SUPPLY & DEMAND

2025

SALT RIVER

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2025 SUPPLY AND DEMAND ASSESSMENT
SALT RIVER BASIN

1 INTRODUCTION

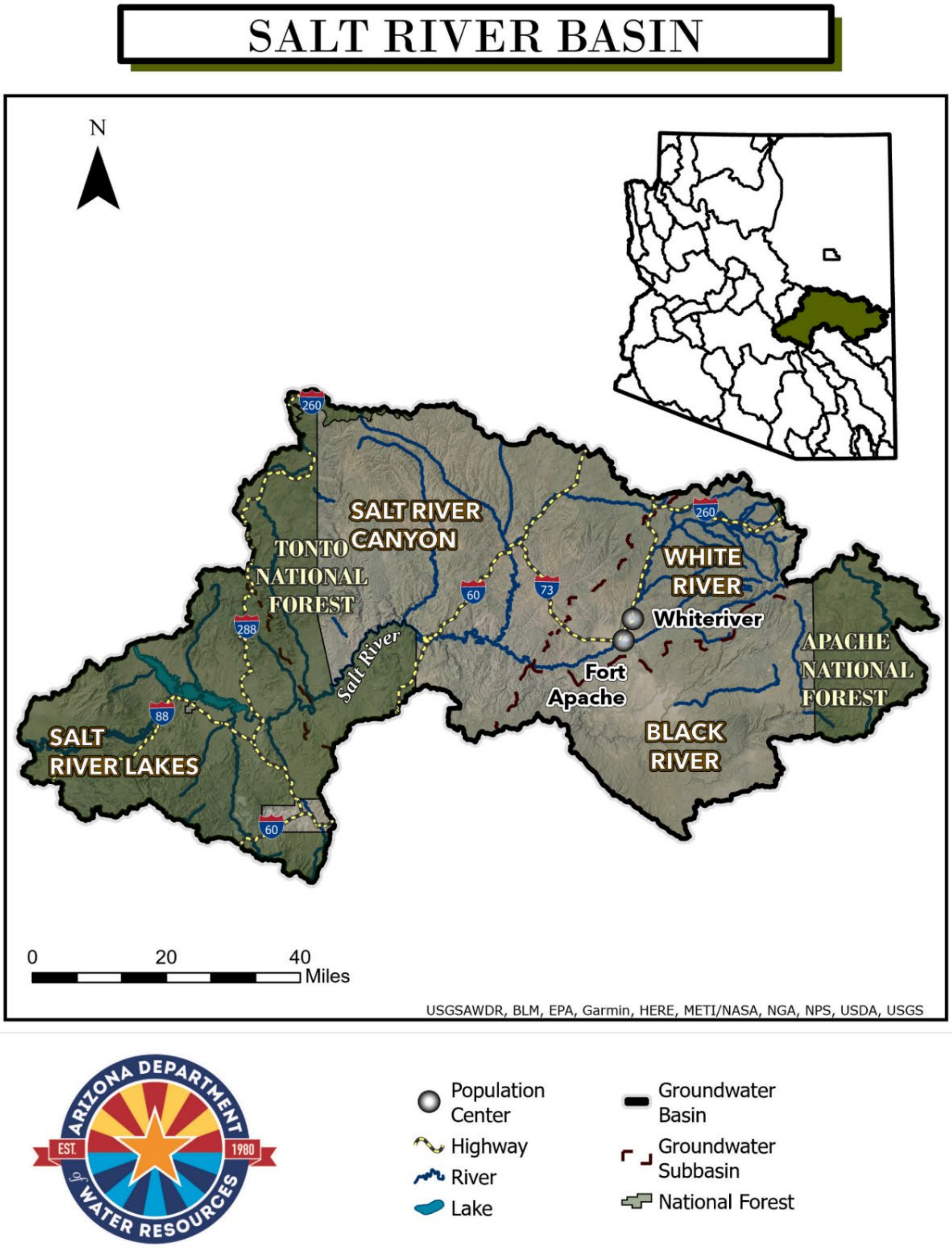

Figure 1. Map of the Salt River Basin.

1.1 REPORT BACKGROUND AND PURPOSE

Preparing the Supply and Demand Reports (SDRs) is a duty of the Director of the Arizona Department of Water Resources (ADWR) required by statute, as stated in Arizona Revised Statutes (A.R.S.) § 45-105(B)(14).[1] Beginning in 2023, the Director must ensure that a water supply and demand assessment for at least six of Arizona's fifty-one groundwater basins are prepared and issued by December 1st of each year.

Although similar assessments have been completed periodically, 2023 was the first time ADWR was allocated dedicated funding and staff to conduct assessments of all of Arizona's groundwater basins on a recurring cycle. By the end of 2027, ADWR will complete assessments for all 51 groundwater basins throughout the state, and each basin will be reassessed at least every five years. The SDRs may be used to inform the Water Infrastructure Finance Authority on funding decisions in the future (see A.R.S. § 49-1304(A)(14)[2]). The SDRs may also be used as a planning tool for water resource management by ADWR, policymakers, community members, and other interested stakeholders.

The basins and subbasins assessed in 2025 include Aravaipa Canyon, Bill Williams (Alamo Reservoir, Burro Creek, Clara Peak, Santa Maria, and Skull Valley Subbasins), Bonita Creek, Coconino Plateau, Dripping Springs Wash, Duncan Valley, Hualapai Valley, Little Colorado River Plateau, Morenci, Sacramento Valley, Safford (San Carlos Valley, Gila Valley, and San Simon Valley Subbasins), Salt River (Black River, White River, Salt River Canyon, and Salt River Lakes Subbasins), and San Simon Wash.

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[1] Arizona Revised Statutes § 45-105(B)(14). https://www.azleg.gov/ars/45/00105.htm

[2] Arizona Revised Statutes § 49-1304(A)(14). https://www.azleg.gov/ars/49/01304.htm

1.2 PROCEDURE AND SCOPE

Figure 2. Depiction of the Salt River Basin water budget, including all available supplies and demands and how they contribute to changes in groundwater in storage.

