



**CAGRD**  
CENTRAL ARIZONA GROUNDWATER  
REPLENISHMENT DISTRICT  
A Division of Central Arizona Project

# **YMIDD/CAGRD Pilot Following Program**

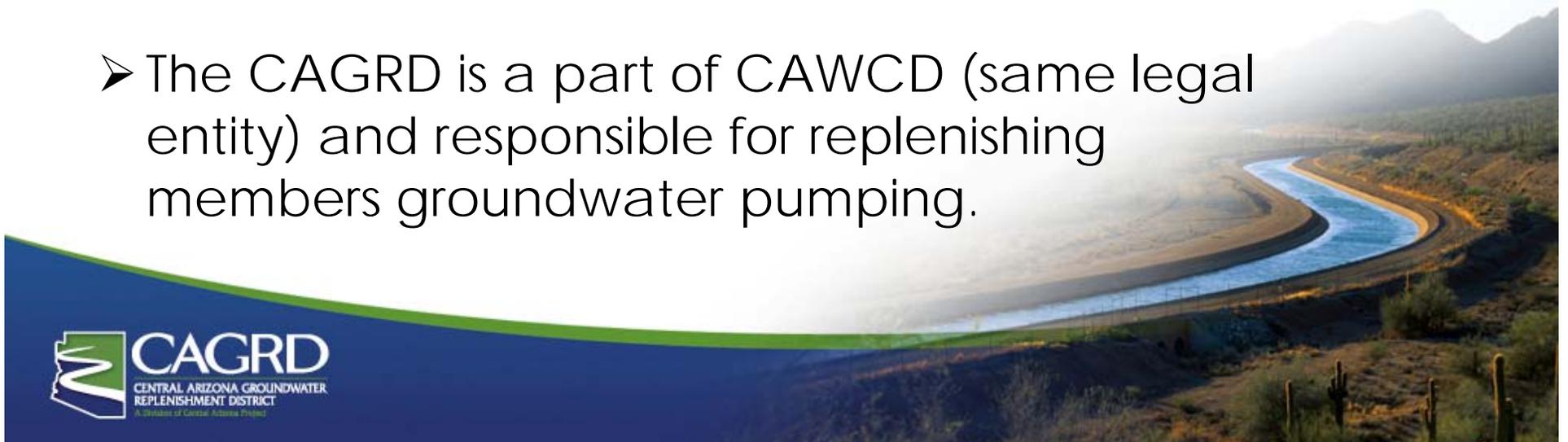
*Good for Business  
Good Water Management  
July 26, 2017*

Perri Benemelis, Manager  
Andrew Craddock, Analyst  
CAGRD Water Supply Program

## What is the CAGRDR?

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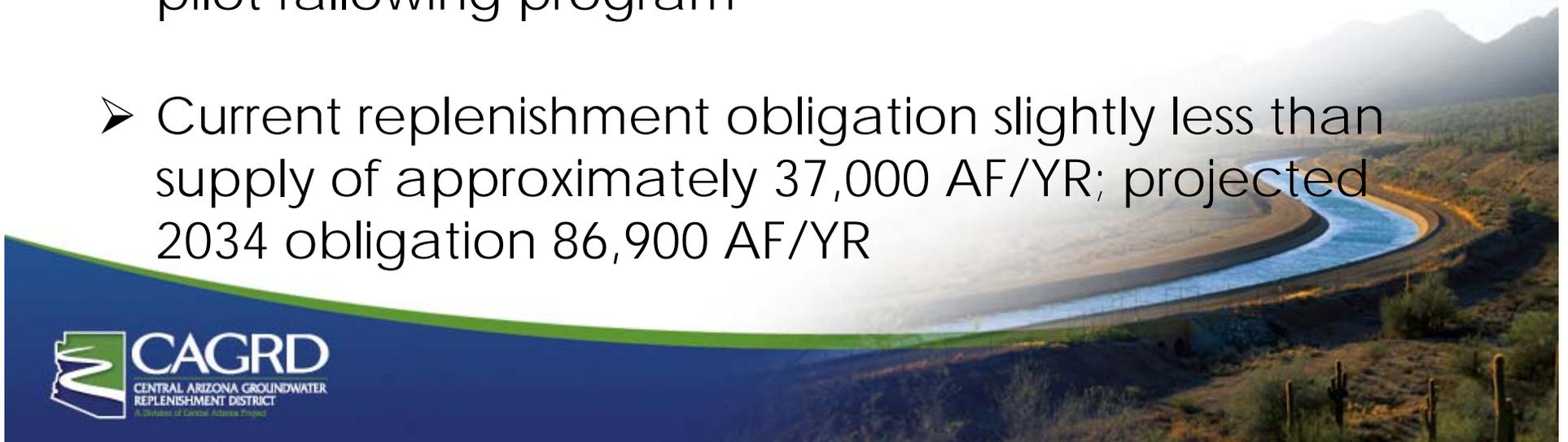
- New development in Arizona's large metropolitan areas must comply with Assured Water Supply Program requirements that are among the most stringent in the county.
  - Membership in the CAGRDR provides one mechanism for meeting this requirement.
- The CAGRDR is a part of CAWCD (same legal entity) and responsible for replenishing members groundwater pumping.



