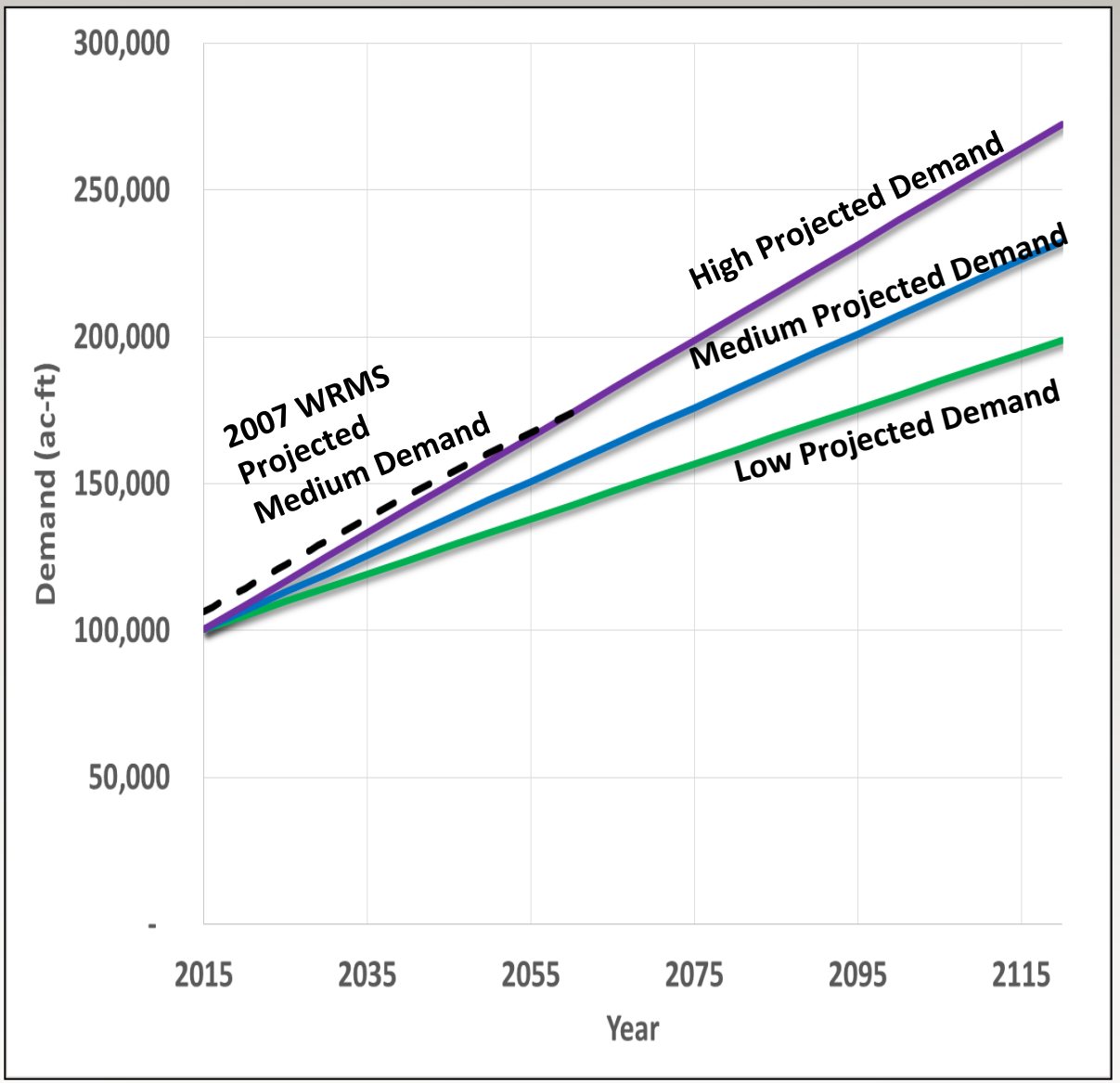
Framework for the Future

Albuquerque Bernalillo County
Water Utility Authority



Range of Projected Demand

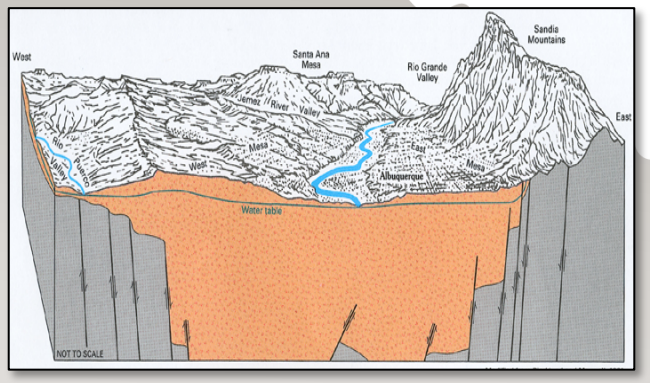
Albuquerque Bernalillo County
Water Utility Authority

