The Water Report

Water Rights, Water Quality & Water Solutions in the West

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MARKET-BASED LAKE RESTORATION

MARKET-BASED MECHANISMS FOR RESTORING WALKER LAKE

by Tess Gardner MESM, Sarah Kruse, PH.D., Davíd Pilz J.D. — AMP Insights

Introduction

Walker Lake is situated in west-central Nevada at the terminus of the Walker River Watershed, a 4,000 square mile closed basin crossing the borders of California and Nevada with headwaters in the eastern Sierra Nevada Mountains. The upper watershed is characterized by high elevation snowpack that feeds downstream flow while the lower watershed is arid with limited precipitation. As a result, flow in the Walker River and its two tributary arms (East Walker and West Walker Rivers) is highly seasonal. Snowmelt and runoff in the spring and early summer results in periods of high flows.

Walker Lake is the terminus of the Walker River system and has historically supported a unique ecosystem, economy, and culture. Over the last 150 years inflow into Walker Lake has been drastically reduced due to: increased and continued diversions for irrigated agriculture; groundwater extraction; and reservoir construction and storage on the East, West, and Main Walker Rivers. Reduced inflow has caused a decline in lake levels of nearly 200 feet and shoreline recession of as much as seven miles (see Figure 1). As a result, the levels of **t**otal **d**issolved **s**olids (TDS) — a measure of the salinity of the lake's water — has skyrocketed, as has eutrophication (dense growth of plant life resulting from excessive nutrients). Other impacts include increased water temperatures and decreased dissolved oxygen levels. Native species, particularly the Lahontan cutthroat trout, have been extirpated or are in deep decline. These detrimental impacts have had far-reaching impacts on the local residents and economy.

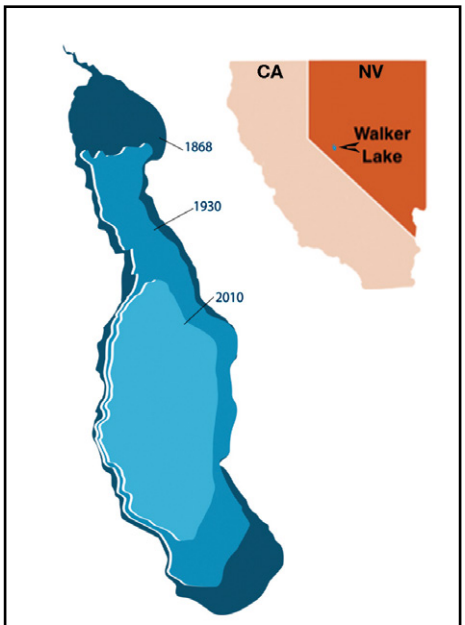

Figure 1: Walker Lake Surface Area

The lake is the traditional home of the Agai Dicutta ("trout eater" in Numu) who are also known as the Walker River Paiute Tribe. Until the 1980s, more than half of the local economy was dependent on Walker Lake either directly or indirectly. Recreators and tourists flocked to the area to participate in boat races, fishing derbies, and annual festivals hosted by local communities.

In 1991, a group of area residents and other citizens formed the Walker Lake Working Group to build public support for a long-term solution to protect the lake without jeopardizing upstream communities. This article will review salient results of these efforts.

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Appurtenant Rights

Addressing Concerns

Purchase of Rights

The Walker Basin Restoration Program

The passage of the 2002 Farm Bill created the Desert Terminal Lakes Program, from which emerged the Walker Basin Restoration Program (WBRP) administered by the National Fish and Wildlife Foundation (NFWF). The Bureau of Reclamation granted over $311 million for WBRP restoration efforts, including acquisitions, research, and conservation activities — making it the highest funded program of permanent water right acquisitions in the country.

The Walker Basin Conservancy (Conservancy) was founded in 2014 as part of the WBRP. The Conservancy functions as the local non-profit under which NFWF would "hold and exercise water rights acquired by, and to achieve the purposes of, the Walker Basin Restoration Program." 111th Congress. 2009, 2010. 123 STAT. 2845 (*see* www.congress.gov/111/plaws/publ85/PLAW-111publ85.pdf).

In 2017, the Conservancy, operating under the mission to "restore and maintain Walker Lake while protecting agricultural, environmental and recreational interests throughout the Walker Basin," became fully responsible for the WBRP.

Strategies for Restoring Walker Lake

Of the more than $311 million granted to the WBRP, nearly $185 million was made available for the purchase of land, appurtenant water, and related interests in the Nevada portion of the Walker Basin. Funding later expanded to include efforts to restore Walker Lake levels in the California portion of the basin. The funding amount reflects the volume of water required to restore Walker Lake to target levels which involve an estimated average of 50,000 acre-feet (AF) per year of reliable inflow to Walker Lake. With this goal in mind, NFWF and later the Conservancy began pursuing the acquisition of water rights for transfer instream in order to augment instream flow volume and inflow into Walker Lake. Other restoration activities included the lease and utilization of land and water assets to restore Walker Lake. Water acquisitions are pursued in collaborative and creative ways with the additional aim of generating alternative revenue streams and supporting the basin's people and economy.

The next several sections detail the source, flow, and bedrock principles of the acquisition program.

Acquisitions — The Source

The primary strategy for acquiring water assets for the restoration of Walker Lake has been the purchase of land and appurtenant water rights. Like much of the western United States, Nevada uses a system based on the principles of prior appropriation and beneficial use for water right allocation. Under this system, water rights also are recognized as private property that transfers "with the land to which appurtenant," unless the water rights are specifically reserved by the seller (Nevada Revised Statute 111.167. 2021). In the Walker Basin, these rights are held mostly by farmers who primarily grow alfalfa using a mixture of natural flow, water storage, and groundwater rights. Most water right holders in the Nevada portion of the Basin are customers of the Walker River Irrigation District (WRID) and beneficiaries of two large on-channel reservoirs near and on the California-Nevada border (Bridgeport Reservoir and Topaz Lake). On the California side of the Basin, there are large water right holders in Bridgeport and Antelope Valleys.

Farming in the Basin has historically been a difficult and costly enterprise, becoming only more difficult as the frequency and severity of droughts increase. In this setting, the initial presence of the WBRP and its acquisition efforts were viewed by some with skepticism and distrust. Public discourse in the local community was dominated by concerns over:

- the impact of acquisitions and instream transfer of water rights, on administration and delivery of water assets to remaining water rights holders
- the potential for growth of invasive species on retired agricultural land
- the impact of the acquisitions program on the market price and competition for water assets

Some pushback and skepticism about the WBRP and the Conservancy remain. However, frequent outreach to the local community, long-term employment of local residents, and stewardship of the acquired assets — including leases of purchased land and water assets to farmers — have helped to allay many concerns.

The Conservancy has been able to gain a toehold in the Basin as a purchaser of water rights through initial acquisitions from sympathetic parties, distress sales, and retiring farmers whose families were no longer interested in farming. In addition, one-on-one negotiations, attendance at town hall meetings, and newspaper advertisements have led to successful acquisitions from large landowners (those owning more than 500 acres). At the time of publication, over $100 million has been used to permanently acquire over 26,000 AF per year of water and other assets from 20 different water right holders.

Innovative Approaches to Water Agreements

Market-Based

Request for Water

Fair Market Value

Online Calculator

More recently, the Conservancy implemented and found success with two innovative approaches to engaging a new pool of potential water right sellers. The first is a Request for Water that solicits interest from water right holders via an online form in which the Conservancy's volumetric and water right type preferences are clearly defined. The second is an offer posted online in the form of an online calculator that a water right holder can use to anonymously generate an estimate of the value of their specific water rights based on fair market valuation data.

In many areas of the western United States it is difficult to determine the fair market value of a water right or apply such valuation widely. In contrast, the Conservancy's focus on data collection using basic information the water right holder has readily available and the relative homogeny of the Walker system of water rights allows the Conservancy to provide a transparent estimate of an individual's water rights in which they can have a relatively strong degree of confidence. The online calculator in particular underscores how critical longevity in a basin and data collection are in establishing a strong water acquisition program (www.walkerbasin.org/sell-water-rights).

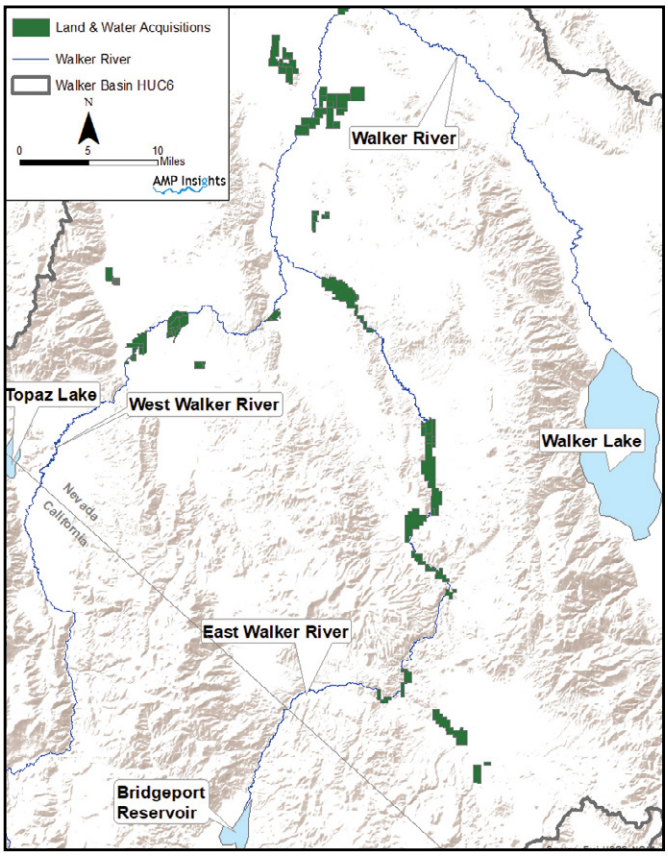

Figure 2

Drought Year Planning and Reliability

Paper vs. Wet Water

Under the "first-in-time, first-in-right" principles of prior appropriation "junior" water rights holders may have their water allocation curtailed or shut-off to satisfy more "senior" rights in times of water shortage. Hence, in the Walker Basin, a water right is not a guarantee of water either at the point of diversion or instream, not to mention at Walker Lake — particularly in light of ongoing climate change impacts. Taking this into account, the Conservancy's evaluation strategy makes a distinction between "paper water" (the volume listed on the water right) and "wet water" (the annual volume that a farmer reliably receives at their turn-out) during the acquisition process. Internally, the Conservancy takes a more detailed approach to their assessment of wet water to estimate the amount of reliable water instream resulting from an acquisition, considering such factors as:

- the proportions of consumptive versus non-consumptive use in the water right
- the historic reliability of the priority dates being acquired
- losses occurring in the river system below the point of diversion

While this estimate of reliable water does not directly impact what the Conservancy pays to a water rights seller — which is based on fair market value and considers only the reliability of the priority dates being acquired — the reliable water estimate does help determine whether the Conservancy continues to pursue an acquisition. It also helps to focus their efforts on water rights and geographies that will result in higher magnitudes of reliable water relative to their cost.

Instream Transfers — The Flow

Natural Flow vs. Storage

Surface water rights in the Walker Basin take two general forms; natural flow rights and storage water rights. Natural flow rights are rights adjudicated under the Walker River Decree C-125 (1936) and administered by priority date as conditions allow. Storage water rights are served from reservoirs in the Walker Basin — typically from Bridgeport Reservoir and Topaz Lake to WRID patrons — and are allocated at the beginning of the irrigation season according to an individual's volumetric water right and the total water available to serve storage water users.

Market-Based

Federal Decree

Natural flow rights in Nevada and in the Walker Basin can be transferred from consumptive, irrigation use to instream rights for wildlife purposes. The Basin, however, is administered under federal decree, so in addition to the Nevada State Engineer, the federal district court must also approve instream transfers. These requirements and the fact that the Conservancy has had, in essence, to establish the precedent for instream flow transfers in the Walker Basin, makes the transfer process for water rights cumbersome and time consuming. The legal process alone takes at least one year and as many as eight or nine years. [For more information on administration under federal decree see Moon, *TWR* #200.]

Instream Transfers

Thanks to its presence in the community, the structure of the WBRP, and continued efforts for involvement and collaboration, the Conservancy has been advancing its relationship with the administrative and legal entities that manage flow of water in the Basin. This monumental effort in relationship-building resulted in the first instream transfers in the Basin, with five permanent instream transfers approved and administered instream to date. The success of the Conservancy is evidenced in the speed with which the most recent transfer applications were approved compared to the initial transfer. The first transfer took nearly a decade from application to administration of the right instream and required litigation in the Federal District Court and the 9th Circuit Court of Appeals. Subsequent transfers, which, by nature of sharing the same point of diversion were largely identical to the first transfer, were approved and administered in under two years.

