



ARIZONA DEPARTMENT OF WATER RESOURCES

Tucson Active Management Area

Water Demand and Supply Assessment: 1985 — 2025

The Arizona Department of Water Resources conducted a Water Demand and Supply Assessment for each Active Management Area (AMA) in preparation for the Fourth Management Plan. The Assessments consist of historical water demand and supply characteristics for 1985 through 2006 as well as projections to 2025. Once the assessment for each AMA is finalized, preparation of the Fourth Management Plan will begin by evaluating the data compiled and identifying potential solutions to water management issues. The Assessments will continue to be updated annually.

The water management goal of the Tucson AMA is to attain safe-yield* by the year 2025.

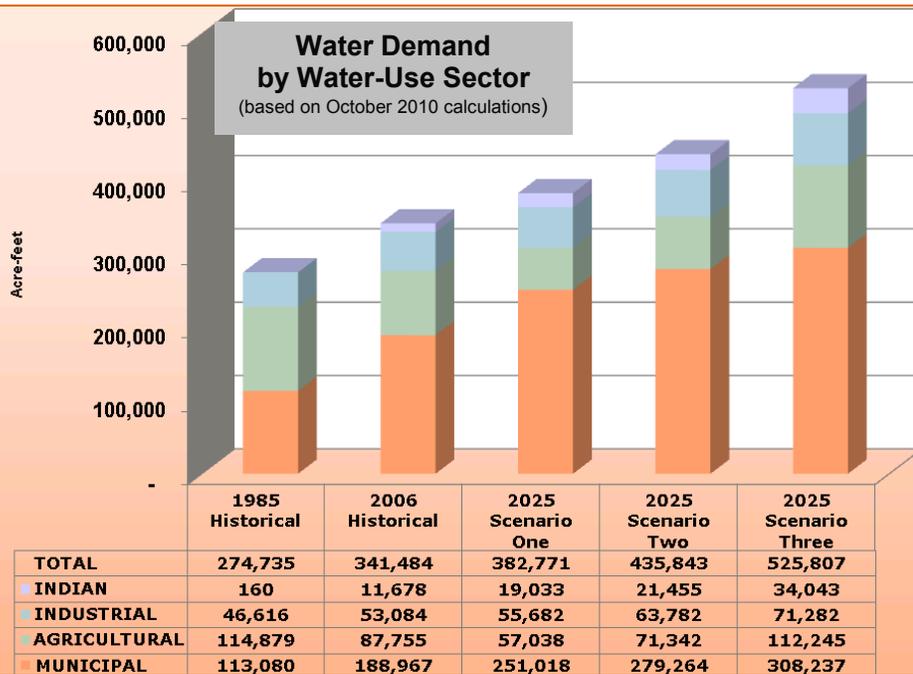
Historically, water users in the Tucson AMA have relied heavily on groundwater. Over the past 30 years, use of renewable supplies has increased, facilitated by the completion of the Central Arizona Project (CAP) and subsequent use of Colorado River water either directly or indirectly through artificial recharge and recovery projects. The use of reclaimed water has also increased over the past few decades, further reducing reliance on groundwater supplies.

A review of historical annual water demand, supply, and overdraft in the Tucson AMA from 1985 to 2000 shows that although groundwater overdraft fluctuated somewhat, it steadily increased through 2000 due to increased demands and continued reliance on groundwater.

After the year 2000, groundwater overdraft in the AMA began a steady decline with the increased utilization of CAP water and increased conservation activities across all water using sectors.

ADWR has evaluated a variety of possible scenarios for future groundwater overdraft which range from the AMA achieving safe-yield by 2025 to an overdraft of more than 100,000 acre-feet in 2025.

*Safe-yield is a balance between the amount of groundwater pumped from the AMA annually, and the amount of water naturally or artificially recharged.



NOTE: The 2025 projections consist of three baseline scenarios with the following assumptions:

- Scenario One: lowest reasonable water demand.
- Scenario Two: demand in-between Scenario One and Scenario Three.
- Scenario Three: highest reasonable water demand.

Since 1985, the proportion of historical water demands among the water use sectors in the Tucson AMA has shifted to less agricultural use and more municipal use. By 2006, the total water demand in the AMA had increased by more than 24%.

MUNICIPAL DEMAND: Between 1985 and 2006, municipal water demand increased by 66%. Municipal water use accounted for 41% of the AMA's total demand in 1985, increasing to 55% by 2006. Municipal demand projections include assumptions on population growth and water use.

