

Safe-Yield in the Phoenix AMA



- ❖ ADWR Fifth Management Plan (5MP)
 - 5MP Safe-Yield Technical Subgroup
- ❖ Governor's Water Augmentation, Implementation and Conservation Council
 - Post-2025 AMAs Committee
- ❖ Through these forums, stakeholders are working to set the stage for the next era of groundwater management in Arizona



What is Safe-Yield?

- ❖ Management Goal of the Phoenix AMA
- ❖ A.R.S. § 45-561(12):

a groundwater management goal which attempts to achieve and thereafter maintain a long-term balance between the annual amount of groundwater withdrawn in an active management area and the annual amount of natural and artificial recharge in the active management area.

- ❖ To be achieved by January 1, 2025. (A.R.S. § 45-562(A))

Safe-Yield Analysis Objectives



Review evolution and implementation



Describe ADWR's water budget accounting approach



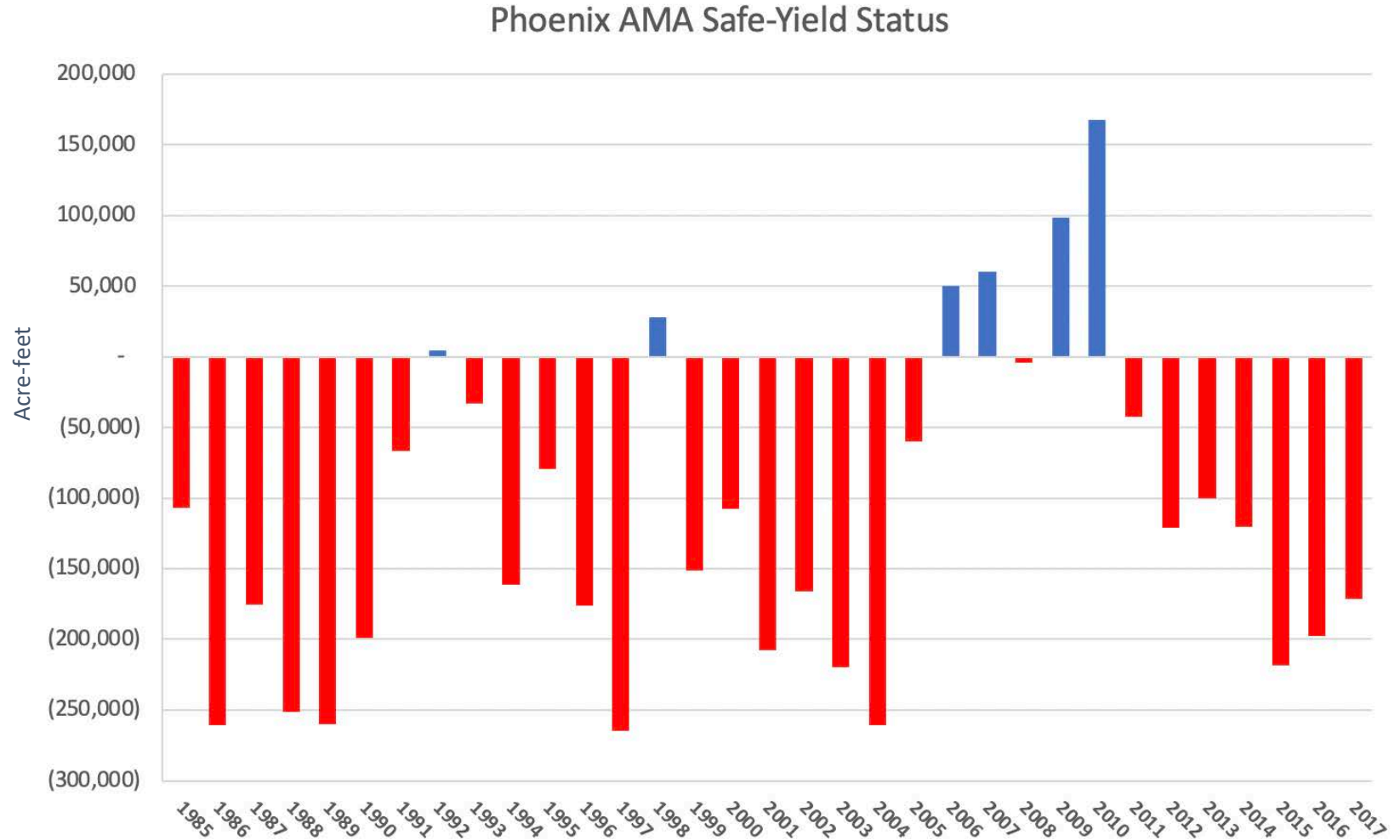
Evaluate progress toward the goal in the Phoenix AMA



