



# Scottsdale Water Campus 20 Years of Sustainable Water Management



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# Agenda

- About Scottsdale Water
- 1980 Groundwater Management Act
- Water Campus Concept
- Recharge and Reuse in Scottsdale
- Overall Water Management

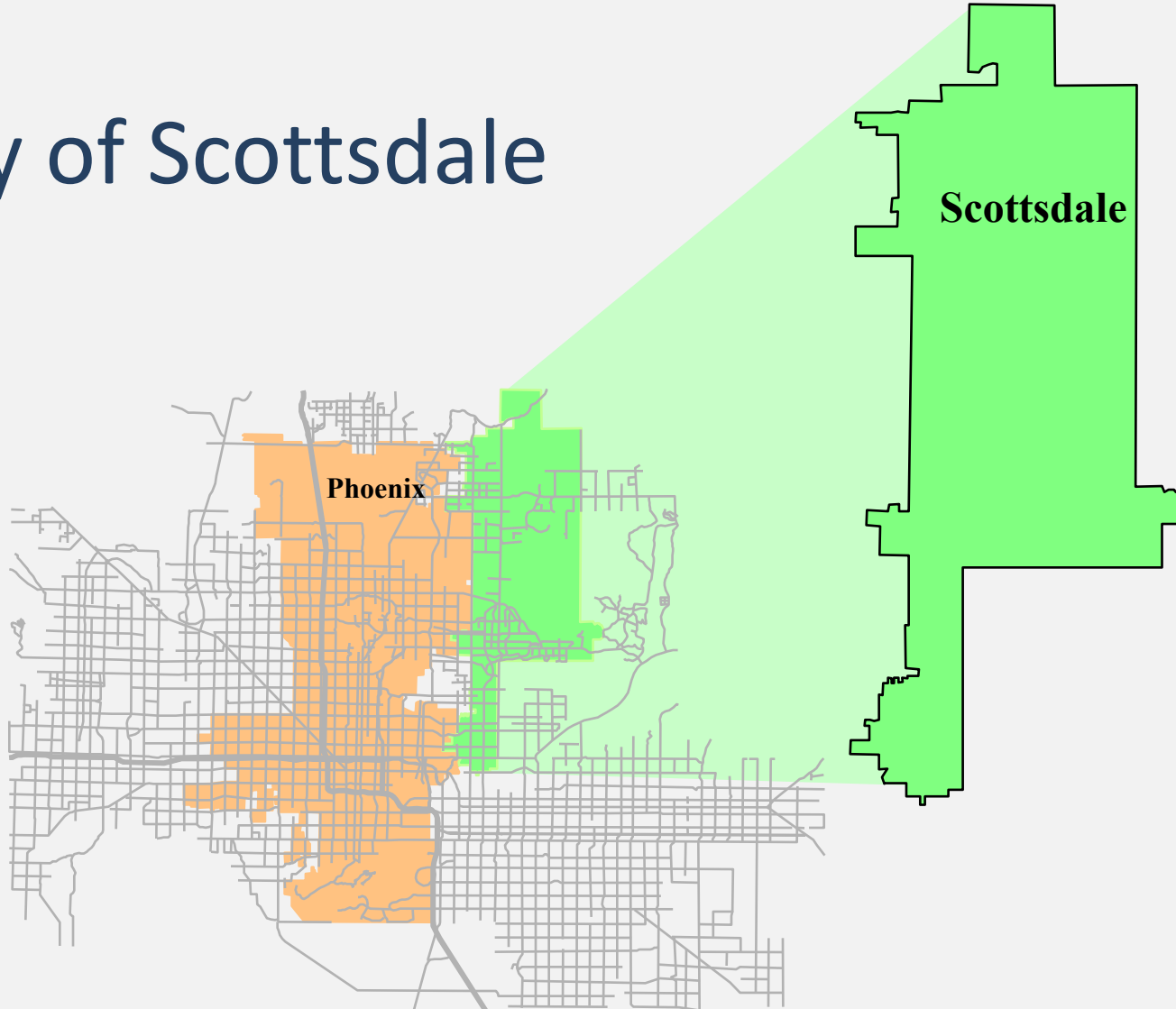


# Learning Objectives

- Scottsdale's commitment to Sustainable Water Mgmt
- Understand how long term planning and commitment produce results
- Reuse/recharge as part of an overall water resource strategy
- Success of private/public partnerships

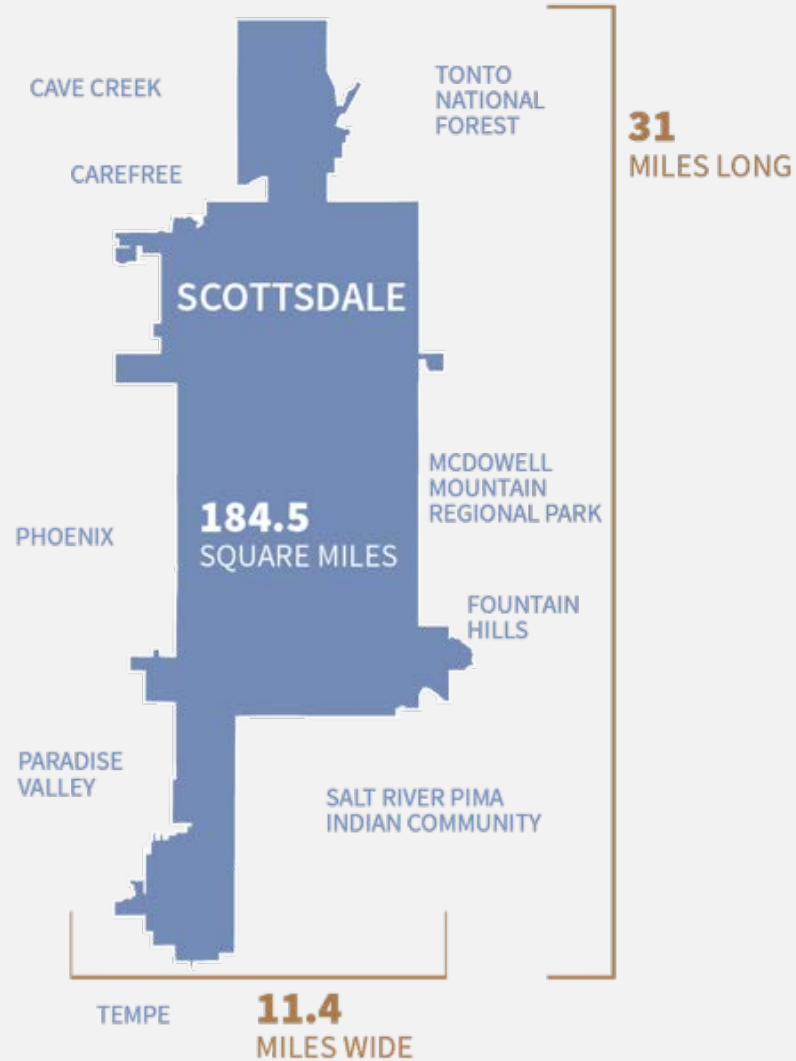


# City of Scottsdale



# About Scottsdale

- Population ~ 231,000
- Build Out ~ 285,000
- New Growth - North
- 184.5 square miles
- Elevation change 3,727 feet

