

# **A growing threat to Arizona's rivers — climate change**

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Since 1912, when Arizona achieved statehood, groundwater pumping and surface water diversions have severely impacted major groundwater basins and seriously degraded five of Arizona's major perennial rivers: Colorado, Gila, Salt, Santa Cruz, and much of the San Pedro, all sacrificed for economic development.

Perennial flow in the Verde River is diminished, and the future base flow of the upper Verde River is significantly threatened. Concerned citizens and groups have struggled for decades to protect our surviving rivers and to restore our degraded rivers, a task now more difficult due to the growing impacts of climate change.

Climate research confirms that the Colorado Plateau will become increasingly hotter and drier, punctuated by erratic and intense storms. Already, we see the effects of warmer-than-normal temperatures: A growing decline in Colorado River flow has created a major stress on Arizona's water supply.

Although the Colorado River gets all the press, other Arizona rivers are also affected. The Gila, Salt, and the Verde depend on snowpack and mountain springs. Skimpy snowpack and higher temperatures cause peak flow to occur earlier in the spring, but reduced annual flow can create dry spots in summer.

During dry periods, as natural recharge diminishes, water users pump more groundwater, leading to rapid drawdowns in aquifers, which results in dry wells, land subsidence and environmental damage. Climate change causes intense and irregular rainstorms that generate floods, erosion and sedimentation — this is happening now.

In response, Salt River Project is proposing to raise Bartlett Dam on the lower Verde for increased flood control and storage.

The base flow of the San Pedro, Santa Cruz and upper Verde rivers is principally groundwater released through springs and seeps. Here we have a double whammy: Hotter and drier conditions reduce aquifer recharge while growing cities and expanding agriculture increase groundwater pumping.

Aquifers become depleted, reducing the base flow of many threatened rivers and intermittent streams (Little Colorado, Agua Fria, Babocomari and others). Low flow plays havoc with riparian vegetation and wildlife. Even one day without water is a very bad day for Arizona's 19 threatened and endangered native fish.

The plight of the upper Verde River is a perfect example. Beginning in 1996, the watershed has been experiencing increasing heat and drought — the most extreme in 1,200 years — and the base flow of the upper Verde began a steady decrease. The cause is groundwater pumping in the Big Chino Valley and climate change. Both threats will grow as temperatures rise. Groundwater pumping for expanded irrigation, population growth or export to Prescott are existential threats — any one will dry the upper Verde.

We can achieve a sustainable water future through effective management. Water users — farmers and ranchers, cities and towns, tribal communities, business and industry, environmental interests and everyday people — must work together to better manage our water resources by modernizing Arizona's water law with an emphasis on conservation, reuse and the environment.

The November elections are critical. The Citizens Water Advocacy Group (CWAG) urges you to vote for candidates who support rivers and sustainable water policy.

I will moderate via Zoom the Oct. 8 CWAG forum on water issues for LD1 House and Senate candidates, and on Sept. 10, Ed Wolfe and I will explore the threats to the upper Verde River from groundwater pumping in the Big Chino aquifer. Details at [cwagaz.org](http://cwagaz.org).

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