Instream Administration

Community relationships, particularly with the Federal Watermaster (i.e., the United States Board of Water Commissioner's representative in the Basin) and WRID, are critical to the successful transfer of water from upstream points of diversion to instream flows downstream. The Conservancy has proactively engaged with these entities to discuss its mission and strategy regarding future instream transfers and has sought their feedback before initiating any legal proceedings. While disagreement over some aspects of instream flow administration continues, this is a far cry from the drawn-out legal proceeding of the first instream transfer. The Conservancy has hopes that continuing proactive engagement will prevent such conflict in the future.

Walker River Paiute Tribe

The first instream transfer set a precedent for collaboration with another key entity in the Basin — the Walker River Paiute Tribe (Tribe). The Tribe is the most senior water right holder on the Walker River and diverts its allotted flow for the irrigation of reservation lands just upstream of Walker Lake. As a result, the Conservancy's instream flow must be shepherded past not only the Tribe's points of diversion but also through their on-channel reservoir. An accounting protocol and accompanying tool were developed by the US Geological Service (USGS) in collaboration with the Conservancy and the Tribe to determine the amount of instream flow in the river as it moves downstream and into Walker Lake. Such accounting was stipulated by the Tribe and NFWF in the first instream transfer and included in all subsequent transfers. The Conservancy has since contracted the USGS to host and maintain a public, real-time version of the accounting tool online (*see* https://webapps.usgs.gov/walkerbasinhydromapper/#home) to provide transparency about instream flow to Basin residents and beyond.

Storage Leasing program

In contrast to natural flow rights, transferring storage rights instream follows a less-defined legal pathway. Recognizing this issue early on, $25 million was granted to WRID for a three-year pilot storage leasing program, under which any storage right holder in WRID could receive compensation in return for leasing their water instream. The Conservancy not only participated in the program but collaborated with WRID to develop an accounting protocol to track and shepherd the leased storage water from the reservoirs at the top of the system to Walker Lake at its terminus. This accounting protocol considers the original points of delivery of the storage water and losses in the river to determine what portion of the leased storage water can be protected as instream flow as it moves downstream toward the lake. The leasing program resulted in nearly 14,000 AF of flow at Walker Lake in the wet year 2019. In the drier pilot years — 2021 and 2022 — storage allocations and therefore water leased to the program were substantially restricted, but the program still resulted in 171 AF and 187 AF at Walker Lake in those years, respectively. The fate of this program is currently unknown, but the Conservancy remains committed to finding a pathway by which storage water can continue to be used to help restore Walker Lake levels.

Other Assets — The Bedrock

In the course of acquiring water assets, the Conservancy has acquired other assets that do not directly increase lake levels but support the Conservancy's broader mission of providing long-term benefits for the river, lake, and local economy. Conscientious long-term management of these assets has also been central to the Conservancy's strategy. The Conservancy has used multiple approaches to land management, including: sales of productive farm land to other farmers; habitat restoration of retired

Market-Based

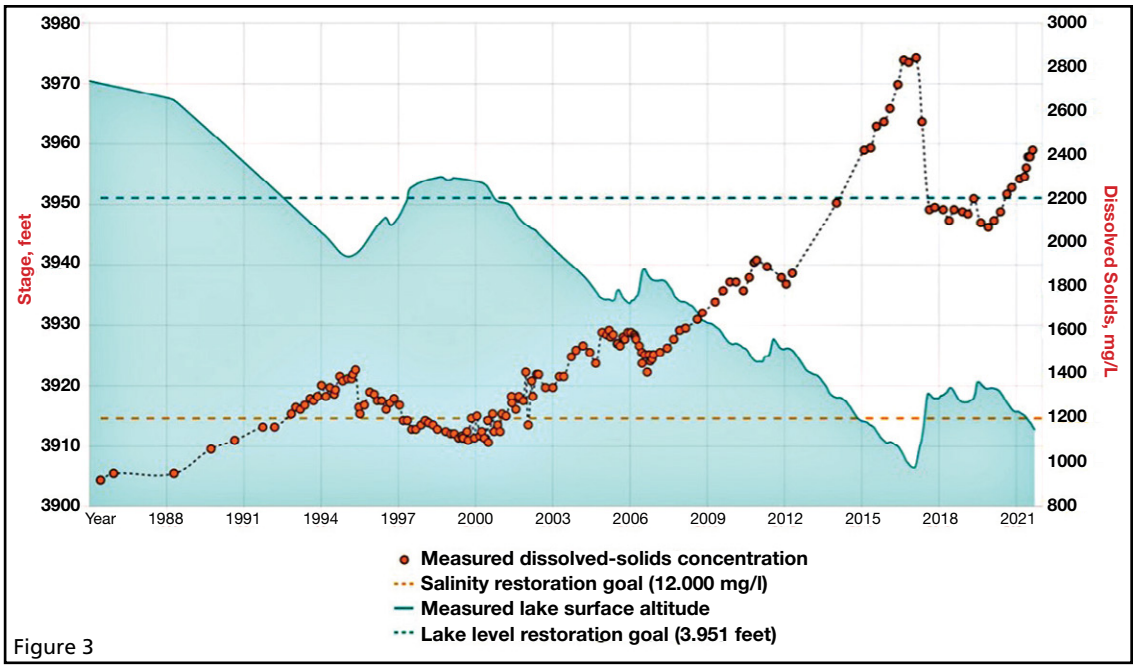

Figure 3

Other Assets

agricultural fields using native plants; and the creation of public access in partnership with Nevada State Parks and Nevada Department of Wildlife. In 2018, the Conservancy facilitated the donation of 13,700 acres to the State to create the first new state park in Nevada in 20 years.

Groundwater Rights

Groundwater is a key agricultural asset in the Basin used to supplement surface water supplies, especially in dry years. Groundwater has also become a key environmental issue impacting streamflow and Basin health due to over-extraction and reduced recharge. The Conservancy has, in large part, retired their groundwater rights to bolster the health of the underlying aquifers and support future instream transfers. Groundwater levels, however, continue to decline, which affects baseflow in the river. This amplifies groundwater's importance as an asset and a focus for the Conservancy going forward.

Waiting/Leasing

Even for surface water assets — natural flow and storage rights — that have the potential to be transferred instream and shepherded to Walker Lake, the process may take months to years from the time of purchase. In the interim the Conservancy has used their surface rights to revegetate acquired land and leased rights back to the water right seller until such time as those assets could be transferred. This practice supports the agricultural community in the years between an acquisition and instream dedication and generates a modest revenue stream.

Auctions

In addition to leasing natural flow water rights, the Conservancy has also completed a series of auctions to lease storage water rights to farmers within WRID. A series of pilot auctions in 2018 tested several auction formats. The first employed was a standard auction format in which storage water was awarded to the highest price and volume bid. The next auction used a set price approach with bids awarded on a first come, first served basis. These pilot auctions established that there was sufficient demand for storage water to justify future auctions and provided information on pricing.

The pilot auctions also demonstrated that under the standard auction format single individuals tended to dominate the market. As a result, subsequent auctions have been set price, round-robin auctions in which storage water is awarded at a set price in 10 AF increments to all participating bidders until the supply is exhausted. This format provides more equitable distribution of available storage to interested farmers, contributing to the Conservancy's mission to broadly support the agricultural community.

Progress and Innovation

Goals

The success of the acquisitions program — with 53% of the water goal having been acquired to date — has provided "proof of concept" for the market-based, permanent acquisitions approach the Conservancy has pursued in the Basin. Throughout the program, the Conservancy has created public access to more than 29 miles of the Walker River, established new practices for restoring native plant communities, and provided increased access to irrigation water for local farmers and ranchers.

However, while water acquisition has proceeded relatively quickly, much of the acquired water has yet to make it to Walker Lake. About 15,000 AF has been restored to the Lake over the lifetime of the program and 17% of acquired assets have been permanently transferred instream. The disconnect

Market-Based

between the amount of water acquired and restored to the lake is due to the hurdles of establishing a legal precedent for instream transfers in the Basin. However, the decade spent setting this precedent has already paid dividends, laying the groundwork for the four more recent water rights transfers proceeding much faster than the first. In other words, progress to date is substantial but measured. This highlights a core truth of the effort — that the program's goals will only be met through persistence, community engagement, and adaptation.

Establishing Precedent

Looking to the future — in addition to acquiring an additional 24,000 AF to reach their average 50,000 AF per year restoration target and successfully transferring those water rights water instream — the Conservancy is also focused on active management of acquired water rights to maximize benefits to the river and lake, as well as continued investment in the local economy.

Four Strategies

Four strategies illustrate this active management approach:

- Innovative Water Agreements that capitalize on wet water year conditions
- Drought Year Planning
- Groundwater Management
- Non-Water Asset Management including promoting recreational opportunities

Flexible Agreements

An example of an innovative water agreement is the exchange of Conservancy water assets with the Nevada Department of Wildlife (NDOW) as part of a lease agreement. More specifically, the Conservancy has exchanged supplemental storage and groundwater for the protection instream of a portion of NDOW's natural flow rights under specified water year conditions. The Conservancy benefits from the fact that their goal — the restoration of Walker Lake — is not seasonally dependent. Water delivered to the lake at any time of year is beneficial. The Conservancy continues to capitalize on this flexibility by engaging in such win-win agreements as the exchange with NDOW.

Additionally, because it does not matter when the lake receives inflow, the Conservancy can also capitalize on wet years to provide large pulses of inflow to the lake. For example, 2019 was a wet year that provided orders of magnitude more flow to Walker Lake. Capitalizing on wet year flows may, over the lifespan of this longterm restoration effort, help balance out the more limited inflow during drier years.

The Conservancy aims to maximize wet year flows for Walker Lake, while also pursuing opportunities to increase Basin resilience during drier years. Similar to their exchange with NDOW, the Conservancy is exploring how it may provide farmers with more water in dry years in exchange for water from farmers that can be sent to Walker Lake in those critical wet years. Ideally, the Conservancy can work to create flexible and efficient exchange structures that will benefit farmers and Walker Lake alike.

Groundwater Crisis

The Conservancy also is working to understand and confront the mounting groundwater crisis in the Basin. From the 1950s-1970s there was substantial development of groundwater to supplement irrigation with surface water. Recent studies have found that this has resulted in precipitous groundwater storage declines on the order of 557,000 AF. The aquifer is no longer replenished during average water years and each drought cycle depletes water levels further. From 2014 to 2016, the Nevada Department of Water Resources attempted to address this decline through curtailing groundwater rights — this measure was ultimately struck down in state court (Order #1267, Office of the State Engineer, Nevada). However, current conditions in the Walker Basin meet the legislatively-established criteria for a "critical management area" — which could generate curtailment efforts from the state (Nevada Revised Statute 534.110 (2021)).

The declining groundwater storage is, in turn, reducing stream efficiencies for the Walker River, increasing losses suffered by surface water. *See* Gwen Davis, and Ramon Naranjo, *"Estimated Effects of Pumping on Groundwater Storage and Walker River Stream Efficiencies in Smith Valley and Mason Valley, West-Central Nevada"* (2022), NWRA Annual Conference, Las Vegas, NV.

Conjunctive Management

Recent state law mandates that the State Engineer regulate groundwater and surface water conjunctively, and the initial steps toward this management are being pursued through litigation in the Humboldt River Basin (Order #1329, Office of the State Engineer, Nevada). Looking forward, the Conservancy is exploring solutions to groundwater decline and the impact on surface water users, in order to provide lasting recovery of the aquifers and restore environmental flows.

Native Plants

The Conservancy's non-water assets have uniquely positioned them to support the region's wider restoration and recreation efforts. Restoration of lands acquired by the Conservancy requires a substantial number of native plants, which are commercially scarce. To meet their own needs and fill a gap in the market, the Conservancy developed a native plant nursery along with a native seed initiative. In 2022, the third year of operations, the native plant nursery is expected to grow approximately 45,000 plants from seed to maturity plus the Conservancy has stored over 200 lots of native seed. In addition to using the plants in their own restoration efforts, the Conservancy is beginning to sell plants to others for their restoration efforts, including selling to the Walker River and Pyramid Paiute Tribes.

Market-Based

Opportunities

While there may be opportunities for boat races and fishing derbies again in the future, in the short-term, the Conservancy is working to support other recreational opportunities in the region. In addition to facilitating the donation of approximately 13,700 acres to the Walker River State Recreation Area, the Conservancy also has facilitated opening 29 miles of Walker River Corridor for fishing, hunting, and recreational access. Over the past year, the Recreation Area had almost 30,000 visitors. The Conservancy also recently submitted a grant application in partnership with the Walker River Paiute Tribe to expand and improve recreation opportunities in the Basin.

