

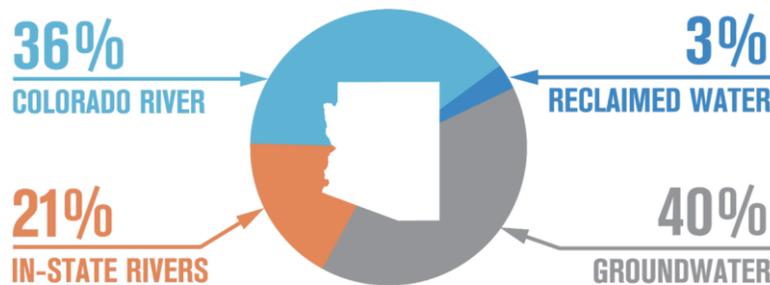
Issue: Water Policy

Water Policy: Sustainability, Quality, Fairness

It should go without saying, but water is a precious resource. Its quality, purity, and availability need to be protected to sustain life. As the basis of all living systems, comprehensive, enduring action must be taken to ensure that ecological life-support requirements are balanced with urban, agricultural, and industrial needs. Such has not been the case in Arizona—a situation that has long been recognized but ineffectively addressed to ensure a viable state going forward.

Water Security – Assurance of Supply

Almost ninety percent of Arizona’s population lives in a desert climate.¹ For many years it has been necessary to plan water use carefully. The largest source is **groundwater** pumped up from subterranean aquifers at numerous locations. **Surface water** from the Colorado River supplies 36% of the state’s needs, much of it through the Central Arizona Project canal (CAP). The remainder comes from in-state systems such as the Salt River Project (SRP) that supplies the Phoenix metro area.



Source: Arizona Dept. of Water resources (ADWR)²

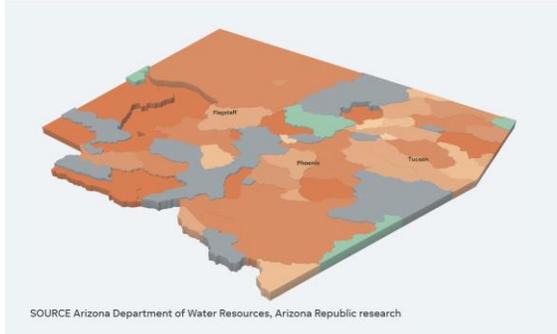
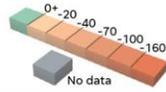
Historic Overuse - Groundwater

Arizona has done well in some areas planning water use. Primarily covering developed areas in Maricopa and Pinal Counties, the system of Actively Managed Areas (AMAs) set up by the Groundwater Management Act of 1980³ ensures that future water needs must be considered in development planning.⁴ Developers are required to show that there is a 100-year ‘secure’ water supply plan in place in order to gain planning permission.⁵ However there are loopholes to this system—developers can claim to meet the adequate supply requirement in part by intending to take an unsustainable amount of water from a local aquifer, as long as they pay a water authority in some other area to pump surface water back into a different aquifer. Meanwhile the local water table continues to drop, and there is no assurance that the surface water for recharging elsewhere (typically Colorado River water) will continue to be available.⁶

Disregarding the long-term impact to the state, Republican lawmakers have made repeated egregious attempts to end-run around AMA regulations, including 2018 SB 1515, 2016 SB 1400, and 2016 SB 1268. The latter represented an AMA-opt-out for developers which the Sierra club says, “...was introduced to facilitate a harmful development in Sierra Vista that will harm flows in the San Pedro River,”^{7,8} forcing their own Republican Governor Ducey to veto the proposed bill.