# CAGRD's Water Supply Program

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- CAGRD's Water Supply Program (WSP) is responsible for acquiring water supplies to meet its member's replenishment obligation
- 21 water supply acquisitions to date: Long-Term Storage Credits, effluent, CAP M&I and NIA-priority water, plus Quartzsite lease and YMIDD pilot following program
- Current replenishment obligation slightly less than supply of approximately 37,000 AF/YR; projected 2034 obligation 86,900 AF/YR



# 2017/2018 CAGRD Member Land Assessment Rate

Acre-Foot Assessment Rate Components (Phoenix AMA)	
Water & Replenishment	\$214
Administrative	\$36
Infrastructure & Water Rights	\$353
Replenishment Reserve	\$101
Total Assessment (\$/AF)	\$704
Annual Membership Due (\$/Lot)	
Phoenix AMA	\$22.63
Pinal AMA	\$14.88
Tucson AMA	\$23.58

# Typical CAGRD Subdivision

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# Typical CAGRDR Subdivision

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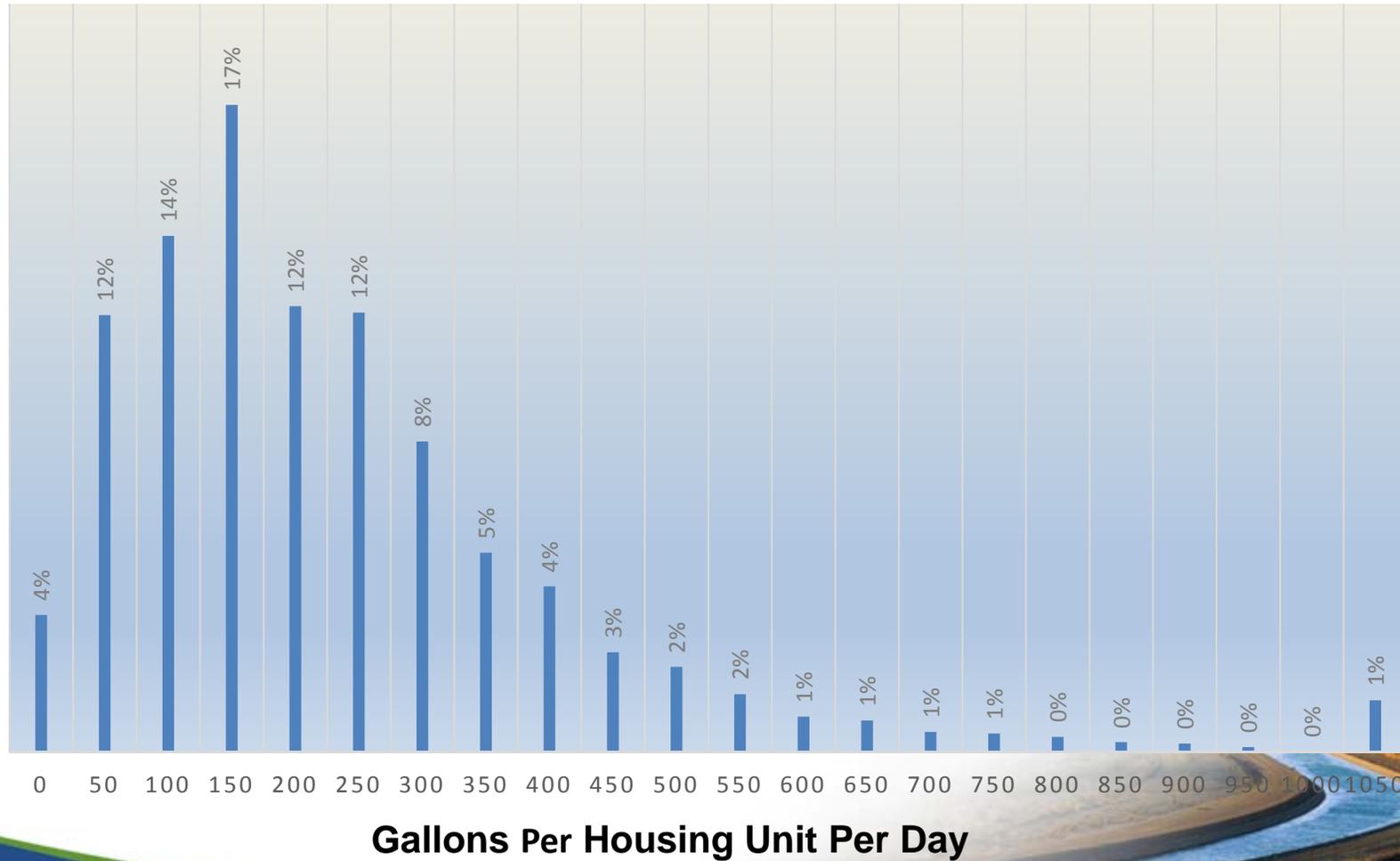