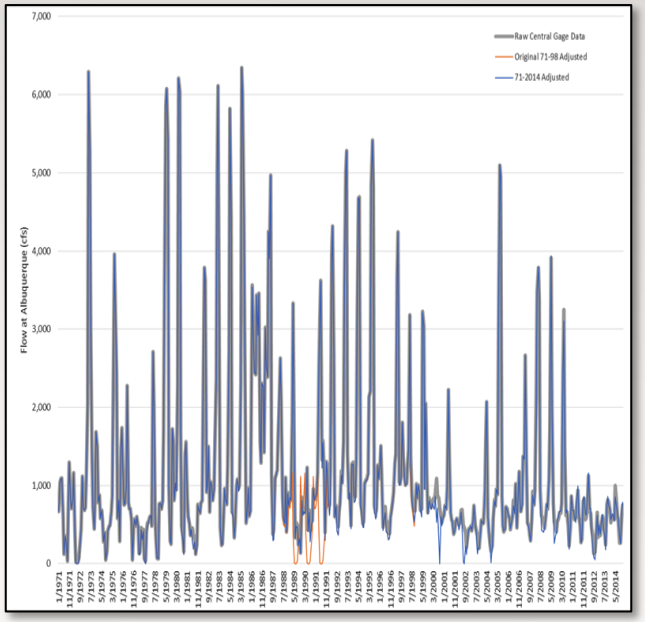


New Information on Supply

Albuquerque Bernalillo County Water Utility Authority

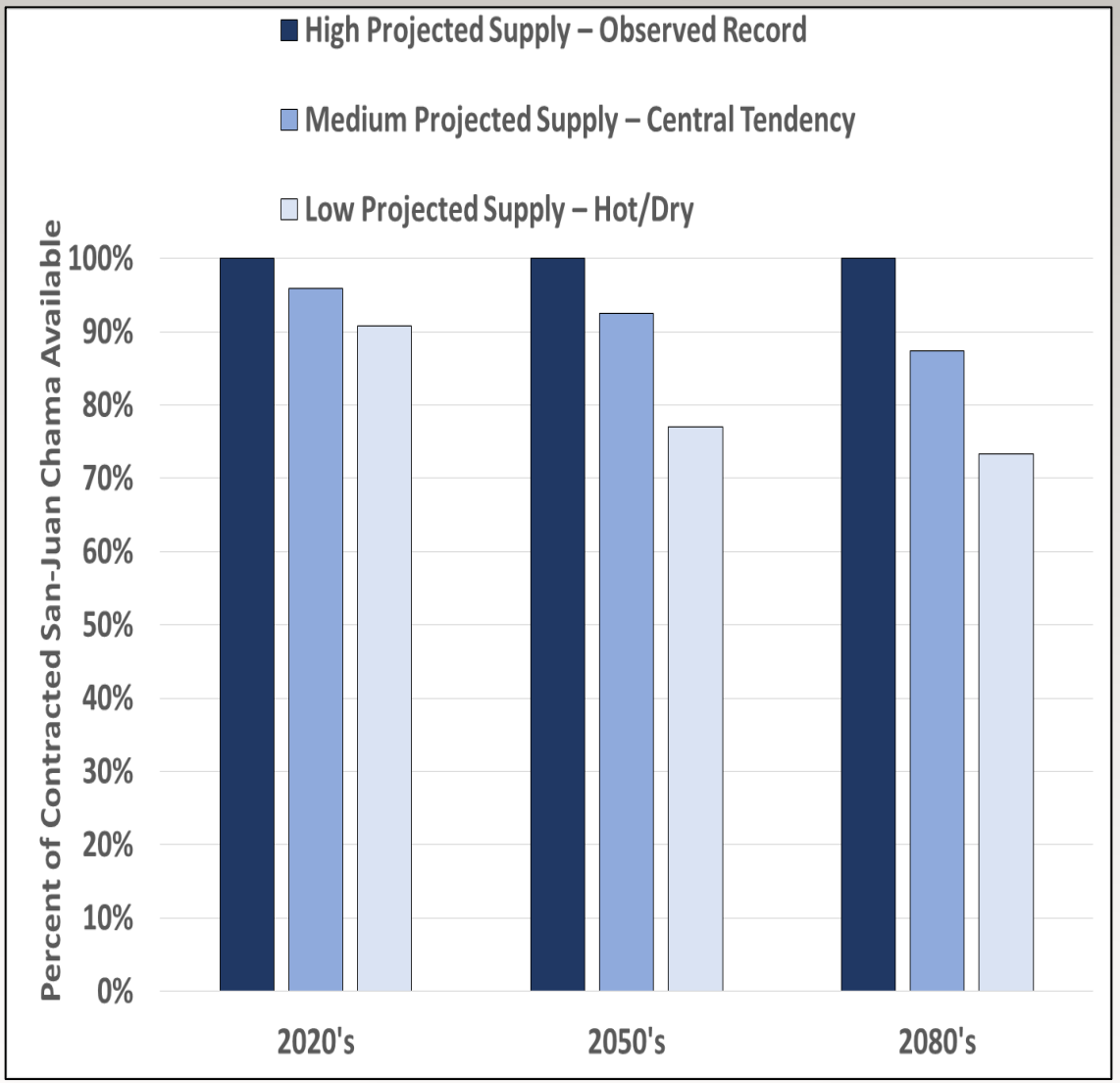
- Groundwater levels are known with relatively high certainty
- Surface water - we have developed time series of flow for low, medium, and high surface water supply – highly variable
- We considered the observed record, as well as potential climate variability





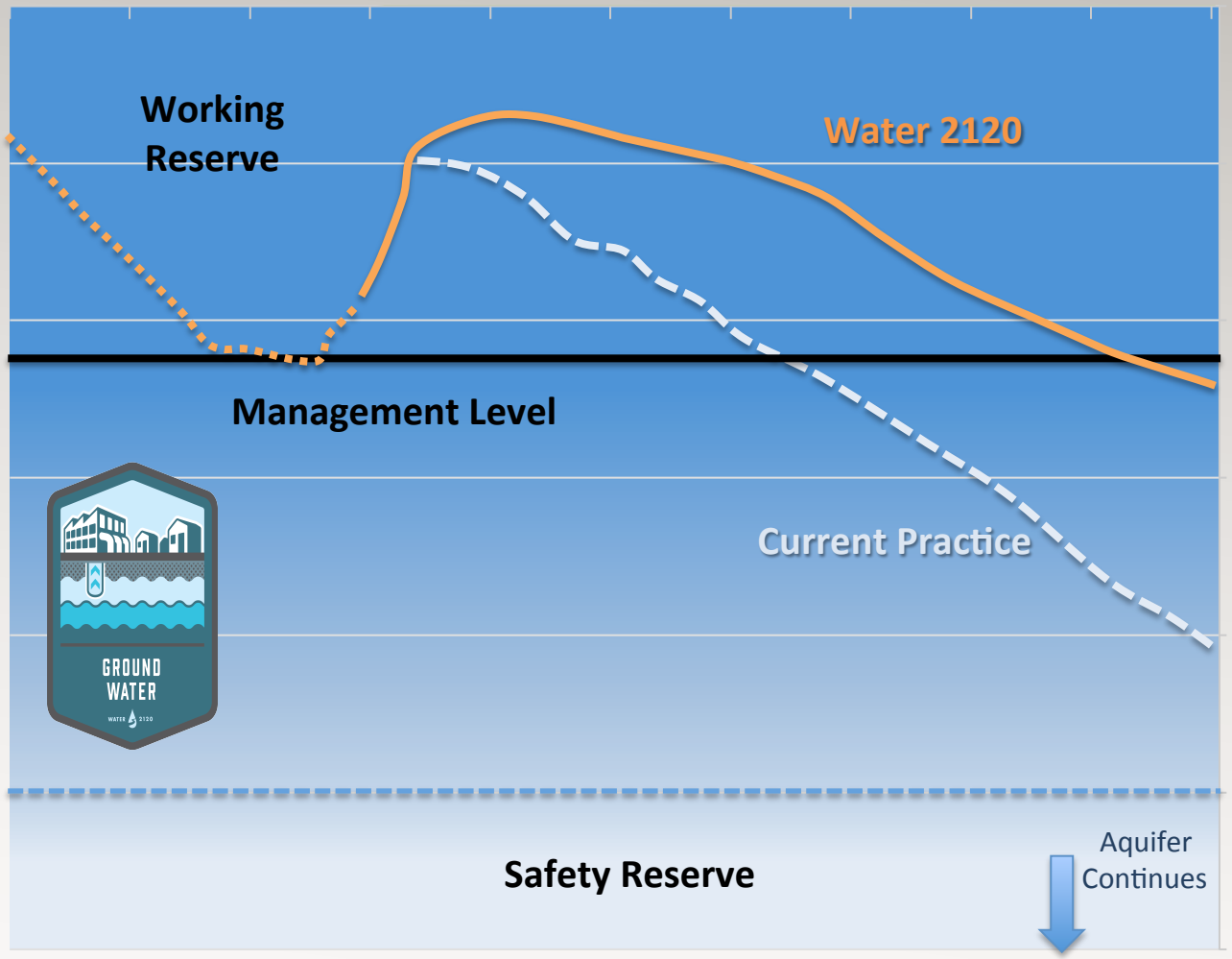
Supply Projections Include Historical and Climate Change

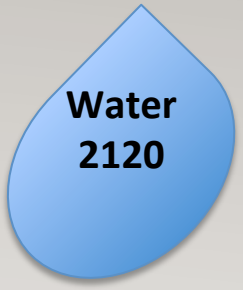
Albuquerque Bernalillo County Water Utility Authority



Groundwater Reserve Management

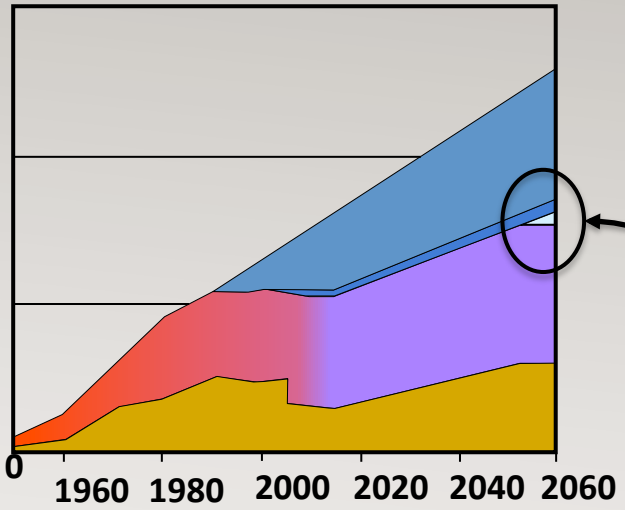
Albuquerque Bernalillo County
Water Utility Authority