Arizona average water levels from 1950s to today

Change in average groundwater levels in feet



SOURCE Arizona Department of Water Resources, Arizona Republic research

Outside the AMAs there are far fewer restrictions in place, and over-pumping of groundwater has seriously depleted aquifers in many regions.⁹ Landowners (increasingly, investors)¹⁰ may drill a well and take out any water they can tap, regardless of how other people’s wells are affected.¹¹ There have also been attempts to buy up land with water rights in order to sell that water to someplace else—a practice sometimes known as ‘Buy and Dry.’¹²

Almost every measured area in Arizona has seen groundwater levels decline in the last 70 years, very steeply in some areas. Groundwater in Arizona aquifers is mostly **fossil water**.¹³ The aquifers were filled over thousands of years and once drained will not recover. Over-pumping has also reduced or entirely dried up many smaller streams.¹⁴

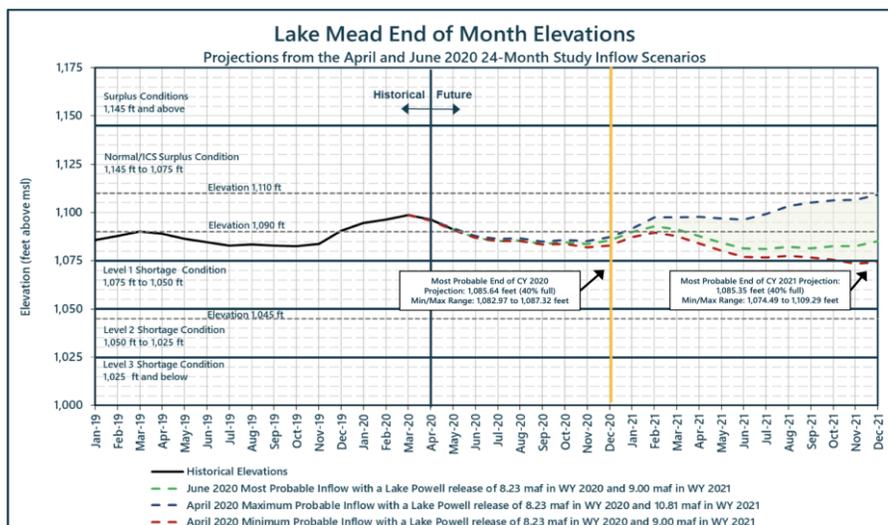
Proper planning of groundwater usage is impossible without having at least some idea of how much is being taken. Presently there is little requirement that well-draws be measured or reported. Democrats have tried to pass metering legislation for non-AMA areas, such as 2019 SB 1368¹⁵ for example, but have been blocked by the Republican majority.

Historic Overuse – Surface Water

Surface water availability is also at risk through direct over-use. Dating back to the 1922 Colorado River Compact, water allocations have been based on unrealistically high estimates of how much would be available each year.¹⁶ Climate change has contributed to a 20-year ongoing drought in the Colorado watershed.¹⁷ This has led to record low levels in Lake Mead and is expected to trigger the first round of “tier zero” mandatory water cuts under the recently-agreed Drought Contingency Plan (DCP).¹⁸ Looking ahead, the chart below shows the lake level is likely to hit the next tier of reductions as soon as 2021.¹⁹

24-Month Study – Lake Mead Projections

Source: CAP²⁰

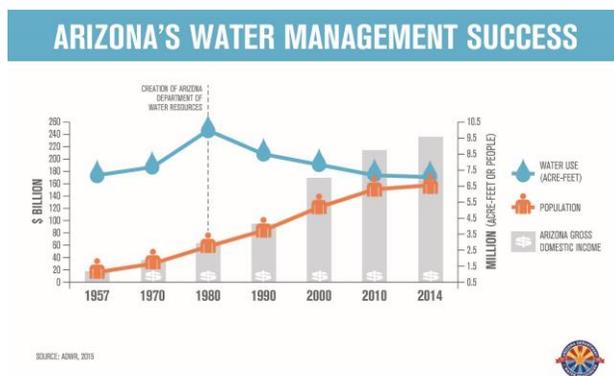


Due to this reduced availability of water from the Colorado River, Arizona’s entitlement to water via the CAP will be reduced 12% from non-drought levels. Water rights holders at the bottom of the seniority ladder (including some Pinal County farmers) may see their CAP allowances fall to *zero* by 2023.²¹ The DCP Amendment bill SB 1227 passed by the Republican majority in 2019 substitutes more groundwater pumping to cover the expected shortfall in CAP water.²² This is no solution at all since groundwater is a finite and dwindling resource which is not being adequately replenished. Under DCP tier zero reductions, the state would not have excess Colorado water available to bank in aquifers in 2020 either, making the over-pumping of well water problem even worse.²³

Conservation

As Arizona’s population grows, continuing conservation efforts will be needed to stay within a fixed water income.

