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**CONNECTING
LAND AND
WATER FOR
HEALTHY
COMMUNITIES**



**AMERICAN
WATER RESOURCES
ASSOCIATION**



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Connecting Land and Water for Healthy Communities

Guest Editor: Mike Antos (mike.antos@stantec.com)

Arguably, managing water separately from land was one of the great missteps of the 20th century. Turning our eyes to past practices, and recognizing the role watersheds play in the health of the environment and our communities, we see that land and water must be managed together as integrated social-natural systems. This issue of *Water Resources IMPACT* is a companion to the AWRA 2021 Virtual Summer Conference: Connecting Land & Water for Healthy Communities, convening in July 2021. As co-chair of the AWRA Integrated Water Resources Management Technical Committee, and in partnership with the team at the Babbitt Center for Land and Water Policy, I am proud as guest editor to share these stories and examples of how land use managers and water managers are rediscovering the power of partnering for the benefit of people and the environment.

FEATURE

Looming Water Gap in the Colorado River Basin Leads Two Arizona Communities toward Integrated Land and Water Planning

Amanda Smith and Ashley Hullinger

LONG-TERM DROUGHT. AGRICULTURAL LAND LOSS. Subsidence. Tense political negotiations. In a semi-arid landscape, water access can make or break communities and economies. A microcosm of these conditions can be found in Pinal County, Arizona, where irrigated green fields mingle with stark desert expanses and are incised by interstate highways that link the state's urban centers.

Pinal County's circumstances are tied to the history of Arizona's water management. Several decades ago, Arizona faced a crisis as severe groundwater overdraft threatened the state's rapid population growth and development. In response to this threat, the 1980 Arizona Groundwater Management Code established an unprecedented water management framework to

protect groundwater in the most-affected parts of the state—Arizona's five Active Management Areas (AMAs; see Figure 1). Among other things, the Code required a program for developers and water providers in the AMAs demonstrate a 100-year assured water supply for new growth, required groundwater permits, prohibited the irrigation of new agricultural lands, and mandated AMA water management plans that include conservation targets and other water management criteria.

Simple Math

Wedged between the metropolises of Phoenix and Tucson, Pinal County maintains a strong rural character. The county lies mostly within the Pinal AMA, whose [water management goal](#) is to allow development of non-irrigation uses, preserving the existing agricultural economy for as long as feasible, consistent with the need to preserve future water supplies for non-irrigation uses. Between 2008 and 2018, agriculture accounted for 90 percent of the Pinal AMA's total annual water demand of 1,113,538 acre-feet per year.

The enactment of Arizona's Groundwater Management Code in the 1980s and establishment of the AMAs was an antecedent to bringing Colorado River water to Arizona's most populous regions through the Central Arizona Project (CAP) canal system. The CAP was built to reduce statewide groundwater dependency—not just by urban centers but also by agricultural water users, such as Pinal County farmers.

Overall, Colorado River water accounted for 45



Figure 1. Arizona's Active Management Areas (AMAs) regulate their groundwater use and are supplied with Colorado River water by the Central Arizona Project. Source: Sonoran Institute.

percent of the Pinal AMA's water supplies between 2008 and 2018, while groundwater contributed an average of 47 percent. The math is simple; without Colorado River water or the introduction of new water supplies, the Pinal AMA will return to groundwater dependency.

The Pinal AMA became the topic of regional

an urban trajectory (to understand the fuller water picture, see [A Visual Guide to Water in the Pinal Active Management Area](#)). The AMA's situation has been exacerbated by (1) the reduced availability of Colorado River water, particularly for agricultural users; (2) anticipated development and population growth; and (3) difficulties in meeting the 100-year assured water supply provision laid out in the 1980 Groundwater Management Code.

Planning for Land and Water

These challenges were the backdrop in February 2020, when leaders of two communities from the Pinal AMA, the city of Casa Grande and the town of Florence, attended a [Growing Water Smart](#) workshop. Growing Water Smart, a multiday workshop hosted by the Sonoran Institute and the Babbitt Center for Land and Water Policy, invites communities to bring a team of water resource professionals, land use planners, and elected officials to create action plans centered on integrating land use planning and water demand



Growing Water Smart workshop participants discuss Arizona's adequate water supply rules with facilitation by Del Corazon Consulting, LLC. Photo credit: Lincoln Institute of Land Policy.

management. conversation just as the seven U.S. Colorado River Basin states and Mexico signed the [Drought Contingency Plan](#) (DCP) on May 20, 2019. With ongoing drought conditions threatening supplies in the Colorado River Basin, the DCP agreements reduce the likelihood that Colorado River reservoirs will decline to critically low levels. The DCP process required Arizona and its local governments to make some difficult decisions that reflect new relationships with water, including accepting small water reductions in the near term to reduce the likelihood of catastrophic shortages later. Through a series of well-publicized negotiations, non-tribal farmers in Pinal County agreed to reduce their use of Colorado River water under the current shortage conditions.