# Typical CAGRDR Subdivision

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# Distribution of CAGRD Parcel Water Use (2014)

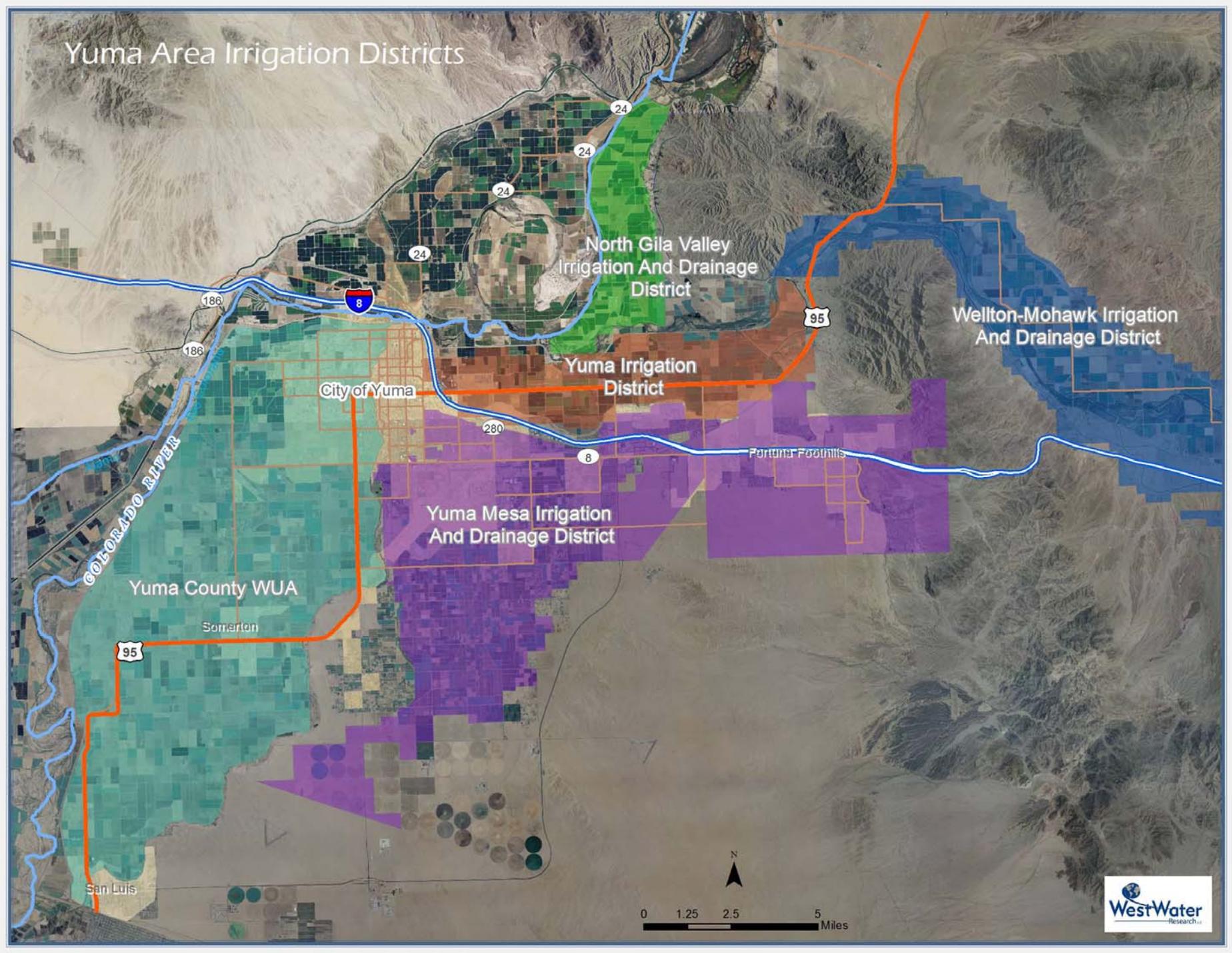




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# **Yuma Mesa Irrigation & Drainage District (“YMDD”) Pilot Rotational Fallowing Program**

# Yuma Area Irrigation Districts



## Following Water Conservation

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- Entitlement holder voluntarily agrees to conserve the use of a portion of the approved annual consumptive use of Colorado River water
