

Conservation Potential

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GWAC Meeting, 2.19.16

Arizona Department of Water Resources



Overview of Conservation Potential

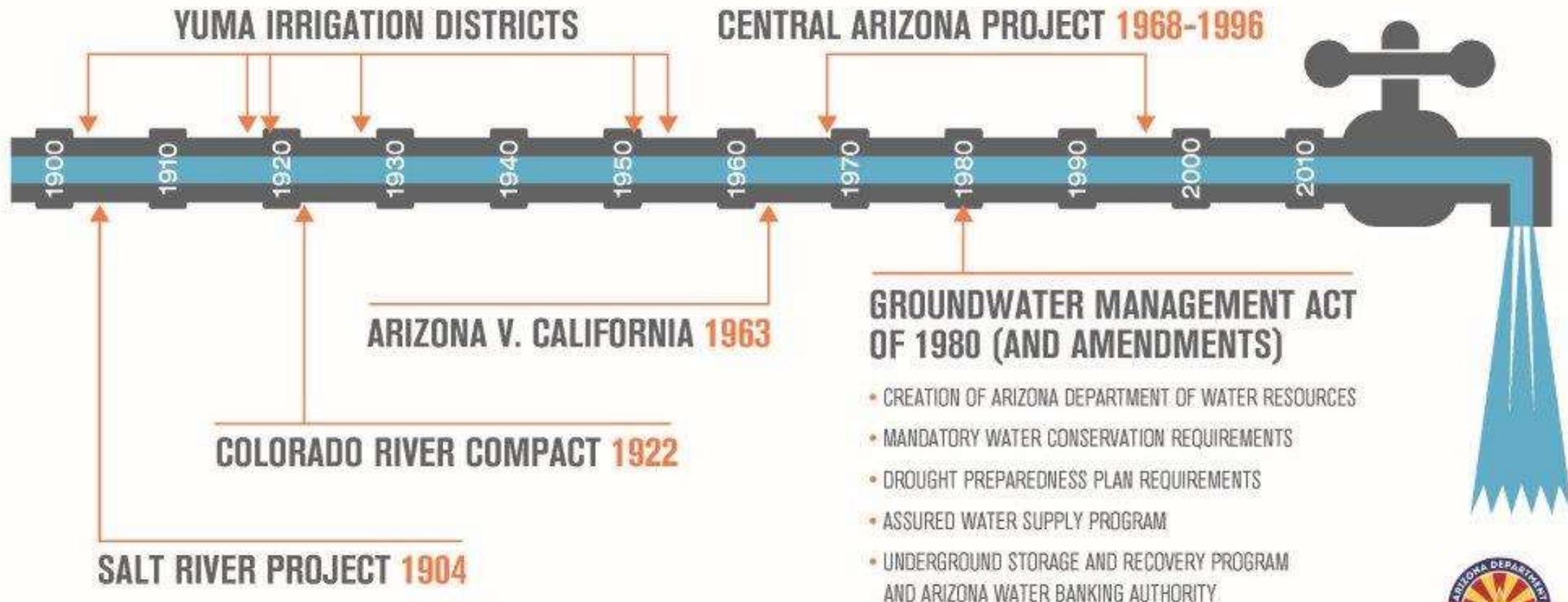
1. Background on water use in Arizona
2. Ideas for further conservation within three use sectors:
 - Municipal Use
 - Agricultural Use
 - Industrial Use



- Funding sources for the proposed expanded conservation projects may be discussed by the council
- These are possible solutions that may be considered in part or in whole and applicability will vary with geographic location
- Please hold questions until the end of presentation



ACTIONS THAT HAVE CONTRIBUTED TO ARIZONA'S WATER MANAGEMENT SUCCESS



YUMA IRRIGATION DISTRICTS

CENTRAL ARIZONA PROJECT 1968-1996

SALT RIVER PROJECT 1904

COLORADO RIVER COMPACT 1922

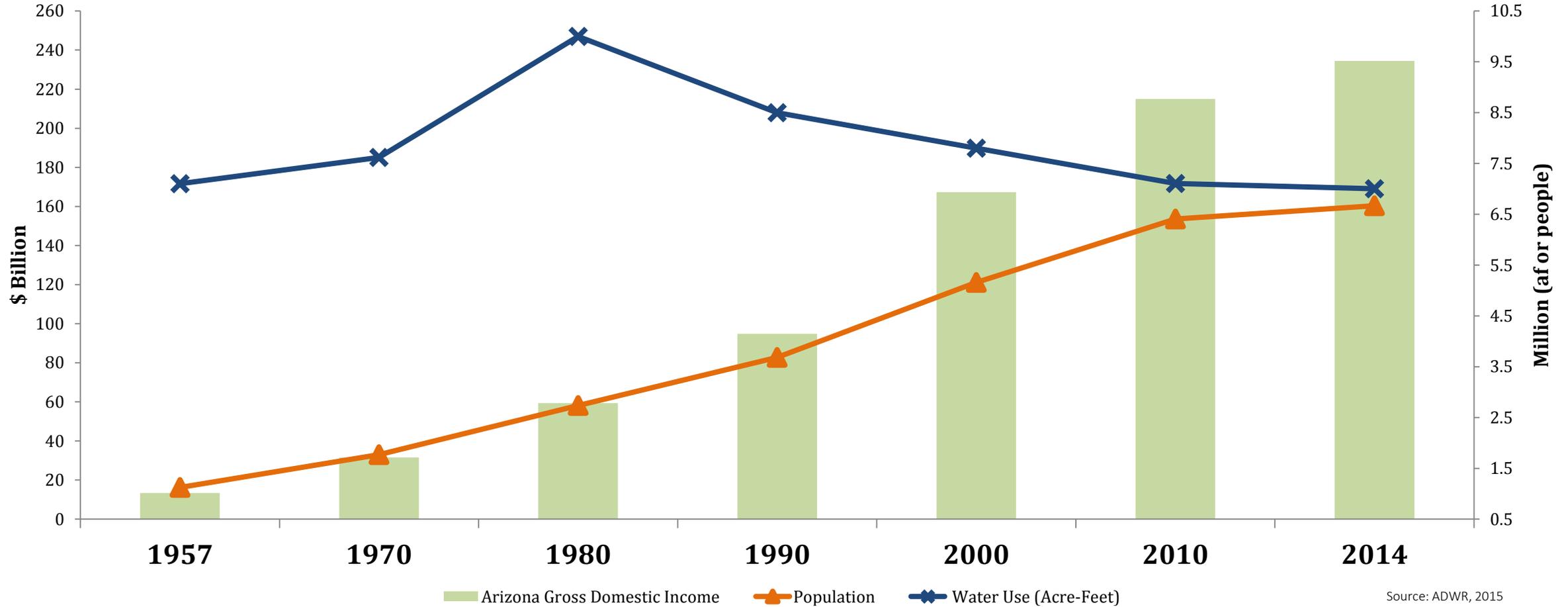
ARIZONA V. CALIFORNIA 1963

GROUNDWATER MANAGEMENT ACT OF 1980 (AND AMENDMENTS)