Simultaneously, the Arizona Department of Water Resources (ADWR) released an update of its [100-year groundwater model](#), projecting unmet water demand of 8.1 million acre-feet across the Pinal AMA (2 million acre-feet of which is municipal demand). This represents a potential 10 percent gap between supply and demand over the modeling period, implying that any future growth will require cities, water providers, and developers in the Pinal AMA to find additional water supplies, reduce existing demand soon, or both.

This brings us back to Pinal AMA's tenuous position today, balanced between an agricultural legacy and

management.

How new development is designed and built can have a significant impact on municipal water demand. Yet land use planning authorities and water resource managers typically operate within separate departments or entities. This fragmentation creates communication gaps and wastes opportunities for water conservation and efficiency. When these entities come together, they can identify and implement actions such as addressing water during the development review process, using land use codes to increase indoor and outdoor water efficiency and promote a compact urban form, and integrating water into long-range plans.

After the workshop, Casa Grande and Florence used follow-up assistance from the Growing Water Smart program to initiate vital water demand management projects.

Tackling Water Demand

Both Florence and Casa Grande recognized water availability as the biggest challenge to their future growth and resilience. With projected shortages making new water supplies more difficult and expensive to procure, the resounding question was, How can we manage water demand so that we can continue to grow?

The town of Florence, population 26,350, is situated in the northern part of the Pinal AMA along the Gila River.

The town is growing, has potential for growth, and has the “paper water” for growth but faces many uncertainties related to future land use patterns, water quality concerns, water infrastructure needs, changing groundwater conditions, and future availability of “wet water.”

To proactively prepare for an uncertain water future, the town is thoughtfully integrating water into their community’s long-range general plan.

With the assistance of the University of Arizona Water Resources Research Center (WRRC) and others, Florence is evaluating its policy options. As the town analyzes its past, current, and future water demands and available water supplies, its options may include incorporating water into the review process for approving new developments, updating landscaping standards, passing low-impact development ordinances, and adopting a water allocation policy.

The city of Casa Grande, Florence’s larger neighbor to the south, has a population of 54,316 and is located centrally in the Pinal AMA on Interstate 10, which links the city to the two major metropolitan areas. Current trends in population growth and water demand predict that Casa Grande will need to double its water supplies in the next 30 years.

In response, the city is collaborating with its primary water provider, the private Arizona Water Company (AWC), to develop a joint Water Resources Plan. Officials used the Growing Water Smart workshop to draft the plan’s first component, the Demand Management Program, which outlines proactive steps for connecting land and water use through innovative ordinances and policies.

To meet its goal of reducing average daily water use by 15 percent, the Arizona Water Company has developed a systematic approach to connecting customers to water-saving strategies. WestWater Research, a third-party research entity, helped AWC identify customers with above-average outdoor water use. Through its new program Water Wise Outside, the Arizona Water Company provides these customers with a tailored list of appropriate cost-saving water conservation measures they can apply. Examples include replacing irrigated turf in fringe areas with walking paths or native vegetation, developing water-efficient irrigation schedules, investing in artificial turf for recreation facilities and sports complexes, increasing shaded areas, and using non-potable water for irrigation. Specific to

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schools, the joint Demand Management Program will also include a strong youth education component that will include both indoor and outdoor conservation.

The partnership between Casa Grande and the Arizona Water Company is a model for water demand management in the region. In spring 2021 the collaborative effort will launch a 12-month awareness

campaign called “Save It CG” that will encourage residents to conserve water. Once piloted in Casa Grande, the awareness campaign will be scaled up and adapted for use in the Arizona Water Company’s other service areas throughout the state, potentially reaching 250,000 people across 22 communities.

Maintaining Momentum toward Water-Smart Goals

Local initiatives in Arizona are leading to improvements and accumulated benefits that reach all the way up to the multistate, water-strapped Colorado River Basin. The Central Arizona Project predicts that activities outlined under the DCP agreement will significantly reduce, but not eliminate, the likelihood of water shortage in 2026, from 42 percent to 8 percent. Communities have only bought time, underscoring the need for local action to integrate water management more extensively into land use planning. Water policy and management are bound to the undeniable forces of hydrology, geography, and climate. Meanwhile, the integration of water and land use can be used to the fullest. The communities of Casa Grande and Florence are harnessing some of the most useful tools in the water-planning toolbox to ensure that the existing built environment and future development proactively address water challenges through innovation, public education, and data-driven approaches. ■

Amanda Smith (asmith@sonoraninstitute.org) is a program coordinator at the Sonoran Institute. She is a land use planner with integrated interests in water, open space, and social justice. The Sonoran Institute is dedicated to connecting people and communities with the natural resources that nourish and sustain them. See www.SonoranInstitute.org and www.GrowingWaterSmart.org for more. Ashley Hullinger (hullinger@email.arizona.edu) is a research analyst at the University of Arizona Water Resources Research Center. She manages the Water Research and Planning Innovations for Dryland Systems (RAPIDS) Program to assist rural communities develop solutions for their unique water challenges.