Many cities have wastewater recycling systems and usage-reduction plans in place. Phoenix, for example, has led the way in addressing water usage through reduction and conservation efforts and now uses no more water than it did 20 years ago despite gaining 400,000 new residents. For consumers, being aware of their ‘water footprint’ has greatly helped reduce consumption and improve conservation. Republican bill 2020 HB 2675 would have allowed water rights owners to set aside some of their allotted water for temporary water conservation purposes without forfeiting their water rights.²⁴



Source: Arizona Farm Bureau²⁵

Arizona is a leader in the reuse of **gray water** (used household water recaptured from bathtubs, laundry, sinks, etc.).²⁶ ADEQ regulations allow for basic gray water irrigation systems to be installed by homeowners without needing a permit.²⁷ The city of Scottsdale’s Advanced Water Treatment Plant goes further. It is the first in the state (and only the third in the nation) to be certified for the direct production of drinking water from gray water. The city has not yet needed to ship purified recycled water directly to customers, but it continues to recharge aquifers with cleansed water for later extraction and use in households.²⁸ The state should continue to enable the proliferation of gray water and rainwater capture systems as cheap and effective conservation measures.

Large amounts of water are used for agricultural purposes. There exists provision for **Irrigation Non-Expansion Areas (INAs)** under the Groundwater Management Act of 1980.²⁹ This is a designation that could be used more to limit the growth of cultivation to within what can be supported by available water. Switching to lower-water requirement crops and employing modern techniques such as drip irrigation and lining irrigation ditches can help make sure water is not wasted.³⁰ It may also prove valuable to offer payment to farmers who fallow some of their land temporarily.³¹

New Water

In 2016 Governor Ducey initiated the Governor’s Water Augmentation Innovation and Conservation Council (GWAICC) within ADWR to explore where future water supply might be found. In addition to continued conservation and reclamation efforts, the committee has identified future sources that broadly amount to either draining untapped existing aquifers or investing in desalination.³² Neither approach is ultimately satisfactory based on the underlying science.

Draining more-distant aquifers such as those in the Harquahala and Butler Basins is unsustainable, as noted above. Desalination encompasses a variety of methods for recovering pure water from seawater or the brackish groundwater found in some Arizona aquifers and agricultural runoff. Most desalination processes require expensive processing plants, are very energy-intensive,³³ and produce highly-concentrated brine as a waste product.³⁴ Coastal desalination plants can discharge brine back into the sea, but disposal of waste from an inland plant is difficult and expensive. A further problem is that withdrawing brackish water from aquifers is also a one-time deal—it does not get renewed fast enough to be a renewable source.

The Yuma Desalting Plant was built in the 1990s to explore this method but has been an expensive failure; since its inception it has “operated just three times while costing millions of dollars to maintain.”³⁵ The Federal Bureau of Reclamation is considering re-starting the plant, a move supported by Arizona Republican lawmakers³⁶ yet it “may need millions more, even to operate at a small fraction of capacity.”³⁷ Other groundwater desalination projects have also been proposed.³⁸ A more creative solution might be for Arizona to co-fund a coastal desalination operation in California or Mexico, in exchange for increased rights to Colorado River water.³⁹