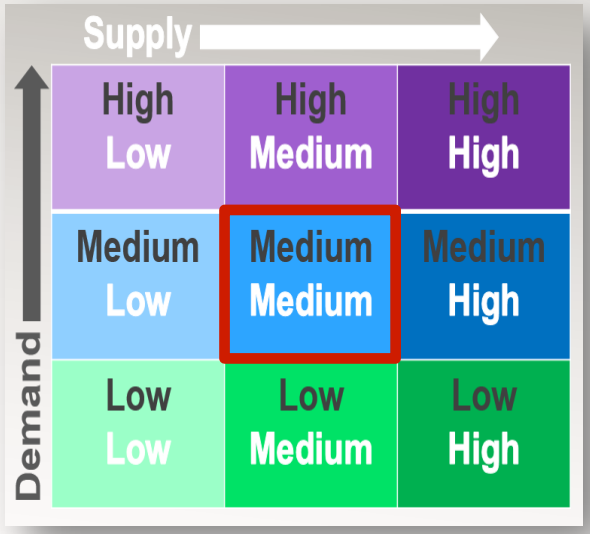


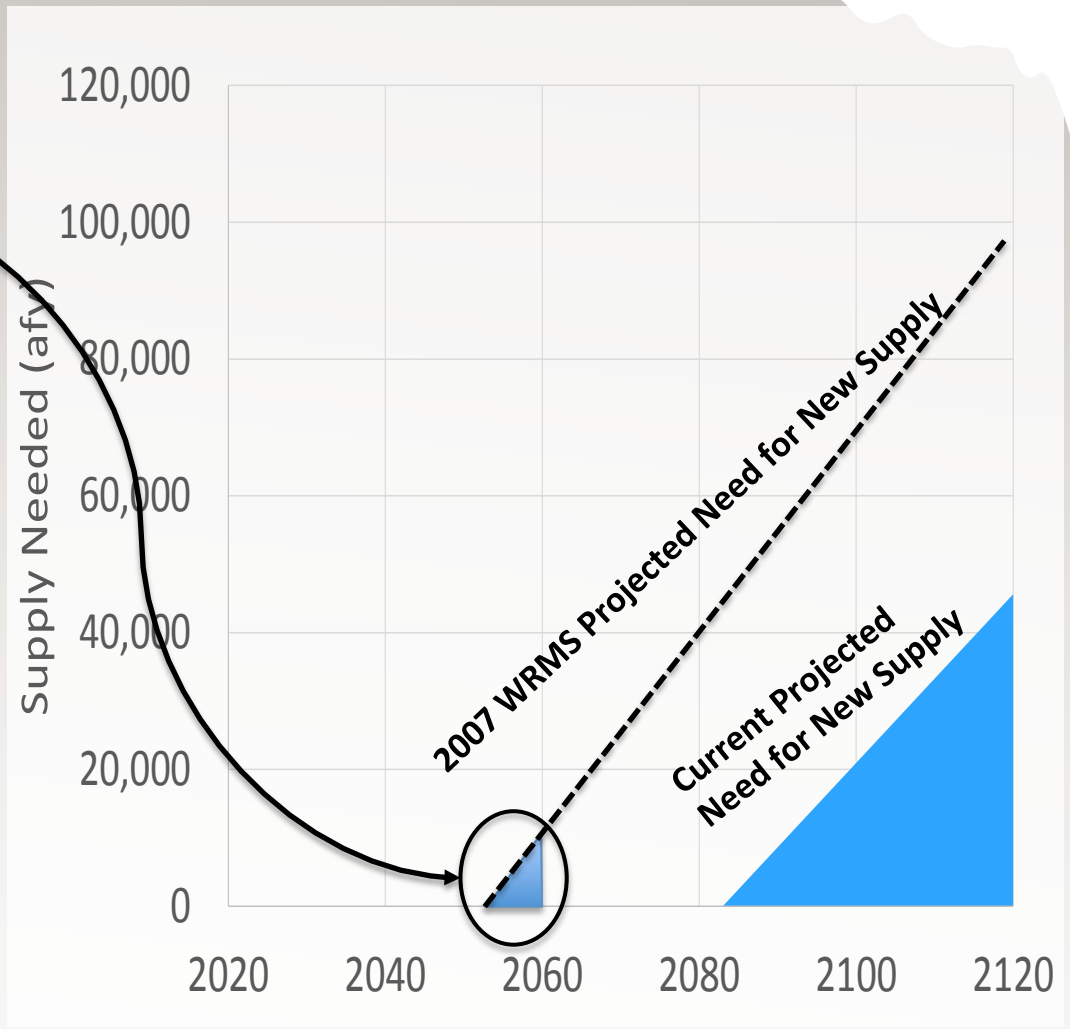


Current Projected Supply Need

Albuquerque Bernalillo County
Water Utility Authority

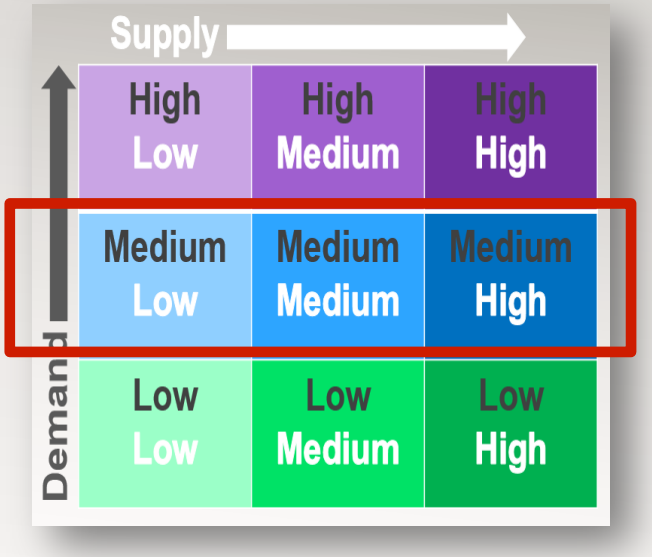


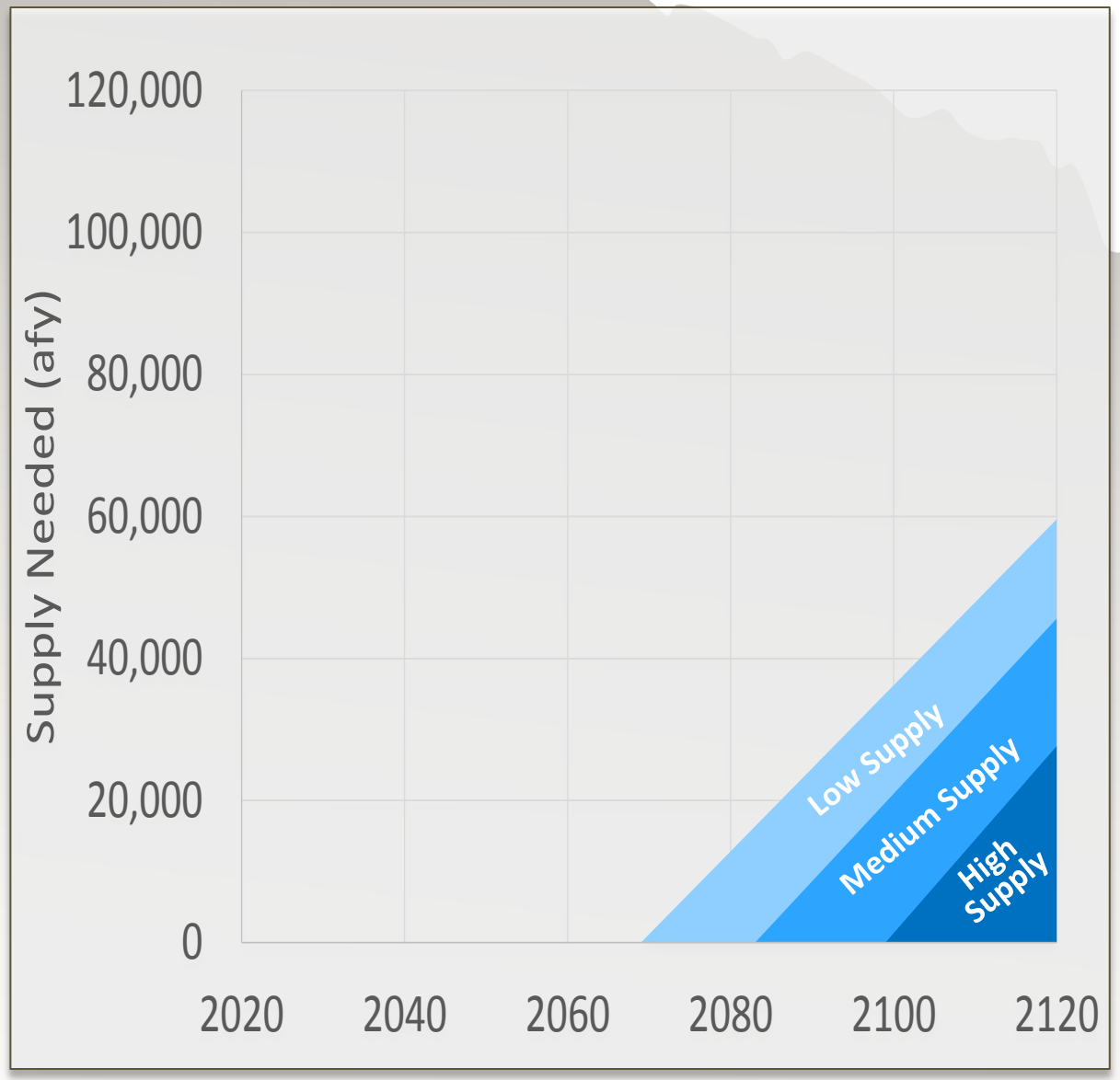




Range of Projected Supply Need:
Medium Demand

Albuquerque Bernalillo County
Water Utility Authority





Meeting the Demand
Portfolio 1