- CREATION OF ARIZONA DEPARTMENT OF WATER RESOURCES
- MANDATORY WATER CONSERVATION REQUIREMENTS
- DROUGHT PREPAREDNESS PLAN REQUIREMENTS
- ASSURED WATER SUPPLY PROGRAM
- UNDERGROUND STORAGE AND RECOVERY PROGRAM AND ARIZONA WATER BANKING AUTHORITY



Arizona Water Use, Population, and Economic Growth (1957 - 2014)

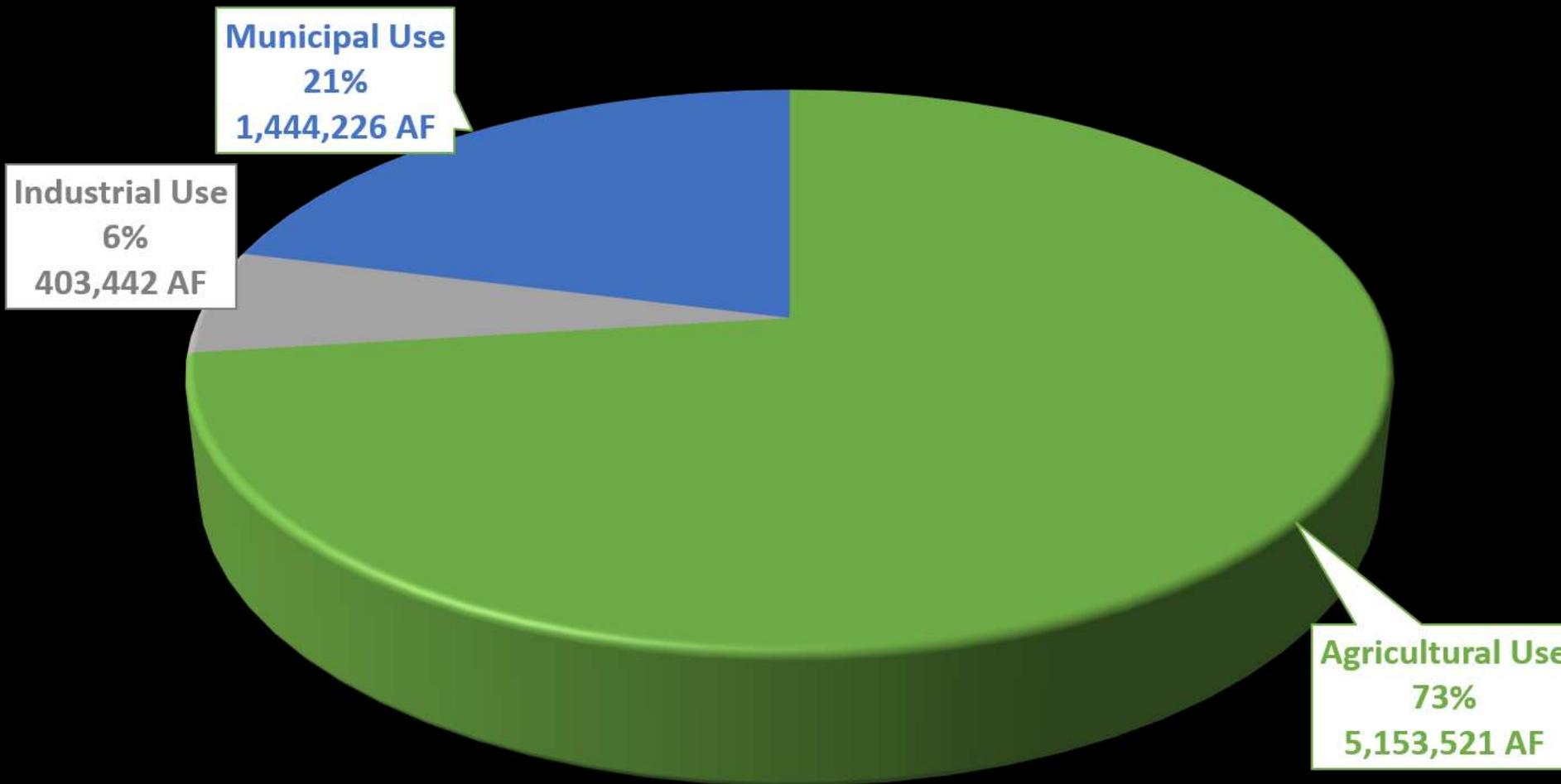


Source: ADWR, 2015

Timeframe	Total Water Use (in million acre-feet)	Population (in millions)	Gross Domestic Income (in billions)
1957	7.1maf	1.1	\$13.4
2014	7 maf	6.7	\$234.5
Change from 1957-2014	-1%	493%	1,652%



Arizona's Water Use by Sector (2014)



