Arizona Department of Water Resources
Santa Cruz Active Management Area
Water Demand and Supply Assessment: 1985 — 2025

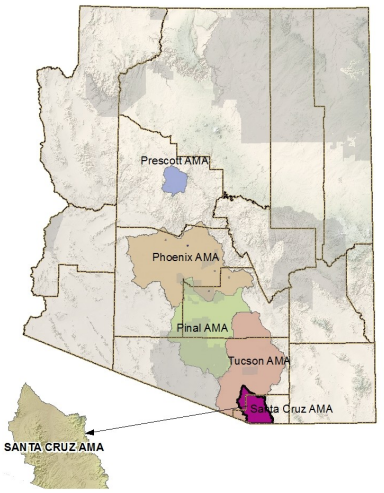
The Arizona Department of Water Resources conducted a Water Demand and Supply Assessment for each Active Management Area (AMA) in preparation for the Fourth Management Plan. The Assessments consist of historical water demand and supply characteristics for 1985 through 2010 as well as projections to 2025. 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.

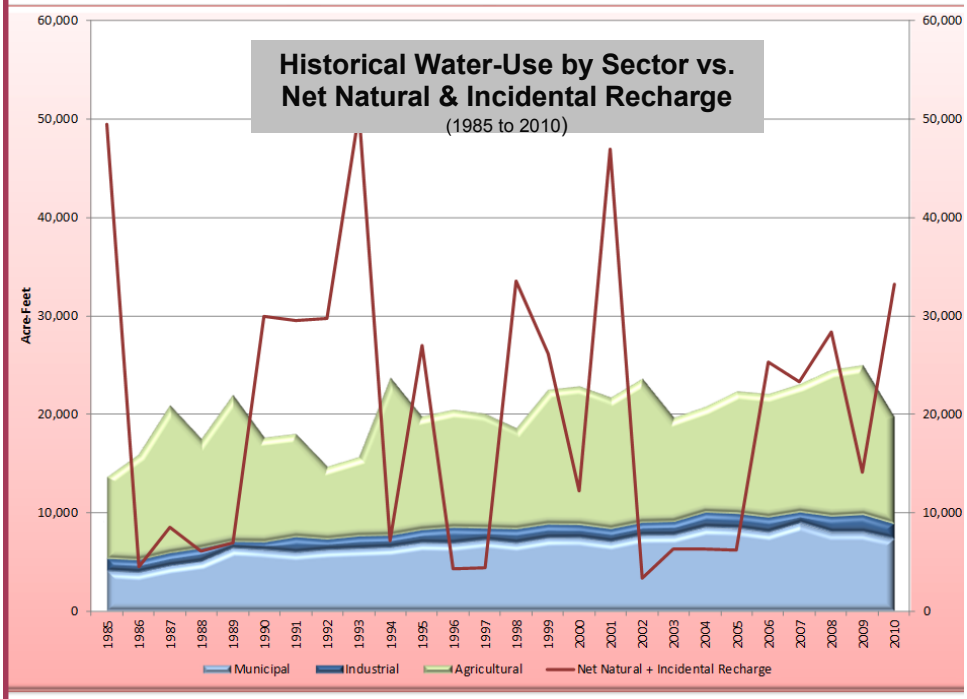
The water management goal of the Santa Cruz AMA is to maintain a safe-yield condition and to prevent local water tables from experiencing long-term declines.

The Santa Cruz AMA was established in 1994 because the international nature of water management issues facing the Upper Santa Cruz River Basin differed significantly from the other basins of the Tucson AMA. The hydrology of the basin requires coordinated management of surface water and groundwater as well as binational coordinated water management. A.R.S. §§ 45-411.02 – 411.04

The Santa Cruz AMA experiences fluctuations in the annual balance of withdrawals and replenishment of its aquifer. Historically, surface water flowed perennially along the Santa Cruz River from the U.S.-Mexico border to Tubac. By the 1940's, intensive groundwater pumping and land-use changes had lowered groundwater levels in the Santa Cruz River Valley resulting in intermittent flow. Recognizing this, the legislature set the goal of the Santa Cruz AMA to maintain safe-yield and prevent local water tables from experiencing long-term declines.

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





The chart at left compares annual demand and supply by sector at the AMA level. The Santa Cruz AMA Assessment differs from the other four AMAs to illustrate the variable nature of supply and demand in this AMA. Rather than presenting data for selected years, the entire history of Santa Cruz AMA supply and demand from 1985-2010 is presented.

Municipal Demand: Municipal uses in the Santa Cruz AMA have gradually increased over time from 4,140 acre-feet in 1985 to 7,543 acre-feet in 2010. During this time, population in the Santa Cruz AMA increased from 20,911 to 42,110. In small municipal provider service areas population and demand has remained fairly constant and most of the service areas are not likely to grow. Population using private, domestic "exempt" wells has also remained fairly stable. The majority of growth has been in the four large municipal provider service areas, which increased from 3.477 acre-feet of demand in 1985 to 7,024 acre-feet in 2010.