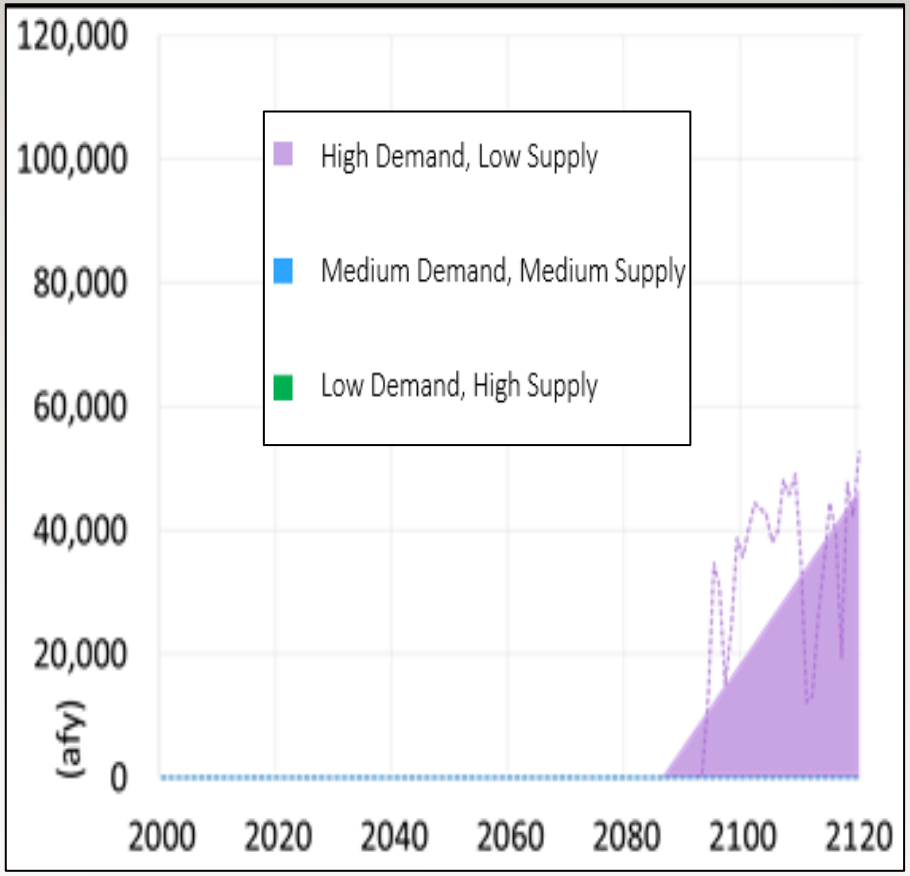
Albuquerque Bernalillo County
Water Utility Authority

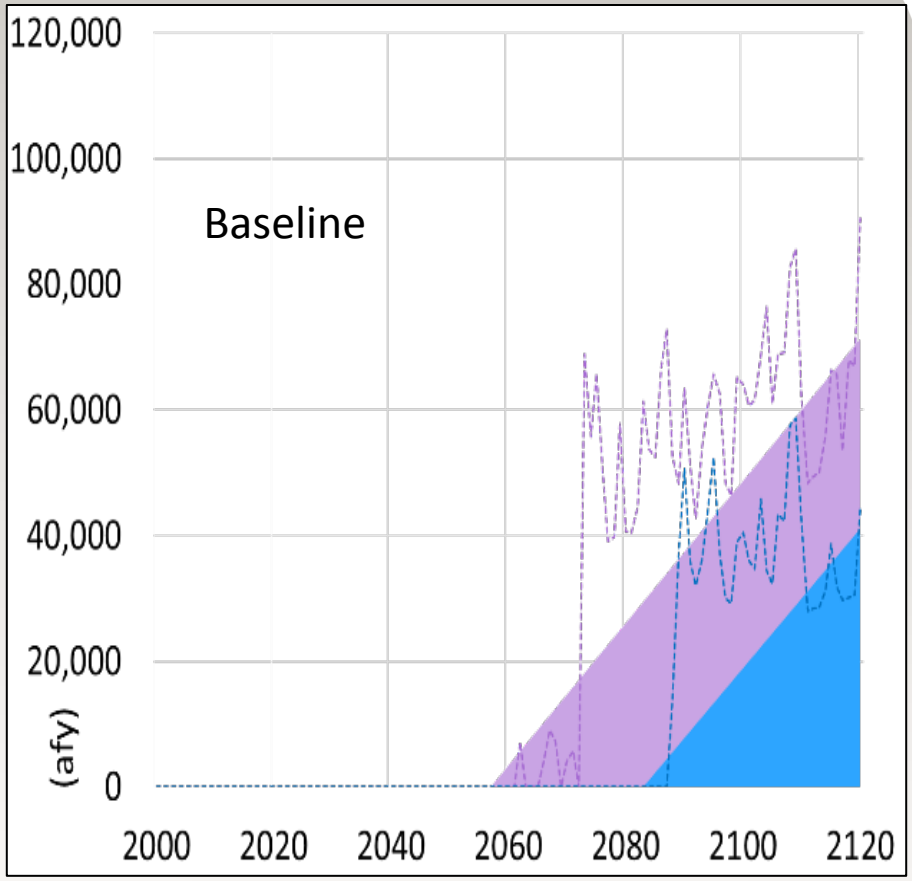
- Existing supplies (groundwater and surface water)
- Conservation – 110 GPCD in 20 years
- Reuse – includes ASR and/or new storage
- Connect North I-25 Nonpotable to Southside Reuse
- Storm water capture
- Indirect potable reuse
- Watershed management