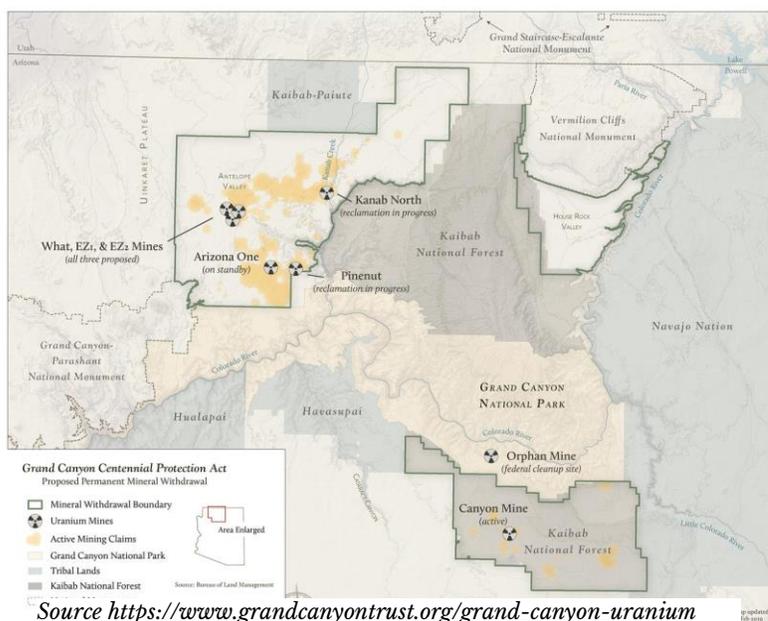
Water Quality

Whether potable or for agricultural use, water must be protected from contamination and disease. States must act to prevent pollution from obvious and not-so obvious sources such as agricultural, industrial, and mining runoff. They must also seek to mitigate pollution from indirect sources such as ash and debris in runoff after forest fires (see ‘Effects of Climate Change’, below).

Uranium Mining around the Grand Canyon

Mining operations have serious and long-lasting effects on the landscape which, in turn, may affect water quality. Cancer rates among the Navajo remain historically high even generations after Uranium mining was abandoned on reservation land.⁴⁰

According to the Grand Canyon Trust, the Canyon’s many seeps and springs are at risk of contamination.⁴¹ The area’s geology is not well-enough understood to know for certain where toxic runoff will end up. However the Trump



administration sought to kill off funding for a geologic survey of the area in 2019, which would have helped map that area’s hydrology.⁴²

Water pollution is of crucial importance to the Havasupai tribe who live within the Canyon and whose sole water source is a spring-fed creek.⁴³ Since 2012 there has been a moratorium on mining around the Canyon but it has been under continued legal threat. Denison Mines Corp. has a grandfathered license to operate an unfinished Uranium mine dating from the 1980s.⁴⁴ Despite a series of court cases, it looks like this mining operation will be allowed to resume.

Arizona U.S. Senator Kyrsten Sinema has proposed the Grand Canyon Centennial Protection Act to outlaw mining there permanently.⁴⁵ It would behoove the state, its citizens, and generations to come to support her in that endeavor.

Pollution from Fracking



‘Fracking’ (hydraulic fracturing) is a mining technique that relies on injecting chemicals into deep rock under pressure to fracture the rock structure and release oil or gas.⁴⁶ In addition to environmental damage and geological effects such as subsidence and tremors, fracking has the potential to pollute the aquifers beneath injection sites. Until the long-term effects of fracking on aquifers are better understood, it should either be delayed or—at the least—subjected to careful monitoring to prevent toxic contaminants from

entering the water supply—an irreversible outcome, should it occur.⁴⁷

Clean Water Act Coverage

The Environmental Protection Agency (EPA), under the direction of the Trump administration, has rolled back scores of environmental regulations protecting natural resources across the country. This regressive action has limited the scope of the Clean Water Act of 1972, which heretofore had ensured clean-water regulation of the intermittent waterways, arroyos, and washes that characterize much of Arizona’s hydrology. The status of intermittent water flows and isolated wetlands, which had been interpreted as being protected by the Act by prior administrations, has now come under legal challenge. The Trump administration’s efforts to eliminate these waters from Clean Water Act protection was challenged by 17 states, yet Arizona’s Republican leadership did not join the lawsuit.⁴⁸ Congressional action to clarify the Act’s scope and explicitly include non-navigable water should be supported if the long-term welfare of the state’s resources is to be considered.⁴⁹

Effects of Climate Change

Climate change is directly affecting how much water will be available from the Colorado and other rivers as annual rainfall declines.⁵⁰ Rising temperatures and more severe drought conditions have indirect effects also, such as the increased frequency of forest fires which pollute the water supply with ash and other toxic runoff. This happened after the Sunflower fire in 2012, when ash and debris washed down all the way into the Salt River. At that time Scottsdale had to shut down its water treatment facility because there was too much organic material in the water, and then faced

additional costs to dilute and treat the sullied water.⁵¹ The Bighorn fire of 2020 is having a similar effect in the Catalinas north of Tucson.⁵²

In light of the continued rise in climate temperatures, Arizona has to factor in damage to the water supply when considering the urgency of action to mitigate climate change.