The SDRs are structured as water budgets, focusing on total inflows and outflows at the basin scale. The SDRs estimate the volumes of water demands from all uses (categorized into sectors of Agricultural, Industrial, Municipal, and Other) and the volumes of water supplies (Surface Water, Groundwater, Effluent, Incidental Recharge, Transportation Water, and Moved Water) available to meet those demands. The reports also include projected demands and supplies under various influences of future scenarios.

The SDRs are not groundwater flow models with finer geographic results. The development of regional groundwater flow models for each basin is an extensive technical process and is not feasible within the time constraints of this project. Outside of Arizona's regulated Active Management Areas (AMAs) and Irrigation Non-Expansion Areas (INAs), data is much more limited. In instances where data does exist, the data may be outdated or lack reliability. ADWR has endeavored to acquire local and specific data to generate the SDRs. However, when such information was not obtainable, staff utilized scientific literature estimates, averages, or assumptions to formulate water usage estimates.

The SDRs attempt to answer the following questions:

1. What is the estimated annual volume of water demand?
2. What is the estimated annual volume of available water supply?
3. Is there sufficient available water supply to balance water demand annually?

The water budget was calculated by subtracting the estimated annual demand from the estimated annual available supply. If demand exceeds supply in a year, the difference is subtracted from the estimated aquifer storage. If supply exceeds demand, the difference is added to estimated aquifer storage. In this manner, the process is like balancing a checkbook, totaling the credits and debits made to the account through the year to understand how much estimated groundwater is available in storage.

The SDRs are designed to be understandable to the general public. The Methods Appendix includes specific technical information and additional details regarding data and methods: [Methods Appendix]. Additional SDRs and an interactive dashboard are available for further information: [Dashboards].

1.3 METHODOLOGY AND LIMITATIONS

This study reviewed and compiled data for two primary purposes:

1. Estimate supply and demand volumes in the basin.
2. Project changes in supply and demand from possible future scenarios.

ADWR developed and compiled baseline data for the period from 1990 to 2024. Staff then developed scenarios based on the most likely impacts on water demands and supplies over 51 years (from 2025 to 2075), and then projections were generated from the baseline data. The results from these scenarios and the combined baseline data were used to estimate whether supply could meet demand each year from 1990 to 2075. ADWR independently developed both the supply and demand estimates.

Due to the limited reported water data available outside Arizona's AMAs and INAs, the supplies and demands outlined in the SDRs are estimates only. When available, ADWR used high-quality data from credible sources. Due to the need to focus staff bandwidth on developing initial methods for analysis of all 51 groundwater basins by the December 1, 2027, statutory deadline, outreach was limited to major water users in the basin. When data could not be obtained, research into existing literature and the use of representative data were necessary to develop estimates.

Please see the Methods Appendix for an in-depth discussion of the methodologies and assumptions ADWR applied to create each estimate: [Methods Appendix].

2 RESULTS

2.1 BASIN SUMMARY

The Salt River Basin encompasses 5,232 square miles in the eastern portion of the state and is characterized by mid-to high-elevation mountain ranges, plateaus, and canyons. The basin consists of the Superstition and Pinal Mountains to the east of the basi, the White Mountains to the north, and the Natanes Plateau along the southern basin boundary. The basin is comprised of the federally recognized White Mountain Apache and San Carlos Apache Indian Reservation lands (59.4%), and National Forest land (38.6%). The basin has an estimated population of 33,300 and (1.5%) of the basin is privately owned. The major aquifers in the Salt River Basin consist of recent stream alluvium, volcanic rock, and sedimentary rock. Previous storage estimates have been

8,700,000 acre-feet (AF) to a depth of 1,200 feet.[3] The basin consists of the Salt River running east to west through the southern part of the basin from the confluence of the White and Black Rivers. Other major tributaries to the Salt River include Cherry Creek, Canyon Creek, Cibecue Creek, Carrizo Creek, and Cedar Creek. The Theodore Roosevelt Lake, Apache Lake, Canyon Lake, and Saguaro Lake lie in the western portion of the basin and in the vicinity of the unincorporated community of Tortilla Flat. Hawley Lake, Sunrise Lake, Crescent Lake, and Big Lake lie near the northeastern portion of the basin.

2.2 SUPPLIES

2.2.1 Surface Water

ADWR examined all water sources defined as surface water in each basin. Surface water includes all water flowing in streams, canyons, ravines, or other natural channels, or in definite underground channels, whether perennial or intermittent, floodwater, wastewater, or surplus water, and of lakes, ponds, and springs discharging to the surface (A.R.S. § 45-141).[4] After examining these sources and deducting any existing surface water diversions (stockponds, reservoirs, and agricultural diversions) from the resulting volumes, ADWR generated a final estimate of the remaining water available for diversion or use. When possible, streamgage data were used to estimate surface water volumes. Where active streamgages were absent, which often applies to areas with intermittent and ephemeral streamflow, the Drainage-Area Ratio (DAR) method (see the Methods Appendix) was used to estimate surface water volume.

For this report, all subflow was accounted for as groundwater in storage. "Subflow" is subterranean or underground water, usually found bordering or beneath a stream, which is considered part of the surface stream and subject to the same laws and rules as other types of surface water, unlike groundwater. ADWR recognizes the extensive and complex interactions between surface water and groundwater. Although some of the estimated water in storage may be legally classified as part of the "subflow zone," ADWR did not differentiate subflow from groundwater in storage. ADWR also did not determine whether wells outside the subflow zone withdraw water from the subflow zone. Since the characteristics of subflow zone delineation are subject to change based on the adjudication of the Salt River and its tributaries, ADWR considered the subflow zone as part of the basin-fill aquifer to accurately determine the overall hydrogeological status of the basin, allowing ADWR to complete a water budget analysis.