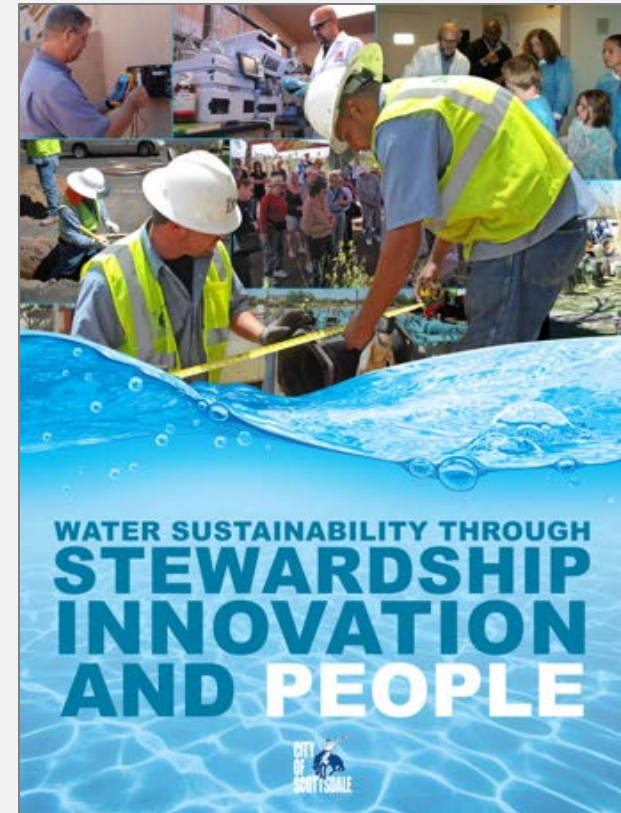
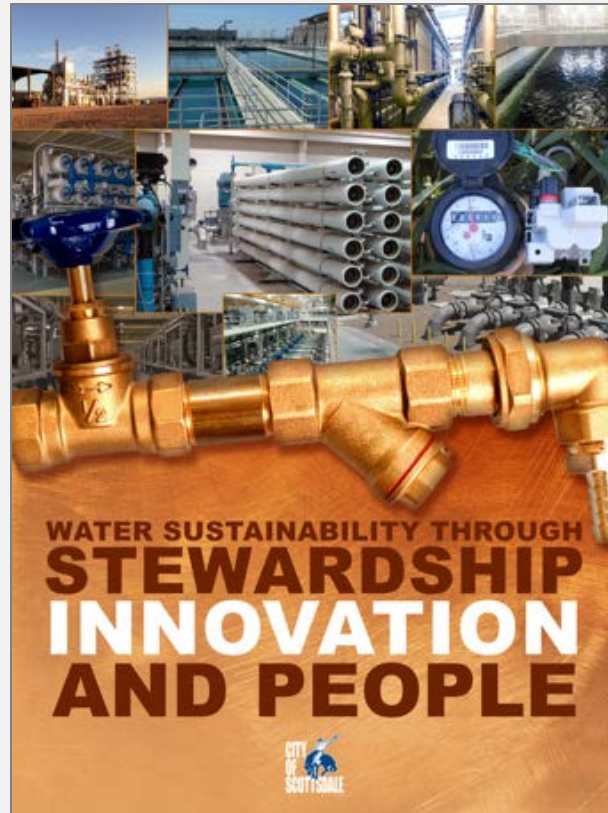
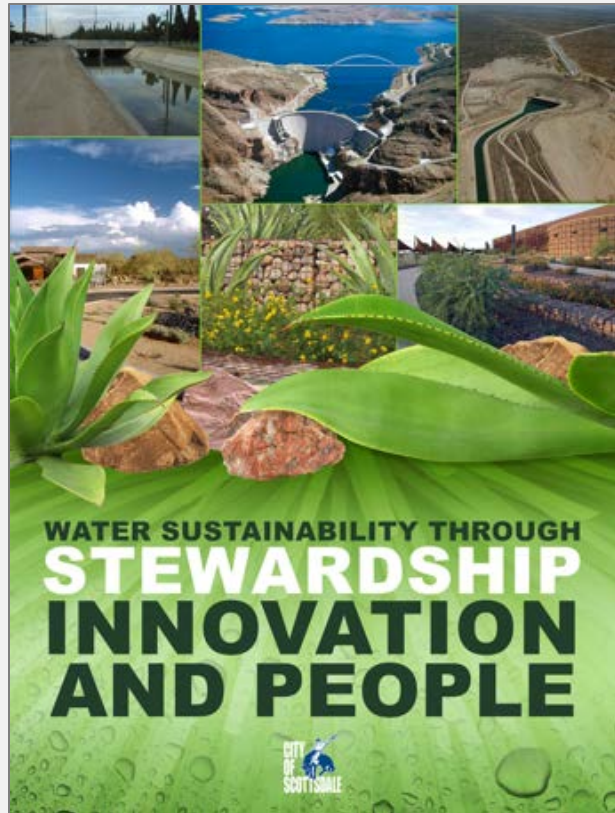


# Scottsdale Water

- Active water accounts: ~90,000
  - 78,500 single-family residential
  - 5,000 multifamily residential
  - 6,000 commercial, nonresidential
- Average potable water delivery: 67 mgd
- Water distribution lines: 2,100 miles
- Active sewer accounts: ~80,000
- Sewer collection lines: 1,455 miles
- 2016 total potable water delivery: 23.2 billion gallons



# Water Sustainability



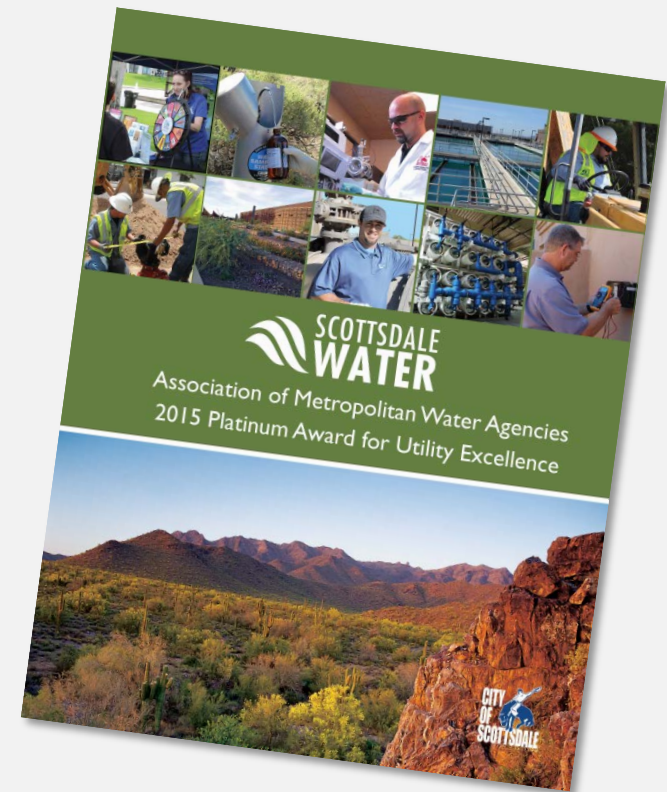
# About Scottsdale Water





# Platinum Award for Utility Excellence Association of Metropolitan Water Agencies

- Must demonstrate excellence in ten Attributes of Effective Utility Management and Keys to Management Success
- Progressive award, at least three years after receiving Gold Award
- Scottsdale Water awarded October 2015



# Utility of the Future Today



## Recognized in four activity areas:

- Organizational Culture
- Community Partnering and Engagement
- Energy Efficiency
- Water Reuse

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## Awarded by a global partnership of water agencies in partnership with the Environmental Protection Agency:

- Water Environment Federation
- National Association of Clean Water Agencies
- WaterReuse Association
- Water Environment and Reuse Foundation

# WaterReuse Public Education Program of the Year

- Awarded September 2017
- Applicants were judged on:
  - Curriculum
  - Classroom instruction
  - Tours
  - Onsite participation
  - Peripheral materials
  - How the outreach enhances a better appreciation of water resources, management and conservation.