Data Source: ADWR

■ Agricultural ■ Industrial ■ Municipal



Further Conservation Efforts



Municipal



Agricultural



Industrial

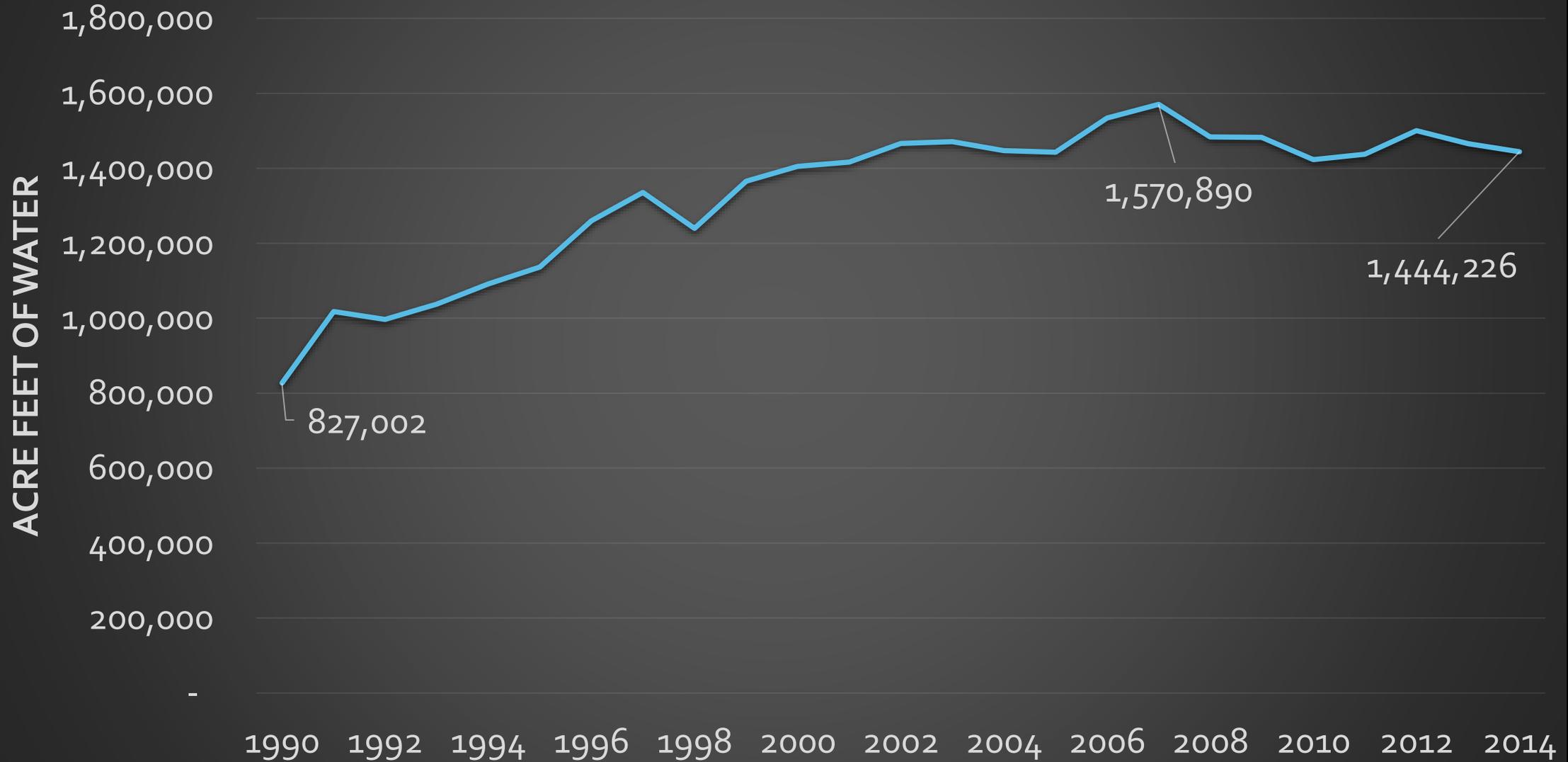
Further Conservation Efforts



Municipal

Trends of Statewide Municipal Water Use

— Statewide Municipal



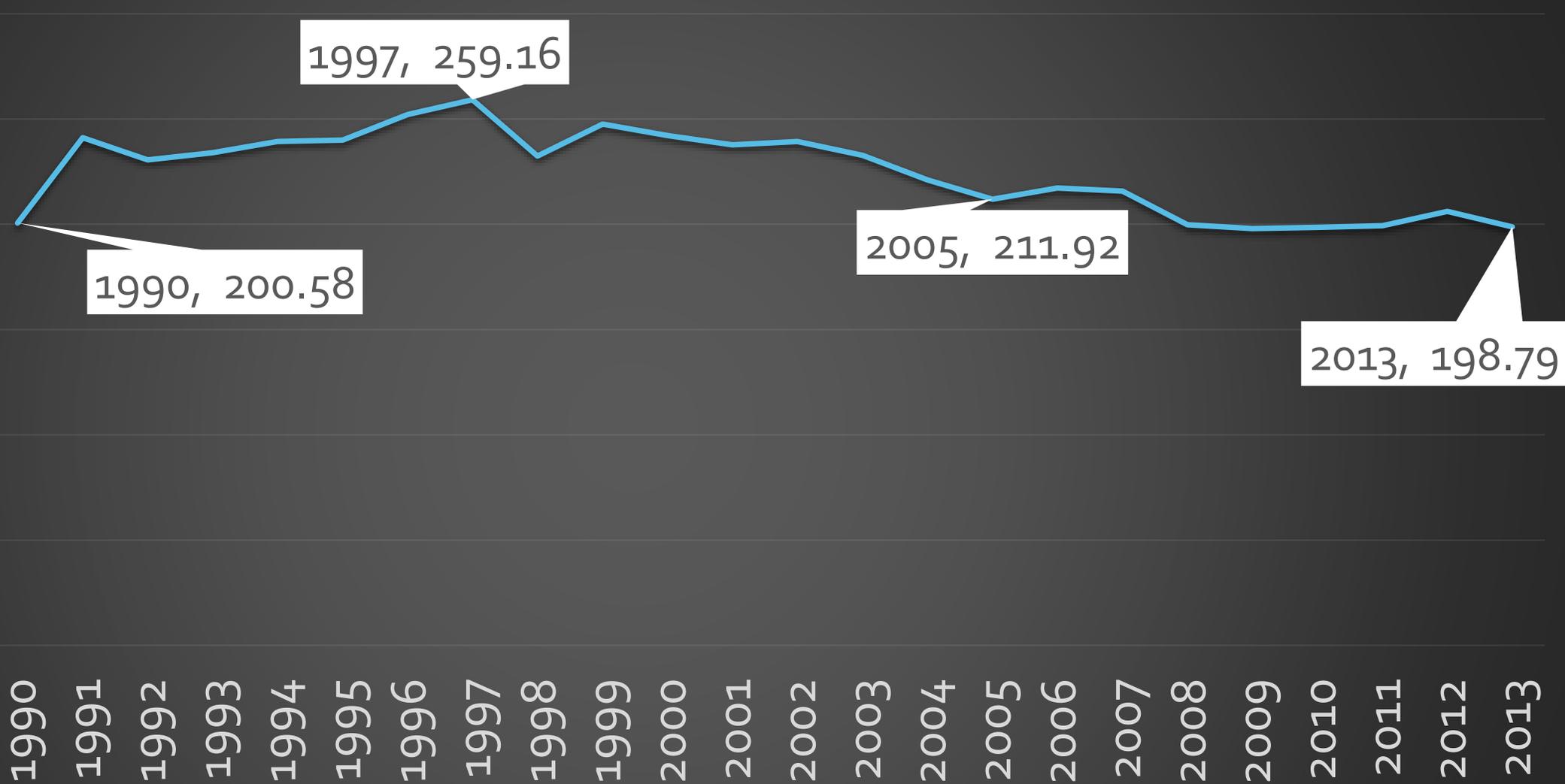
Data Source:
ADWR



Municipal Water Use in Gallons Per Capita Per Day

GALLONS PER CAPITA PER DAY

300.00
250.00
200.00