Identify obstacles to achieving safe-yield by 2025 and thereafter

Status of the Phoenix AMA

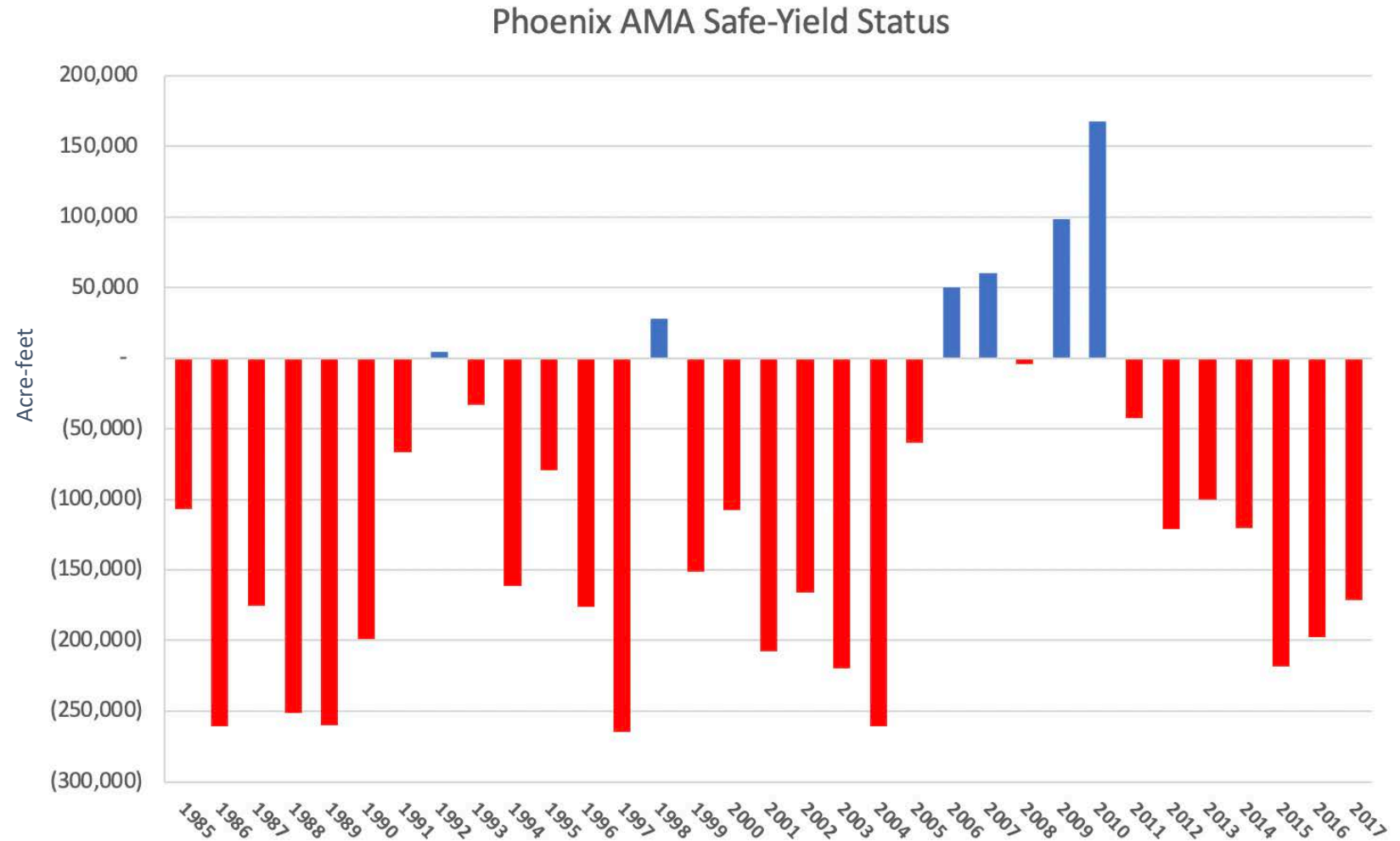
- ❖ All sectors included: agricultural, municipal, tribal, industrial, & natural groundwater flows
- ❖ Phoenix AMA in overdraft since 2010
- ❖ Level of annual overdraft fluctuates