# Arizona's Historical Water Supply



Central Arizona

- Historically most Arizona communities were dependent on groundwater
- 1970s – Discussions begin surrounding groundwater pumping in Arizona



Queen Creek, Arizona

# Subsidence



West Valley



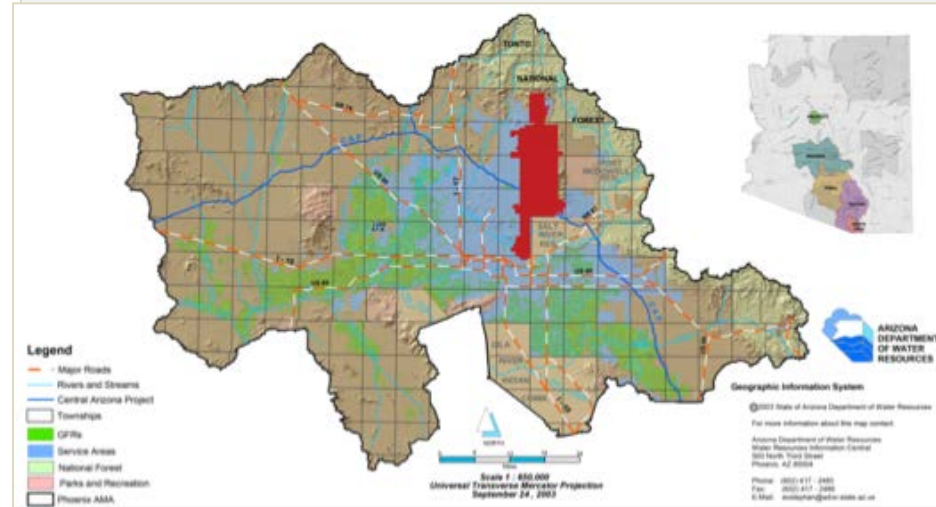
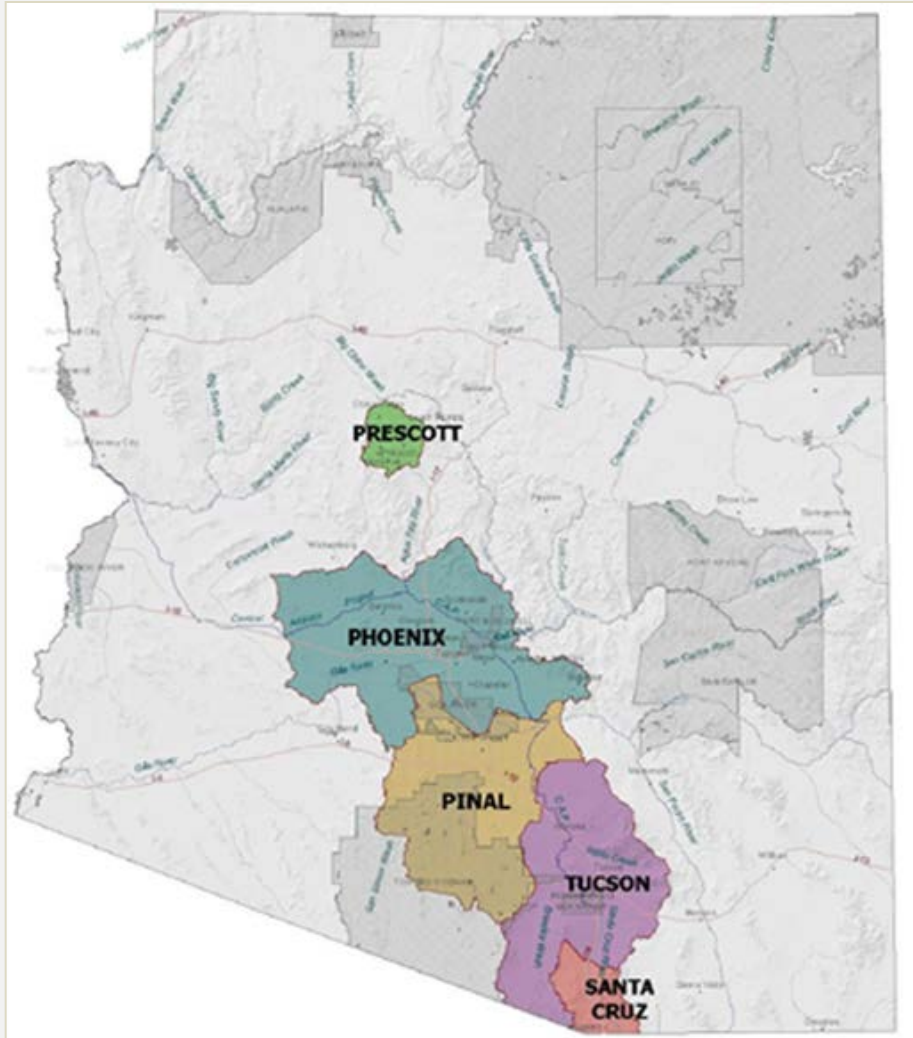
East Valley

# Groundwater Management Act of 1980

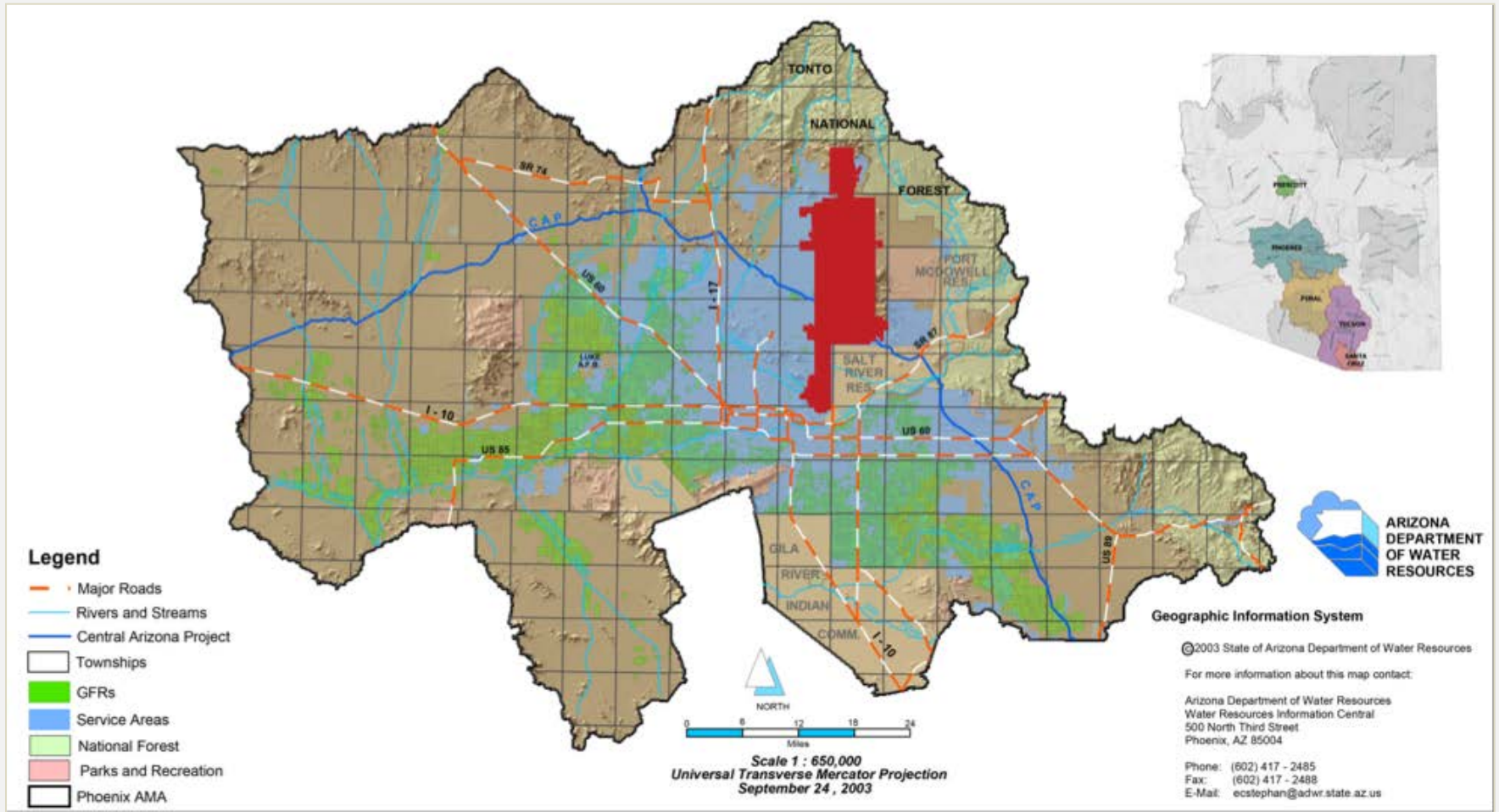
- Created the Arizona Department of Water Resources
- Identified Active Management Areas with goals and requirements to address groundwater overdraft (safe yield)
- Established 100-year Assured Water Supply provision
- Required management plans that include mandatory conservation measures
- Encouraged practices to augment groundwater levels through water supply development