While Colorado River water is subject to a different legal framework, the term "surface water" necessarily encompasses Colorado River water, including Central Arizona Project ("CAP") water. Therefore, Colorado River water, including CAP water, is incorporated in the estimates of available surface water supplies. The availability of Colorado River water in Arizona will be subject to

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[3] ADWR (2009). Arizona Water Atlas, Volume 5, Section 5.2, pg. 138, Table 5.2-6. https://infoshare.azwater.gov/docushare/dsweb/Get/Document-10430/Volume_5_Final.pdf

[4] Arizona Revised Statutes § 45-141. https://www.azleg.gov/ars/45/00141.htm

operations to be determined by the Secretary of the Interior in an ongoing federal process. While significant uncertainty surrounds the reliability of Colorado River water supplies, particularly on the mainstem of the Colorado River in the Lower Basin, this report assumes that Non-Indian Agricultural (NIA) Priority CAP water will generally not be available during the projection period, but that all other Colorado River water and CAP water will be available.

2.2.2 Groundwater

This report refers to the "inflow to" and "outflow from" the aquifer each year as groundwater. This volume is distinct from the volume of groundwater considered to be available in storage. "Inflow to" represents the annual recharge or replenishment of groundwater through processes such as the percolation of precipitation or surface water into the subsurface, which is observed through processes such as streamflow infiltration, groundwater inflow, and mountain-front recharge. "Outflow from," the movement of water leaving the system, is represented by such processes as baseflow and groundwater outflow. See the Methods Appendix for more information on how streamflow, baseflow, groundwater inflow/outflow, and mountain-front recharge estimates were obtained.

The total groundwater storage volume provided in this report reflects the volume of groundwater reasonably accessible at the average depth of the wells in the basin, rather than at the 1,200 feet groundwater storage depth used in previous ADWR reports. The water level falling below the basin's average well depth suggests that wells will have begun to go dry. Using this approach to estimate groundwater storage effectively illustrates the impact of declining water levels on the current existing infrastructure of property owners, residents, and other water users in each basin. Please note that this report does not address potential subsidence or permanent loss of aquifer storage that could occur if the estimated water volume in storage were to be removed from the basin. See the Methods Appendix for more information on how groundwater storage was estimated.

2.2.3 Effluent

Effluent is defined as "water that has been collected in a sanitary sewer for subsequent treatment in a facility that is regulated pursuant to Title 49, Chapter 2."[5] ADWR used effluent data provided by the Arizona Department of Environmental Quality (ADEQ) to estimate the amounts of effluent available for reuse. These effluent estimates are based on effluent volumes produced from wastewater treatment plants designated for reuse. These volumes do not include wastewater discharged from the treatment plants. Effluent volumes also do not include septic tanks or other wastewater collection systems. Recharge from septic tanks is included in the Incidental Recharge estimation.

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[5] Arizona Revised Statutes § 45-101(4). https://www.azleg.gov/ars/45/00101.htm

2.2.4 Incidental Recharge

Incidental recharge is defined as water from human use that replenishes groundwater supplies. Incidental recharge is associated with agricultural, industrial, and municipal water demands. ADWR used data derived from demand analyses to estimate incidental recharge volumes.

2.2.5 Transportation Water

Certain basins have been identified in A.R.S. Title 45, Chapter 2, Article 8.1[6] as basins from which groundwater may be withdrawn for transportation to an AMA. Where such transportation has been authorized, that groundwater is referred to as "Transportation Water" in this report.

2.2.6 Moved Water

Any water that crosses basin boundaries through artificial means and that does not fall under the Transportation Water definition is referred to as "Moved Water" in this report. Moved Water includes groundwater that is transported between basins that are not AMAs, pursuant to A.R.S. Title 45, Chapter 2, Article 8.[7]

2.3 SUPPLY RESULTS

This subsection contains ADWR's estimates of annual supplies available to the Salt River Basin.

2.3.1 Surface Water

In the Salt River Basin, ADWR identified the following surface water conveyances (USGS streamgages in parentheses):

- Ash Creek
- Bear Wallow Creek
- Beaver Creek
- Big Bonito Creek
- Black River (09489500, 09490500)
- Bog Creek
- Burnt Corral Creek
- Campaign Creek
- Canyon Creek
- Carrizo Creek (09496500)
- Centerfire Creek
- Cherry Creek (09497980)
- Cibecue Creek (09497800)
- Connor Wash
- Coon Creek
- Corduroy Creek
- Corn Creek
- Coyote Creek

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[6] Arizona Revised Statutes Title 45, Chapter 2, Article 8.1. https://www.azleg.gov/arsDetail/?title=45

[7] Arizona Revised Statutes Title 45, Chapter 2, Article 8. https://www.azleg.gov/arsDetail/?title=45

- Crouch Creek
- Deep Creek
- Diamond Creek
- Earl Creek
- East Fork Black River
- East Fork White River
- Ellison Creek
- Firebox Creek
- Fish Creek
- Gentry Creek
- Gooseberry Creek
- Hess Creek/Canyon
- Home Creek
- Horseshoe Creek
- La Barge Creek
- Little Bonito Creek
- Little Diamond Creek
- McNary Ditch
- Moon Creek
- North East Fork Black River
- North Fork White River
- Oak Creek
- Ord Creek
- P B Creek
- Pacheta Creek
- Paddy Creek
- Paradise Creek
- Pinal Creek
- Pine Creek
- Pinto Creek
- Poker Gap Creek
- Reservation Creek
- Rock Creek
- Rockhouse Creek
- Ruins Tank
- Salome Creek
- Salt River (09497500, 09498500)
- Sand Creek
- Sedal Canyon
- Soldier Creek
- South Fork Parker Creek (09498503)
- Squaw Creek
- Sun Creek
- Sweater Creek
- Tonto Creek
- Tonto Creek
- Trout Creek
- Turkey Canyon
- Turkey Creek
- White River (09494000)

Flows on the Black River are measured with two streamgages (09489500, 0949500). Flows on the Salt River and its tributaries are measured with six streamgages (09496500, 09497980, 09497800, 09497500, 09498500, 09498503). Flows on the White River are measured with one streamgage (09494000). For streams without streamgage data, the DAR method was applied to estimate streamflow volumes. The streamflow volume estimates provided in the table above are composites of the streamgage and DAR estimation methods.