- Conservation savings quantified based upon the foregone beneficial water use that would otherwise have occurred



# YMIDD History: Reclamation Demonstration Program

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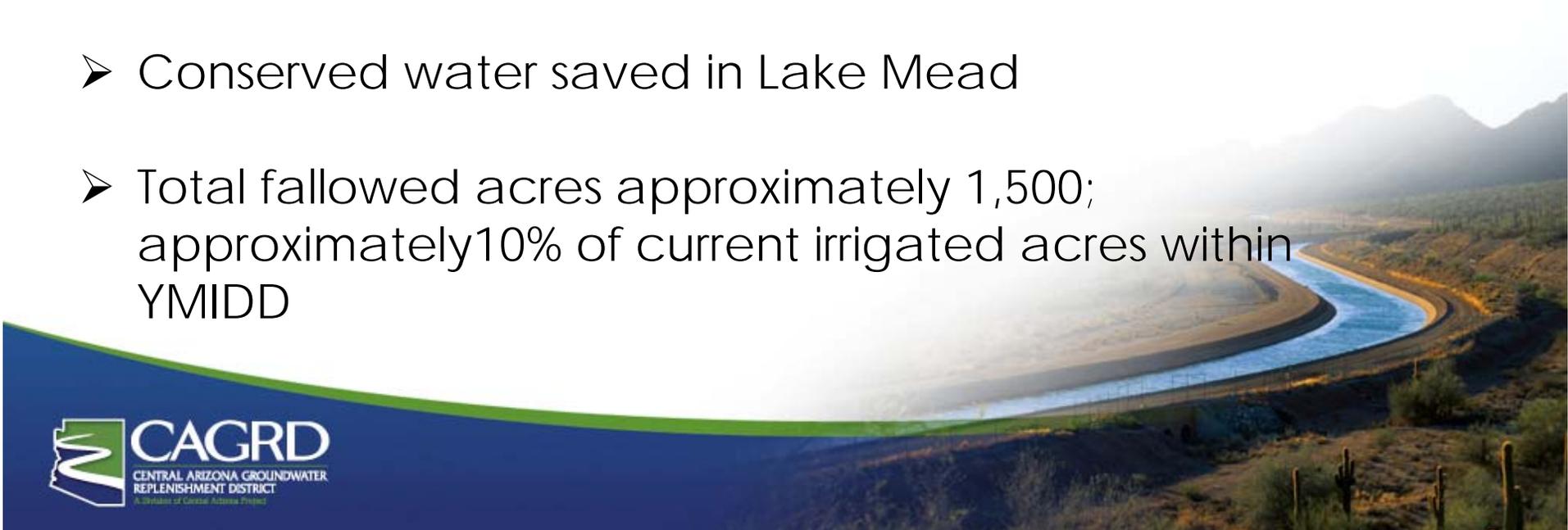
- 2008 – 2010 YMIDD participated in a Reclamation Demonstration Program for System Conservation of Colorado River water
  - Federal budget issues
  - “Baseline” issues
  - Could not measure/confirm water savings