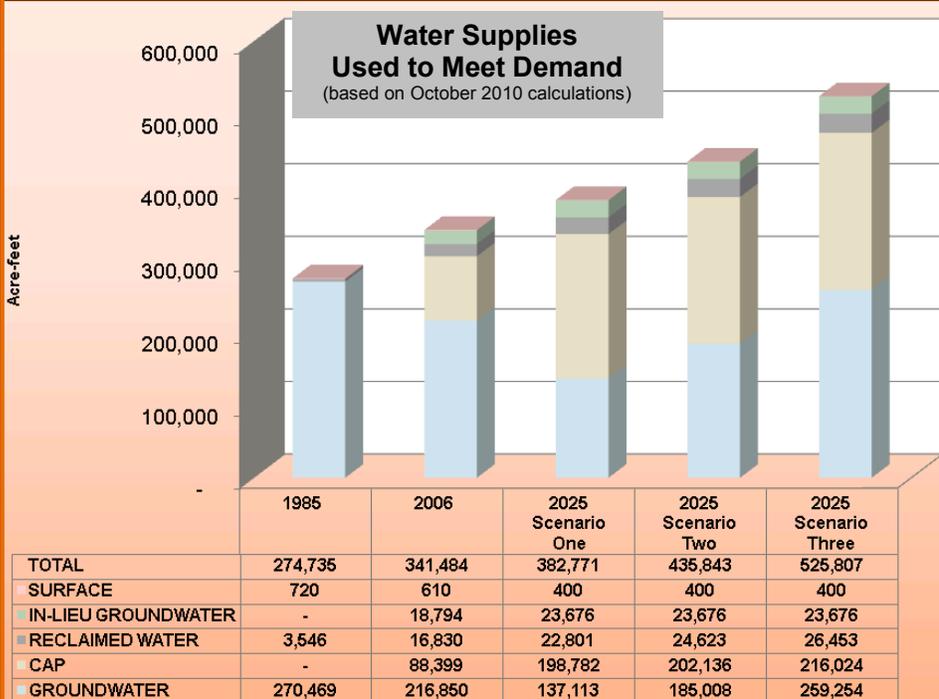
AGRICULTURAL DEMAND: Agricultural water demand has remained below 100,000 acre-feet per year since 1985. Although agricultural water use decreased by nearly 24% between 1985 and 2006, water demand within that period varied significantly. Projected agricultural demand scenarios include assumptions on whether certain irrigable lands will be fully farmed or be taken out of production for residential development.

INDUSTRIAL DEMAND: Industrial water demand fluctuated between 1985 and 2006, primarily due to the influence of the largest industrial sub-sector – metal mining. Metal mining water use peaked in the mid 1990s, accounting for almost 70% of the AMA's total industrial demand, decreasing only slightly by 2006. Projected industrial demand scenarios include assumptions on future mining production and corresponding water use.

INDIAN DEMAND: The Pascua Yaqui tribal lands, San Xavier District of the Tohono O'odham Nation, and part of the Schuk Toak District are located in the Tucson AMA. Indian water use is exempt from state regulation, however, it is included to show its hydrologic impact on the AMA's safe-yield goal. The projection scenarios include assumptions on increases in agricultural irrigation on reservations within the AMA.

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Historically, water users in the Tucson AMA have relied heavily on groundwater. Over the past 30 years, utilization of renewable supplies has increased significantly.

Renewable supplies, including CAP, reclaimed water, and a small volume of surface water, were only 1% of total water use in 1985, increasing to 30% by 2006.

The following is a list of water supplies used during the period of 1985 to 2006 to meet the demands of water-use sectors in the Tucson AMA.

GROUNDWATER: In 1985, groundwater was the primary source of supply, accounting for over 98% of the total supplies used in the AMA. While still the primary source of supply, groundwater had decreased to approximately 64% of AMA water supplies used in 2006. Projected scenarios assume that once renewable supplies are fully utilized, any remaining additional demand will be met with groundwater, resulting in an increase in overdraft.

CAP: In 1985, the CAP canal had not yet been extended into the Tucson AMA. By 2006, CAP water accounted for approximately 26% of the AMA's total water use. In the projection scenarios, CAP use increases as a result of increased on-reservation Indian agriculture and the full utilization of municipal providers' CAP allocations. Additional supply projections include CAP shortage scenarios to account for the potential impacts of climate change.

SURFACE WATER: The volume of non-CAP surface water supplies in the Tucson AMA has been very low compared to the Phoenix and Pinal AMAs. Surface water use was held constant in the projection scenarios.

IN-LIEU GROUNDWATER: In-lieu groundwater is a renewable water supply (such as reclaimed water or CAP) that is delivered to Groundwater Savings Facilities (GSF) (typically an irrigation district or farm) as an alternative to groundwater pumping. Projections for in-lieu groundwater assume an increase in GSF storage to ensure all available CAP water is fully utilized.

RECLAIMED WATER: Reclaimed water supplied only 1% of AMA demands in 1985, largely due to a lack of infrastructure and artificial recharge facilities. By 2006, reclaimed water accounted for 5% of the AMA's total supplies. Reclaimed water use, which is a function of projected municipal demand, is expected to increase in all projected scenarios.

The historical data presented in the AMA Assessments were obtained from Annual Water Withdrawal and Use reports submitted to the Department from 1985 to 2006.

The projections for 2025 consist of three baseline scenarios:

- Scenario One assumes the lowest reasonable water demand
- Scenario Two assumes demand in between Scenario One and Scenario Three
- Scenario Three assumes the highest reasonable water demand

The Assessments also address two other scenarios:

- the effects of climate change on each baseline scenario, and
- a scenario that maximizes the use of reclaimed water due to population growth

The Templates and Budget Summaries for each AMA Assessment are available on the web at:

www.azwater.gov/AzDWR/WaterManagement/Assessments/default.htm