150.00
100.00
50.00
.



— GPCD



Statewide Best Management Practices in Place

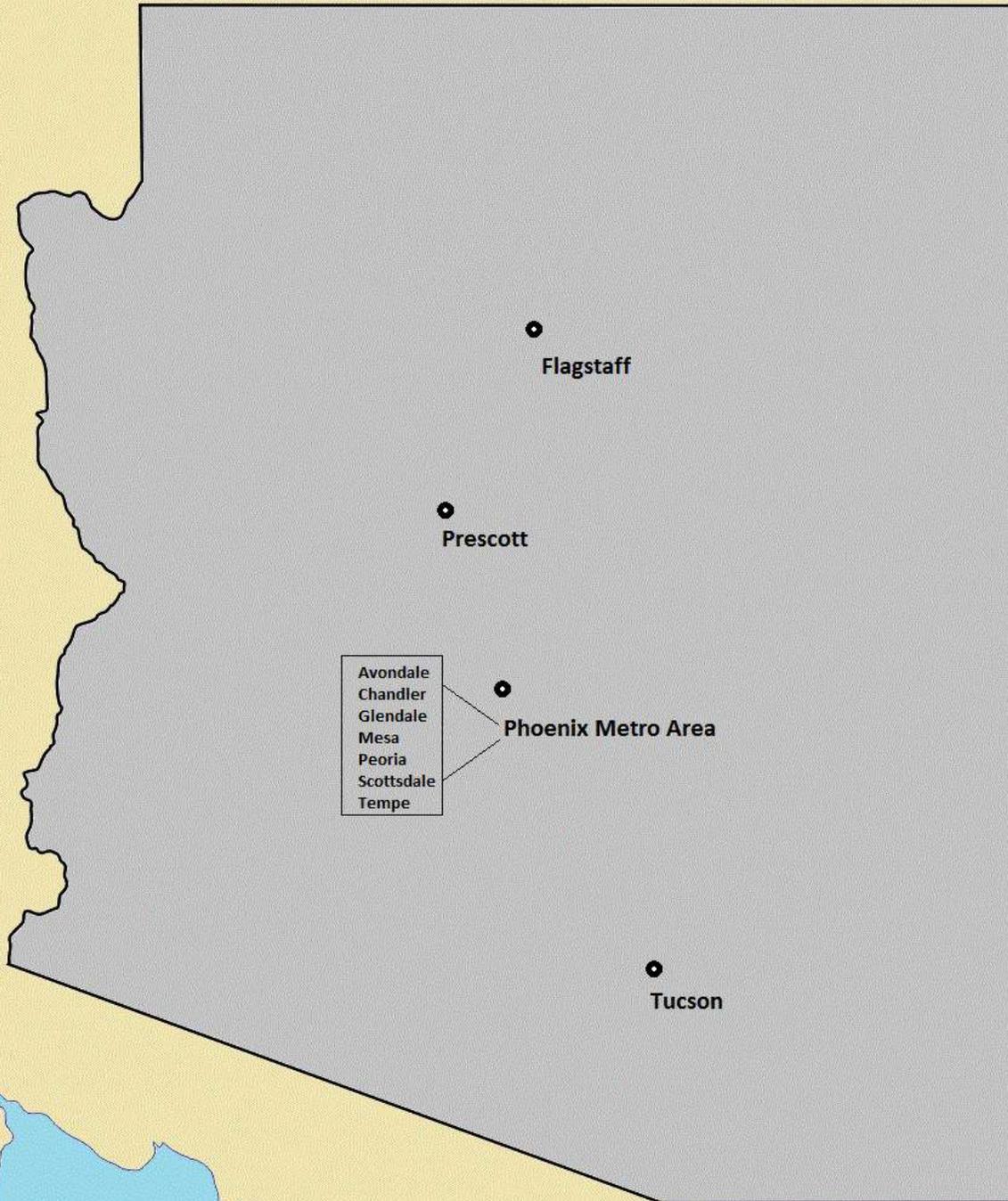
Detailed BMP list available from ADWR:

<http://www.azwater.gov/AzDWR/WaterManagement/AMAs/Conservation.htm>

Ways that municipalities conserve water:

- Lawns converted to xeriscape
- Lawn removal rebates
- Zoning limitations regarding lawn size and type
- New Home lawn limitations
- Outdoor recreation water use limitations