CONCLUSION

BROADER APPLICABILITY OF LESSONS LEARNED INTHE WALKER BASIN

Watersheds and irrigation-dependent communities and rural economies across the western US are facing many of the same issues as the Walker Basin. These include: environmental degradation; declining water availability caused and exacerbated by climate change; and groundwater declines. Lessons learned in the Walker Basin provide important guideposts for tackling these challenges. Specifically, the efforts of the Conservancy demonstrate the potential to balance permanent water acquisition and instream flow restoration with enhancement of rural economies and communities.

Buy & Manage

The Conservancy is replacing the more traditional "buy and dry" strategy with a "buy and manage" for environmental and community resilience strategy. Under a "buy and dry" strategy, the buyer purchases land strictly for its water rights without regard for the health or use of the land, usually selling off the dry land afterwards. The "buy and manage" strategy utilized by the Conservancy, on the other hand, recognizes that agriculture is an integral part of the Walker Basin and supports the local economy and a productive community, which it strives to support in conjunction with restoring Walker Lake. The Conservancy works with willing sellers to ensure that agricultural lands either stay in production through partial sales of water rights, water leasebacks, or land sales to other farmers, or that the land is returned to a natural state through planting of native grasses and shrubs.

Applying Lessons

The innovative and collaborative ideas and technical tools that have enabled this approach can and should be replicated elsewhere. For example, at the time of publication (December 2022), the US Bureau of Reclamation in the Lower Colorado River Basin is preparing to spend millions of dollars to temporarily lease water from water right holders for up to three years to help stave off the collapse of Lake Mead. Even if this program is successful, it will have an ephemeral impact on the basin's overall water balance. The success in the Walker Basin shows that temporary water leasing is not the only possible strategy for reallocating water between historic and contemporary water needs.

Permanent water acquisitions can be done in a way that not only respects rural, historically agricultural communities, but also supports diverse water-based economies that are more resilient to drought and climate change.

For additional information:

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Sarah Kruse & Davíd Pilz are Partners at AMP Insights (AMP), a small consulting firm working with clients on the most vexing water, economic, and natural resources management issues in unique, creative and energizing ways. AMP (and previously, Ecosystem Economics LLC) have provided support to the Walker Basin Restoration Program since 2009 including research, advice, analysis, and modeling related to program design and acquisition, transfer and finance strategies.

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Edwards Aquifer

EDWARDS AQUIFER SUSTAINABILITY

MANAGING THE EDWARDS AQUIFER FOR THE NEXT GENERATION

by Marc Friberg, Executive Director of External and Regulatory Affairs
Edwards Aquifer Authority (San Antonio, TX)

Introduction

It has been over 25 years since the State of Texas created the Edwards Aquifer Authority (EAA) in response to litigation over the endangered species dependent upon the Aquifer and a divided interest in its groundwater and associated surface water flows. The EAA is a local governmental authority, created and designed to do three things: manage, enhance, and protect the Aquifer system. As was discussed in the first article of this publication, adjudication of the Aquifer by the EAA began in June of 1996. Frownfelter & Trejo, *The Water Report #1* (March 15, 2004). The EAA Act is the guiding legislation for the EAA, requiring comprehensive regulation to protect the water rights of permit holders and to preserve the Aquifer for all that depend upon it. The passage of Senate Bill Number 1477 (the Act) in 1993, was scheduled to become effective on September 1st of that year. However, due to legal battles, the EAA did not become fully operational until June 28, 1996.

EAA Legislation

Over time, and through numerous starts and stops, the management goals and directives contained within the EAA's enabling legislation evolved to recognize the magnitude of the Aquifer's historic use. This evolution led to the implementation of a hard permit "cap" for water rights of 572,000 acre-feet per calendar year, the codification of a drought management system that mandates the curtailment of up to 40 percent of those rights during significant drought ("Critical Period Management" or CPM), and the requirement for a stakeholder process designed to ensure regional cooperation in protecting the aforementioned endangered species. This is a process that ultimately resulted in a federally-approved habitat conservation plan (the "Edwards Aquifer Habitat Conservation Plan" or EAHCP) and a corresponding Incidental Take Permit that covers Aquifer withdrawals. As approved, the EAHCP includes specific, market-based springflow protection programs and adds an additional four percent of potential curtailment of water rights under the EAA's CPM.

Water Rights Cap

Curtailment

The Aquifer region is home to some of the fastest growing areas in the country. The current rate of growth in the greater San Antonio area is approximately two percent per year, creating a projection that the metro population will double from 2.47 million (2017) to almost five million in the next 35 years. In addition to the rapidly growing population and its accompanying water demands, advancing climate change impacts will need to be evaluated and addressed through strategic planning.

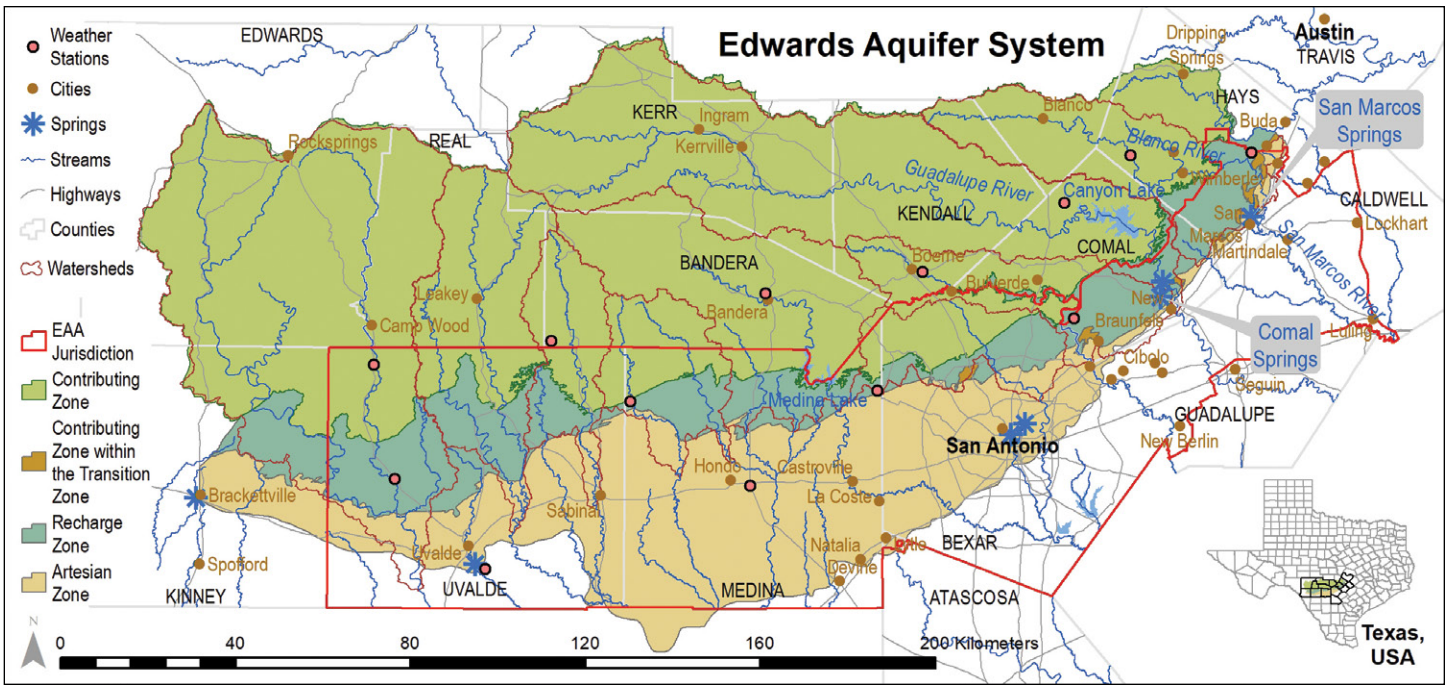
EAA's Mission

As described below, the EAHCP and the EAA's regulatory programs currently provide significant water certainty for all Aquifer users. However, the EAA's mission to "Manage, Enhance, and Protect" the Aquifer system in a way that establishes that same level of certainty for future generations remains a challenge. This article discusses how that challenge is being met,

Background

The Balcones Segment of the Edwards Aquifer (Aquifer) is a unique groundwater resource, extending 180 miles from the City of Brackettville in Kinney County, Texas, to the City of Kyle in Hays County, Texas. It is the primary source of drinking water for over two million people in south-central Texas, including the City of San Antonio, and serves the irrigation, industrial, municipal, and recreational needs of all regional residents and visitors. It is also the source of the two largest springs remaining in Texas — the San Marcos and Comal springs. These springs are the headwaters of the San Marcos and Comal rivers, which are tributaries to the Guadalupe River. Eight species that depend directly on water in or discharged from the Aquifer are federally listed as threatened or endangered. These species include the fountain darter (Etheostoma fonticola), the San Marcos salamander (Eurycea nana), the San Marcos gambusia (Gambusia georgei), the Texas blind salamander (Eurycea [formerly Typhlomolge] rathbuni), the Peck's cave amphipod (Stygobromus pecki), the Comal Springs dryopid beetle (Stygoparnus comalensis), the Comal Springs riffle beetle (Heterelmis comalensis), and the Texas wild rice (Zizania texana).

Endangered & Threatened



Edwards Aquifer

Multi-Faceted Approach

Incentive Programs

Common Ground

Non-profit Arm

The Next Generation — Collaboration and Funding

To prepare itself to meet rising challenges, the EAA has developed a plan to implement and scale innovative programs to ensure the resiliency and reliability of the Aquifer for future generations. The EAA's "next generation" regional sustainability concept is new, developed over the Summer of 2020, as an attempt to identify multi-faceted measures that can supplement existing regulatory programs, expand upon incentive-based programs, and help facilitate partnerships that marry similar goals and missions. Each program within the concept is designed to help advance another — with the ultimate goal being a regionally accepted suite of conservation activities that can provide water certainty for generations to come. The key to the plan is to develop programs that deliver on elements of the EAA's mission but also provide collateral environmental benefits to both water quantity and quality. While structural solutions are being explored throughout the region — including efforts by the EAA to encourage aquifer storage and recovery (ASR) facilities — initial efforts under the concept have focused on incentive-based programs for property owners. This focus is a departure from a regulation-driven philosophy, but is a natural step in the evolution of the EAA's approach to managing, enhancing, and protecting the Aquifer system. For example, the EAA is currently collaborating with New Braunfels Utilities to explore the feasibility of ASR in the Aquifer's Saline Zone (*see* www.nbutexas.com/wp-content/uploads/2020/04/19-12568-ASRFactSheet11x17.pdf).

The EAA's goal is to identify the most beneficial and viable paths forward. Of course, the EAA has finite resources. It's operations and programs are paid for by user fees associated with the Aquifer's permitted water rights. For the next generation concept to be successful, the EAA recognizes that it must actively seek relationships with key participants in both conservation and industry circles — finding common ground where resources can be shared to accomplish goals that benefit all. To do this, the EAA purposely deviated from the traditional role of a governmental agency, looking beyond the mandates contained in its enabling legislation and leaning into incentive-based programs. In 2014, before the next generation concept was born, the EAA began to plan for future financial and programmatic flexibility, creating a non-profit arm of the EAA in the form of a 501(c)(3) supporting organization, the Edwards Aquifer Conservancy (see www.eaconservancy.org). Since its inception, the Conservancy has been actively engaged in efforts to build corporate partnerships and establish mutually beneficial relationships with other non-profits, governmental organizations, and like-minded entities. As the EAA looks to the future, the Conservancy stands to serve as the perfect vehicle to aid in the success of the EAA's programmatic goals.

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Cap & Trade

Impact Analysis

Conserved Groundwater

EAA's Permitting and Drought Management System

THE FOUNDATION FOR CONSERVATION

Before discussing the next generation plan's current incentive-based programs, or any that may be designed for the future, it's important to take a step back and understand the regulations that serve as the foundation of water management for the Aquifer. Without this foundation, and subsequent buy-in from the EAA's regulated community, the positive impacts from complimentary conservation and enhancement programs would be much less certain.

Regulation of withdrawals from the Aquifer began in 1996, and by the fall of 2008, all water rights for Aquifer withdrawals were finalized and issued. Thus, all uses of the Aquifer were managed through a water market that allows a limited amount of water rights to move throughout the region under a "cap and trade" concept that is undergirded by the EAA's Critical Period Management program. The management system for the Aquifer was fully implemented by the fall of 2008, but its impact on the resource was anecdotal at best.