# YMIDD & CAGRDR Pilot Program

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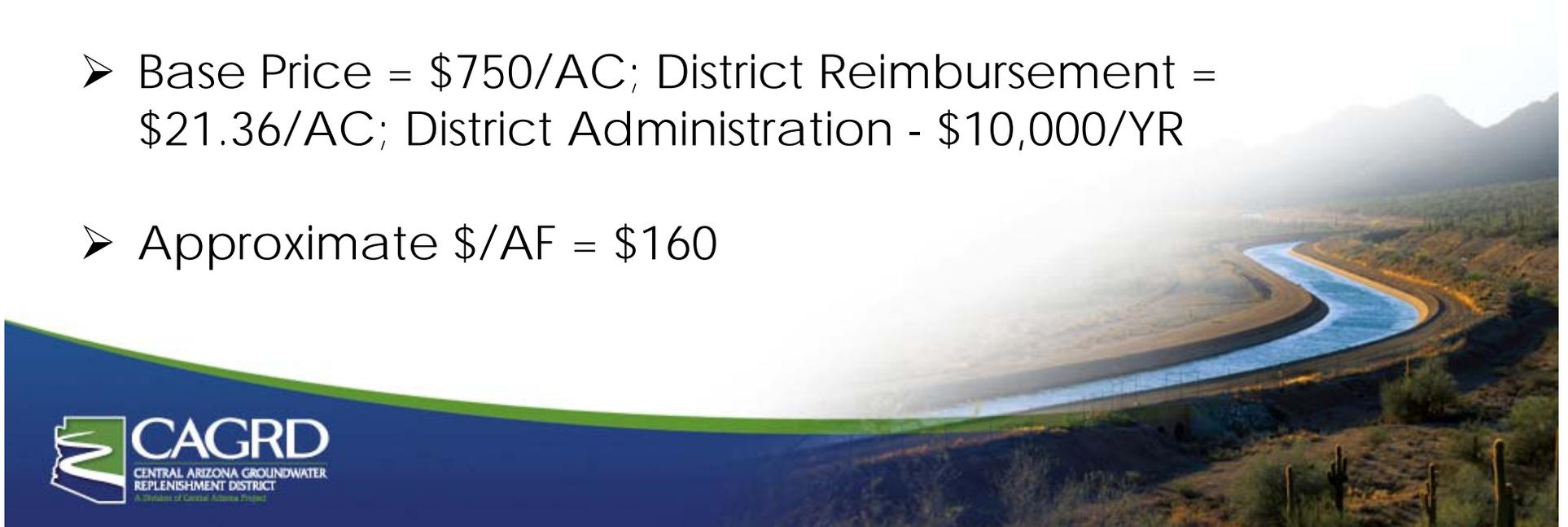
- September 2013: CAWCD Board approves the pilot program
- 2-3 year terms; re-evaluate at year 3
- Farmers paid to fallow lands that would otherwise be farmed
- Conserved water saved in Lake Mead
- Total fallowed acres approximately 1,500; approximately 10% of current irrigated acres within YMIDD



## YMIDD & CAGRD Pilot Program

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- “Qualified Land” must have produced crops in 4 of the last 5 years, at least 5 contiguous acres, would be irrigated if not enrolled in the program
- Enrollment capped at 15.7% of total irrigated acres for most landowners (approx. 10% for large landowners)
- Base Price = \$750/AC; District Reimbursement = \$21.36/AC; District Administration - \$10,000/YR
- Approximate \$/AF = \$160