Table 1. Estimated Surface Water Volumes in the Salt River Basin for 1990-2024. (SDR 2025)

Subbasin	Streamflow Minimum	Streamflow Maximum	Average Streamflow (Streamgage Method)	Average Streamflow (DAR Method)	Total Average Streamflow	Median Streamflow
Black River	63,207(2018)	1,208,031(1993)	344,894	8,528	353,422	270,869
Salt River Canyon	115,061(2018)	1,649,206(1993)	424,375	24,954	449,329	344,147
Salt River Lakes	138,943(2018)	2,520,412(1993)	573,451	11,238	587,046	410,905
White River	45,200(2002)	568,266(1993)	167,182	4,223	171,405	135,718

All values are shown in AF. Parentheses indicate the year streamflow volume was recorded.

Surface water is estimated to contribute 1,161,639 AF to the supplies in the basin in a typical year. However, there are years with extremely high or low surface water inflows. Due to the extremely high flow years associated with floods, the average surface water supply in the basin is much higher than the median of 1,161,669 AF per year.

Table 2. Estimated Surface Water Volumes Diverted for Use in the Salt River Basin for 1990-2024. (SDR 2025)

Year	Diverted Streamflow
1990	437,533
2007	437,562
2024	437,533
Average Annual Diverted Streamflow from 1990-2024	437,534

All values are shown in AF.

Examples of estimated surface water volumes diverted from the Salt River Basin for use, either for storage in reservoirs or for municipal or industrial purposes.

2.3.2 Groundwater

The following groundwater volumes were estimated in the Salt River Basin:

Table 3. Estimated Streamflow Infiltration Volumes in the Salt River Basin for 1990-2024. (SDR 2025)

Subbasin	Average Annual Streamflow Infiltration (Perennial)	Average Annual Streamflow Infiltration (Intermittent & Ephemeral)	Total Average Annual Streamflow Infiltration
Black River	29,316	2,318	31,634
Salt River Canyon	36,072	7,305	43,377
Salt River Lakes	48,743	2,288	51,031
White River	14,210	2,741	16,951

All values are shown in AF.

- Streamflow Infiltration: Infiltration for perennial streams was estimated using the fixed percentage listed in the Methods Appendix. Infiltration for intermittent and ephemeral streams, was estimated using infiltration rates from the United States Department of Agriculture Natural Resources Conservation Service (USDA NRCS) Soil Quality Indicators.[8] The predominant soil types were fine, undetermined, loamy-skeletal, and fine-loamy respectively.[9] The standard storm duration utilized was 1.5 hours.[10] In the Black River subbasin, total streamflow infiltration peaked in 1993 at approximately 108,483 AF and was lowest in 2018 at 6,663 AF. In the Salt River Canyon subbasin, total streamflow infiltration peaked in 1993 at approximately 148,231 AF and was lowest in 2018 at 11,296 AF. In the Salt River Lakes subbasin, total streamflow infiltration peaked in 1993 at approximately 216,992 AF and was lowest in 2018 at 12,094 AF. In the White River subbasin, total streamflow infiltration peaked in 1993 at approximately 50,349 AF and was lowest in 2002 at 4,861 AF.

Table 4. Estimated Groundwater Volumes in the Salt River Basin for 1990-2024. (SDR 2025)

Basin	Average Annual Baseflow	Average Annual Groundwater Inflow	Average Annual Groundwater Outflow	Average Annual Mountain-Front Recharge	Calculated Initial Groundwater Storage
Salt River	-313,668	0	0	192,346	631,481 (2024)

All values are shown in AF. Negative numbers indicate demands or water flows leaving the basin
Parentheses indicate the representative year chosen to calculate initial storage.

[8] USDA NRCS. (2008). Soil Quality Indicators. United States Department of Agriculture Natural Resource Conservation Service. https://www.nrcs.usda.gov/sites/default/files/2022-10/Infiltration.pdf

[9] Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture (NRCS, USDA). (2016). Web Soil Survey (STATSGO2). http://websoilsurvey.nrcs.usda.gov/

[10] Food and Agriculture Organization of the United Nations (FAO). (2024). Annex 2 Infiltration Rate and Infiltration Test. https://www.fao.org/4/s8684e/s8684e0a.htm

- Baseflow: ADWR estimated baseflow using the USGS Hydrologic Toolbox in ArcGIS.[11] Streamgage data were utilized when available. Any gaps in the data were filled using precipitation data from PRISM[12] and the USGS StreamStats website.[13]
- Groundwater Inflow/Outflow: Inter-basin underflow volumes were based on USGS predevelopment maps and scientific literature estimates.[14]
- Mountain-Front Recharge: The mountain-front recharge estimates were calculated using precipitation data, model data, scientific literature estimates for groundwater inflows/outflows,[15] and a water budget accounting for the inflows/outflows that affected the mountain-front recharge volume.
- Groundwater Storage: Storage was calculated using either a model data plus water budget method, if model data were available for the basin, or a GIS-based geological data non-model method, if model data were unavailable for the basin (Section 2.5.4, Methods Appendix). Initial groundwater storage was calculated using wells located within alluvial aquifer boundaries in the basin. A representative year was selected containing the most water level measurements at those wells. If no representative year contained enough well measurements to calculate groundwater storage, which was the case with Salt River Basin, a composite of all water level measurements from any year was utilized. The estimated storage volume was calculated to the basin's average well depth, 314 feet.

2.3.3 Effluent

Effluent reuse began in the Salt River Basin in 2013 from the Lake Roosevelt Wastewater Treatment Plant. Effluent appears to have been used intermittently between 2013 and 2019. In 2018, Pinal Creek Wastewater Treatment Plant sold 368 AF of treated effluent to Freeport McMoran Mine for reuse.