# Arizona Active Management Areas

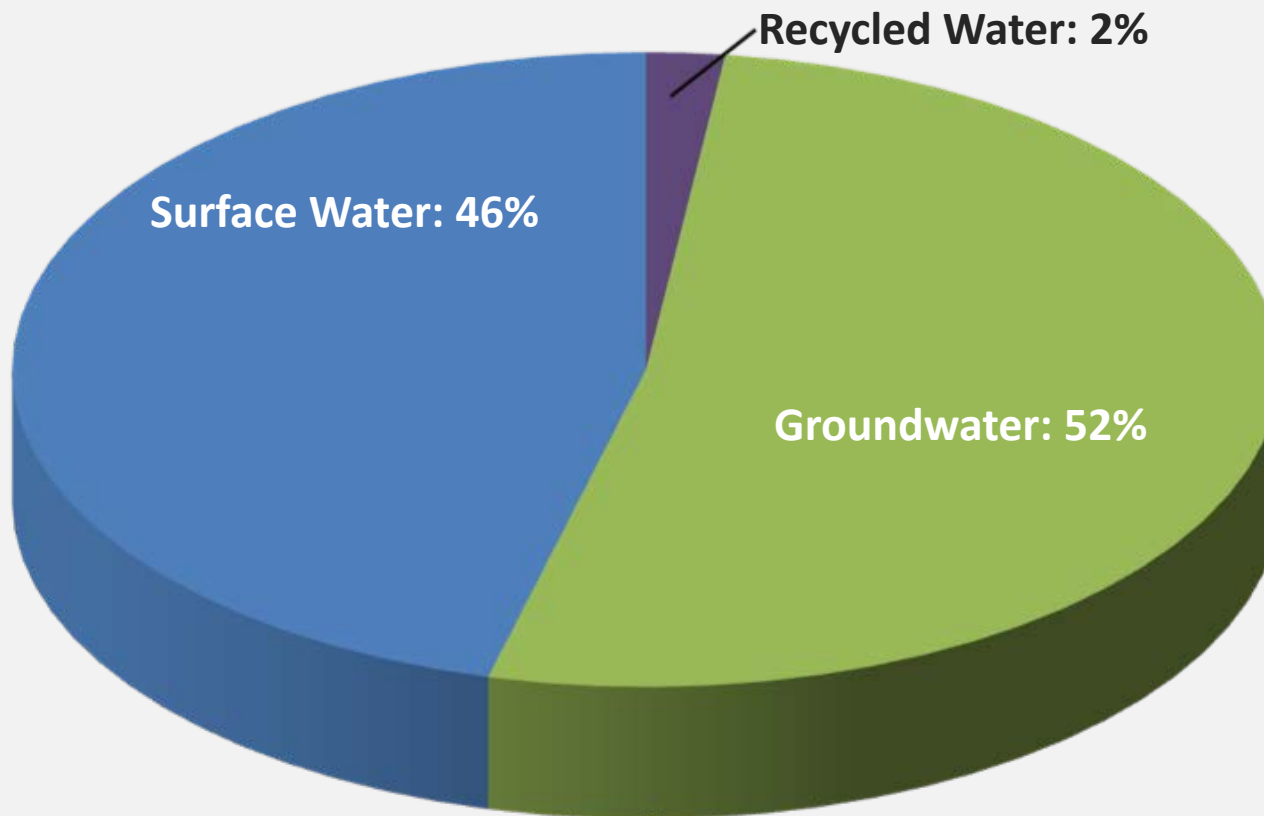


# Arizona Active Management Areas





# Scottsdale Water Supply Portfolio 1996



# Master Planning Efforts

- Capture our own water resource:  
Recycle our wastewater
- Establish a plan to reuse our effluent and replenish the aquifer
- Partnership with developers
- Birth of the Water Campus concept