Status of the Phoenix AMA

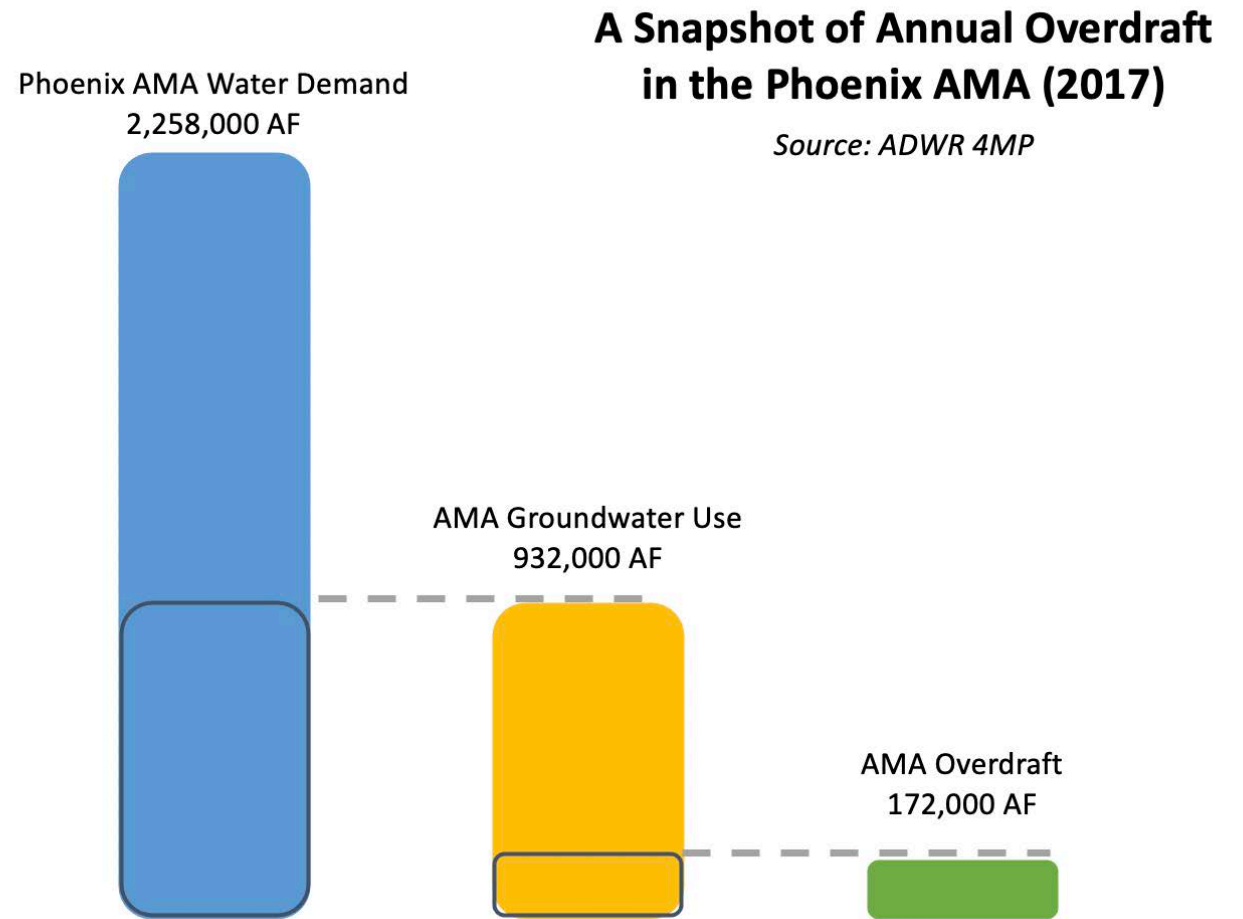
Running Avg Overdraft
= **114,400 AF/year**