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[11] Barlow, P.M. et al. (2022). U.S. Geological Survey Hydrologic Toolbox — A graphical and mapping interface for analysis of hydrologic data: U.S. Geological Survey Techniques and Methods, book 4, chap. D3, 23 p. https://doi.org/10.3133/tm4D3

[12] PRISM Climate Group. (2024). 30-Year Normals [dataset] https://prism.oregonstate.edu/explorer/

[13] USGS. (n.d.-b). StreamStats [dataset]. https://www.usgs.gov/streamstats

[14] Tillman, F. et al. (2011). Water Availability and Use Pilot: Methods Development for a Regional Assessment of Groundwater Availability, Southwest Alluvial Basins, Arizona (Scientific Investigations Report 2011–5071). United States Geological Survey. https://media.kjzz.org/s3fs-public/field/docs/2011/09/21/sir2011-5071_text.pdf

[15] Tillman, F. et al. (2011). Water Availability and Use Pilot: Methods Development for a Regional Assessment of Groundwater Availability, Southwest Alluvial Basins, Arizona (Scientific Investigations Report 2011–5071). United States Geological Survey. https://media.kjzz.org/s3fs-public/field/docs/2011/09/21/sir2011-5071_text.pdf

Table 5. Estimated Effluent Reuse Volumes in the Salt River Basin for 1990-2024. (SDR 2025)

Year	Quantity
1990	0
2007	0
2013	2
2014	6
2015	2
2018	370
2019	1
2024	0

All values are shown in AF.

The average estimated annual effluent reuse was 32 AF from 2013 to 2024.

2.3.4 Incidental Recharge

Sources of incidental recharge in the Salt River Basin are municipal and industrial.

Table 6. Estimated Incidental Recharge Volumes in the Salt River Basin for 1990-2024. (SDR 2025)

Sector	1990	2007	2024
Agricultural	0	0	0
Municipal	959	976	675
Industrial	29	38	44

All values are shown in AF.

- Agricultural Incidental Recharge: Agricultural incidental recharge depends on the total irrigation withdrawals and irrigation efficiency within a basin. There is no agricultural water use in the Salt River Basin, so no agricultural incidental recharge occurs.
- Municipal Incidental Recharge: Municipal incidental recharge is a byproduct of lost and unaccounted for (L&U) water from water providers and seepage from septic tanks. The estimated volume of municipal incidental recharge has decreased over the baseline period from 959 AF in 1990 to 675 AF in 2024.
- Industrial Incidental Recharge: Industrial incidental recharge occurs from the irrigation of turf facilities and is influenced by irrigation systems' total withdrawals and efficiency. The estimated volume of industrial incidental recharge has increased over the baseline period from 29 AF in 1990 to 44 AF in 2024. An increase in irrigated acreage has resulted in increased industrial incidental recharge volumes.

2.3.5 Transportation Water

Certain basins have been identified in A.R.S. Title 45, Chapter 2, Article 8.1 as basins from which groundwater may be withdrawn for transportation to an AMA. Where such transportation has been authorized, that groundwater is referred to as "Transportation Water" in this report.

The Salt River Basin was not identified as a transportation water basin.

2.3.6 Moved Water

Any water that crosses basin boundaries through artificial means and that does not fall under the Transportation Water definition is referred to as "Moved Water" in this report. Moved Water includes groundwater that is transported between basins that are not AMAs, pursuant to

The Salt River Basin was identified as a basin with moved water.

Table 8. Estimated Moved Water Volumes from the Salt River Basin (Black River Subbasin) to the Morenci Basin for 1990 - 2024. (SDR 2025)

Year	Volume
1990	6,074
2007	241
2024	8,180

All values are shown in AF.

Due to the lack of available data, ADWR estimated diversions from the Black River from 1990 to 1997 using reported data from the period 1998-2002. From 1990 to 2024, an average of 6,353 AF was moved annually from the Salt River Basin (Black River Subbasin) to the Morenci Basin. Freeport-McMoRan diverts Black River water for use at the Morenci Mine pursuant to a lease agreement with the San Carlos Apache Tribe.

2.4 DEMAND RESULTS

The Demand subsection contains ADWR's estimates of annual demands in the Salt River Basin.

Table 9. Estimated Demand Volumes for the Salt River Basin by Sector for 1990-2024. (SDR 2025)

Sector	Subsector/Water Type	Year		
		1990	2007	2024
Agricultural	Agriculture	0	0	0
Municipal	Residential Provider	-4,266	-4,216	-3,094
	Residential Non-Provider	-1,289	-1,274	-935
	Non-Residential	-1,109	-1,301	-1,196
	L&U	-753	-772	-600
Industrial	Dairies	0	0	0
	Feedlots	0	0	0
	Grazing	-173	-173	-173
	Mining*	-20,593	-6,208	-19,406
	Power	0	0	0
	Sand and Gravel	0	-26	-42
	Turf	-233	-317	-389
	Other	0	0	0
Environmental	Riparian	-13,184	-13,184	-13,184

**Value includes the water that is moved from the Salt River Basin to the Morenci Basin for mining purposes.*
Negative numbers indicate demands or water flows leaving the basin—all values in AF.

2.4.1 Agricultural

Agricultural demand is water applied to two or more acres of land to produce plants or parts of plants for sale for human consumption or use as feed for livestock, range livestock, or poultry.

There is no agricultural water use in the Salt River Basin.

2.4.2 Municipal

Municipal demand is defined as the non-agricultural and non-industrial uses of water supplied by a city, town, private water company, irrigation district, domestic water improvement district, water cooperative, or private domestic well.

The Salt River Basin has an estimated 33,300 residents, with the greatest population centers being the Towns of Miami and Globe, and the unincorporated communities of Whiteriver, Cibecue, and Canyon Day. Seasonal tourism and transitory users are presumed to impact water use. Cabin and short-term rentals affected population estimates, as each is counted as a service connection.

- Residential Provider: Residential provider use is supplied by a municipal provider, or a Community Water System (CWS) as defined in A.R.S. § 45-341[16]. The Salt River Basin has approximately 25,573 residents served by a CWS. Between 1990 and 2024, residential provider water demand decreased 27%, with the lowest annual rate of 3 AF from 1990 to 2007. After 2007, the annual rate increased to 66 AF due to a shift in service area population.
- Residential Non-Provider: Residential non-provider use is any residential water use that is not supplied by a municipal provider but rather by a non-public water system or domestic well. An estimated 7,727 residents in the basin rely on self-supplied water resources. From 1990 to 2024, residential non-provider demand decreased by 27%, with the lowest annual rate of approximately 1 AF occurring during this period. After 2007, demand continued to decrease, but at a higher annual rate of 20 AF.
- Non-Residential: Non-residential use is defined as municipal water not used for residential purposes but instead used for commercial, institutional, recreational, or transitory uses. From 1990 to 2007, non-residential demand increased 11 AF annually. After 2007, demand fell by 6 AF annually, resulting in an eight percent decline by 2024.
- Lost and Unaccounted for Water: Lost and Unaccounted for water is defined as the total quantity of water from any source that enters a water distribution system minus the total amount of authorized deliveries from the distribution system during the calendar year. During the baseline period from 1990 to 2007, the volume of L&U water increased three percent, with an annual rate of approximately 1 AF. After 2007, the volume of L&U water decreased at 10 AF per year, reflecting a 20% decline by 2024.