Portfolio 1 Performance

Supply Gaps

Albuquerque Bernalillo County Water Utility Authority

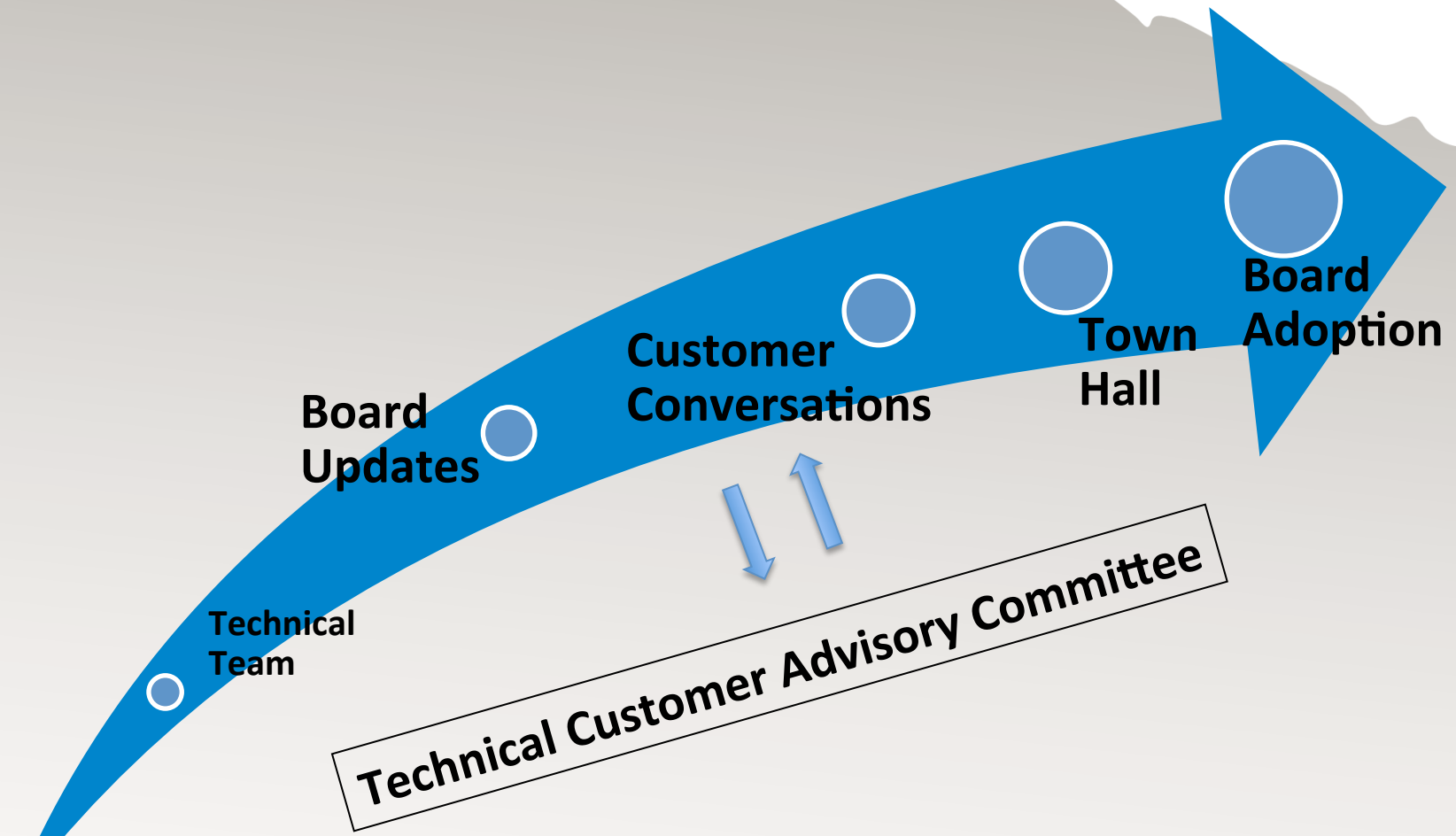




Example Results – Do Not Quote or Cite

Questions?