Water for Everyone

Access to clean running water is something the vast majority of people in this country take for granted. In the Navajo Nation, however, this is currently far from the case. As many as one in three Navajo lack running water, have no sink or flush toilet, and must travel long distances to fetch water in containers.⁵³ While some prefer preserving this status quo as part of their traditions-based lifestyle free of government interference, and others distrust the Navajo Nation Environmental Protection Agency, all are at risk from contaminated water.



30%

Percent of Navajo residents who have to haul water, according to a report from the United Nations



54,000

Number of Navajo Nation members without access to a public water system



\$550

Annual cost for residents to haul water, about 2 percent of median household income

Source: Cronkite News / Arizona PBS⁵⁴

This situation is particularly problematic in the time of the COVID-19 pandemic when the first line of defense is simple handwashing. Following shelter-in-place orders is equally challenging when a third or more of the residents have to leave their homes to haul water back at great distances to survive, much less try and keep communal living environments contagion-free. Without running water and limited access to healthcare facilities, this is a problem for many in rural areas and reservations alike.⁵⁵ Public health fundamentally depends on extending adequate provision of running water into all inhabited areas. The inordinate number of COVID-related deaths within the Navajo Nation starkly illustrates what happens when safe water is unavailable.

The risks of the COVID-19 pandemic aside, collecting drinking water from untreated sources puts consumers at increased health risk. In 2011, a study by researchers from Johns Hopkins found extensive bacterial and viral contamination in the Navajo Nation household drinking water and linked it to the increased prevalence of acute gastrointestinal infection, including *E. coli* and parasitic presence in the population there.⁵⁶

Water Fairness

When an industrial farm drills a 2000-foot well causing neighboring farms' wells to dry up, who compensates for that loss? Who pays for water-truck deliveries to households with dried up wells? Who pays householders to drill deeper wells that cost more than half the value of their houses? The answer, painfully illustrated in the *New York Times* article, "The Water Wars of Arizona," is *no one*.⁵⁷ The 'law of the largest pump' prevails under a system basing groundwater rights on a "reasonable

use” doctrine. Dating back to frontier days, the practice grants a landowner the right to pump as much water as they need, as long as it’s put to a “reasonable use” such as farming. Hence, there is no recourse when a well goes dry as a result of a neighboring operation.⁵⁸ This laissez-faire system worked fine until large industrial farms moved in from the Middle East⁵⁹ and elsewhere, taking more than their fair share of water from local residents. Stymied by tradition, local residents and small farmers attempted to put a collaborative system into place, only to fail for lack of consensus and an overwhelming, myopic intolerance of *regulation*.

Given competing corporate farm interests versus citizen’s rights, it falls to the state to step up on behalf of small and large landowners alike to address this fundamental unfairness. Bills like 2019 HB 2467, unanimously supported by Democrats, to create local stakeholder committees to examine groundwater depletion and develop potential solutions tailored to each region’s needs are a step in the right direction.⁶⁰

With regard to surface water regulation, allocations and water rights continue to be debated in the context of dwindling availability under DCP restrictions. The state must remain committed to a fair, open, and transparent process for Colorado River water allocation under the new Arizona Reconsultation Committee (ARC) responsible for implementing allocations under the DCP agreement. Tasked with doing a “complex analysis of how every drop of Colorado River water is allocated and used to support the 40 million people whose livelihoods depend on the river—municipal, rural, tribal, industrial, agricultural, environmental interests in the United States and the Republic of Mexico,” long-term state support and funding of ARC’s efforts is essential.⁶¹

Water for Jobs

A large part of Arizona’s economy is dependent upon water-related revenue including travel, tourism, and outdoor activities. Annual usage of waterways for recreational activities alone contributes an estimated \$7.1 billion to Arizona’s GDP.⁶² The health and natural beauty of forests, rivers, and the Grand Canyon itself are at risk if the water they depend on is mismanaged or depleted.