Population in the Santa Cruz AMA is concentrated along the Santa Cruz River corridor and in Nogales, Arizona. Demand in the Santa Cruz AMA is influenced by a large fluctuation in temporary residents attributable to the close business and family connections between the residents of the AMA and the Mexican state of Sonora. These connections account for much of the travel through Nogales, Arizona and Nogales, Sonora (collectively referred to locally as "Ambos Nogales").

Agricultural Demand: Although highly variable, agriculture is the largest demand sector in the Santa Cruz AMA. Demand in this sector averaged 12,746 acre-feet per year between 1985 and 2010. Annual use has fluctuated between from between 52 and 72% of the total AMA demand, with an average of 60%. The Downstream Area and the Outside Area of the are both dominated by agricultural uses.

Industrial Demand: In the Santa Cruz AMA, Industrial demand is composed of the following subsectors: Sand and Gravel, Turf, Other, and Drainage and Dewatering. Total Industrial water demand was 1,407 acre-feet in 1985 and 1,611 acre-feet in 2010. Each subsector has a yearly water allotment, however each subsector's water demand is dependent on population growth and the economy, and in some cases, the difference between the actual water use and the total allotment is substantial.

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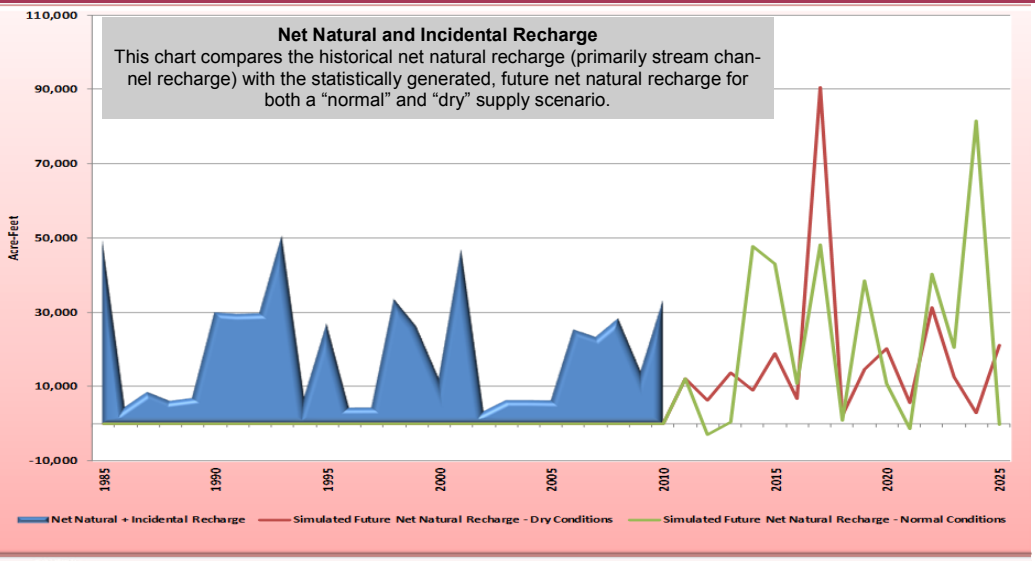
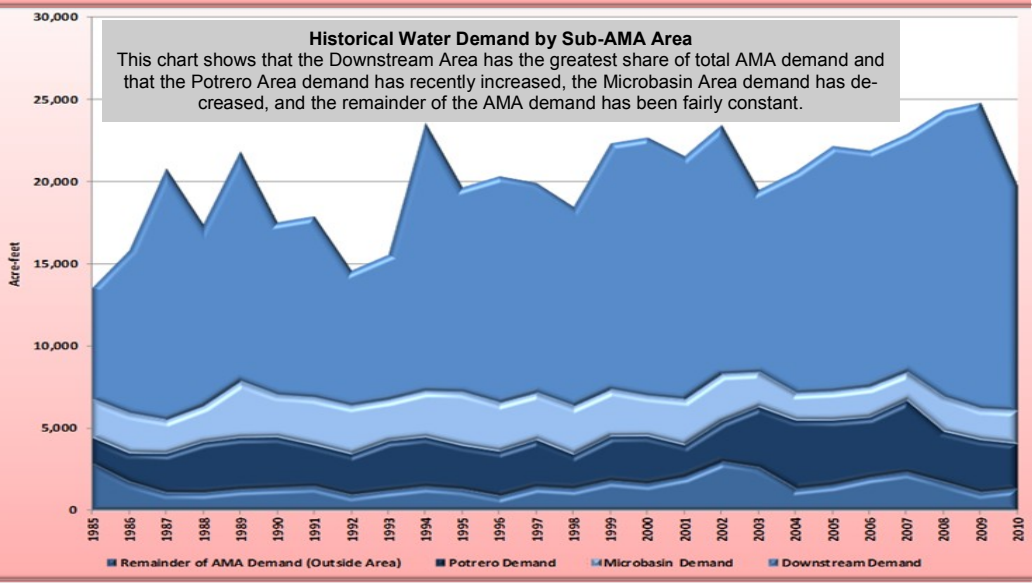
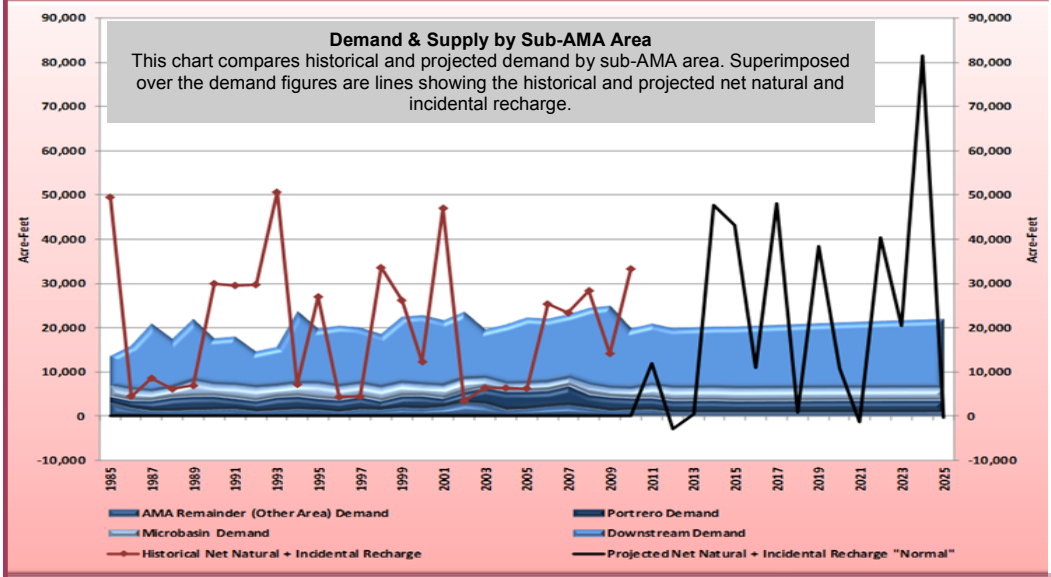
Net Natural and Incidental Recharge
This chart compares the historical net natural recharge (primarily stream channel recharge) with the statistically generated, future net natural recharge for both a "normal" and "dry" supply scenario.