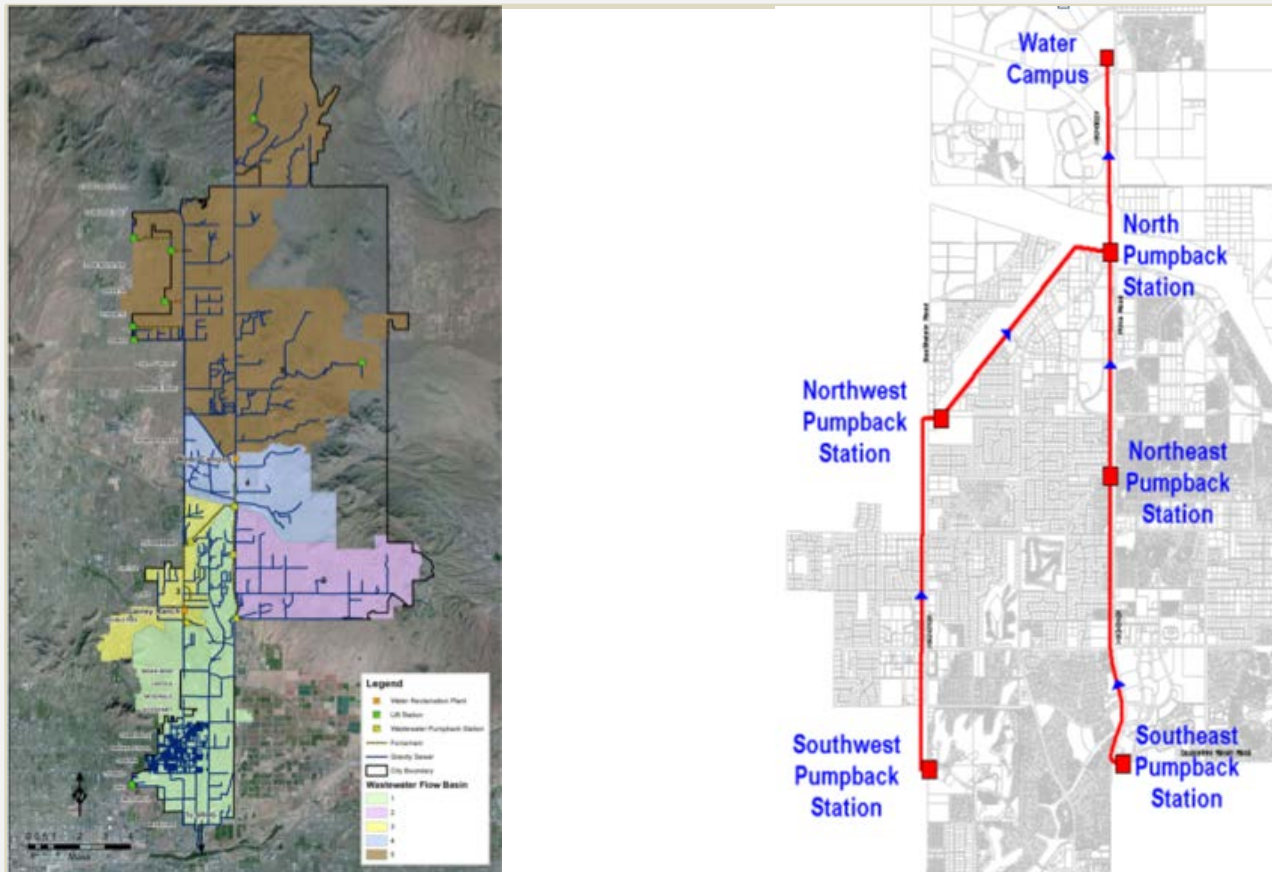


# Water Campus Concept

- Potable Water Treatment Plant (70 mgd )
- Water Reclamation Plant (23 mgd)
- Advanced Water Treatment Plant (20 mgd)
- State-of-the-art Water Quality Laboratory
- Injection and ASR wells



# Water Campus Requirements: Pumpback System



# Water Campus Requirements: Water Reclamation Plant

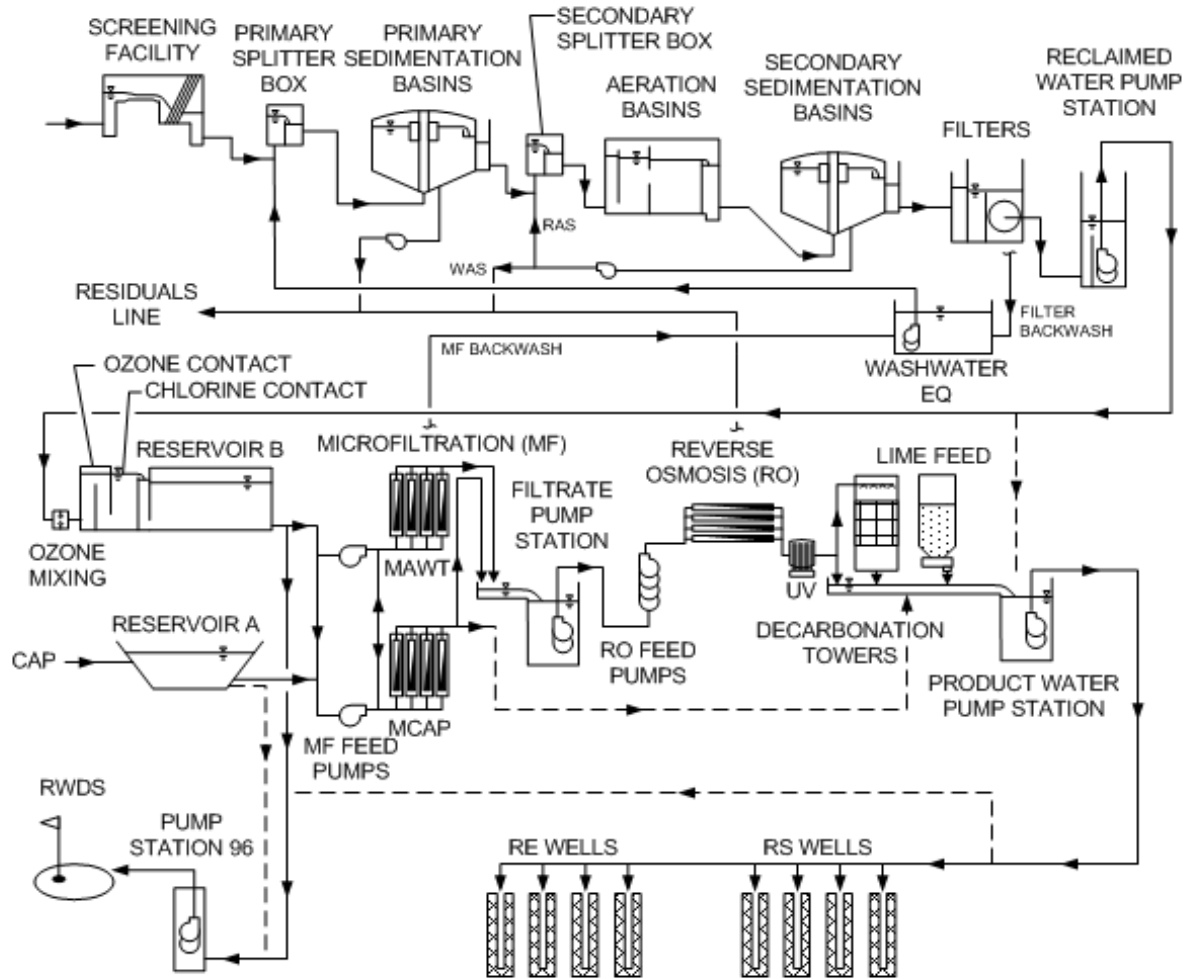
- Phased approach to 23 mgd
- State Regulatory Parameters – somewhat in flux
- Future Regulatory Requirement
- Tertiary Treatment
- Odor control

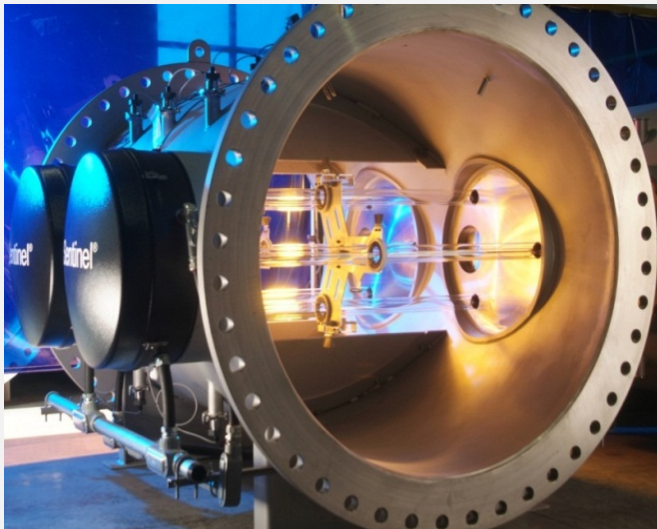


# Water Campus Requirements: Advanced Water Treatment Facility

- Meet water quality requirements
- State regulatory parameters
  - somewhat in flux
- Best available technology and processes
  - Ozonation/Chloronation
  - Ultrafiltration
  - Reverse Osmosis
  - Ultraviolet Disinfection









# Indirect Potable Recharge

- Indirect potable recharge began in 1998
- Over 1.7 billion gallons of ultrapure recycled water recharged annually