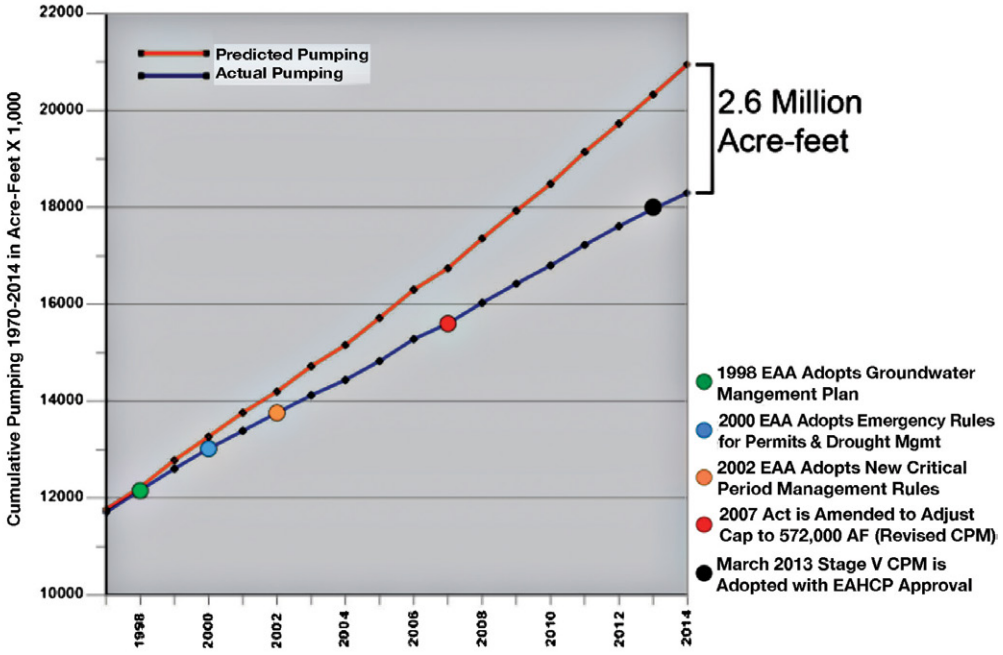
In 2014, on the heels of what was, at the time, the most intense and significant drought since the EAA's creation and the worst drought since the drought of record, an impact analysis was performed that affirmed and quantified the protections provided to the resource and Aquifer users by EAA regulations. EAA staff analyzed water-use trends to determine what measurable effects up to that point in time, could be identified and attributed to the implementation of the EAA's permitting system and CPM program.

It was found that the continued growth in pumping trends observed from Aquifer data tracking back to the 1940's began to flatten in 1997 — despite a population increase of approximately 670,000 residents in the Aquifer region during that same period. The average annual increase in pumping between 1947 and 1997 was approximately 6,100 acre-feet per year.

It was estimated that, between 1997 and 2014, approximately 2.6 million acre-feet of Aquifer water that, based on those historic pumping growth projections, should have been needed to meet demand, were not pumped. Instead, the water projected to be needed to sustain demand remained within the Aquifer.

This 2.6 Million Acre-Feet of Conserved Water Equates to:

- 1.95 million acre-feet of springflow that has directly benefitted the threatened and endangered species of the Aquifer and regional river flows;
- 650,000 acre-feet of water has remained in the Aquifer itself;
- Water level averages approximately 17 feet higher than otherwise predicted (without the permit system and CPM in place, the 2008-2014 drought would have resulted in Aquifer levels lower than those recorded during the drought of record);
- Flows from Comal Springs approximately 90 cubic feet per second (cfs) higher on average than otherwise predicted for the period 1997-2014 (without the permit system and CPM in place, the springs would have gone dry during the summer of 2014); and
- Flows from San Marcos Springs approximately 45 cfs more on average than otherwise predicted for the period 1997-2014.



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Existing Conservation Programs: Transactional Relationships

WATER MARKET-BASED SPRINGFLOW PROTECTION & LAND CONSERVATION PROGRAMS

Innovative Programs

Property Rights

The positive impacts documented in the Aquifer in 2014 provided evidence that the EAA regulatory programs were effective in mitigating population-induced demand stressors to the Aquifer as well as short-term drought effects. However, the long-term goal, as per the EAHCP, remained — i.e., ensuring continuous minimum springflows from the Aquifer through a repeat of the drought of record. To provide such assurance, two innovative programs were established within the EAHCP: 1) the Voluntary Irrigation Suspension Program Option (VISPO); and 2) the Aquifer Storage and Recovery Springflow Protection Program (ASR Program). Both programs rely on the concept of forbearance of withdrawals during drought. The concept is simple to administer because, in Texas, groundwater is owned by the property owner (Texas Water Code § 36.002 and EAA Act § 1.07.). In the case of Aquifer rights, EAA-issued rights are real property, issued in perpetuity. Therefore, outside of reasonable regulation, use and non-use of an Aquifer right is a management decision left to the owner of that right. The success of both programs was made possible because of the marketable nature of the Aquifer's water rights and the monetary incentives provided through a cooperative partnership with the region's irrigators.

VISPO

In its simplest terms, VISPO is a dry-year option contract whereby irrigators within the region agree to forbear against withdrawing their water rights after certain environmental conditions are met. In the case of VISPO, that condition is when Aquifer levels have declined to a pre-established critical level and been confirmed by the EAA at a statutorily defined monitoring well located in Bexar County, Texas. The monitoring well ("Well J-17") is identified and defined by the EAA Act.

The details of the VISPO program are as follows:

Triggering Event

- 40,000 acre-feet of water rights were enrolled into the program between 2013 and 2015, with enrollment reaching 41,795 acre-feet by 2021;
- Participants agree to five-year terms and get paid a "stand-by" fee of $54 per acre-foot of enrolled water — regardless of forbearance requirements;
- If a specific index well for the Aquifer reads at 635 feet above mean sea level or lower on October 1st of a given year, the program "triggers" and the water right holder is required to forbear withdrawals during the following calendar year; and
- In addition to the yearly $54 per acre-foot stand-by fee, participants are compensated for forbearance with an additional $160 per acre-foot payment — for a total of $214 for each acre-foot forborne.

VISPO has triggered twice during its existence. It triggered during the 2008-2014 drought in 2014, with the region getting the benefit of 40,000 acre-feet of conservation in 2015. And it triggered again this year (2022), requiring 41,795 acre-feet of Aquifer rights to be forborne in 2023.

ASR Program

Contractual Partnerships

ASR Storage

The ASR springflow protection program is a bit more complex, with more variables to consider. While commonly referred to as the "ASR Program," this springflow conservation measure is only partially related to aquifer storage and recovery. The program is effectuated through a contractual partnership between the EAA, the San Antonio Water System (SAWS), and regional irrigators. Overall, the program controls 50,000 acre-feet of water rights through a combination of leases and long-term forbearance agreements. SAWS currently has an Edwards Aquifer groundwater withdrawal right for over 250,000 acre-feet per year. Under the agreement, SAWS would voluntarily reduce its available withdrawal rights by up to 44,000 acre-feet in a year of significant drought. It would be compensated for voluntarily reducing its permitted water availability by accessing the Edwards groundwater that the EAA provided for it to pump and store through its ASR facility.

From a conservation perspective, the program focuses on recharge to the Aquifer, or lack thereof, during sustained drought as the primary criteria for triggering forbearance.

The ASR Program works as follows:

Recharge Management

- SAWS owns and operates an aquifer storage and recovery facility located within the Carrizo Aquifer (South of Bexar County, Texas and the Aquifer), where it stores both its excess Edwards Aquifer water rights during times of plenty. This essentially creates a large "bubble" of Edwards Aquifer water within the Carrizo Aquifer (differentiated by water chemistry) for use in future times of need.
- From 2013 to 2020, the EAA leased 16,000 acre-feet of water rights under terms that varied from one to fifteen years in length. In addition, the EAA entered into long-term forbearance agreements for an additional 34,000 acre-feet of water rights — providing control of over 50,000 acre-feet of water rights. Groundwater leases were set at water market rates, varying by term and ranging from $100 to $175 per acre-foot.

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Forbearance Agreements

- The forbearance agreements work in the same manner as VISPO, but as opposed to aquifer levels, the "triggering" environmental event is when the ten-year rolling recharge average falls below 500,000 acre-feet per year. The payment structure differs as well, providing $100 per acre-foot, per year, regardless of a requirement to forbear.
- Under a license, the EAA has allowed SAWS to withdraw, on a yearly basis, the 16,000 acre-feet of EAA-leased water rights for storage within its facility. This "regional water" is earmarked for use by SAWS during an extreme drought scenario as evidenced by the aforementioned rolling recharge average. Between 2014 and 2020, SAWS pumped and stored the program's goal of 126,000 acre-feet of Aquifer water for storage within the "bubble" of Aquifer water previously established within the Carrizo Aquifer via its facility.
- In exchange for access to the 126,000 acre-feet of stored water, SAWS agreed to forbear up to 44,000 acre-feet of its permitted Aquifer rights per year, for up to three years, or up to the total of 126,000 acre-feet of stored water rights — all during what is assumed to be the worst years of a repeat of the drought of record.
- Once storage of the 126,000 acre-feet was complete, the pumping of leased Aquifer rights was no longer required; therefore the EAA began converting its expiring leases into additional long-term forbearance agreements — maintaining a level of control over 50,000 acre-feet of water rights.

Triggering Event

After a triggering event occurs for the program:

- The EAA will call the forbearance of all enrolled water rights for the calendar year *after* the recharge average is confirmed.
- SAWS will forbear up to 44,000 acre-feet of groundwater rights from its permit, but will be able to access and use a corresponding amount of the water previously stored in its facility to meet emergency demand.
- The EAA will forbear the use of all remaining leased water rights under its control.

These actions will provide the region with up to 94,000 acre-feet of conservation during the worst years of a repeat of the drought of record. When coupled with VISPO, the total benefit to the region is 135,795 acre-feet of water conserved within a calendar year to bolster Aquifer levels and protect springflow discharge.

Future Programs: Expanding the Portfolio

As the VISPO and the ASR programs mature, the EAA is evaluating ways to make them more efficient from a cost-benefit perspective. Currently, these programs require renegotiations as their terms expire, creating uncertainty in the financial impact they may have on long-term planning. In addition, the EAA would like to supplement these programs by expanding its portfolio of conservation programs. One program currently being explored is the concept of a groundwater easement, coupled with a groundwater pooling opportunity for irrigators within the region.

Conservation Easements

Groundwater Easements

In Texas, Aquifer water rights are considered real property, and a conservation easement may be placed on any form of real property. Therefore, the EAA intends to explore the viability of placing conservation easements on Aquifer water rights. To fully understand the concept, one must first understand how irrigation permits were originally issued and how they are currently managed.

BIG Rights

When the EAA first issued irrigation rights, it did so in two categories: (1) Base Irrigation Groundwater withdrawal rights; and (2) Unrestricted Irrigation Groundwater withdrawal rights (EAA Act § 1.34(d) and EAA Rules §§ 711.95; 711.324; 711.330; and 711.332). Base Irrigation Groundwater withdrawal rights (BIG rights) represent one-half of the total permitted irrigation withdrawal rights established by statute.

BIG rights are restricted by law in that:

- BIG rights must remain appurtenant to the land associated with the right (if the land is sold, the BIG rights cannot be reserved and must transfer to the new owner with the land).
- BIG rights may only be used for agricultural purposes.
- BIG rights may be leased — but only for short periods of time.

UIG Rights

Unrestricted Irrigation Groundwater withdrawal rights (UIG rights) represent the other half of the total withdrawal rights issued to irrigators. Unlike BIG rights, UIG rights may be used for any beneficial purpose and at any place of use within the Aquifer region (they may be severed from the land and sold). For now, the EAA's project is focused on implementing conservation easements on BIG rights as a management tool.

Because of the natural way the Aquifer works, and due to the EAA's regulatory management process (described above), the more groundwater conserved during times of drought, the more water is available

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within the system. This management practice bolsters Aquifer levels, which helps maximize permit use due to the associated delay in the implementation of curtailments under CPM. The groundwater easement project does not create "new water" to be pumped, but it is designed to help create scenarios where an Aquifer user can have more of their permitted water available to them for use during drought — all while maintaining, and even enhancing, the Aquifer.

When implemented, encumbrances in the easement language will allow the EAA to "control" the use of the associated groundwater when the region is trending toward significant drought. Through the process, the EAA will have an early opportunity to make science-based determinations as to whether water rights under its control should be forborne from pumping or released back into the market.