Arizona has attracted tourists and new residents in great numbers in the last few decades. But the increasing perception that Arizona is an arid place with triple digit temperatures increasing by the year, prone to forest fires, and lacking effective long-term water management strategies may negatively affect that inflow. The state should be proud of its successes and ongoing commitment to water planning and project a responsible image to potential visitors and residents. Recent steps in that direction should be amplified.

Water for Life

When water users are enumerated, one major aspect is often left out: the environment as a whole. Without an adequate supply of water, entire ecosystems are disrupted. Negative effects follow for both wildlife and people.⁶³ The state would do well to recognize the category of **Ecological Water** in figuring allocations and projecting future needs.

Overuse of surface water has dried up many of Arizona’s river flows to nothing, resulting in the loss of fish species, wildlife, and riparian habitat. It is estimated that up to 90% of Arizona’s original riparian forest habitat has already been lost due to human activity.⁶⁴ In order to preserve the dwindling 10% of animals and ecosystems that still survive, it is vital to keep rivers flowing where possible. The sources of surviving rivers such as the San Pedro and Verde are greatly threatened by groundwater pumping.⁶⁵ It is critical to recognize that the environment—Mother Nature—has

seniority rights to water in order to sustain life. Water usage policy must include set-asides for responsibly preserving habitats and species that would otherwise be irretrievably lost.⁶⁶ That includes proper planning for new construction projects such as the Trump administration's expanded border wall which poses ecological peril across the San Pedro as it flows into Arizona. Studies have shown it risks causing further damage to riparian habitats due to the inevitable debris buildup during the monsoon season, choking river flow.⁶⁷

Other ecosystems unique to Arizona are currently in a critical state, affecting animals such as the endangered river otter,⁶⁸ southwestern willow flycatcher,⁶⁹ and Yaqui catfish⁷⁰ among many others. At-risk species and ecosystems must be protected in order to preserve our stunningly beautiful, eco-diverse state.

Last, but certainly not least, the state should continue to work with Tribal and environmental groups to bring back water flow to dried-up rivers where possible. Success stories like the deal with Phoenix that brought flowing water back to the Gila River Indian Community should be expanded and continued.⁷¹ Given the U.S. Supreme Court's recent *McGirt v. Oklahoma* decision on July 9, 2020, expanding tribal lands—with potential precedent for states like Arizona, it may behoove the state to get ahead of the issue through a collaborative approach to equitable water rights restoration.⁷²

Legislative Priorities

Arizona is a state that simply cannot afford to let water utilization and appropriations evolve on an ad hoc basis. What worked in Frontier days will not suffice moving forward. Systemic planning, commitment, and funding are required to ensure the state will continue to thrive economically and socially. If the legislature is to act as custodians of Arizona's limited resources—as they are uniquely empowered to do—they would do well to consider:

- Correct the structural deficit over-estimation of water available from the Colorado River:
 - The Drought Contingency Plan (DCP) is a positive step but is shortsighted and ends in 2026.
 - Water seniority disputes must be resolved to allow comprehensive planning.
 - Cease negating DCP surface water allocation cuts by pumping more groundwater—a zero-sum game.
 - Climate change must factor into water availability projections.
- Groundwater draw outside AMAs must be properly measured and regulated.
- Essential environmental and dependent ecosystem needs for water must be considered.
- Prevent end-runs around Arizona's existing water regulations through local pre-emptions.
- Protect river-adjacent counties from 'Buy and Dry' water export tactics.
- Support conservation efforts with reasonable, measurable targets.

A number of water-related bills, some with bipartisan support, were proposed in the 2020 legislative session which adjourned early due to the COVID-19 pandemic. These included important measures to address the problem of proliferation of deep wells for large farm operations and the resulting drying-up of nearby shallower wells. It is essential that the legislature return to these issues when it next convenes.

Republicans’ thoughts on responsible water policy appear to be evolving in some cases. Republican-proposed 2020 HB 2896 would have allowed counties to designate their own AMA-style regulated area—a Rural Management Area (RMA)—in endangered-groundwater basins.⁷³ Where such bills are valuable, strong enough, and comprehensive, they may deserve Democratic support.

Some significant water bills and resolutions in recent years are tabulated below.