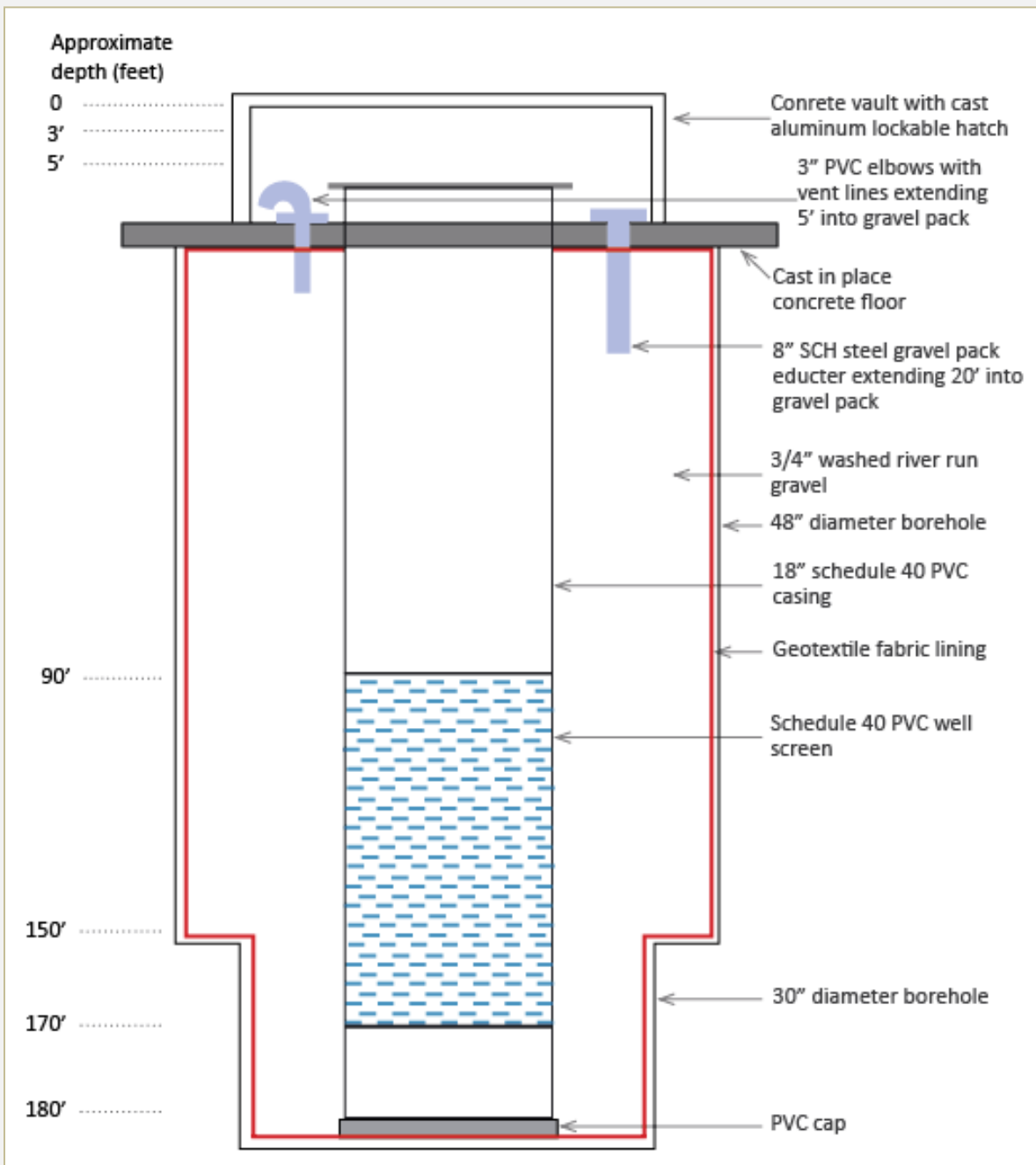


# Onsite Recharge Wells

- 63 Vadose Zone Well Field
- 180 feet in depth
- Groundwater depth at roughly 500 feet BLS
- Over 400 feet natural filtration



# Vadose Zone Schematic



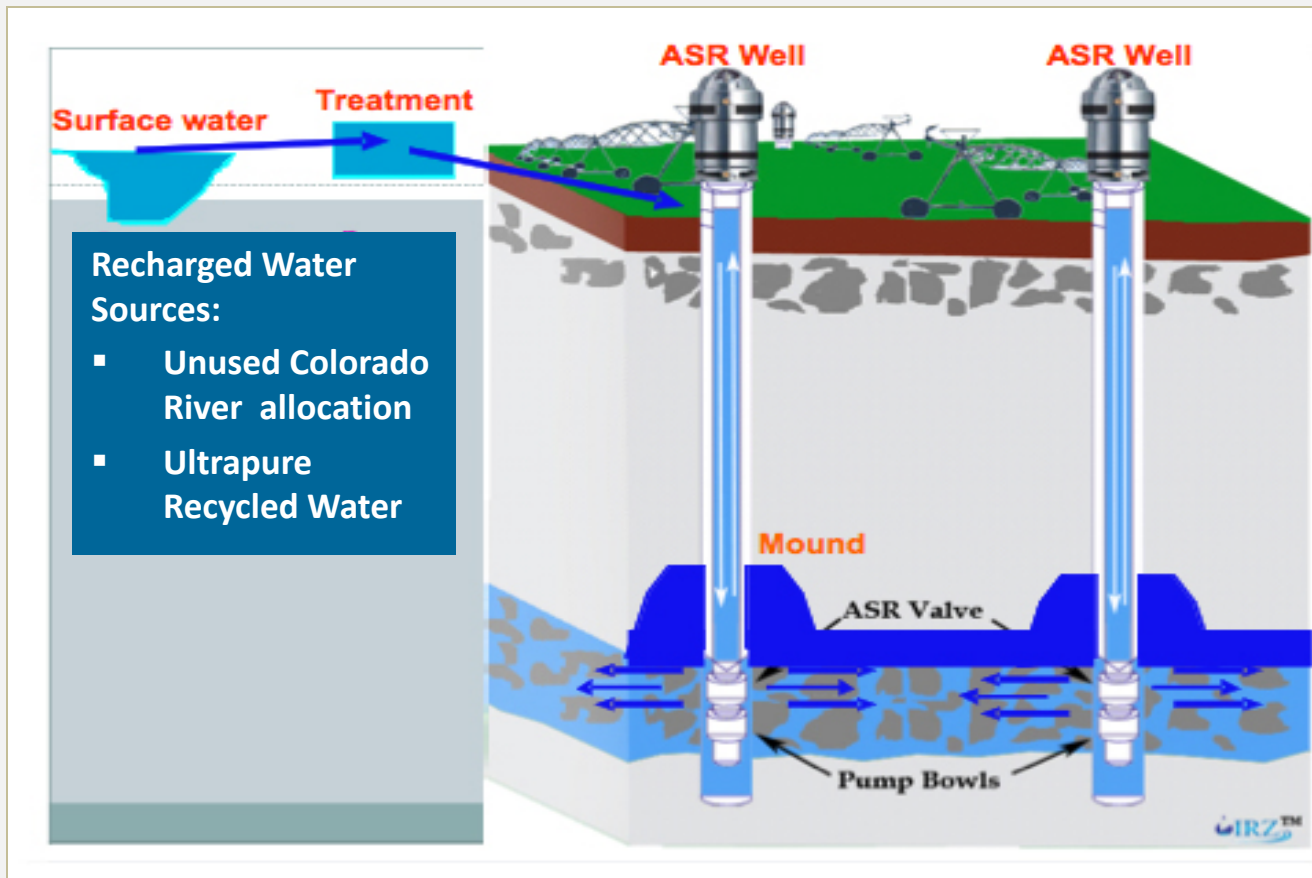
# Groundwater Recharge: CAP

- Scottsdale's original CAP allocation: 19,700 AF (~6.4 billion gallons)
- Current CAP allocation: 81,000 AF (~26.4 billion gallons)
- Scottsdale holds third largest CAP allocation in the state.
- Unused allocation (about 20 percent) recharged for long-term storage credits.