2.4.3 Industrial

Industrial demand is water used by an industrial facility, such as a golf course, dairy, feedlot, power plant, mine, or paper mill.

The current industrial water demands in the Salt River Basin come from grazing, mining, sand and gravel operations, and the irrigation of turf facilities.

- Grazing: Grazing demand is defined as the water used to maintain stock ponds for the sole purpose of watering livestock. There are an estimated 10,268 cattle that graze in the Salt River Basin. The annual water use for the cattle is estimated to be 173 AF.
- Mining: Mining demand is defined as water use that is consumed for the purposes of extracting or processing ores or minerals. The Salt River Basin contains the Globe-Miami mining region, which is a significant mining district with large deposits of copper. There are three mines currently operating in the basin: the Miami mine, which has been in operation since 1915, the Carlota mine, which started operations in 2008, and the Pinto

[16] Arizona Revised Statutes § 45-341. https://www.azleg.gov/ars/45/00341.htm

Valley mine, which has been in operation since 1975. The Salt River Basin also exports water from the Black River to the Morenci Basin for use at the Morenci mine, see Moved Water. From 1990-2024, the average water use for the three mines located in the Salt River Basin, excluding the water diverted to the Morenci mine, was 11,512 AF per year. This value has fluctuated over time due to changes in copper markets, shifts in the ownership of the mines, and changes to the type of processing used at the mines.

- Sand and Gravel: Sand and gravel demand accounts for the water use of any facility or establishment that produces aggregates or quarried materials. Water use for sand and gravel operations has increased over the baseline period as new facilities became operational. From 1990-2006, there were no estimated water withdrawals for sand and gravel operations. In 2007, it was estimated that 26 AF of water were used for sand and gravel operations, and by 2024, the annual water use for sand and gravel facilities increased to an estimated 42 AF.
- Turf: Turf demand is defined as the irrigation or maintenance of any area of landscaping that is not part of a private residence. The volume of water used to irrigate turf facilities increased by 67% from 1990 to 2024. An expansion of irrigated acreage, predominantly for schools and parks, led to the increased water demand for turf.

2.4.4 Environmental

Environmental demand is quantified within this report as evapotranspiration along streams, rivers, lakes, and drainage ways. In the west of the Salt River Basin, most riparian habitat is found along the Salt River, its tributaries such as Cherry Creek, and at the ends of Theodore Roosevelt Lake. To the east in the Black and White River Subbasins, most of the riparian habitat is located in high-elevation forests in the White Mountains. The riparian demand values in the SDRs represent a high-end estimate of the potential water needs of riparian plants within a basin. In the absence of site-specific data, these estimates assume an average value for riparian plants' water needs, which does not consider local environmental conditions. Please see the Methods Appendix for an in-depth explanation of the methodologies.

- Annual net water requirements for the riparian plants are estimated to be 13,184 AF.

3 COMBINING SUPPLY AND DEMAND

The water budget in the Salt River Basin shows an overall positive trend throughout the baseline period, with both supply and demand showing fluctuations. Supply averaged 196,271 AF per year but ranged in values from the minimum of 76,045 AF in 2018, to a maximum of 589,348 AF in 1993. Demand values oscillated through the baseline period, trending above average from 1990 to 1998, below average from 1999 to 2010, and reverting to above average from 2011 to 2024. Groundwater storage has increased over time due to supply exceeding demand in the basin.

Table 10. Summary of Total Estimated Demand and Supply Values from 1990-2024 in the Salt River Basin. (SDR 2025)

	1990	2007	2024
Supply	105,650	128,154	155,124
Demand	-41,600	-27,471	-39,019
Balance	64,050	100,683	116,105
Resulting Water Available in Storage	-4,828,827	-1,699,803	631,481

Negative numbers indicate demands or water flows leaving the basin—all values in AF.

4 RESULTS OF PROJECTION SCENARIOS

Staff developed scenarios based on the most likely impacts on water demands and supplies over 51 years (from 2025 to 2075). Projections were then generated from the baseline data.

The projection scenarios developed are:

1. Status Quo: baseline volumes were carried forward through the projection period.
2. Growth: volumes were assumed to increase within specific parameters throughout the projection period.
3. Conservation: volumes were assumed to be influenced by specific conservation practices through the projection period.
4. Technology: volumes were assumed to be influenced by technological advancements through the projection period.
5. Climate: volumes were adjusted for three different climate scenarios, using a 1-degree Fahrenheit temperature increase in the mean annual temperature for the projection period, following a lower emissions pathway for Arizona; a 5-degree Fahrenheit temperature increase, following a medium emissions pathway; and a 10-degree Fahrenheit temperature increase, following a high emissions pathway.

While Colorado River water is subject to a different legal framework, the term "surface water" necessarily encompasses Colorado River water, including Central Arizona Project ("CAP") water. Therefore, Colorado River water, including CAP water, is incorporated in the estimates of available surface water supplies. The availability of Colorado River water in Arizona will be subject to operations to be determined by the Secretary of the Interior in an ongoing federal process. While significant uncertainty surrounds the reliability of Colorado River water supplies, particularly on the mainstem of the Colorado River in the Lower Basin, this report assumes that Non-Indian Agricultural (NIA) Priority CAP water will generally not be available during the projection period, but that all other Colorado River water and CAP water will be available.

4.1 SUPPLY PROJECTION RESULTS

4.1.1 Surface Water

For the Status Quo scenario, the estimated projected volume of surface water will remain constant until 2075.