Bills	Issue or Title	Lead Sponsor	Most Recent Action
2020 SB 1465	Ecological Water; Watersheds Use; Survey	Dalessandro (D)	2020 Session abandoned
2020 SB 1405	Water; Well Metering; Non-Exempt Wells	Mendez (D)	2020 Session abandoned
2020 HB 2880	Assured Water Supply; Availability; Plats	Roberts (R)	2020 Session abandoned
2020 HB 2818	Adjudication; Subflow Wells; Claim; Priority	Griffin (R)	2020 Session abandoned
2020 HB 2758	Watershed Health; Use; Survey	Engel (D)	2020 Session abandoned
2020 HB 2158	Water; Well Metering; Non-Exempt Wells	Engel (D)	2020 Session abandoned
2020 HCM 2004	Yuma Desalting plant – continued operation	Griffin (R)	2020 Session abandoned
2019 SCM 2003	Grand Canyon; Uranium Mining; Oppose	Mendez (D) et al	Died in Chamber
2019 SB 1368	Water; Well Metering; Non-Exempt Wells	Mendez (D) et al.	Died in Chamber
2019 HB 2498	Hydraulic Fracturing; Prohibition	Tsosie (D) et al.	Died in Chamber
2019 HB 2467	Committees; west basin water users	Cobb (R)	Signed into Law
2019 HB 2475	Water Use; Criminal Penalty; Wells	Bowers (R)	Signed into Law
2019 HB 2397	Water Adequacy Requirements, Statewide Application	Engel (D) et al.	Died in Chamber
2019 HB 2394	Water Efficient Plumbing	Engel (D) et al.	Died in Committee
2018 SB 1494	Environment; Underground Injection Control Program	Griffin (R)	Signed into Law
2018 SB 1493	Environmental Quality; Dredge Fill Permits	Griffin (R)	Signed into Law
2018 SB 1227	Drought Contingency Plan and Amendments	Fann (R), Otondo (D) et al.	(Bipartisan) Signed into law
2018 SB 1515	Adequate Water Supply; County Review	Griffin (R)	Died in Chamber
2017 SB 1412	Surface Water; Adjudication Sequence	Griffin (R)	Signed into Law
2016 SB 1400	County Water Supply Provision; Renewal	Griffin (R)	Vetoed by Gov. Ducey
2016 SB 1268	Adequate Water Supply Requirements; Municipalities	Griffin (R) et al.	Vetoed by Gov. Ducey

“Water is life,” the Navajo say. “Tó éí ííná.”⁷⁴

Further Resources

Arizona Department of Environmental Quality (ADEQ) <https://www.azdeq.gov/wqd>

Arizona Department of Water Resources (ADWR) <https://new.azwater.gov>

Arizona Municipal Water Users Association (AMWUA) <https://www.amwua.org>

Water for Arizona Coalition <https://www.waterforarizona.com>

Arizona State University Kyl Center for Water Policy <https://morrisoninstitute.asu.edu/content/kyl-center-water-policy>

University of Arizona Water Resources Research Center <https://wrrc.arizona.edu>

Sierra Club (Grand Canyon Chapter) <https://www.sierraclub.org/arizona>

Audubon Arizona <https://az.audubon.org>

¹ <https://www.census.gov/library/stories/2019/02/fast-growth-in-desert-southwest-continues.html>

² <http://www.arizonawaterfacts.com/water-your-facts>

³ <https://www.azcentral.com/story/opinion/op-ed/joannaallhands/2018/01/04/lessons-groundwater-management-act-saved-arizona/1000061001/>

⁴ <https://new.azwater.gov/ama>

⁵ <https://new.azwater.gov/aaws>

⁶ https://tucson.com/news/local/ancient-aquifers-are-dropping-as-tucson-s-suburbs-pump-groundwater/article_f7d43ecf-d7e5-586c-ab4a-62524d5a9427.html#tracking-source=home-trending

⁷ https://www.sierraclub.org/sites/www.sierraclub.org/files/sce/grand-canyon-chapter/legislative_updates/2018/2018%20Environmental%20Report%20Card_Final.pdf (page 9)

⁸ https://www.sierraclub.org/sites/www.sierraclub.org/files/sce/grand-canyon-chapter/political_action/2016_Enviro_Report_Card_Final.pdf (pages 13, 12)