Marketing Program

An important distinction is that the easement would solely restrict the use of the BIG rights. It would not restrict the farming activities taking place on the property or any other land use associated with the property. In addition, the EAA plans to increase the cost-effectiveness of the program by providing water right holders an opportunity for additional benefits through a subsequently employed marketing program whereby dividend payments to participating irrigators may be realized after the EAA successfully markets the encumbered water rights. This type of added incentive should allow for lower up-front costs due to the additional income provided to the irrigator over time. The marketing part of the concept is further explained below, but essentially, all rights controlled under the easement would be pooled together, and when positive environmental conditions exist, the EAA would make them available through short-term leasing to new and existing irrigators. Otherwise, when drought conditions warrant, the withdrawal rights would be forborne to bolster aquifer levels and provide additional springflow protection.

Short-Term Leasing

By taking advantage of both the flexibility inherent in conservation easement principles and the existing legal limitations placed upon BIG rights, a "win-win" collaboration with the agricultural community can be accomplished. In keeping with the original spirit of and legal rationale for the statutory limitations on BIG rights, the easement concept would ensure that, when not conserved, the encumbered rights remain in agricultural use, to the benefit of the overall agricultural economy, now and into the future.

Easement Operations

The easement will provide the EAA with full control of when and how the BIG rights are utilized.

The easement operates as follows:

- The EAA will prohibit the use of the BIG rights if existing springflow protection programs contained in the EAHCP are implemented due to Aquifer conditions (low aquifer levels or recharge averages). It is intended that any program triggers incorporated into any future EAHCP programs would be included in this prohibition as well.
- The EAA will have the right to further prohibit the use of the BIG rights if the region is trending toward drought. This "Trend Trigger" is explained in further detail below.
- If EAHCP springflow protection programs are not employed and the "Trend Trigger" in the easement has not been met, the EAA will be required to market the BIG rights for either agricultural use or for short-term, contractual forbearance (additional conservation).
- If the EAA successfully markets the BIG rights, the owner of the rights would be entitled to a portion of the proceeds.
- It is intended that the owner will also have a right of first refusal to use the BIG rights if they are eligible to be marketed under the easement as described above.
- If the EAA markets the BIG rights, it is assumed they would be priced at current market rates (approximately $50 per acre-foot currently) and reviewed yearly, utilizing transparent information from the current Aquifer water market contained in the EAA's water right transfer records.
- Because the EAA administers and officially records all transfers and trades within the region's established water market, under the program the EAA would act as a broker for the encumbered rights. By providing this service, the EAA would eliminate transaction costs that may be incurred with transactions facilitating in the private sector and could simplify the process of pooling small amounts of rights, eliminating the need to make multiple transactions to secure large amounts of water.

Trend Trigger

The EAA will define the "Trend Trigger" as environmental criterion that identify scenarios indicative of the onset of a serious drought. This action will allow the EAA to "pump the breaks" on groundwater withdrawals and make an informed determination as to whether "early" conservation, in terms of forbearance of withdrawals, is necessary to help delay or mitigate against the impacts of significant drought and early implementation of CPM. If forbearance is necessary, the EAA would call the encumbered water rights into forbearance to allow the benefits associated with the action to be realized.

Benefits

Additional benefits from the project are multifaceted.

For the EAA and regional stakeholders, the project will provide:

- lower up-front costs for perpetual control of water rights when compared to purchasing or leasing

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Program Benefits

• added flexibility for water management strategies
• a hedge against future climate change impacts

For the Irrigator / Agricultural Community, the project will provide:

• an immediate influx of money that can be used for the installation of more efficient equipment and/or operational expansion/improvement
• long-term protection for the agricultural economy — ensuring that (outside of drought of record conditions) water rights are available for agricultural use
• an opportunity for new irrigators to acquire low-cost water rights (when available under the program)
• flexible financial planning for irrigators who don't anticipate that their children or relatives will continue the family farming operations — while maintaining the legacy of the irrigation rights they perfected over time

Conservation Easements and Land Management

Recharge Zone

Urbanization of the Recharge and Contributing zones of the Aquifer increases the potential for negative impacts from non-point source pollution. The Recharge and Contributing zones of the Aquifer represent its most sensitive and vulnerable geographic regions. The Contributing Zone is the catchment area for the Aquifer that funnels stormwater and streamflow to the Recharge Zone, where those flows enter the Aquifer through faults, fractures, and karst features. Historically, these areas were largely undeveloped and they remained unregulated. Today, however, evolving changes in land use, whether from development or neglectful practices, is altering runoff, destroying soils, and otherwise modifying the natural processes necessary to maintain the Aquifer's health and vitality. Ultimately, these changes will have a significant impact on both water quality and quantity within the system. Moving forward, the EAA hopes that many of these issues can be addressed directly with landowners through new collaborative programs.

Replicating Programs

For the next generation of users, the EAA hopes to replicate and supplement an existing conservation easement program currently being implemented by the City of San Antonio (City). Under the program, lands where Aquifer recharge directly impacts the quantity and quality of the City's water supply are placed under conservation easements and paid for by a combination of sales tax revenue and the City's general budget (*see* www.sanantonio.gov/ >> News Releasees >> Edwards Aquifer Protection Program). Under the EAA's newly formed program, the organization will initially identify properties east of the City's conservation easements, where efforts can have a more direct impact on springflow. The EAA will rely on a combination of EAA properties and City properties to protect and enhance supplies in the western portion of the Aquifer.

Solutions

As the EAA secures conservation easements on properties within its targeted area, its goals are to both preserve the historic recharge quantity associated with the property and to provide protection against negative water quality impacts associated with the rapid development within the area. Utilizing the protection and access provided by the acquired easements, the next step in the process is to enhance the properties by employing land management solutions.

Land Management Solutions include:

• providing additional recharge above what has historically been associated with the property by creating additional water holding capacities in the soil and enhancing vertical infiltration of surface runoff
• mitigating against flooding
• improving soil profiles with the intent to provide water quality protection and increased carbon sequestration

Beneficial Practices

The overall idea is to protect, effectively improve, and then manage lands within various watersheds that can positively impact the Aquifer from the top of the natural system down. Techniques will vary based on the property, but essentially the management practices will consist of activities designed to: enhance soil health; bolster soil profiles over time; slow stormwater runoff; and retain water both on and within the land. Examples of beneficial watershed practices include:

• establishing woody vegetation on steep slopes
• establishing native grasses and woody brush to enhance swale and berm structures
• installing permeable rock and brush dams in riparian zones to slow, spread, and infiltrate runoff
• restoring floodplain connectivity/bank storage
• maximizing living organic cover with seeding/cover crops

Filter Runoff

When appropriately designed and implemented, these practices will slow surface water runoff and effectively filter that runoff before it becomes Aquifer recharge. The practices are designed to enhance water quality and quantity by holding water on the land longer, allowing for increased infiltration, and reducing rapid surface runoff and sediment entrainment. Furthermore, these practices have the potential to sequester carbon through the establishment of additional vegetative ground cover and woody plants in

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areas where the soil profile can be slowly restored from barren rock to rich organic matter.

Supportive research for this endeavor has already begun at the EAA's Field Research Park, located on 150 acres of preserved land along Cibolo Creek in Bexar County (Recharge Zone). On the site, EAA scientists are conducting field-based experiments and measurements. This fieldwork includes the evaluation of various land use and land management practices and their potential impact on Aquifer recharge and water quality. Results of these studies will provide quantitative information that can be used to understand the importance of soil health and be applied to maximize the potential benefits to both the Aquifer and the region. The implementation of land management practices on the acquired easements will be used to accelerate and confirm the results obtained at the Field Research Park.

Land Management

The following studies are currently underway:

- an assessment of changes in soil microbiomes, organic content, and soil moisture due to implementation of various types of land management practices
- evaluation and quantification of infiltration and movement of water in the vadose and epikarst zones and the effects of land management practices on infiltration and deep percolation of water
- investigation of the infiltration, transport, and filtering of nutrients and potential groundwater contaminants in the vadose and epikarst zones and the effects of land management practices on potential contaminant filtration

Ultimately, as scaled, the practices will make the Aquifer more resilient in the face of increasing water demands and impacts from climate change.

Resilient Aquifers

Specific resiliency factors include:

- Recharge that is protected will bolster available water and secure existing springflow protection measures contained in the EAHCP.
- Management practices that hold water on land for a longer period of time, coupled with recharge enhancement, will allow more water to enter the Aquifer's system, mitigating against the severity or pace of permit curtailment associated with the EAA's CPM. More water entering the system allows the EAA to manage the resource in a way that can potentially provide more springflow than the "minimum continuous" amount currently provided under the EAHCP. This ability strengthens the conservation plan and provides an additional hedge against climate change impacts.
- Improvement of soils on protected open spaces will add to the existing carbon sequestration capabilities of a subject property, further mitigating against climate impacts.
- Positive working relationships with regional landowners will allow for further exploration of technical research and land enhancement practices.

Supplementing Existing Programs

Impacts

Abandoned Wells & Assessment Tool

One of the highest risks to the future sustainability of the Aquifer is contamination events through abandoned wells. As wells age, become deteriorated, or are forgotten, they become direct conduits for contamination of the Aquifer. The rapid development that is occurring in the region only exacerbates the problem as these wells can be destroyed or negligently closed during the development process.

Historically, the EAA has worked to identify and require the plugging of abandoned wells, occasionally needing to turn to enforcement processes and litigation to facilitate compliance for a particularly dangerous well. However, this process is slow and cumbersome and is financially inefficient. In the Aquifer region, the cost to plug an abandoned well can range from $1,000 to over $200,000. Property owners, in many cases, just don't have the funds.

Closure Program

In response, the EAA funded a needs-based abandoned well closure program to assist well owners with the proper plugging of wells. While initially successful, the program has stalled due to a lack of participation; specifically due to reticence to supply the necessary financial information to qualify. As followup, while not ignoring or conceding the legal responsibilities of well owners, the EAA is exploring public-private partnerships with local, civic-minded organizations and corporations that could help facilitate and expedite the proper closure of abandoned wells with private funds.

To encourage landowners to take responsibility of abandoned wells, the EAA has also developed a process of filing "Notices of Abandoned Wells" within property records across the Aquifer region. While these notices do not provide a lien on the associated property, they do help the EAA take advantage of one of the region's challenges — its rapid development and population growth. As properties change hands, the notice and the potential liability it highlights is recognized by lenders and potential purchasers. The simple action of filing a notice helps the EAA leverage property closings against properly addressing an abandoned well. In many instances, lenders require the abandoned well to be addressed before funding for property acquisition is provided.

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Risk Assessment

In addition, the EAA has recently developed and implemented an abandoned well assessment tool to rank the potential severity of risk to the Aquifer for over 200 identified abandoned wells within its database. The ranking system is based on GIS tools and both geologic and geographic factors to help EAA staff prioritize enforcement efforts in approachable "chunks" that can have immediate and substantial impacts on water quality protection.

Learning Opportunities

Educational Center

Finally, throughout the development of its next generation concept, the EAA was keenly aware of the importance of education. The residents and visitors of a region need to know where their water comes from if they are expected to care enough to protect it. Over the years, the EAA has provided in-classroom learning opportunities for schools within its jurisdictional footprint. But during the 2020-2022 timeframe, the EAA transitioned to a much loftier goal, building an educational center that individuals of all ages and abilities can visit for free and cultivate a curiosity about the Aquifer and various conservation initiatives (*see* www.eaaeoc.org). The center includes a virtual cave, houses a few of the endangered species protected by the EAHCP, contains interactive exhibits on weather impacts and land management practices, and provides hands-on learning opportunities regarding water quality protection and abandoned wells — it even has a demonstration garden.

The center creates a destination for the EAA to bring the region together, establish a greater conservation ethic, and develop the next generation of scientists and leaders to help meet the goals and mission of the EAA.

Conclusion

CERTAINTY IN SUSTAINABILITY

Incentive-Based Programs

In Texas, the groundwater management system established for the Aquifer is a unique deviation from the norm. The EAA proved that consistent implementation of its regulations could achieve sustainability in the face of drought. In addition, as conservation programs were developed and deployed through the Edwards Aquifer Habitat Conservation Plan, the region realized the value of incentive-based programs that utilized the Aquifer's water rights market. Building upon those successes, the EAA hopes to establish certainty in sustainability so that future generations can continue to rely on one of the state's most important natural resources.

To help meet the consumptive demands of population growth and to mitigate against the impacts from rapid development and a changing climate, the EAA is seeking to deploy more ambitious conservation initiatives, utilizing conservation easement concepts, encouraging structural aquifer storage and recovery strategies, and capitalizing on the benefits that nature-based improvements can bring to the region. The EAA recognizes that it cannot achieve its goals alone. As it moves forward, education of the public regarding the region's water source and collaboration with its regulated community, like-minded entities, and non-traditional partners will be essential for success.