Arizona Cities with Turf Management Programs



Some AZ cities conserving water with turf management programs

Some Western U.S. cities with turf management programs

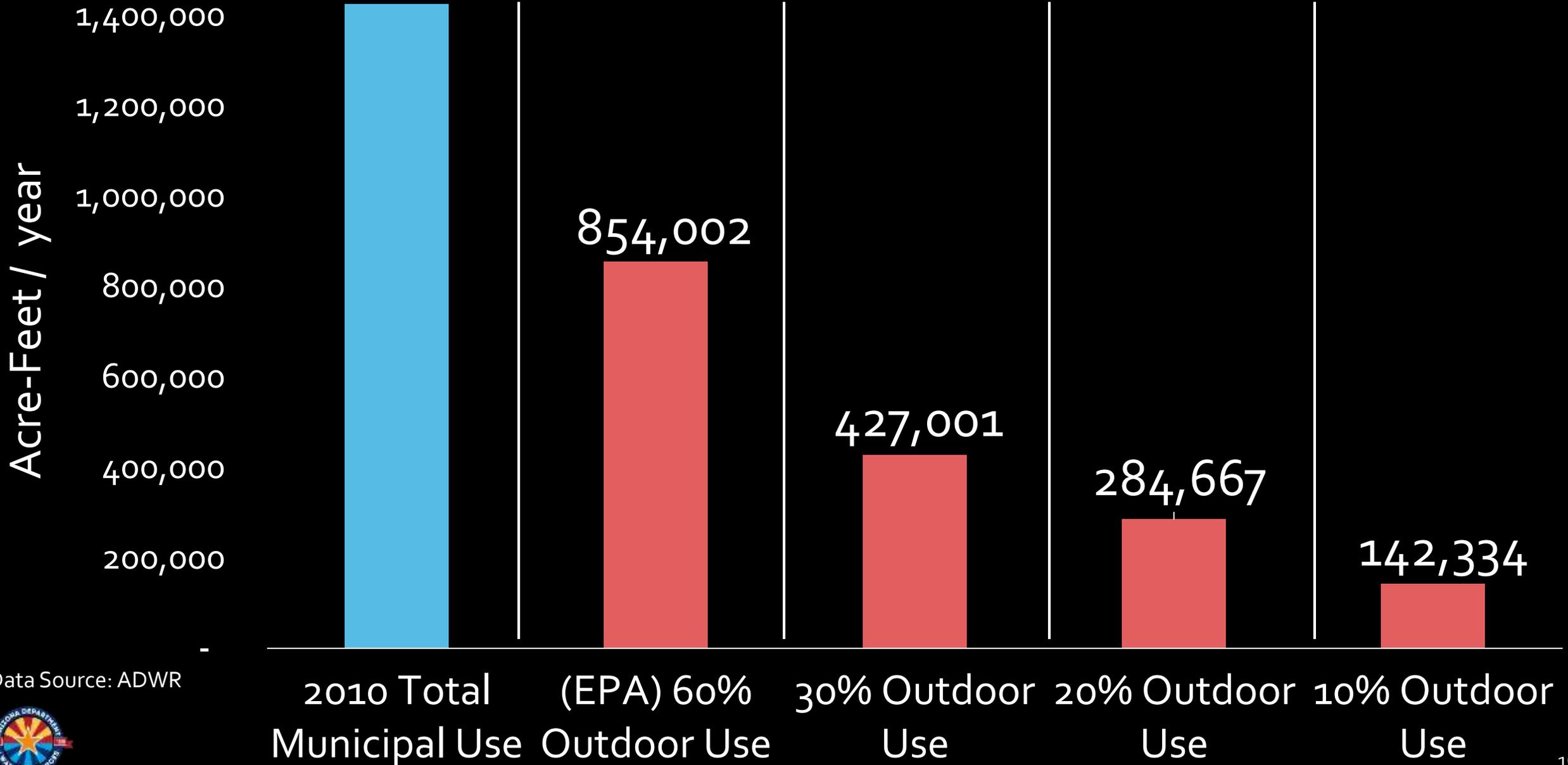
- Austin, TX
- Las Vegas, NV
- Las Angeles, CA

Municipal Outdoor Water Use and Turf

- To better estimate what volume of municipal water is used for irrigating lawns, we analyzed data of municipal water use
- Models for outdoor water use were applied to the 2010 AMA municipal water demand, as well as the 2010 statewide demand
- These models are derived from an EPA estimate that 60% of Municipal water use within the Phoenix AMA was used for “Outdoor” purposes
- Understanding that the 60% estimate for the Phoenix AMA may be high for other parts of the state, we also have 30, 20, and 10% outdoor use models



Statewide Potential for Savings in the Municipal Sector (2010 data)



Data Source: ADWR



2010 AMA Possible Municipal Savings with Outdoor Use Models



Data Source: ADWR

AMAs	Total Municipal Use	EPA Model:			
		60% Outdoor Use	Model: 30% Outdoor Use	Model: 20% Outdoor Use	Model: 10% Outdoor Use
Prescott	16,474	9,884	4,942	3,295	1,647
Santa Cruz	7,543	4,526	2,263	1,509	754
Pinal	39,179	23,507	11,754	7,836	3,918
Tucson	173,694	104,216	52,108	34,739	17,369
Phoenix	1,015,346	609,208	304,604	203,069	101,535
TOTAL	1,252,236	751,342	375,671	250,447	125,224