⁹ <https://www.azcentral.com/in-depth/news/local/arizona-environment/2019/12/05/unregulated-pumping-arizona-groundwater-dry-wells/2425078001/>

¹⁰ <https://www.azcentral.com/in-depth/news/local/arizona-environment/2019/12/05/biggest-water-users-arizona-farms-keep-drilling-deeper/3937582002/>

¹¹ <https://www.azcentral.com/story/opinion/op-ed/ej-montini/2019/12/16/why-arizona-water-drained-saudi-arabian-farmers/2659993001/>

¹² <https://kjzz.org/content/1401701/bill-would-ban-water-transfers-river-communities-central-arizona>

¹³ <https://www.amwua.org/blog/arizona-aquifers-protecting-the-water-beneath-our-feet>

¹⁴ <https://www.azcentral.com/story/news/local/arizona-environment/2019/07/21/ua-study-explores-groundwater-pumping-and-surface-water-connections/1735959001/>

¹⁵ <https://legiscan.com/AZ/bill/SB1368/2019>

¹⁶ <https://www.newsdeeply.com/water/community/2018/04/18/if-you-understand-history-colorado-river-shortages-are-no-surprise>

¹⁷ <https://journals.ametsoc.org/jcli/article/32/23/8181/344319/Causes-for-the-Century-Long-Divide-in-Colorado>

¹⁸ https://www.pinalcentral.com/arizona_news/lake-mead-ends-up-with-more-water-than-projected/article_cbda34b0-534b-5ca7-bcdf-73b4da3b24de.html

¹⁹ <https://www.cap-az.com/documents/departments/planning/colorado-river-programs/ARC-Presentation.pdf>

- ²⁰ <https://www.cap-az.com/documents/departments/planning/colorado-river-programs/ARC-Presentation.pdf> (Slide 7)
- ²¹ <https://www.azcentral.com/story/news/local/arizona-environment/2020/04/24/arizona-pinal-farmers-colorado-river-dcp-funding/3012413001/>
- ²² https://www.sierraclub.org/sites/www.sierraclub.org/files/sce/grand-canyon-chapter/legislative_updates/2019/2019%20Environmental%20Report%20Card_Final.pdf (page 9)
- ²³ <https://www.azcentral.com/story/news/local/arizona-environment/2020/04/24/arizona-pinal-farmers-colorado-river-dcp-funding/3012413001/>
- ²⁴ https://www.sierraclub.org/sites/www.sierraclub.org/files/sce/grand-canyon-chapter/legislative_updates/2020/Sierra%20Club%202020%20Legislative%20Update%20%2311.pdf
- ²⁵ <https://www.azfb.org/public-policy/issues/water>
- ²⁶ <https://wrrc.arizona.edu/grey-water-as-resource>
- ²⁷ <https://legacy.azdeq.gov/envIRON/water/permits/download/graybro.pdf>
- ²⁸ <https://www.scottsdaleaz.gov/water/recycled-water>
- ²⁹ <https://new.azwater.gov/ama>
- ³⁰ <https://wrrc.arizona.edu/sites/wrrc.arizona.edu/files/Arroyo-7-24-2015.pdf>
- ³¹ <https://www.sustainablewaters.org/beef-its-where-the-water-goes/>
- ³² <https://new.azwater.gov/sites/default/files/Long%20Term%20Water%20Augmentation%20Options%20Executive%20Summary.pdf>
- ³³ <https://www.forbes.com/sites/quora/2017/09/07/why-desalination-isnt-the-answer-to-the-worlds-water-problems/#4fa2d6434737>
- ³⁴ <https://www.scientificamerican.com/article/slaking-the-worlds-thirst-with-seawater-dumps-toxic-brine-in-oceans/>
- ³⁵ <https://cronkitenews.azpbs.org/2018/05/02/yuma-plant-meant-to- conserve-water-will-cost-millions-to-update/>
- ³⁶ https://www.sierraclub.org/sites/www.sierraclub.org/files/sce/grand-canyon-chapter/legislative_updates/2020/Sierra%20Club%202020%20Legislative%20Update%20%2311.pdf
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