Historical Water Demand by Sub-AMA Area
This chart shows that the Downstream Area has the greatest share of total AMA demand and that the Potrero Area demand has recently increased, the Microbasin Area demand has decreased, and the remainder of the AMA demand has been fairly constant.



Demand & Supply by Sub-AMA Area
This chart compares historical and projected demand by sub-AMA area. Superimposed over the demand figures are lines showing the historical and projected net natural and incidental recharge.



•NOTE: Water supply was projected using a statistical approach. A "normal" and "dry" supply scenario was developed. In addition three demand scenarios were developed. This sheet shows the lowest demand projected.

WATER WITHDRAWN FROM WELLS: The majority of water uses in the Santa Cruz are served by water withdrawn from wells. Currently, the statutory language pertaining to Santa Cruz does not refer to groundwater or surface water but "water withdrawn from wells." In the future, depending on the result of the General Stream Adjudication, individual water uses in the Santa Cruz will be regulated either as groundwater or as surface water.

NOGALES INTERNATIONAL WASTE WATER TREATMENT PLANT (NIWWTP): Since 1972, wastewater generated in Nogales, Sonora has been piped into the United States to be treated at the NIWWTP. Reclaimed water is discharged into the river channel and augments baseflow, creating an additional source that recharges the near-stream aquifer and helps sustain riparian habitat downstream. Once treated and discharged to the stream, state law dictates that water legally becomes surface water.

THE DOWNSTREAM AREA: The inner valley area of the Santa Cruz River downstream of the NIWWTP is characterized by complex stream-aquifer interactions. The majority of the water demand in the AMA is located within this area, as are the majority of exempt wells. The potential for additional demand in this area is significant. The Downstream and Microbasin areas experience extreme fluctuations in water levels corresponding to natural variations in river flow.

THE MICROBASIN AREA: Along the Santa Cruz River upstream from the NIWWTP, the water supply is predominantly from natural flow in the river. Much of the water demand in the City of Nogales has historically been met through wells located in the Microbasin Area. When there is insufficient flow in the river to infiltrate the aquifer and refill the Microbasins, water demand is met through wells in the Potrero Area and the Outside Area. There are no man-made reservoirs in the Santa Cruz to retain flood flow for future times of water shortage.

THE POTRERO AND OTHER AREAS: The Potrero Area and the Other Area (the remainder of the AMA) rely primarily on mountain front recharge and natural flood flows to replenish the aquifer systems. Both areas have relatively low water demands. The backup well field for the City of Nogales is located in Potrero Canyon.

The historical data presented in the AMA Assessments were obtained from Annual Water Withdrawal and Use reports submitted to the Department from 1985 to 2010. The Templates and Budget Summaries for each AMA Assessment are available on the web at:
www.azwater.gov/AzDWR/WaterManagement/Assessments/default.htm

www.azwater.gov
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September 2012