Further Conservation Efforts



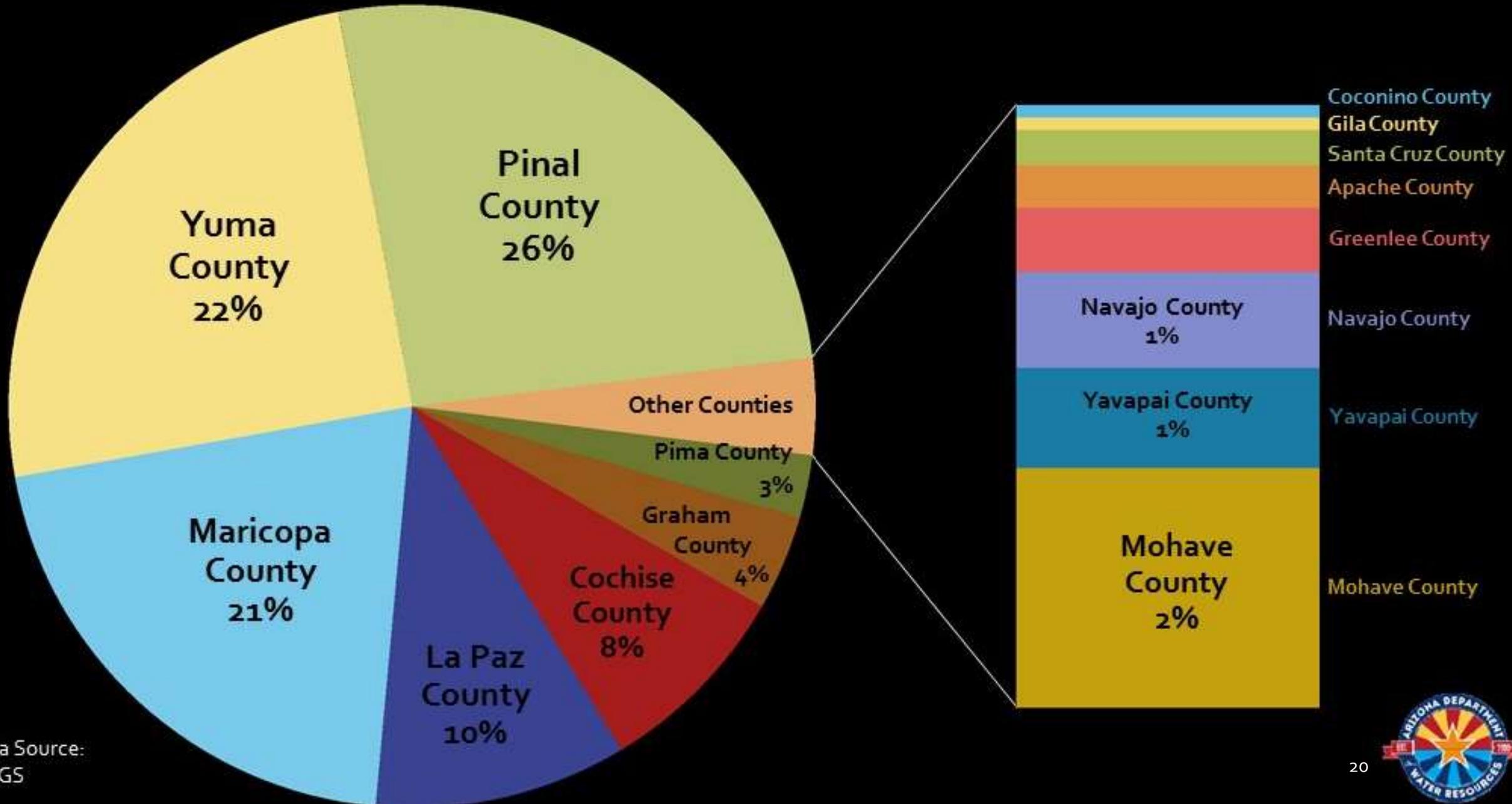
Agricultural

Agricultural Water Use

- This is the largest use sector at 73% of the statewide annual water budget
- The largest use of water within the agricultural sector is surface (flood) irrigation
- Efficiency of water use varies by region