Albuquerque Bernalillo County
Water Utility Authority



2015 2016

TAMPA BAY WATER

Supplying Water To The Region

Building Resiliency Through Innovation at Tampa Bay Water

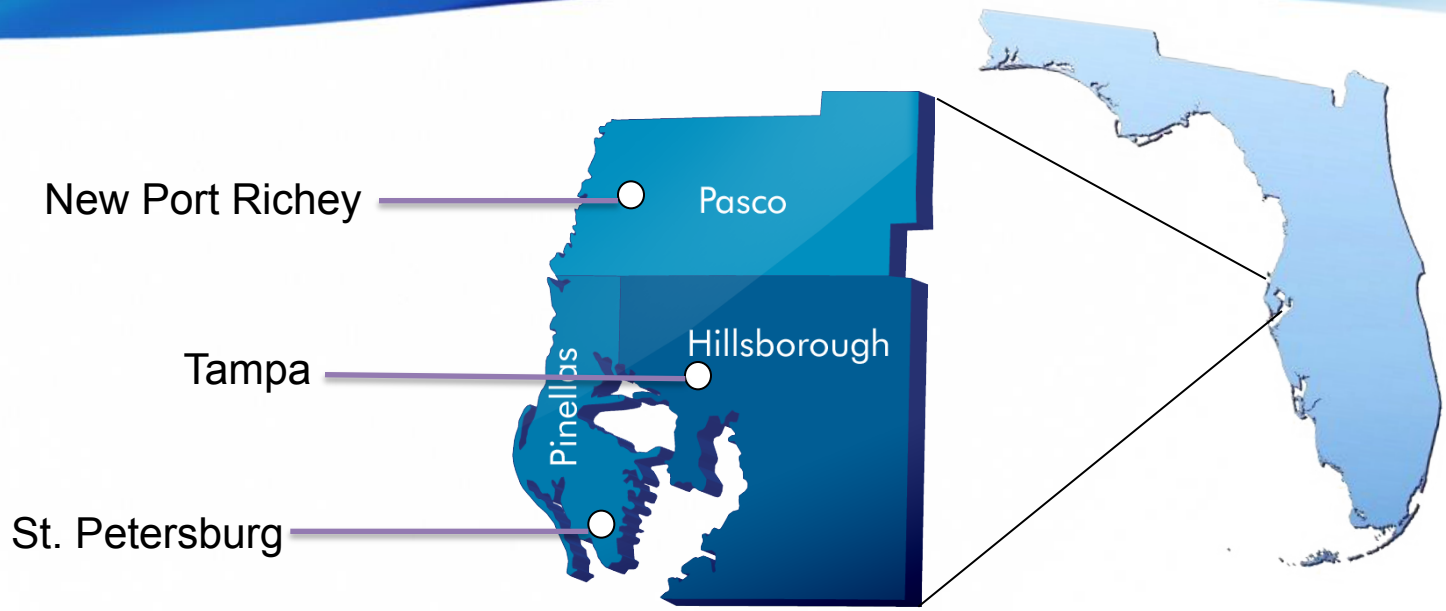
AMWA Innovation Series

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

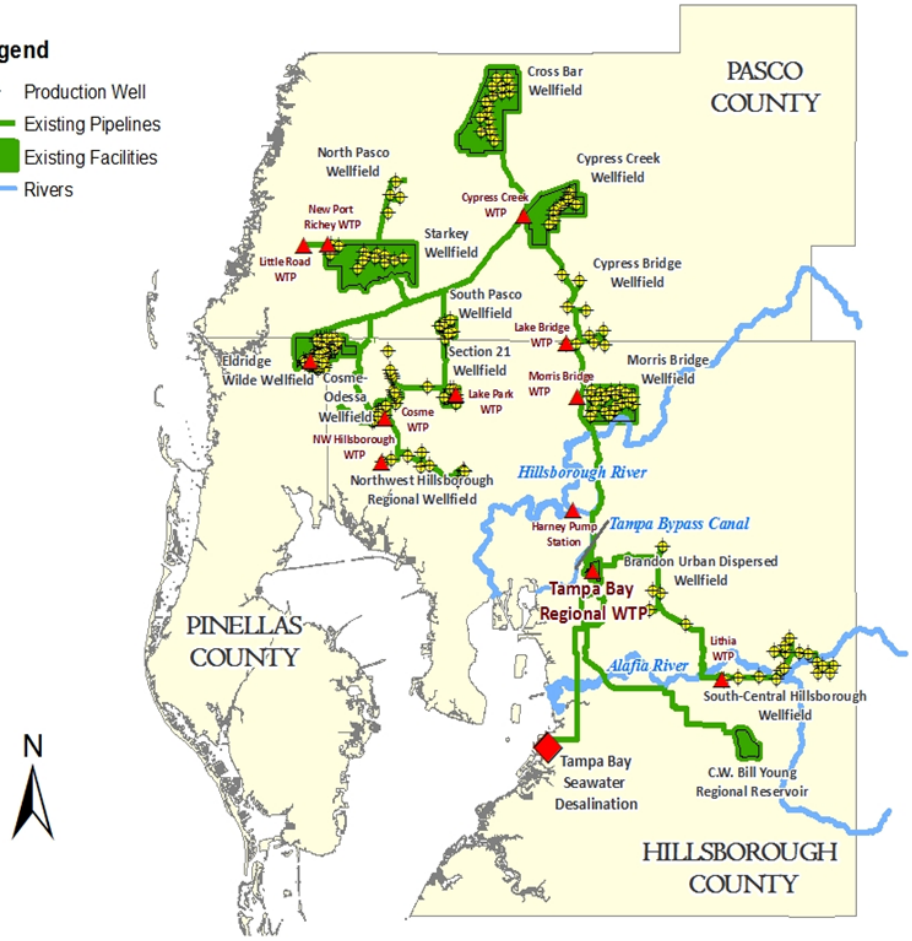


Tampa Bay Water Service Area Facts

- **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 surfac 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

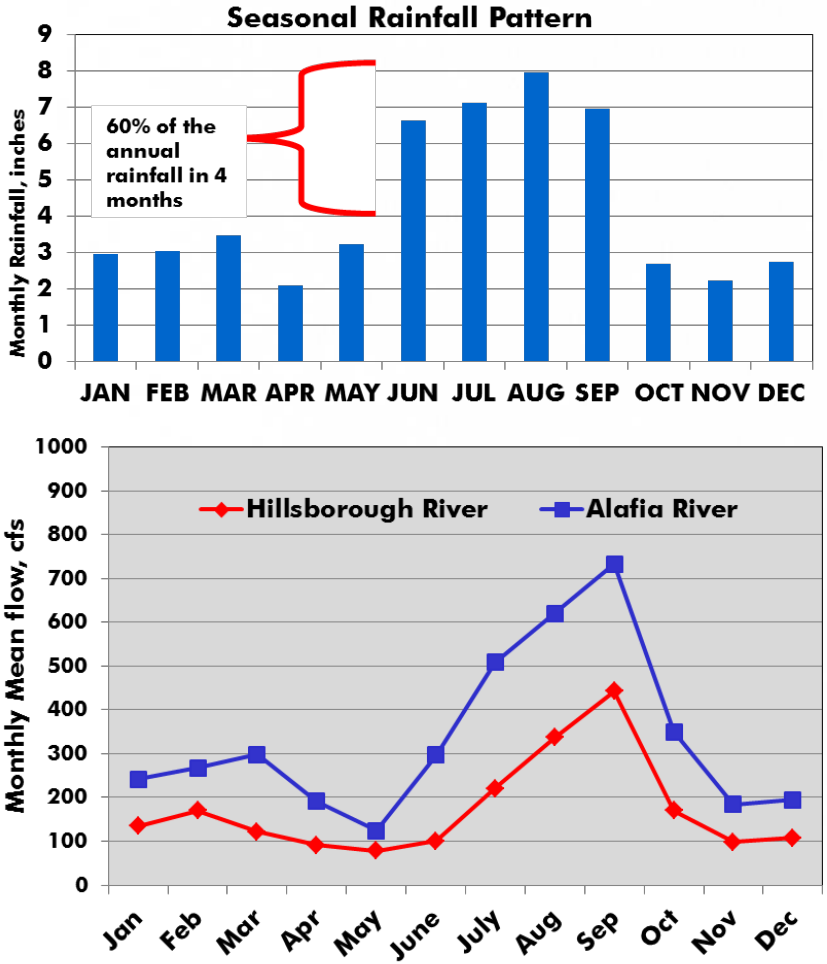
How does the Agency use innovation to accomplish this

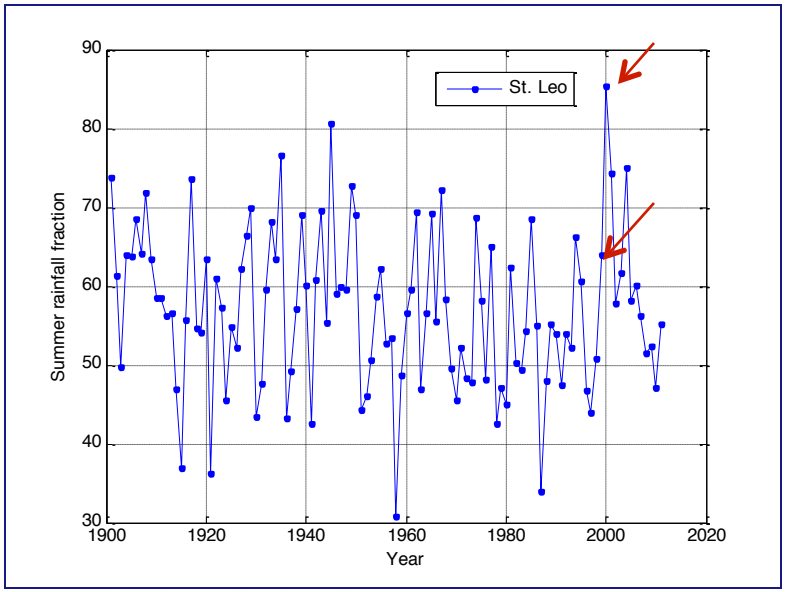
- Building in-house expertise in modeling and data analysis
- Building multi-disciplinary working teams
- Building collaborative relationships with research and professional partners
- Investing in computational capabilities
- Investing in SCADA and advanced hydrologic data collection networks
- We recover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

Case Study Examples

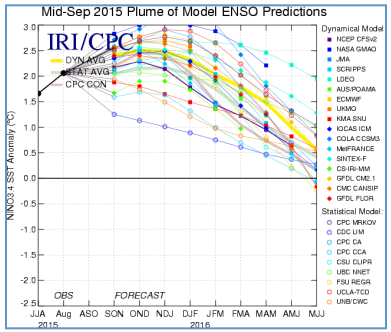
- **Seasonal Surface Water Forecasts incorporating climate variability**
- **Incorporating climate change into long-term hydrologic investigations**
- **Internal and external collaborations**