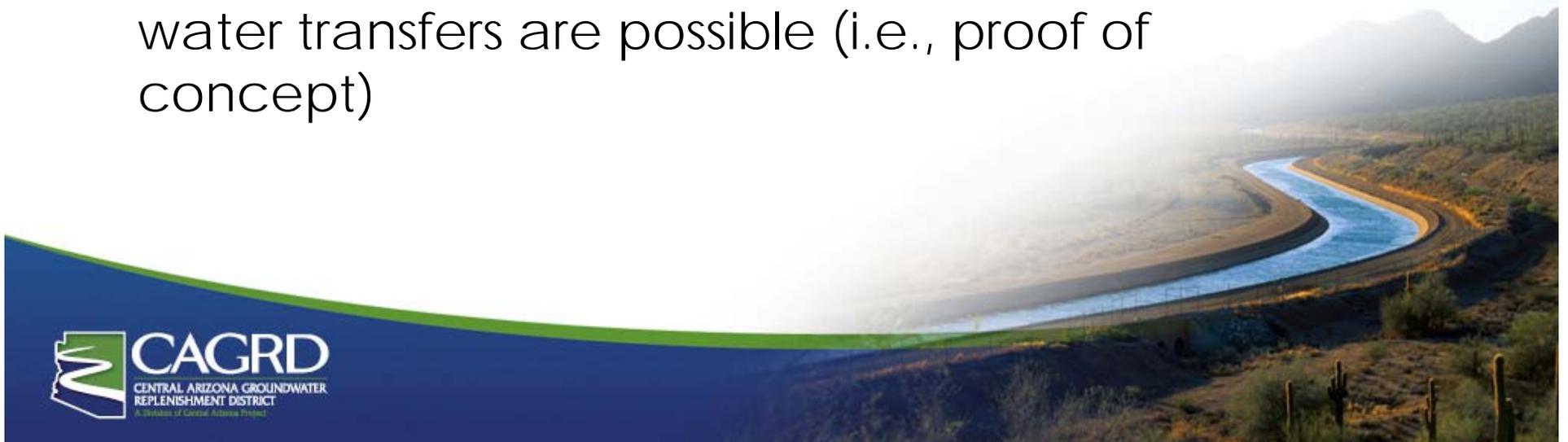




# Pilot Program Objectives

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- Develop data, methodologies and processes to inform a future longer-term water supply following program
  - Quantify water savings
- Prove that mutually beneficial, willing seller / willing buyer, temporary agriculture to urban water transfers are possible (i.e., proof of concept)