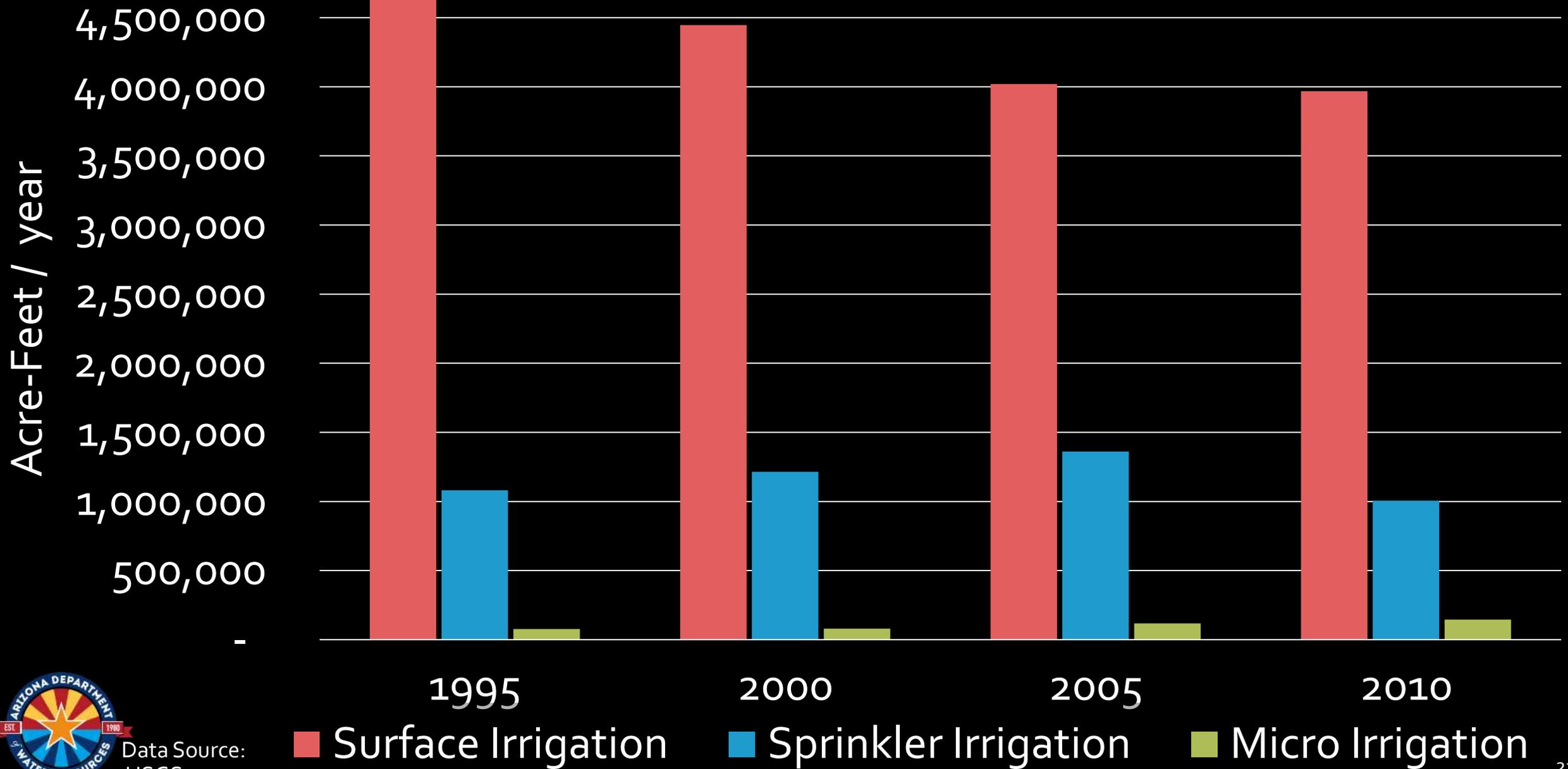
Arizona Irrigated Area by County - 2010



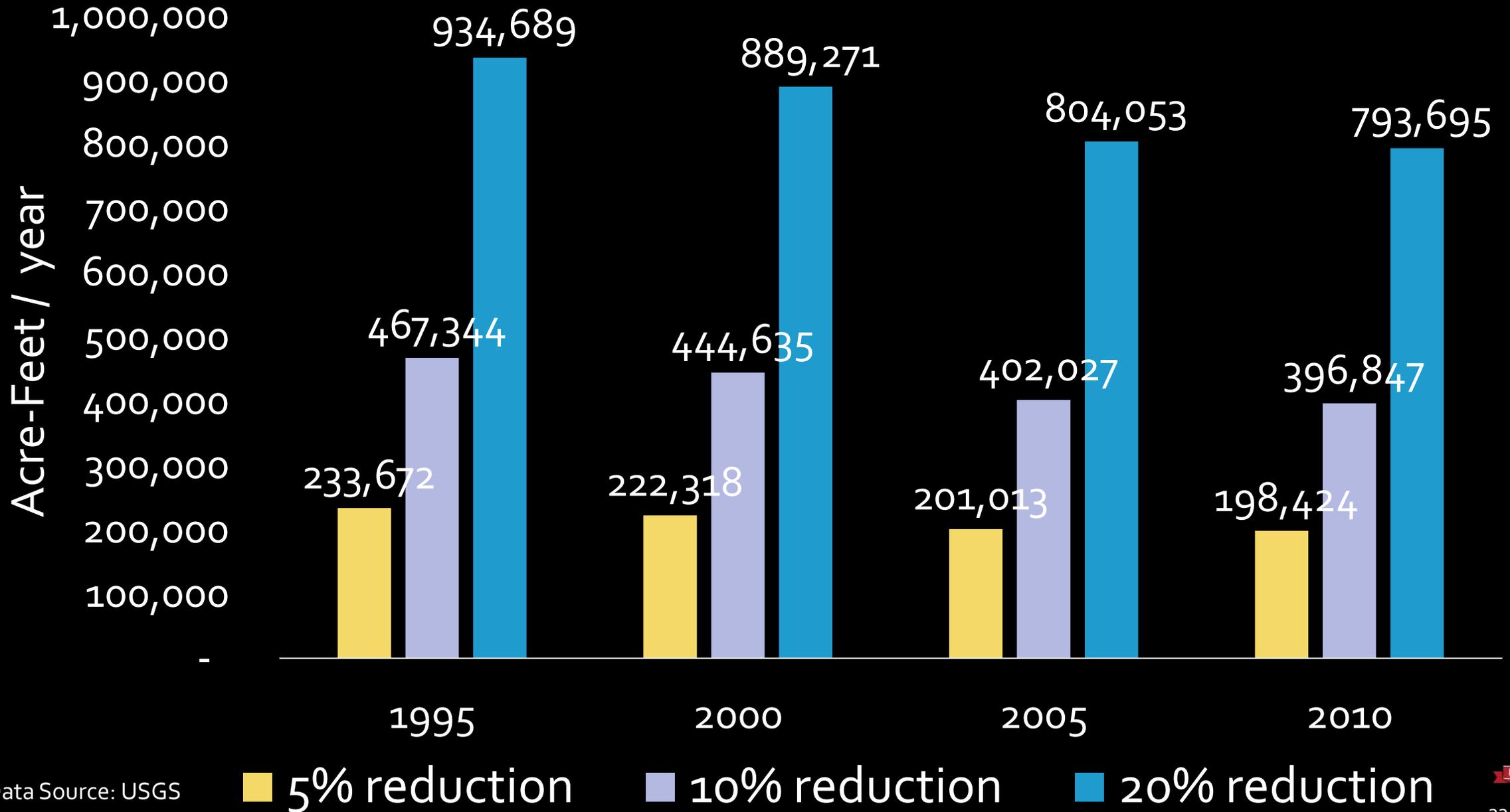
Data Source:
USGS



Statewide Agricultural Use by Irrigation System Type



Savings from Reducing Surface Irrigation by 5%, 10%, 20%



Data Source: USGS



Practical Considerations for Further Agricultural Water Conservation

- Profitability per acre
- Salinity
- Cost of introducing new conservation measures
- Crop type / market
- Lining surface irrigation ditches
- Increased efficiency = increased yield

Options for Agricultural Conservation

- Explore agriculture assistance program opportunities to improve efficiency
- Consider incentive programs for switching to higher efficiency irrigation systems