***2016 Total Recharge (all sources): 3.9 Billion Gallons***

***Since 2005: 39.2 Billion Gallons Recharged***

# Recharging Surface Water



# Reclaimed Water Distribution System (RWDS)

- Desert Mountain signs initial agreement in 1991
- Expectations are 10 years to sell 100% capacity
  - Capacity sold in 18 months
- Delivery of raw CAP water begins in 1993
- Delivery of effluent begins in 1998



TPC Scottsdale 1987

# RWDS System Today

- 14 miles of pipe, 5 pump stations, 20 mgd capacity
- Irrigation for 23 golf courses, city-owned sports complex

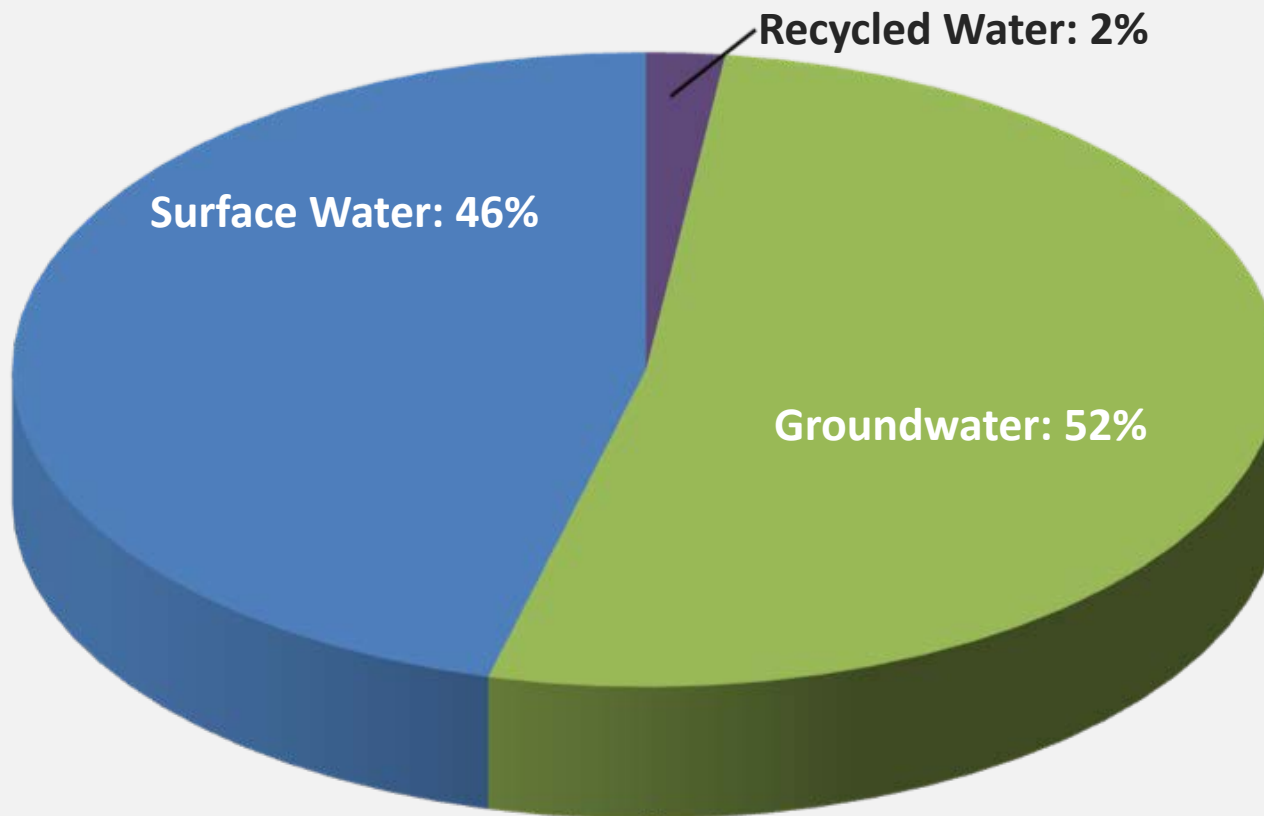
**2016 RWDS Water Delivery:**  
3.95 billion gallons