Cumulative Overdraft
= **3,774,500 AF**



Understanding the Numbers

- In 2017, groundwater satisfied 41% of all demands in Phoenix AMA
- Overdraft amounted to 18% of groundwater use
 - 7% of total water use



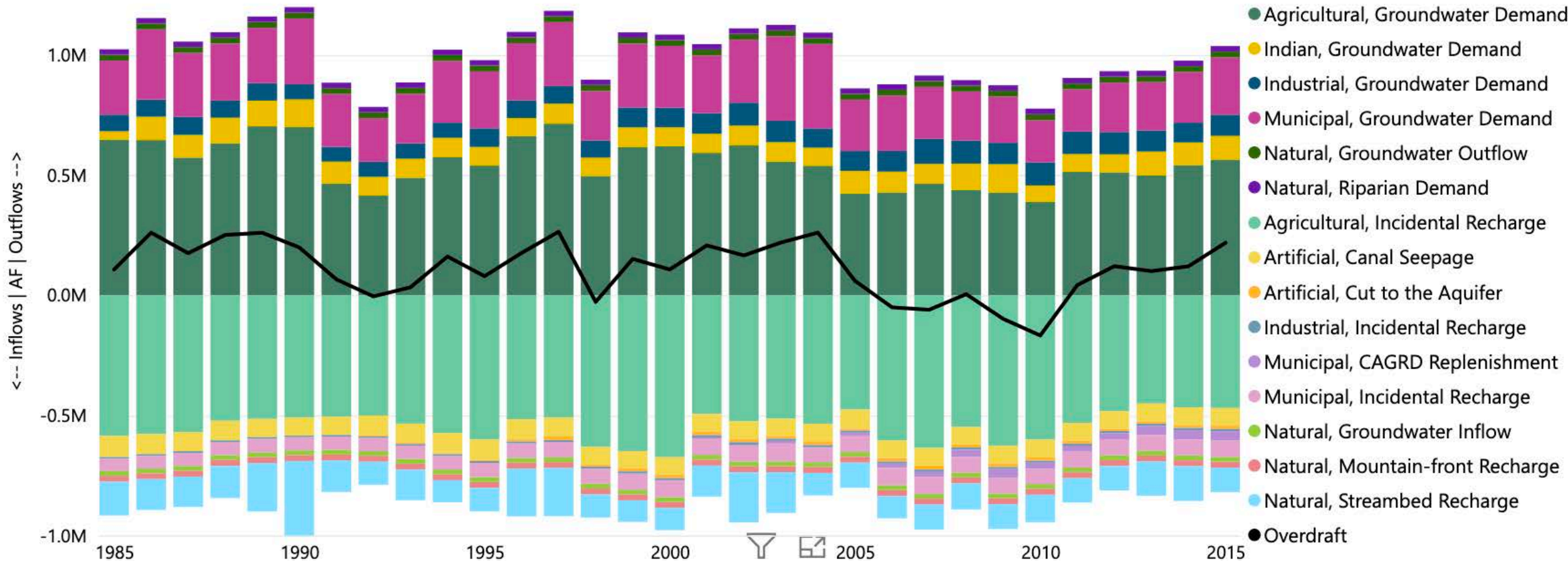
In the Phoenix AMA, 41% of all water demands in 2017 were satisfied with groundwater. Of that groundwater use, 172,000 AF was pumped over and beyond the volume of natural or artificial recharge included by the safe-yield calculation. The volume of overdraft fluctuates from year to year, based upon groundwater pumping and recharge.