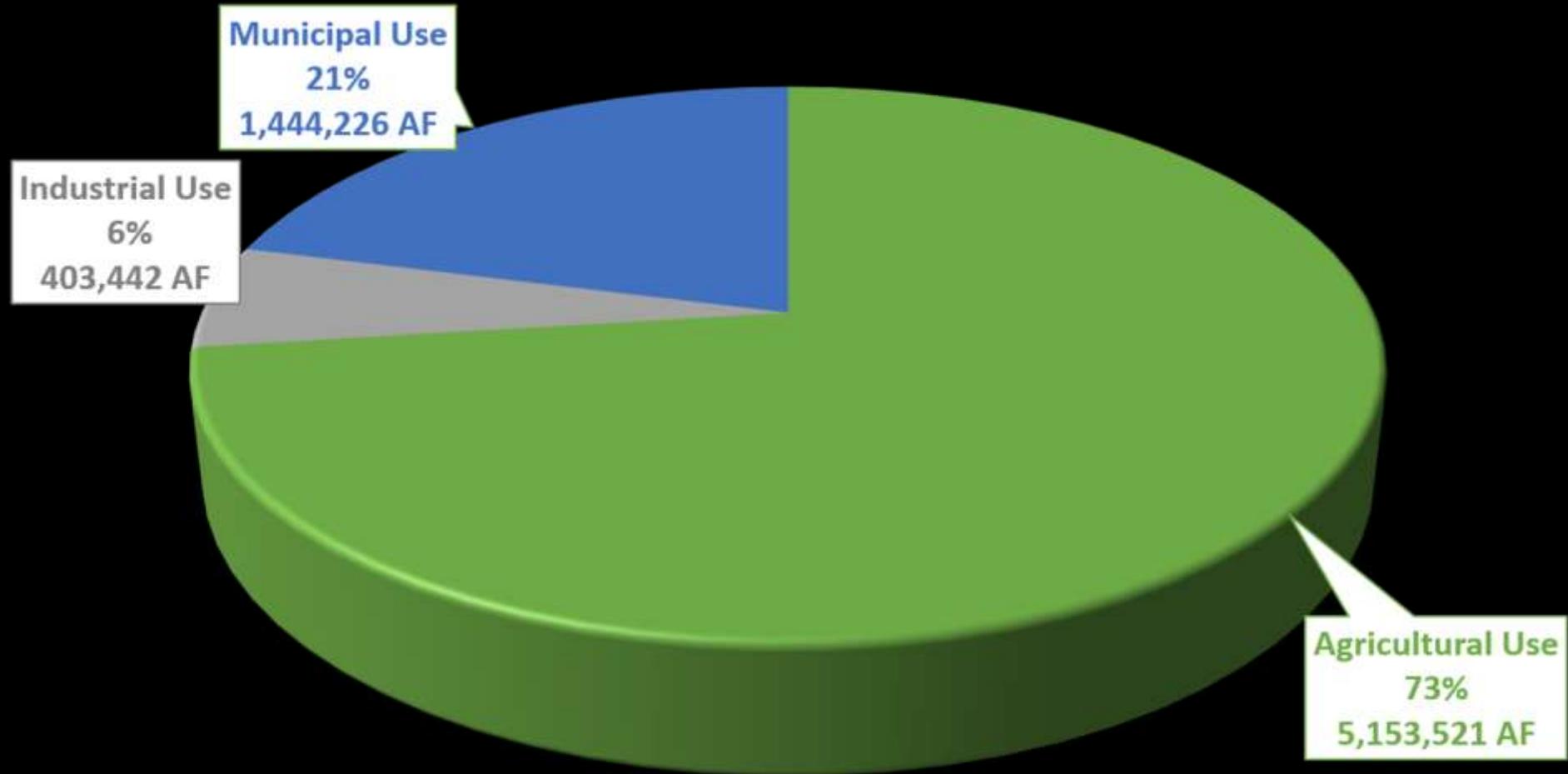


Further Conservation Efforts



Industrial

Industrial Demand Represents 6% of Total State Water Budget



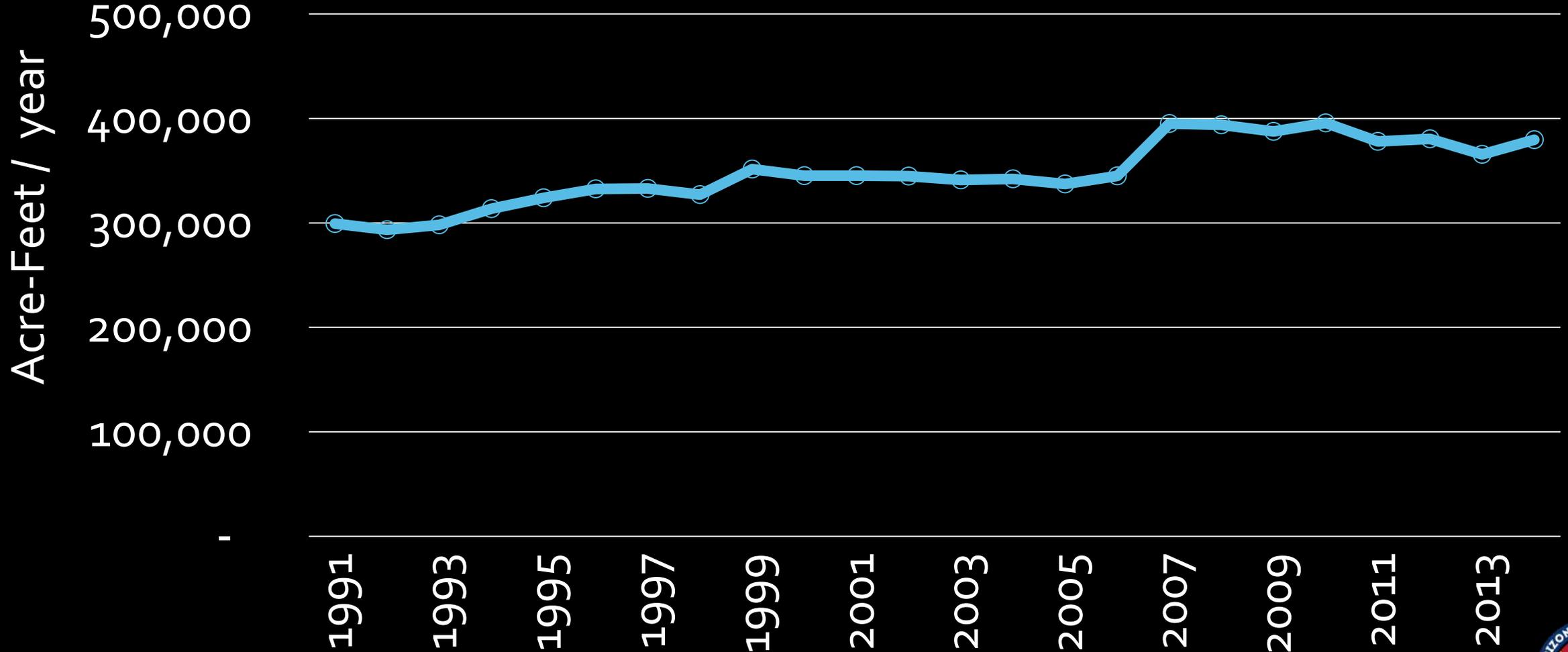
Data Source: ADWR



■ Agricultural ■ Industrial ■ Municipal

Industrial Sector Historical Water Use

Statewide Industrial/Mining/Thermoelectric



Data Source: ADWR



Industrial Conservation within AMAs

The Third AMA Management Plan requires conservation measures for industry:

Best management practices or designed limitations are required of mines, cooling towers, sand and gravel operations, large scale power plants and new large landscape users

Summary of Presented Options

- **Turf management programs**
- **Efficient irrigation incentives**
- **Addressing lost/unaccounted for water**
- **Other ideas?**