For additional information:

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MARC FRIBERG, is the Executive Director of External and Regulatory Affairs for the Edwards Aquifer Authority, where he manages the EAA's permitting, conservation, regulatory, and legislative programs while providing support to the EAA in activities related to its federally approved Habitat Conservation Plan. While at the EAA, Marc has also been responsible for the Authority's external relations through management of the Outreach and Education department. Prior to joining the Authority in 2008, Marc worked for the Texas Commission on Environmental Quality in the Office of Legal Services. Marc is a graduate of Baylor University and the Baylor University School of Law.

Agricultural Conservation

AGRICULTURAL WATER CONSERVATION

WATER CONSERVATION & DROUGHT MITIGATION ON PRIVATE WORKING LANDS IN THE WEST
POLICY OPPORTUNITIES IN THE FARM BILL AND BEYOND

Editors' Note: In October, the Western Landowners Alliance released a report: "Western Water Conservation and Drought Mitigation on Private Lands: Policy Opportunities in the Farm Bill and Beyond" — Authors: Zach Bodhane and Ward Scott. What follows is an abridged version of that report, which has been edited and condensed to better match our format. The full report is available from the Western Landowners Alliance website https://westernlandowners.org/publications/

Introduction

Drought Resilience

The western United States continues to face extended and increasingly severe drought conditions that threaten municipal and agricultural water supplies, energy production, wildlife and aquatic habitat, recreational opportunities, and overall water and environmental quality. In response to continuously diminishing water supplies in Lake Powell and Lake Mead on the Colorado River, the federal government has begun taking measures to curtail water delivery to western states. Congress has recognized that current drought conditions pose a critical threat to western water supplies and has taken several recent actions to address drought resilience and promote water conservation in federal water management operations, as well as on private farmlands, ranches and forests.

Federal and Private Lands

Although western water is largely managed under state laws, the federal government and private landowners play a critical role in large-scale efforts to conserve limited water resources through the implementation of conservation practices. Federal agencies, such as the US Bureau of Reclamation (Reclamation), have authority over the management of major federal storage projects, including Lake Powell and Lake Mead. Additionally, several programs — largely authorized under the federal farm bill Conservation Title and administered by the US Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) — provide technical and financial assistance to private landowners to plan and implement water conservation practices on their lands. Congress has recognized that drought has become the single largest cause of US farm production losses, and has directed "the development of creative solutions to conserve water while maintaining productive use of farmland."

Conservation Title Programs

Through the Agriculture Improvement Act of 2018 (2018 Farm Bill), Congress prioritized water conservation and drought mitigation as areas of focus to be addressed through reauthorized Conservation Title programs, including: the Environmental Quality Incentives Program (EQIP) and its subprograms; the Conservation Stewardship Program (CSP); the Conservation Reserve Program (CRP) and its subprograms; the Regional Conservation Partnership Program (RCPP); and the Watershed and Flood Prevention Operations (WFPO) program. Additionally, the Inflation Reduction Act of 2022 (IRA) extends authorization and funding of several farm bill conservation programs and provides funding for additional western drought measures.

In this report, the Western Landowners Alliance (WLA) examines amendments to farm bill conservation programs under the 2018 Farm Bill along with other relevant federal programs that may be used to address western water challenges, with the goal of preventing the need for further federal restrictions on water allocations within the Colorado River Basin and other western watersheds. Based on these findings, WLA also provides recommendations for amendments to the next farm bill and other state and federal policies to:

Recommendations

- Expand farm bill conservation programs' focus on water conservation and western drought mitigation
- Empower community-based leaders to play a larger role in addressing water shortages and innovating in agricultural water conservation
- Improve coordination among state and federal agencies to leverage collective capacity and resources
- Address challenges to farm bill program delivery to improve landowners access to programs that support land and water stewardship

Colorado River Drought Contingency Plans

Colorado River Compact

The Colorado River is critical to the southwestern US and to the national economy, providing water to over 40 million people and to almost 5 million acres of farmland. Over-appropriation of the river and reduced water supplies within the system have resulted in critical conditions and the urgent need for large-scale, coordinated actions, to promote conservation among the millions of water users within the Colorado River Basin. Allocation of water within the Colorado River Basin is primarily governed by the Colorado River Compact of 1922 (Compact), a Congressionally-approved agreement among the

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seven Basin states which established the Upper Basin (Colorado, New Mexico, Utah and Wyoming) and the Lower Basin (Arizona, California and Nevada). The Compact provided that each Basin was to be allocated 7.5 million acre-feet of water annually. A 1944 treaty obligated an annual delivery of an additional 1.5 million acre-feet to Mexico from the system. In 1922, the parties to the Compact incorrectly assumed that water supplies in the Colorado River would average 16.4 million acre-feet per year. From 1906 to 2020, actual annual flows in the Colorado River averaged 13.9 million acre-feet per year. Since 2000, long-term drought conditions have reduced flows to an average of just 12.5 million acre-feet per year.

DCP's

Facing mandatory Reclamation water delivery cuts from Lake Powell and Lake Mead, the seven Colorado River Basin states finalized drought contingency plans (DCPs) in March 2019 for the Upper and Lower Basins. The DCPs, which outline coordinated strategies among the states for Colorado River reservoir operations during drought and water supply shortages, were subsequently approved by Congress in April 2019.

The Upper Basin DCP focuses on the volume and management of Lake Powell to ensure that its surface maintains a minimum elevation of 3,525 feet (the minimum level required for hydropower generation) and calls for the establishment of an Upper Basin DCP Demand Management Program, which would pay private water rights holders for temporary reductions in water use. Despite Upper Basin DCP efforts, in 2022 Lake Powell fell to its lowest level in over 50 years. In May 2022, Reclamation invoked emergency authority to protect hydropower generation at Lake Powell by diverting approximately 500,000 acre-feet from the Flaming Gorge Reservoir to Lake Powell, and by retaining 480,000 acre-feet in Powell that would have otherwise been released into the Lower Basin.

Water Restrictions

The Lower Basin DCP requires curtailed water deliveries to Lower Basin states when the surface of Lake Mead lowers to predetermined "trigger" levels. Despite efforts through the Lower Basin DCP, water supplies at Lake Mead continue to diminish. Recent Reclamation studies indicate that the surface of Lake Mead will likely continue to lower significantly. On August 16, 2021, Reclamation announced that total Colorado River system storage had depleted to 40% capacity and implemented Tier 1 delivery curtailments in the Lower Basin. On August 16, 2022, Reclamation announced that surface levels of Lake Mead require additional Tier 2 water restrictions, which will take effect in January 2023. Under the terms of the Lower Basin DCP, Tier 1 and 2 restrictions represent a curtailment of 21% for Arizona, 8% for Nevada and 7% for Mexico. As of September 6, 2022, the US Drought Monitor reported that Lake Mead and Lake Powell are 28% full and 24% full, respectively.

Federal Farm Bill

The federal farm bill, typically reauthorized every five years, is an omnibus law that addresses nationwide issues surrounding food, nutrition, agricultural policies, forestry, and natural resource conservation. The most recent farm bill, the 2018 Farm Bill, is comprised of 12 separate titles.

Voluntary Programs

The Conservation Title (Title II) was first added to the farm bill as part of the Food Security Act of 1985 and encourages environmental stewardship on private working lands. Title II programs provide technical and financial assistance to landowners for: the implementation of conservation practices; development of innovative conservation and technologies; and for the retirement of environmentally sensitive lands from production. Participation in all farm bill conservation programs is voluntary. These programs are administered by the USDA, primarily through NRCS, as well as through the USDA's Farm Service Agency. Although eligibility for participation in most conservation programs is broad, many programs require a competitive selection process for acceptance.

Source Water

The 2018 Farm Bill amended several farm bill conservation programs by adding language expressly intended to promote: water conservation; efficient water management practices; and drought mitigation in the western US — particularly within the Colorado River Basin. The Bill also requires that 10% of mandatory conservation program funding be dedicated to source water protection. The USDA is directed to "encourage practices that relate to water quality and water quantity that protect source water for drinking water (including protecting against public health threats) while also benefiting agricultural producers." NRCS is authorized to offer producers increased incentives and higher payment rates (up to 90% cost-share) for the implementation of such practices through farm bill conservation programs.

Inflation Reduction Act of 2022

Inflation Reduction Act of 2022 (IRA) was enacted in August 2022. Among the IRA's primary goals is to address climate change, with a specific focus on reducing greenhouse gas emissions and addressing the ongoing drought in western states. The IRA provides billions of dollars in new funding for farm bill conservation programs, specifically EQIP ($8.45 billion), CSP ($3.35 billion), ACEP ($1.4 billion), and

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Drought Funding

RCPP ($4.95 billion), through 2026. The IRA also extends authorization for the four programs (as well as for CRP) until 2031.

Additionally, the IRA includes $4 billion in funding for drought relief and mitigation in the 17 Reclamation states, with priority given to Colorado River Basin activities. The $4 billion in funding for drought relief is set aside for grants, contracts, or financial assistance agreements.

IRA Drought Relief Funding supports:

- Compensation for Voluntary Reduction (temporary or multi-year) in diversion of water or consumptive water use
- Voluntary System Conservation Projects that achieve verifiable reductions in use of or demand for water supplies or that provide environmental benefits in the Lower Basin or Upper Basin of the Colorado River
- Ecosystem & Habitat Restoration Projects to address issues directly caused by drought in a river basin or inland water body

Federal Farm Bill Programs Addressing Water Conservation

Environmental Quality Incentives Program (EQIP)

The Environmental Quality Incentives Program (EQIP) provides "flexible technical and financial assistance" to private landowners and agricultural producers to address targeted environmental and natural resource issues (including water conservation) while keeping their lands in production. EQIP assistance is available to agricultural producers and owners of non-industrial private forestland, as well as tribal governments. Eligible lands under EQIP include: cropland; rangeland; pastureland; non-industrial private forestland; and other farm or ranch lands. EQIP funding is available nationwide. In FY2021, the EQIP program provided $1.26 billion in funds through 34,054 contracts, covering 11.6 million acres.

Conservation Plans

EQIP participants work directly with NRCS to develop conservation plans and implement various conservation practices in their operations. Landowners are eligible for reimbursement from USDA through a contracted cost-share agreement, which typically covers up to 75% of costs associated with planning, implementation, management, and maintenance of approved practices.

EQIP is a competitive program. Eligible landowners may submit applications for EQIP funding which are then ranked by NRCS state offices based on designated criteria specific to each state. General criteria that NRCS evaluates in the EQIP project selection process include: (i) cost-effectiveness of proposed conservation practices; (ii) magnitude of expected conservation benefits; (iii) effectiveness of the project addressing designated resource concerns; (iv) use of conservation practices that provide long-term conservation enhancements; and (v) compliance with federal, state, tribal, and local laws and regulations.

Use Reduction

USDA EQIP regulations express that NRCS may give priority to EQIP project applications that include water conservation or irrigation-related practices that: (i) result in a reduction of water use in the agricultural operation; or (ii) include an agreement by the applicant not to use any associated water savings to bring new land under irrigation production unless the producer is participating in a watershed-wide project that will effectively conserve water.

The 2018 Farm Bill reauthorized EQIP through FY2023 and funded the program at the following levels: $1.75 billion for FY2019; $1.75 billion for FY2020; $1.8 billion for FY2021; $1.85 billion for FY2022; and $2.025 for FY2023. The IRA reauthorized EQIP through 2031 and provided $8.45 billion in additional funding for the program at the following levels: $250 million for FY2023; $1.75 billion for FY2024; $3 billion for FY2025; and $3.45 billion for FY2026.

Streamlining Programs

The 2018 Farm Bill also amended EQIP to address water conservation issues and expanded EQIP eligibility to water management entities (WMEs) that service private agricultural producers. Under Section 2304(e), USDA may enter into a EQIP contract for water conservation or irrigation efficiency practices with "a State, irrigation district, groundwater management district, acequia, land-grant mercedes, or similar entity under a streamlined contracting process to implement water conservation or irrigation practices under a watershed-wide project that will effectively conserve water, provide fish and wildlife habitat, or provide for drought-related environmental mitigation, as determined by the Secretary." This provision was intended to address a widely held concern among private landowners, particularly in the West, that participation in EQIP had been overly cumbersome (financially, technically, and otherwise) for many individual landowners and that water conservation measures can be more effectively implemented at the watershed level.