Table 11. Estimated Surface Water Status Quo Projection Volumes for the Salt River Basin for 2025-2075. (SDR 2025)

Basin	Volume
Black River	343,908
Salt River Canyon	418,987
Salt River Lakes	532,781
White River	155,967

All values are shown in AF.

Due to ongoing projection scenario improvements, no other projection scenarios were applied to surface water for this report.

4.1.2 Groundwater Storage

For the Status Quo scenario, the estimated projected balance between Supply and Demand will remain constant at 117,979 AF through 2075. However, a limitation of the Non-Model Groundwater Storage Method is that a physical upper storage limit is not recognized. This results in projected groundwater storage calculations, if in a positive balance, to unnaturally increase indefinitely. This limitation will be explored in future Method improvements.

Table 11. Estimated Groundwater Storage Status Quo Projection Volumes for the Salt River Basin for 2025-2075. (SDR 2025)

Scenario	2025	2050	2075
Status Quo	749,460	3,698,923	6,648,386.6

All values are shown in AF.

Due to ongoing projection scenario improvements, no other projection scenarios were applied to groundwater storage for this report.

4.1.3 Effluent

Since no effluent reuse occurred in the Salt River Basin over the last five years (2020 to 2024), effluent reuse was assumed to have been halted in the basin. Therefore, no effluent reuse is projected to occur in the Salt River Basin.

4.1.4 Incidental Recharge

Table 15. Estimated Municipal Incidental Recharge Projection Volumes for the Salt River Basin for 2025-2075. (SDR 2025)

Sector	Scenario	2025	2050	2075
Municipal	Status Quo	1,090	1,090	1,090
	Climate – Low	1,085	1,090	1,094
	Climate – Medium	1,085	1,109	1,133
	Climate - High	1,086	1,134	1,182
	Conservation	1,081	994	907
	Growth	949	906	849
	Technology	1,082	1,014	946

All values are shown in AF.

- Status Quo: The Status Quo scenario estimated projected volume will remain constant through 2075.
- Climate: Under the Climate scenario, rising temperatures and increased evaporation rates are expected to increase water demands. Projected incidental recharge volumes by 2075 are estimated to increase approximately one percent under the low emissions scenario, four percent under the medium, and nine percent under the high emissions scenario.
- Conservation: Under the Conservation scenario, additional water-saving measures and requirements similar to those in the initial AMAs' 5th Management Plan are implemented. Under the scenario, the projected demand is expected to decrease 16% by 2075.
- Growth: Under the Growth scenario, population projections produced by the Arizona Commerce Authority Office of Economic Opportunity (ACA OEO)[17] were used to estimate the growth in the basin. The incidental recharge is projected to decrease 11% by 2075 due to decreasing population.
- Technology: The Technology scenario assumes widespread adoption of water monitoring technologies, such as advanced metering infrastructure (AMI) or home-based devices, with active leak detection and customer response. Estimated savings of 14,000 gallons per household per year reflect reductions from leaks and improved water use efficiency. This reduction is projected to result in a decrease in incidental recharge of 13% by 2075.

[17] Arizona Commerce Authority (ACA). (2022a). Population Estimates. Arizona Commerce Authority. https://www.azcommerce.com/oeo/population/population-estimates/

Table 16. Estimated Industrial Incidental Recharge Projection Volumes for the Salt River Basin for 2025-2075. (SDR 2025)

Sector	Scenario	2025	2050	2075
Industrial	Status Quo	42	42	42
	Climate – Low	44	44	45
	Climate – Medium	44	46	47
	Climate - High	44	48	51
	Conservation	42	41	41
	Growth	42	42	42
	Technology	42	39	37

All values are shown in AF.

- Status Quo: The Status Quo scenario estimated projected volume will remain constant through 2075.
- Climate
    - Turf: Increased temperatures and evapotranspiration are expected to raise overall turf irrigation requirements in the Climate scenarios. Industrial incidental recharge is projected to increase by 1 AF in the low emissions scenario, 3 AF in the medium emissions scenario, and 7 AF in the high emissions scenario.
- Conservation
    - Turf: Under the Conservation scenario, increased irrigation efficiency requirements are expected to have a modest impact on total water use, with total industrial incidental recharge projected to decrease by 1 AF, or two percent, by 2075.
- Growth: Status Quo volumes were applied in the absence of a defined Growth scenario.
- Technology
    - Turf: The Technology scenario assumes that eligible acres of natural turf will be replaced with synthetic turf. Synthetic turf requires less water to maintain than natural grass and reduces groundwater recharge. The conversion of natural turf to synthetic turf is projected to decrease industrial incidental recharge by five AF, or 12%.

4.1.5 Agricultural Incidental Recharge

- There is no estimated agricultural incidental recharge in the Salt River Basin. Therefore, no projection scenarios were estimated.

4.2 DEMAND PROJECTION RESULTS

4.2.1 Agricultural

There is no estimated agricultural demand in the Salt River Basin. Therefore, no projection scenarios were estimated.

4.2.2 Municipal

Table 18. Estimated Projected Demand Volumes for the Municipal Sector for Salt River Basin for 2025-2075. (SDR 2025)

	Residential Provider			Residential Non-Provider		
	2025	2050	2075	2025	2050	2075
Status Quo	-3,111	-3,111	-3,111	-940	-940	-940
Climate – Low	-3,094	-3,108	-3,121	-935	-939	-943
Climate – Medium	-3,094	-3,167	-3,233	-936	-956	-977
Climate - High	-3,099	-3,235	-3,372	-936	-978	-1,019
Conservation	-3,084	-2,835	-2,587	-932	-857	-782
Growth	-2,708	-2,586	-2,422	-818	-781	-732
Technology	-3,086	-2,892	-2,699	-932	-874	-816

Negative numbers indicate demands or water flows leaving the basin—all values in AF.

	Non-Residential			L&U		
	2025	2050	2075	2025	2050	2075
Status Quo	-1,190	-1,190	-1,190	-602	-602	-602
Climate – Low	-1,196	-1,196	-1,196	-1,629	-1,631	-1,632
Climate – Medium	-1,196	-1,196	-1,196	-1,629	-1,639	-1,648
Climate - High	-1,196	-1,196	-1,196	-1,629	-1,648	-1,668
Conservation	-1,196	-1,196	-1,196	-608	-409	-385
Growth	-1,201	-1,147	-1,074	-547	-523	-490
Technology	-1,196	-1,196	-1,196	-599	-572	-545

Negative numbers indicate demands or water flows leaving the basin—all values in AF.