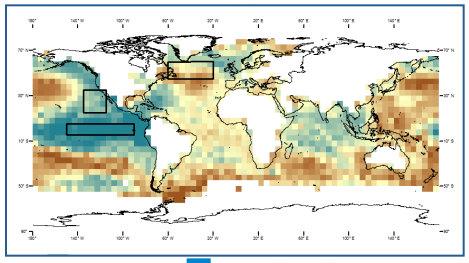
Why Climate Variability is Important

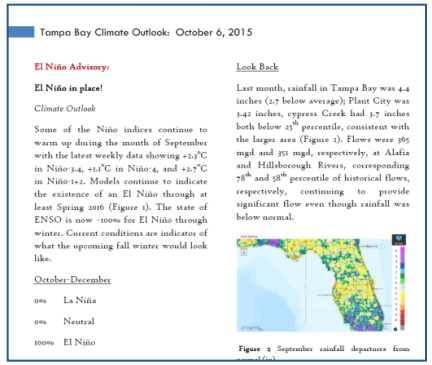


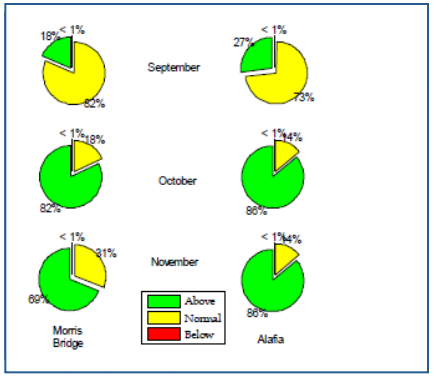


Seasonal Outlook Models and Analysis Developed by Staff to improve reliability





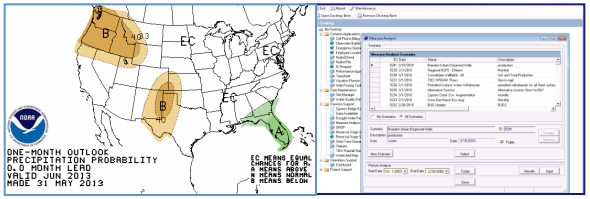




Climate Outlook & Observation

ENSO Rainfall Contingency Table

Weather-based Rainfall Model



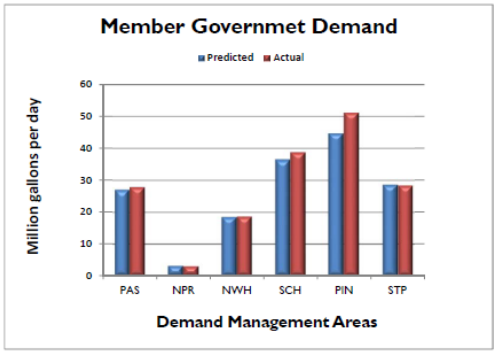
Rainfall/ Runoff Model

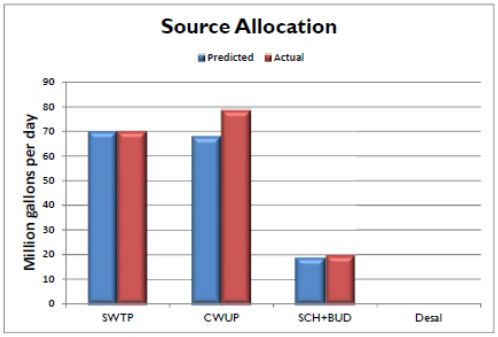
Monthly Source Allocation Performance

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

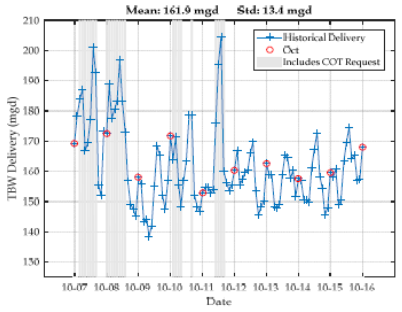




October Delivery: 167.9 mgd
Difference from Forecast 5.7 %

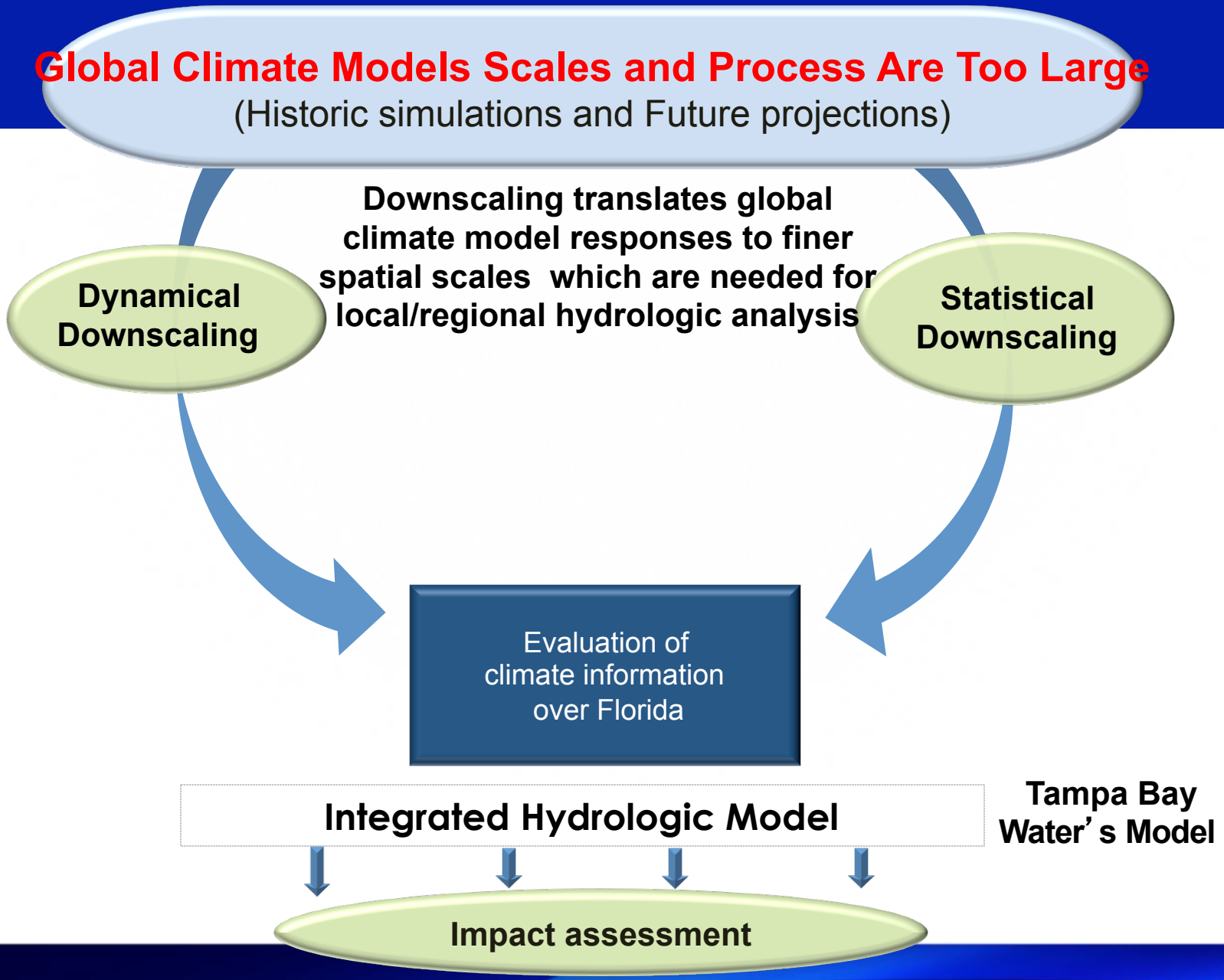
	Difference (mgd)	(%)	YOY (%)
PAS	0.8	2.9	2.5
NPR	-0.1	-3.2	0.1
NWH	0.1	0.4	0.8
SCH	2.2	6.1	1.0
PIN	6.5	14.5	4.4
STP	-0.3	-1.0	-0.5

Regional Demand 8.25



	Difference (mgd)	(%)
SWTP	0.0	0.0
CWUP	10.7	13.7
SCH+BUD	0.9	4.5
Desal	0.0	0.0

Long-term Climate Projection Analysis Framework



Findings for the Region Based on Research to Date

- Temperature Results
  - Projections are consistent
  - **2 - 3 ºC 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