Eligible water conservation practices expressly listed under the new EQIP provisions for WMEs include: water conservation scheduling; water distribution efficiency; soil moisture monitoring; irrigation-related structural or other measures that conserve surface water or groundwater, including managed aquifer recovery practices; a transition to water-conserving crops; water-conserving crop rotations; or

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deficit irrigation. The 2018 EQIP amendments also expand eligible lands for WME contracts to include not only the producer's land, but also land that is adjacent to the producer's land, as well as land that is under the control of the WME.

Cost-Share

The 2018 Farm Bill also introduced language to EQIP that increases cost-share payments to eligible landowners (up to 90% reimbursement) for costs associated with "high-priority" conservation practices focusing on water quality and/or water quantity. Each state may designate up to 10 high-priority practices to be eligible for increased payments. Designated practices must: (i) address specific causes of impairment relating to excessive nutrients in groundwater or surface water; (ii) address the conservation of water to advance drought mitigation; (iii) meet other environmental priority and other priority resource concerns identified in habitat or other area restoration plans; or (iv) be geographically targeted to address a natural resource concern in a specific watershed.

WaterSMART Coordination

EQIP-WaterSMART INITIATIVE

NRCS and Reclamation have established the EQIP WaterSMART Initiative (EQIP-WSI), wherein the agencies work to ensure that activities using EQIP funds to address water and drought issues are coordinated with Reclamation investments made through the WaterSMART program. WaterSMART supports state, local, and tribal water managers with the planning and financial assistance for implementation of projects to increase water supply, such as modernization of existing water storage and delivery infrastructure and other drought resilience measures.

NRCS and Reclamation investments are coordinated toward priority areas proposed by NRCS State Conservationists. Projects are selected by NRCS through a competitive process. Common activities funded through EQIP-WSI include: irrigation water management, irrigation water conveyance, structures for water control, cover crops, and sprinkler irrigation systems. Assistance under EQIP-WSI in FY2021 totaled 159 contracts in western states, covering over 23,374 acres of working lands, and providing over $11.6 million in assistance to landowners.

Technology Trials

EQIP CONSERVATION INNOVATION GRANTS (CIG)

The Conservation Innovation Grant (CIG) program, first authorized in 2002, is a subprogram under EQIP that awards grants for the development and implementation of new tools and technologies to address natural resource conservation on private agricultural lands. CIG funding opportunities are announced each year and grants are awarded through a nationwide competitive grants process. CIG projects must involve EQIP-eligible lands and landowners, but eligibility for CIG grants extends to individuals, as well as non-governmental organizations and state, local and tribal governments. CIG grantees match federal investments on a one-to-one basis.

The 2018 Farm Bill directs USDA to use $25 million of EQIP funding annually (increased to $50 million under the IRA) to conduct on-farm conservation innovation trials on private lands to test "new or innovative conservation approaches" including: precision agriculture technologies; enhanced nutrient management plans, nutrient recovery systems, and fertilization systems; soil health management systems; water management systems; resource conserving crop rotations; cover crops; and irrigation systems.

Funding for trials is directed to program partners, who then provide payments and technical assistance to producers to offset risks of adopting new conservation practices. The 2018 Farm Bill authorizes the USDA to enter into agreements to provide payments (including compensation for foregone income) to producers completing conservation innovation trials on their land.

Priority Watersheds

EQIP CONSERVATION INCENTIVE CONTRACT (CIC) PROGRAM

The 2018 Farm Bill established a new Conservation Incentive Contract (CIC) program under EQIP, which focuses on the implementation of conservation practices to address specific priority resource concerns within designated watersheds. The CIC program is open to agricultural producers, subsistence landowners, non-industrial private forest landowners, and tribes. Eligible lands under CIC include: cropland; rangeland; pastureland; non-industrial private forestland; and other farm or ranch lands. CIC contracts last from five to 10 years

Conservation Stewardship Program (CSP)

The Conservation Stewardship Program (CSP), established in 2008, provides financial and technical assistance to eligible landowners for the implementation of approved conservation activities on their lands. Like EQIP, CSP is a competitive program in which participants are selected by NRCS under designated criteria. CSP differs from EQIP in that CSP focuses on conservation across the entire operation of the subject land, and provides participants with annual payments for meeting the stewardship

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Stewardship Payments

Sensitive Lands

CRP

USDA Priorities

Water Quality

thresholds that address specific priority natural resource concerns. In 2021, CSP provided over $513.6 million in financial assistance to new participants, covering over 9.8 million acres.

The 2018 Farm Bill changed CSP from an acreage-based program (previously limited to 10 million acres, annually) to a dollar-based program with annual funding of $700 million in FY2019, increasing to $1 billion in FY2023. The IRA extended CSP authorization through 2031 and provided an additional $3.25 billion in CSP funding through FY2023. Notably, the 2018 Farm Bill also extended eligibility to include public lands associated with an operation. This provision is critical to western producers where operations frequently include both private land and allotment on public lands.

Conservation Reserve Program (CRP)

The Conservation Reserve Program (CRP), originally authorized in 1985, provides private landowners with annual rental payments for voluntarily removing environmentally sensitive lands from production for a specified period. CRP is administered by the Farm Service Agency (FSA); NRCS oversees CRP land eligibility determinations, conservation planning, and implementations on the ground. Through CRP, participating landowners receive annual rental payments, typically over a 10-15 year period, to replace crops with resource conserving flora on highly erodible and environmentally sensitive lands. Rental rates are based on the productivity of soils within each county and the average dryland cash rent.

CRP enrollment is divided into two categories: 1) General CRP and 2) Continuous CRP. General CRP contracts are awarded on a competitive basis, using an Environmental Benefits Index (EBI); proposed applications with the highest score are accepted to participate in the program. General CRP applications are limited to annual enrollment periods. Time periods to apply for general CRP enrollment are limited. Continuous CRP contracts are utilized for special CRP subprograms and initiatives and allow for the continuous enrollment of environmentally sensitive lands devoted to specific designated conservation practices. Continuous CRP enrollment is not subject to a competitive selection process.

CRP is an acreage-based program. The 2018 Farm Bill capped CRP enrollment at the following levels: 24.5 million acres in FY2020; 25 million acres in FY2021; 25.5 million acres in FY2022; and 27 million acres in FY2023. Increases in acreage enrollment are partially offset by reduced rental rates. As of May 2022, there were 22.1 million acres enrolled in CRP, with an estimated $2 billion dedicated to 2022 CRP funding.

CRP CONSERVATION RESERVE ENHANCEMENT PROGRAM (CREP)

The Conservation Reserve Enhancement Program (CREP) is a continuous CRP program that was first established in 1997 but codified in the 2018 Farm Bill. CREP authorizes USDA to enter into agreements with states and NGOs to target designated project areas with continuous CRP enrollment contracts. Farmers and ranchers are paid an annual rental rate, along with other federal and non-federal incentives, as specified in the CREP agreement. CREP agreements are limited to specific geographic regions and to lands where specific conservation practices can address high priority natural resource issues. Annual rental payments for CREP contracts are typically higher than those for general CRP contracts. Lands can only be enrolled in CREP if the state or eligible NGO has a CREP agreement with USDA.

The 2018 Farm Bill expressly addresses drought and water conservation agreements under CREP by authorizing USDA to: (i) enroll other agricultural land on which identified resource concerns can be addressed if enrollment of such land is critical to accomplishing the purposes of the agreement; (ii) permit dryland agricultural uses with the adoption of best management practices on the land if the agreement involves the significant long-term reduction of consumptive water use, and if dryland production is compatible with the agreement; and (iii) calculate annual rental payments consistent with existing administrative practice for similar drought and water agreements to ensure regional consistency in those rates.

CRP CLEAN LAKES, ESTUARIES, AND RIVERS (CLEAR30) INITIATIVE

The 2018 Farm Bill established the Clean Lakes, Estuaries, and Rivers (CLEAR30) Initiative as a continuous CRP. CLEAR30 is intended to address water quality issues — specifically the reduction of nutrient and sediment loading and harmful algal blooms — by enrolling lands into 30-year contracts. Participants receive annual payments for maintaining their land in accordance with an approved conservation plan. The initiative, which was initially limited to the Chesapeake Bay region, was expanded nationwide in April 2022. As of May 2022, the CLEAR30 initiative had enrolled 23,212 acres.

GRASSLAND CRP (GCRP)

The Grassland CRP (GCRP) is a CRP subprogram supporting grazing operations and grasslands. GCRP is functionally similar to general and continuous CRP in that producers enter into long-term

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contracts (10 or 15 years) and receive annual per-acre rental payments in exchange for maintaining enrolled land according to an approved conservation plan and prohibiting land from conversion or development. GCRP differs from general and continuous CRP in that producers may keep land in agricultural production (e.g., haying and/or grazing) while following an approved conservation plan.

Ecological Significance

Along with reauthorization to include a floor of two million acres enrolled nationwide, the 2018 Farm Bill included several changes to the program which improved its utility in western grasslands. USDA was authorized to prioritize enrolling lands of "ecological significance" including land that may contribute to the conservation and recovery of at-risk, threatened or endangered species under the Endangered Species Act, and land that supports wildlife migration and habitat connectivity. In GCRP signup 203 (2021), the USDA made use of these provisions by establishing two National Grassland Priority Zones in the "Greater Yellowstone Wildlife Corridor Priority Zone" and the "Dust Bowl Priority Zone." Landowners enrolling in these zones received additional offer ranking points and increased per acre rental rates. These priority zones were subsequently expanded in GCRP signup 204 (2022).

Long-Term Contracts

While there were no explicit water conservation provisions tied to GCRP in the 2018 Farm Bill, the program's focus on promoting grassland ecosystem health and resilience through long-term contracts with producers makes it a potential vehicle for expanded investments in drought resilience in the West.

Regional Conservation Partnership Program (RCPP)

Non-Federal Partners

The Regional Conservation Partnership Program (RCPP), established in 2014, addresses on-farm, watershed, and regional natural resources concerns through coordination between NRCS and non-federal partners. RCPP provides funding and technical assistance for projects that address priority natural resource issues within a region or in one of eight designated critical conservation areas (CCAs). RCPP projects are proposed by a lead project partner, who works with private landowners within the approved RCPP area. Eligible lead partners under RCPP include: agricultural or silvicultural producer associations; farmer cooperatives or other groups of producers; state or local governments; tribal governments; municipal water treatment entities; water and irrigation districts; conservation-driven NGOs; and institutions of higher learning.

If a proposed RCPP project is approved by NRCS, farmers and ranchers are then allowed to apply to NRCS for participation in the project. Program funds may be used by lead partners to provide direct assistance to producers to implement conservation practices on their farms. RCPP funds may also be used by lead partners for technical assistance, including: resource assessment; conservation practice survey and design; conservation planning; and resource monitoring.

The 2018 Farm Bill amended RCPP to be a stand-alone program and RCPP funding was increased to $300 million annually for FY2019 through FY2023 — a $200 million increase from previous levels. Amendments to RCPP under the 2018 Farm Bill also reallocated funding under the program — 50% of RCPP funding is now designated to state and multi-state projects, while the other 50% is designated to projects in CCAs.

Watershed Protection and Flood Prevention Act: Watershed and Flood Operations (WFPO)

Watershed Plans

The Watershed Protection and Flood Prevention Act (Watershed Act), first authorized in 1954, focuses on providing technical and financial assistance to public entities for planning and implementing authorized projects. Project sponsors utilize the Watershed and Flood Prevention Operations (WFPO) section of the program. Project sponsors work with NRCS to develop a watershed plan. Once a watershed plan has been approved, project sponsors work with landowners to install conservation measures and outline areas in which conservation goals may be achieved.

Project Purposes

WFPO projects are intended to be developed only "when land or water resource issues in a watershed cannot be adequately addressed by individuals or groups making use of other USDA conservation programs. Projects should not be developed for the purpose of providing higher cost-sharing rates than those available through other USDA conservation programs." Authorized project purposes under WFPO include: flood prevention and flood damage reduction; watershed protection, including land treatment practices installed to conserve and develop water quality and quantity; public recreation, including any practice that creates or improves a water resource or surrounding area; fish and wildlife habitat management and improvements; agricultural water management, including groundwater recharge measures and projects to improve irrigation efficiency; agricultural water supply measures; and water conservation and quality improvements.

The 2018 Farm Bill establishes permanent funding for WFPO in the amount of $50 million annually, in addition to funds already designated by Congress; the program had historically received discretionary funding through the annual appropriations process. Additionally, the 2018 Farm Bill allows NRCS to

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waive WFPO's watershed planning requirements where "unnecessary or duplicative," including where environmental or cultural resource compliance activities have been completed by another agency.