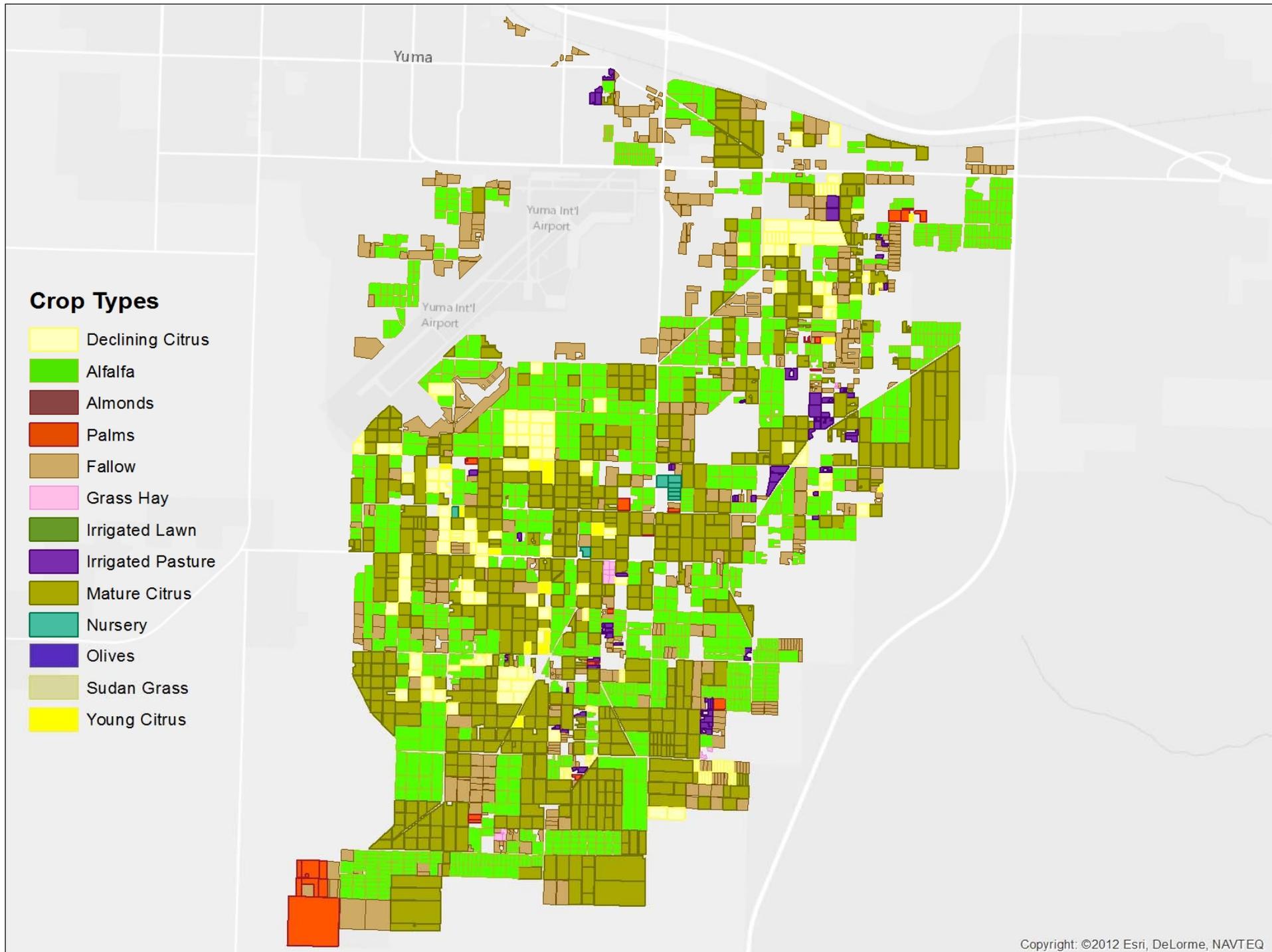


# Quantify the Volume of Water Savings

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- Forgone Consumptive Crop Water Use:
  - Crop mapping: Develop crop mapping from years 2010 – 2013; visited the district and recorded field and crop information using a GPS and current satellite imagery
  - Determine consumptive crop water use by the crops identified in the mapping