OVERDRAFT DASHBOARD

Last Updated: 08/27/2020

ANNUAL INFLOWS & OUTFLOWS BY SECTOR & COMPONENT

Click on the columns and/or legend components to highlight specific data



AMA [Click here to see AMA Management Goals](#)

Phoenix Pinal Prescott Santa Cr... Tucson

YEAR

1985

2015



SECTOR

- Agricultural
- Artificial
- Industrial
- Municipal
- Natural

COMPONENT

- CAGR D Replenishment
- Canal Seepage
- Cut to the Aquifer
- Groundwater Demand
- Groundwater Inflow
- Groundwater Outflow

Show Components

Hide Components

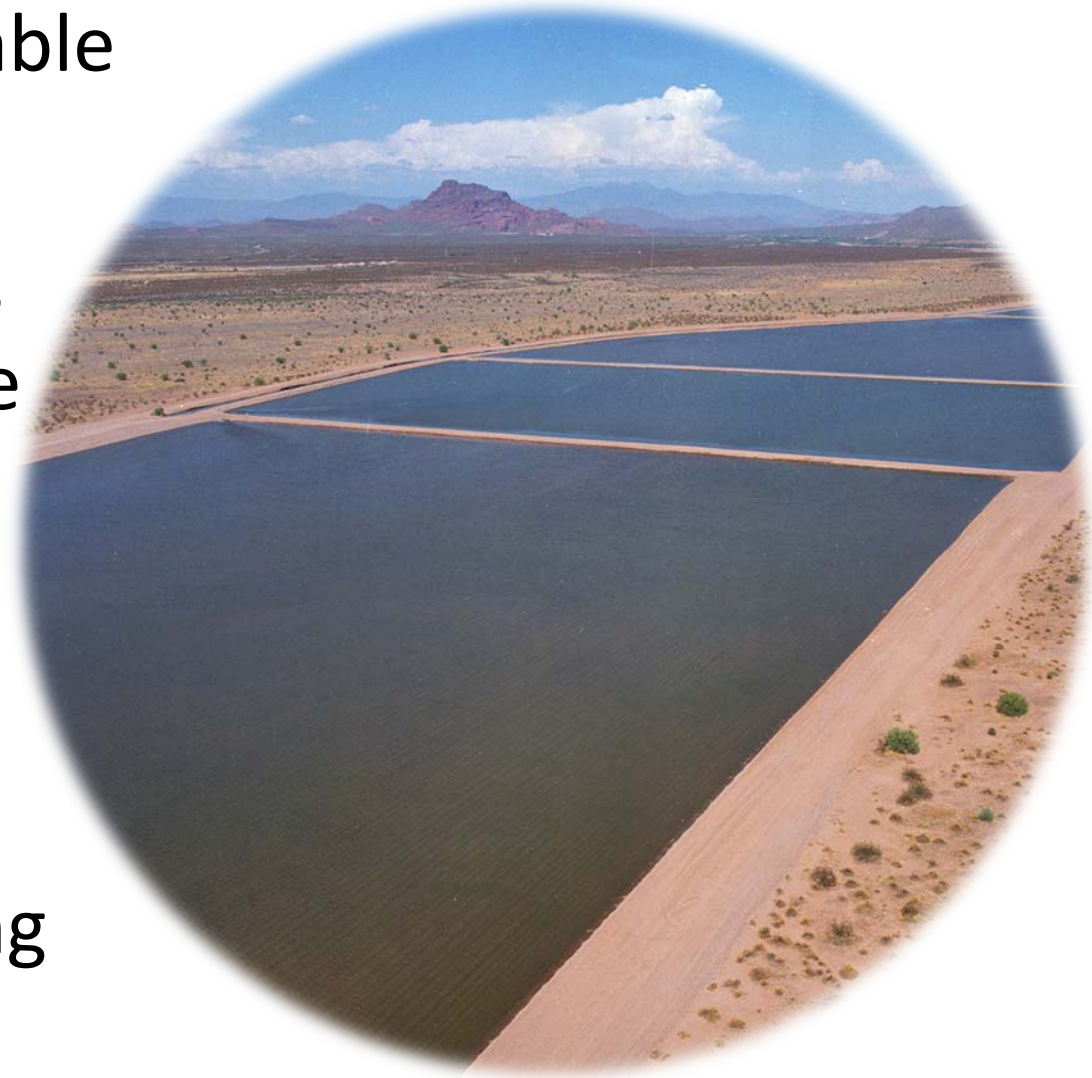
Hold down "Ctrl" to select multiple AMAs, Sectors, and/or