- Status Quo: The Status Quo scenario estimated projected volume will remain constant through 2075.
- Climate: Under the Climate scenario, rising temperatures and increased evaporation rates are expected to increase water demands. By 2075, residential provider water demand is projected to increase one percent under the low emissions scenario, five percent under the medium, and nine percent under the high scenario. Similarly, residential non-provider demand is expected to increase one percent under the low emissions scenario, four percent under the medium, and nine percent under the high scenario. Non-residential demand is expected to remain unchanged across all scenarios. Lost and Unaccounted for (L&U) water is anticipated to show minimal change under the low emissions scenario, one

percent under the medium emissions scenario, and two percent under the high emissions scenario.

- Conservation: Under the Conservation scenario, additional water-saving measures and requirements similar to those in the initial AMAs' 5th Management Plan are implemented. By 2075, residential provider and non-provider demand is projected to decline by 16%. Non-residential demand is expected to remain constant throughout the projection period. The total volume of L&U water is projected to decrease 37%.
- Growth: Under the Growth scenario, population projections produced by the Arizona Commerce Authority Office of Economic Opportunity (ACA OEO)[17] were used to estimate the growth in the basin. Projected demand for residential provider and residential non-provider demand is anticipated to decline 11% by 2075. Non-residential demand is expected to decrease 11%. The total L&U volume is projected to decline 10% by 2075.
- Technology: The Technology scenario assumes widespread adoption of water monitoring technologies, such as AMI or home-based devices, with active leak detection and customer response. Estimated savings of 14,000 gallons per household per year reflect reductions from leaks and improved water use efficiency. By 2075, residential provider demand is anticipated to decline 13%. Residential non-provider demand is expected to fall 12% by 2075. Non-residential demand is expected to remain constant with no changes. The total volume of L&U water is projected to reach a decrease of nine percent.

4.2.3 Industrial

Table 19. Estimated Projected Demand Volumes for the Industrial Sector for Salt River Basin for 2025-2075. (SDR 2025)

	Grazing	Sand and Gravel	Mining
Status Quo	-173	-42	-19,418

Status Quo projections were the only projection scenarios that were applied to the grazing, sand and gravel, and mining subsectors. Negative numbers indicate demands or water flows leaving the basin—all values in AF.

Projections were not developed for the grazing, sand and gravel, or mining subsectors due to limited data or the limited expected impact of a given scenario on the subsectors.

	Turf		
	2025	2050	2075
Status Quo	-374	-374	-374
Climate – Low	-389	-392	-396
Climate – Medium	-390	-406	-422
Climate - High	-390	-423	-455
Conservation	-389	-362	-362
Growth			
Technology	-380	-357	-341

Negative numbers indicate demands or water flows leaving the basin—all values in AF.
Status Quo projection values were applied in the absence of a defined scenario for a subsector.
This is indicated by a gray cell.

- Status Quo: The Status Quo scenario estimated projected volume will remain constant through 2075.
- Climate
  - Turf: Increased temperatures and evapotranspiration are expected to raise overall turf irrigation requirements in the Climate scenarios. Irrigation demands are projected to increase by less than two percent in the low emissions scenario, eight percent in the medium emissions scenario, and 17% in the high emissions scenario.
- Conservation
  - Turf: Under the Conservation scenario, increased irrigation efficiency requirements are expected to have a moderate impact on total water use. With full implementation of conservation measures, the irrigation demands for turf are projected to decrease by 27 AF, or seven percent.
- Technology
  - Turf: In the Technology scenario, it is assumed that eligible acres of natural turf will be converted to synthetic turf. The conversion of natural turf to synthetic turf is projected to decrease irrigation needs in the basin by 10% by 2075.

4.2.4 Environmental

Table 20. Estimated Projected Environmental Demand Volumes for Salt River Basin for 2025-2075. (SDR 2025)

	Environmental		
	2025	2050	2075
Status Quo	-13,184	-13,184	-13,184
Climate – Low	-13,184	-13,250	-13,321
Climate – Medium	-13,184	-13,476	-13,733
Climate - High	-13,184	-13,743	-14,179

All values are shown in AF.

- Status Quo: The Status Quo scenario estimated projected volume will remain constant through 2075.
- Climate: The Climate scenarios for riparian use consider the impact of increased temperatures, increased evapotranspiration, and habitat transition. Under the set parameters of these scenarios, riparian use is expected to increase in the Salt River Basin as the higher temperatures increase evapotranspiration from riparian plants. Riparian water use is estimated to increase by one percent in the low emissions scenario, four percent in the medium emissions scenario, and eight percent in the high emissions scenario.

5 CONCLUSION

The balance between water supplies and demand has been positive in the Salt River Basin during the baseline period, with supply outweighing demand by an average of 137,521 AF per year. Mountain-Front Recharge was the largest contributor to supply values, averaging 192,346 AF per year. If groundwater levels were to drop below the basin's average well depth of 314 feet, approximately 74% of existing wells would become dry. The average recorded water level of wells in the Salt River Basin is 104 feet.

Streamflow estimates for the Salt River Basin covered a large range. Three of the subbasins produced their lowest streamflow in 2018, with all four subbasins' maximum streamflow occurring in 1993 with a combined estimated value of 5,945,915 AF. Infiltration from streamflow was a prominent part of supply values, averaging 142,992 AF per year throughout the entire basin.

Environmental and mining constituted a majority of demand values, making up 64% of total demand on average. Environmental, which averaged 13,184 AF per year, ranged between 28% and 43% of total demand throughout the baseline period. Mining demand decreased from 1999 to 2010 before rising back above average. Three of the four Municipal subsectors saw a decrease in overall demand, with non-residential showing both positive and negative fluctuations throughout.

The Salt River Basin maintained a positive balance during the baseline period.

5.1 ATTACHMENTS

- **Acronyms and Definitions**
- **References (Sources) – general**