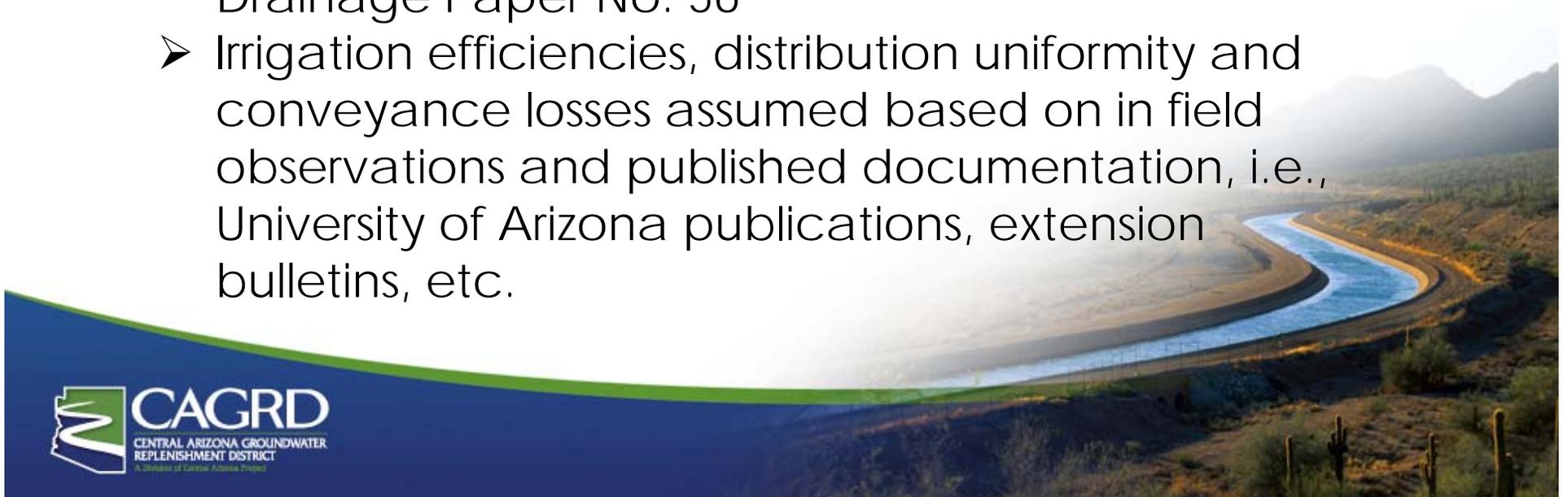




# Quantify the Volume of Water Savings

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- Forgone Consumptive Crop Water Use:
  - The south Yuma AZMET station was used for daily reference evapotranspiration (Eto) values for the years of interest
  - Crop coefficients and durations of growth stages were taken from chapter 6 of FAO Irrigation and Drainage Paper No. 56
  - Irrigation efficiencies, distribution uniformity and conveyance losses assumed based on in field observations and published documentation, i.e., University of Arizona publications, extension bulletins, etc.



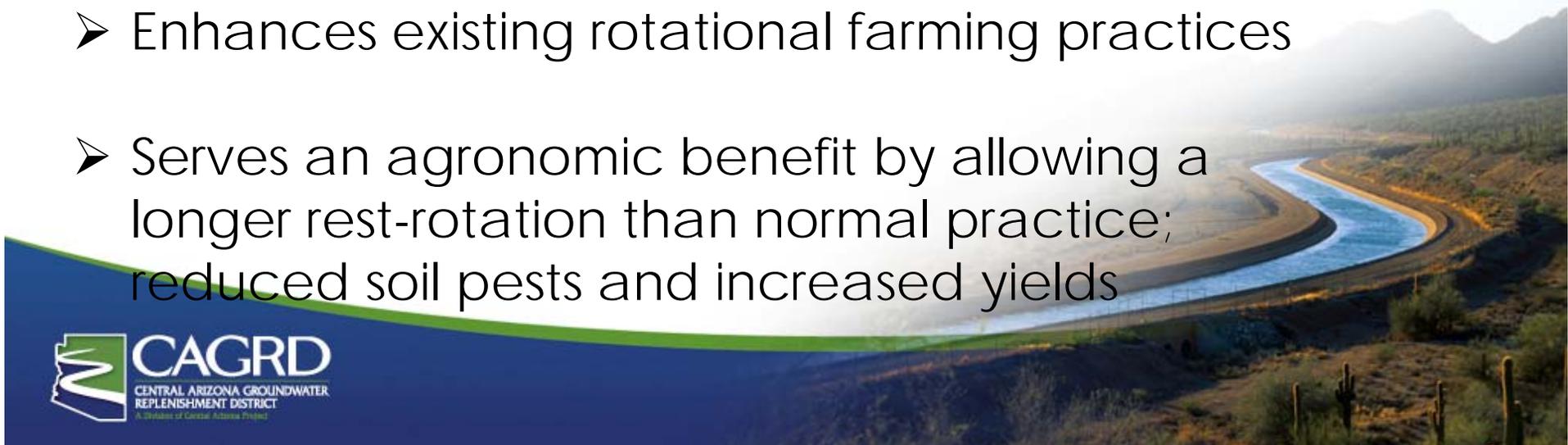




## Pilot Program Benefits

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- Provides a stable revenue stream for YMIDD farmers with limited impact on current farming operations
- Avoids permanent loss of productive agricultural land and avoids or minimizes any adverse local economic impact
- Enhances existing rotational farming practices
- Serves an agronomic benefit by allowing a longer rest-rotation than normal practice; reduced soil pests and increased yields



## Pilot Program Benefits

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- Allows CAGRD to develop data, methodologies and processes to inform a future longer-term water supply following program
- Develops relationships with on-river entitlement holders
- Conserved water supply retained in Lake Mead will help to minimize or avoid shortages to water users in Arizona and the Lower Basin



## Conclusions

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- Previous year's cropping pattern is the best indicator of "baseline" conditions
- May require adjustment for drought or significant change in crop market conditions
- 2014 calculated water savings of 6,827 AF or average of 4.9 AF/acre
- 2015 calculated water savings of 7,180 AF or average of 5.1 AF/acre
- 2016 calculated water savings of 7,509.04 AF or 5.36 AF/acre
- Values compared with "conservative" initial estimate of potential water savings of 9,000 acre-feet