**2016 AWT Recharge:**  
1.3 billion gallons



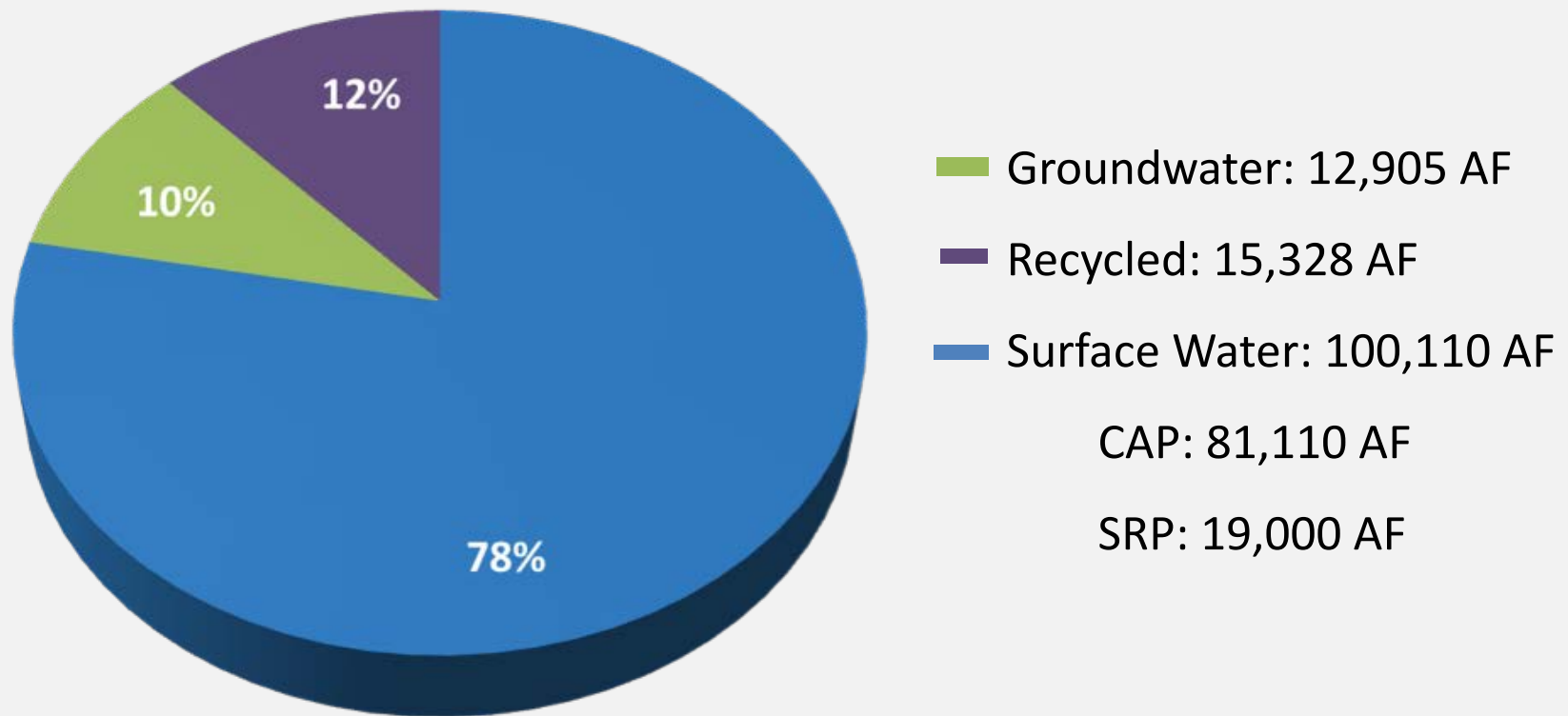
Courtesy: Desert Mountain

# Scottsdale Water Supply Portfolio 1996





# Scottsdale Water Supply Portfolio 2016



**Total Available Water Supply 2016: 128,000 AF (~36 billion gallons)**

# Scottsdale's Commitment to Safe Yield

- Phoenix AMA mandated to achieve safe yield by 2025.
- Scottsdale first city in Arizona to achieve safe yield (in 2006)
- Two reasons for success:
  - Reduced groundwater reliance by obtaining additional surface water supplies
  - Water Campus

# Water Conservation and Drought Management



# Rebates

## Installations:

- Toilets – up to \$75
- Urinals – up to \$200 (waterless qualify)
- Showerheads – up to \$25
- Irrigation Controller – up to \$250

## Removals:

- Water softeners – up to \$250
- Pool/spa\* – up to \$1,500
- Turf – up to \$1,500 residential, up to \$5,000 multifamily/commercial



\*single-family residential only

# Water Efficiency Workshops

**65 percent of residential water use is outdoors!**

- Teach residents about:
  - Efficient water use
  - Low-water-use plants
  - Irrigation maintenance
- Workshops held throughout the year
- Free to Scottsdale residents



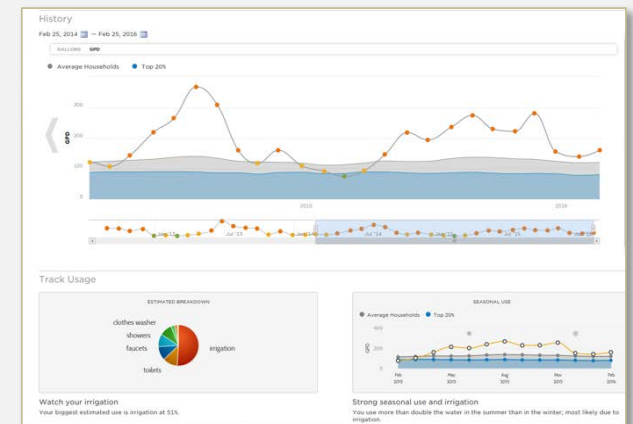
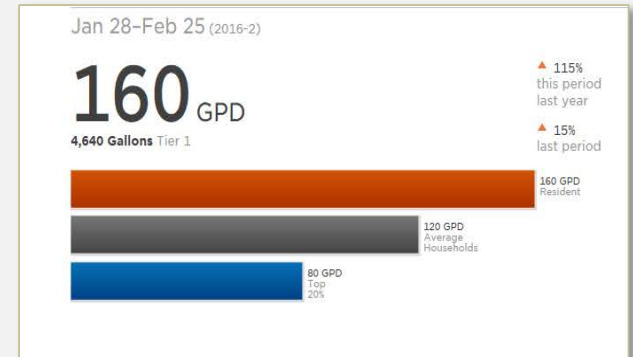
# Youth Education Program

- Water Conservation hands-on activities
- Free educational booklets to schools
- Garden tours
- Scouts and troops talks



# WaterSmart Software

- Three-year pilot
- 3,500 participants
- Social norm-based comparisons
- Consumption and demographics
- Customized reports
- Encourage water efficient behaviors
- Control group



## Choose low-water-use plants



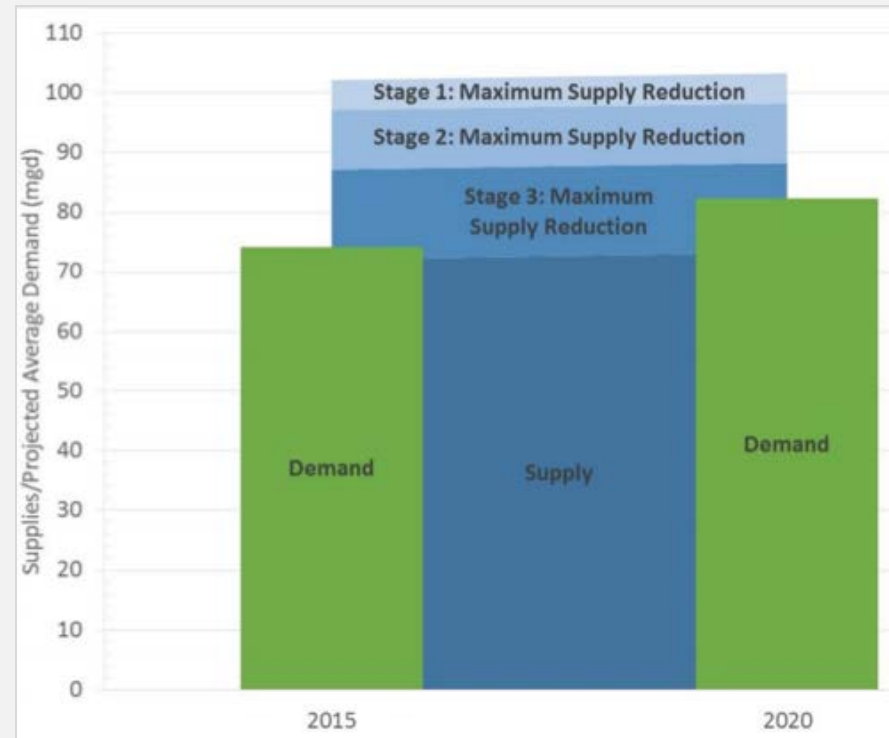
Did you know?...  
Low-water-use plants adapted to the Sonoran Desert require less maintenance, water, fertilizers and pesticides than non-desert-adapted varieties. They are also more drought-tolerant!

What to do next...  
When choosing new plants, choose ones that are heat-tolerant and require little water. Use these three easy guides to make your landscape thrive:

1. **Select** - find the right plants for your landscape, lifestyle and vision.
2. **Install** - our step-by-step guide will help you design, install and maintain a beautiful low-water-use landscape.
3. **Succeed** - proper watering and care are the keys to landscape success.

# Proactive Drought Management Plan

- Identifies four stages of shortage:
  - Stage One: 0-5 mgd water supply reduction
  - Stage Four: reduction > 30 mgd
- Each stage has corresponding water use reduction responses, which increase with each stage
- No residential watering restrictions until Stage Two





# Learning Objectives

- Scottsdale's commitment to Sustainable Water Mgmt
- Understand how long term planning and commitment produce results
- Reuse and recharge as part of an overall water resource strategy
- Success of private/public partnerships



# Questions?



# Project Implementation Lessons Learned

- Public outreach and education
  - Buy in and support from community
  - Input from academic community
- Treat to potential future standards
- Identify opportunities for potential commercial/ industrial partnerships within your community