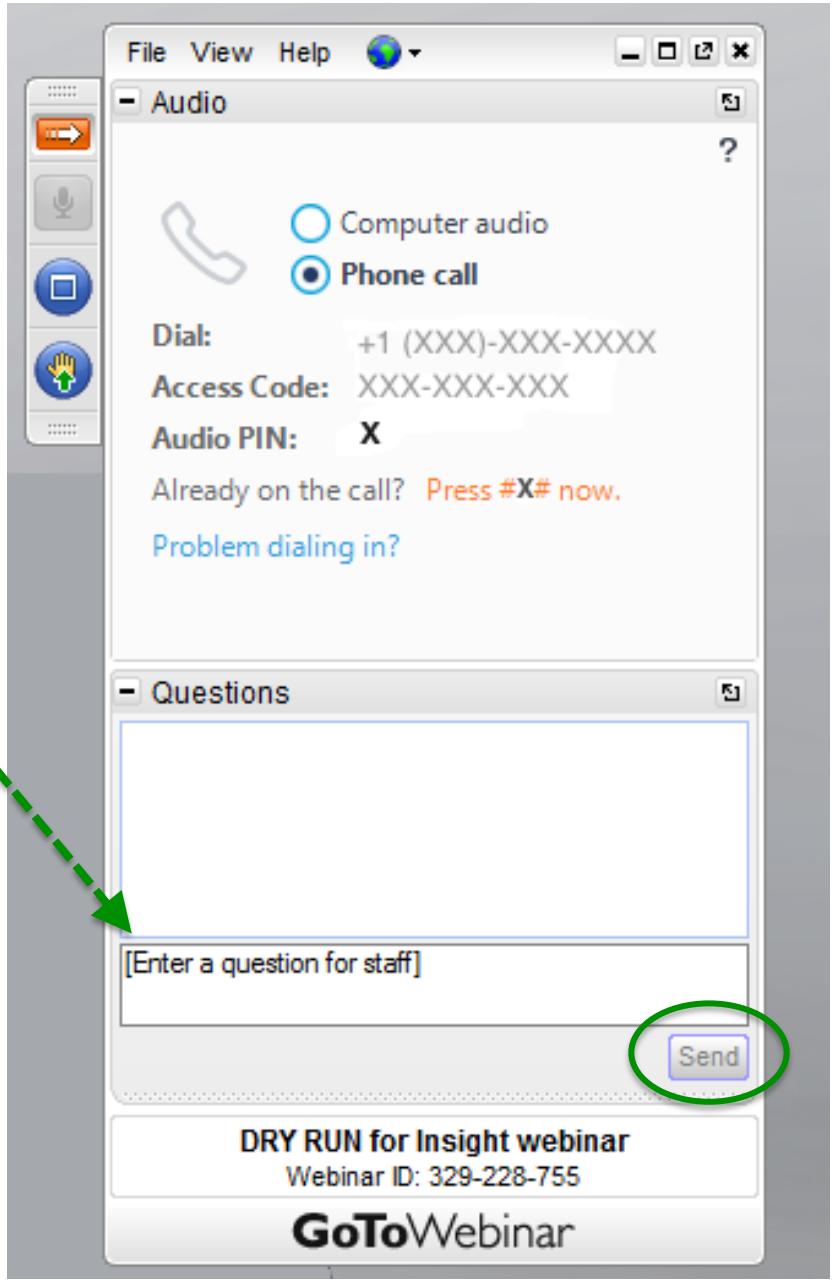
Summary and Take Aways

- 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


Questions?

How to Ask a Question

Type and send your question.




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.*

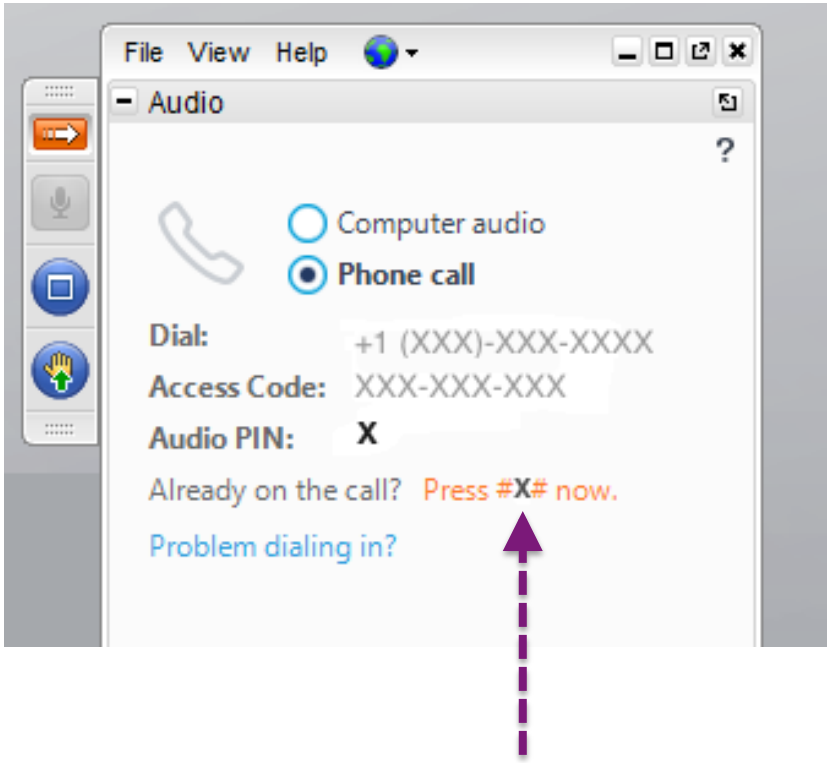
All lines will be unmuted. Please raise your hand to be recognized.

How to Raise Your Hand

Raise your hand

Make sure your phone is unmuted.

We will unmute your audio connection and call on you.

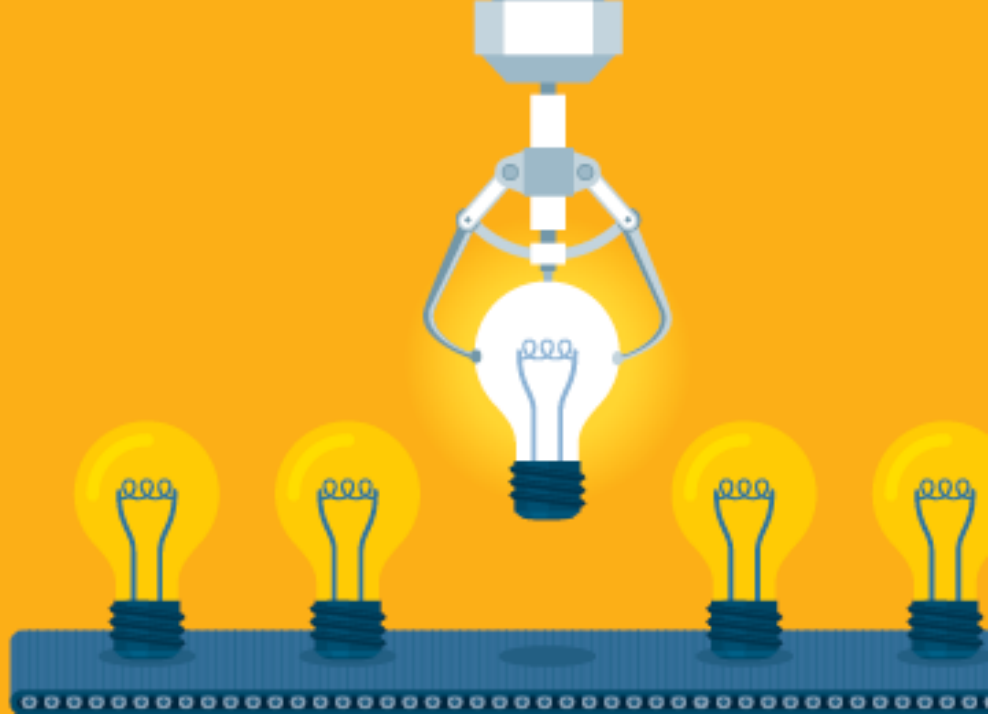


If you dialed in, enter your Audio PIN on your phone keypad if you did not when you logged in.

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