Table 2: Safe-Yield Components by Source and Accounting Method

	Source			Accounting		
	ADWR Groundwater Models (M)	Estimated (E) or Calculated (C) by ADWR	Annual Reports (R)	Annual/In-Year Accrual (A)	Time-Lagged (L)	Constant Value (k)
OUTFLOWS						
Natural						
Groundwater Outflow	M			A		k
Riparian Demand	M			A		
Artificial						
Indian Sector Demands		E		A		
Industrial Sector Demands						
Groundwater			R	A		
Poor Quality Groundwater			R	A		
Agricultural Sector Demands						
Groundwater		E (<10 acres)	R	A		
GSF Water (CAP)			R	A		
GSF Water (effluent)			R	A		
Municipal Sector Demands						
Remediated Groundwater			R	A		
Groundwater		E	R	A		
Excess Pumping (CAGRDLands)			R	A		
Exempt Well Pumping		E		A		
Groundwater Allowance Pumping			R	A		
GSF Water (CAP)			R	A		
INFLOWS						
Natural						
Groundwater Inflow (AKA underflow)	M			A		k
Streambed Recharge	M				L	
Mountain-front Recharge	M			A		k
Artificial						
Incidental Recharge: Ag	M				L	
Incidental Recharge: Industrial		C		A		
Incidental Recharge: Municipal		C		A		
Canal Seepage	M			A		k
Cut to the Aquifer			R	A		
CAGRDLands Replenishment			R	A		

- ❖ Safe-Yield has helped guide sustainable groundwater management
- ❖ Despite not yet achieving safe-yield, groundwater use has declined in the AMA
 - Municipal groundwater use has decreased despite increasing demand for water
- ❖ Progress has been made but meeting the goal by 2025 is unlikely



- ❖ Implementation and measurement of the goal limit its effectiveness
 - More complex in practice
 - Difficult to track
- ❖ Limits to achievement:
 - Many exemptions allow groundwater use in all sectors
 - Recharge/replenishment is limited in comparison to withdrawals



- ❖ Doesn't capture other management issues that need be addressed
- ❖ Safe-Yield is not a measure of local groundwater conditions
- ❖ Surface water stored via underground storage facility (USF) is not a safe-yield inflow
- ❖ Storage at groundwater savings facility (GSF) is a safe-yield outflow



- ❖ Continue participation in ongoing, State-led processes
 - Encourage participation of all watching today
 - Next Safe-Yield Technical Subgroup Meeting on March 10th

- ❖ Support policy discussions addressing:
 - Current safe-yield methodology
 - Solutions for groundwater management issues not addressed by current goal
 - Future AMA management goals (Post-2025 AMAs Committee)

Questions & Comments

Jessica Fox

jfox@amwua.org

<https://www.amwua.org/uploads/15932029936cae07.pdf>