Farm Bill Program Implementation Issues

Despite the myriad of provisions, programs and initiatives included in the 2018 Farm Bill intended to promote water conservation and drought mitigation, western water supplies continue to suffer. Western states face the prospect of additional cuts to Colorado River conveyances under terms of the Colorado River DCPs. A number of water conservation provisions included in the 2018 Farm Bill are in need of further development, clarification and input from relevant stakeholders.

Program Flexibility

On August 1, 2019, a bipartisan group of 11 western US Senators sent a letter to Secretary of Agriculture Sonny Perdue (Senators' Letter), requesting that USDA immediately implement western drought provisions that were included in the 2018 Farm Bill "and use them in a coordinated and flexible manner to establish a western drought initiative to address the water supply challenges in the West and sustain our agricultural economy." The Senators' Letter emphasizes the need for immediate and effective implementation of various new water conservation authorities under the 2018 Farm Bill.

Participation & Approval

USDA reports demonstrated issues with the competitive application processes for EQIP and CSP contracts. Between 2010 and 2020, just 31% of eligible landowners that applied for EQIP and only 42% of landowners that applied for CSP were awarded contracts. In 2010, USDA awarded EQIP contracts to 36,499 of 98,030 applicants (37%). In 2020, the number of EQIP applicants increased to 125,341, while only 33,701 (27%) were awarded contracts under the program. In 2021, USDA received 113,893 applications for EQIP contracts and funded 34,054 (30%). Notably, 21,116 applications were determined to be valid but did not receive EQIP funding. In 2010, USDA awarded CSP contracts to 20,567 of 38,501 applicants (53%). In 2020, 12,142 of 34,572 (35%) applications for CSP funding were approved for funding. 6,682 of 27,110 applications for CSP contracts (25%) were approved. Despite lower participation and approval rates, overall acreage enrolled in CSP has generally increased throughout the West.

Funding & Awareness

Other reports indicate that USDA program implementation suffers generally from: funding and staffing shortages; lack of consistent national guidance to inform decisions at the NRCS State Conservationist level; lack of agency expertise with various state water law issues; and general lack of awareness and understanding among eligible landowners of the opportunities available to them under farm bill conservation programs. Insufficient coordination among USDA agencies and across departments further limits the success of program delivery. This is particularly true where responsibilities for conservation planning and/or technical assistance and program enrollment and delivery are split between different agencies.

Adequate Funding

Community-Based Organizations (CBOs), such as place-based groups or producer-led groups hold significant promise in helping to deliver durable, voluntary and collaborative solutions to western communities struggling with drought. These groups could also improve conservation program delivery by providing producers with a trusted single point of entry into the process. However, these groups often struggle to secure predictable and adequate funding. They are often functionally unable to utilize farm bill conservation programs and other federal funds due to prohibitive non-federal match requirements, and the complexity of program enrollment and implementation. RCPP is cited as an especially cumbersome program for these organizations to use. For example, numerous CBOs reported passing on potentially successful landscape-scale RCPP projects as they would come at too great of a financial loss to the organization.

State Water Laws

Another potentially significant impediment to implementation of water conservation measures as part of federal programs is state water law. States have largely retained their primary authority over the management and allocation of water resources. State water laws vary, but western state water laws are largely based on the legal doctrine of "prior appropriation" — which ensures that limited water supplies are delivered to the user who was the first to establish their right. Under the doctrine, water rights holders must put their allocation of water to a "beneficial use." Failure to put water to a beneficial use for a certain amount of time (prescribed by state law) will result in a water rights holder losing the unused portion of their right under the doctrine of abandonment or through state forfeiture laws. This rule of "use it or lose it" poses a significant risk to water rights holders, as many states do not recognize water conservation (i.e., non-use of the water) as a valid "beneficial use." Some western states have passed legislation to expressly recognize water conservation measures as beneficial uses, to be quantified as part of a user's larger water right. Other states have expressly exempted water conservation measures from abandonment and/or forfeiture under state law. The complexity of western state water law and the inherent risks to water rights holders of losing a portion of their rights to forfeiture and/or abandonment

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under state laws presents a significant issue that must be addressed for federal water conservation measures to work on watershed and regional scales.

Analysis & Recommendations

In recognition of the importance of federal measures to incentivize water conservation on private working lands, Congress amended several conservation programs in the 2018 Farm Bill to broaden and strengthen water conservation and drought mitigation provisions. Implementation of these provisions has not yet been fully effective, but the upcoming farm bill cycle (presumably in 2023) presents opportunities to refine and improve farm bill programs, to address worsening drought conditions throughout the West, and to avoid further federal intervention in interstate water allocation. Water conservation and drought mitigation under farm bill conservation programs could be improved through additional legislation, regulations, policies, and/or guidance documents that:

Opportunities

- Encourage and facilitate effective coordination and collaboration between federal Departments (e.g., USDA and DOI) and agencies (e.g., NRCS, FSA, and Reclamation), as well as with state and tribal authorities, in the implementation of water conservation efforts. The EQIP-WSI Initiative may provide a model for how agencies within DOI and USDA can work together with private landowners to ensure that conservation efforts are coordinated and working in concert to ensure the greatest water conservation results at a watershed scale.

National Standards

- Direct USDA/NRCS to develop rules, regulations and/or agency guidance outlining nationwide standards for new water conservation provisions in farm bill programs, including for new EQIP provisions providing eligibility (and streamlined application processes) to WMEs and definitions of watershed-scale projects.
- Direct USDA/NRCS to develop rules, regulations and/or agency guidance to give the highest priority to conservation practices that address western water conservation and drought mitigation, and that result in actual and quantifiable savings of system water and identify best practices and innovative water conservation technologies for utilization in conservation program projects.
- Continue to expand farm bill conservation programs' focus on water conservation and western drought mitigation, including establishing new CRP continuous programs, CIG grants, CIC contracts, and other initiatives, and pilot programs.
- Develop a CRP sub-program focused on water conservation similar to GCRP to pay producers annually to reduce water consumption through a range of practices or improvements (e.g., switching to less water intensive crops, implementing partial fallowing). This program would compensate producers for lost income opportunity as a result of implementing water conservation measures and would allow continued agricultural production in line with an approved management plan.

Underserved

- Empower CBOs and other locally-led conservation organizations to lead in local and regional water conservation efforts and address funding barriers posed by non-federal match requirements and program complexity. One avenue to accomplish this would be to reserve a portion of RCPP funds allocated to projects in critical conservation areas for the purpose of ensuring participation of CBOs and entities working with historically underserved farmers and ranchers.
- In coordination with state water planning efforts, explore opportunities to support the establishment of community-developed water plans and water sharing agreements through RCPP and Reclamation WaterSMART grants.

Leveraging Funds

- Ensure that USDA/NRCS receive adequate funds for program implementation (including necessary staffing and technical assistance capacity) from dedicated sources and determine how new funds for western drought provided in the IRA and other recent federal legislation can be most effectively utilized to complement water conservation efforts through farm bill programs.
- Codify opportunities to leverage USDA, state, and other federal conservation programs against one another while avoiding clear situations of "double-dipping". For example, landowners receiving baseline payments for long-term conservation efforts through CRP contracts could then also utilize EQIP, Reclamation and/or state funds for cost-share and technical assistance on water infrastructure improvements or watershed health projects.

Coordinator

- Empower community leaders to match opportunity with need. Explore how to fund and support jointly-funded resource coordinator positions housed in CBOs to conduct outreach and work with interested landowners to identify state and federal funding opportunities across agencies and departments.
- Incentivize landowners to apply for, and participate in, farm bill programs through adequate financial and technical assistance, practical and streamlined application and planning processes, and effective legal protections of real property and water rights.
- Direct USDA/NRCS to consult with state water authorities and CBOs to identify opportunities to

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Water Law

Cooperative Approach

develop state legislation that would protect private water rights from potential abandonment and/or forfeiture due to conservation measures. Explore how to qualify enrollment in a qualified state or federal soil and water conservation program as a "beneficial use" under state law. State agricultural property tax laws and regulations include similar provisions allowing for participation in qualified conservation program (e.g., CRP) to qualify under an agricultural tax assessment.

- Ensure that landowners are informed of and educated on conservation assistance opportunities available through farm bill conservation programs through NRCS, as well as through CBOs.
- Direct USDA/NRCS to consult with private landowners and CBOs to better understand impediments to landowner participation in conservation programs, as well as to identify farm bill conservation programs that are underutilized and/or underfunded. For example, NRCS currently participates in annual meetings with land trust partners to discuss implementation of the Agricultural Conservation Easement Program. This cooperative approach to improving program delivery should be expanded to cover implementation of water conservation programs with WMEs, states, CBOs, producers and relevant federal agency staff.

For additional information:

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Zach Bodhane directs government relations and policy advocacy work for the Western Landowners Alliance. Prior to joining WLA, he worked as a Policy Advisor for the Western Governors' Association for six years. His work at WGA included leading the Western Governors Species Conservation and Endangered Species Act Initiative and facilitating WGA's Working Lands Roundtable. Central to both of these initiatives was a focus on building bipartisan coalitions to advance collaborative species conservation recommendations. He holds a B.S. in Natural Resources Management from Colorado State University, specializing in Watershed Science and Fishery Biology. Zach lives in Washington DC with his partner Lauren and their dog, Phoebe.

WATER BRIEFS

KLAMATH DAM REMOVAL WEST

DECOMMISSIONING FOUR DAMS

The Federal Energy Regulatory Commission (FERC) gave its final approval November 17th for a plan to remove four dams on the Klamath River in California and Oregon.

The order paves the way for enactment of a settlement agreement nearly 15 years in the making by California, Oregon, the Yurok and Karuk Tribes, Berkshire Hathaway Energy-owned utility company PacifiCorp, fishing groups, and other stakeholders to carry out the ambitious plan to remove dams, and address fish populations, river health and Tribal communities and cultures.

In its ruling, FERC commissioners found "surrender of the Lower Klamath Project license and removal of the project to be in the public interest and grant the Renewal Corporation's surrender application, subject to terms and conditions and acceptance of the license transfer."

The approval of the dam removal plan provides the final ruling from the federal regulator needed for parties to fully implement the Amended Klamath Hydroelectric Settlement Agreement as signed in 2016. In June 2021, FERC approved allowing dam owner PacifiCorp to be removed from the license for the hydroelectric project and transfer it to the states of California and Oregon and the nonprofit Klamath River Renewal Corporation (KRRC) as co-licensees to carry out removal of the dams pending final sign-off on the dam removal plan.

Following formal acceptance of the license transfer by the states and the KRRC, parties led by the KRRC will take a number of pre-construction steps during 2023 to lay the groundwork to complete removal of the dams. The Copco No. 2 dam will be removed as soon as the summer of 2023 under the approved plan, with removal of J.C. Boyle, Copco No. 1, and Iron Gate dams planned during 2024. The four dams are located in Klamath County, Oregon and Siskiyou County, California.

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EPA PFAS PROGRESS US

STRATEGIC ROADMAP

On November 17th, the EPA released "A Year of Progress Under EPA's PFAS Strategic Roadmap," which underscores key actions taken by the agency during the first year of implementing the PFAS Roadmap. EPA is implementing a whole-of-agency approach, advancing science, and following the law to safeguard public health, protect the environment, and hold polluters accountable.

Since the Roadmap's release in October 2021, EPA:

- Proposed to designate two PFAS as CERCLA hazardous substances. If finalized, this will be a critical step toward increasing transparency around releases of PFAS and holding polluters accountable for cleaning up their contamination.
- Released drinking water health advisories. Acting in accordance with EPA's mission to protect public health and keep communities and public health authorities informed when new science becomes available, the Agency issued drinking water health advisories for four PFAS.
- Laid the foundation for enhancing data on PFAS. This included an order under EPA's National PFAS Testing Strategy requiring companies to conduct PFAS testing, and nationwide sampling for 29 PFAS in drinking water starting in 2023.
- Began distributing $10 billion in funding to address emerging contaminants under the Bipartisan Infrastructure Law. EPA is making transformational investments in cleaning up PFAS and other emerging contaminants in water, especially in small or disadvantaged communities.
- Expanded the scientific understanding of PFAS. The Agency issued more than 30 scientific publications by EPA researchers and released EPA's PFAS Thermal Treatment Database.
- Translated the latest science into EPA's cross-agency PFAS efforts. This included updating EPA's contaminated site cleanup tables, developing new PFAS methods and conducting toxicity assessments, and issuing draft national recommended water quality criteria to protect aquatic life.
- Continuing engagement with the public. EPA's PFAS work was informed by public webinars, stakeholder meetings, Congressional testimony, and engagement with EPA's federal advisory committees.

This report demonstrates EPA's commitment to act on PFAS with transparency and accountability by keeping the public informed of the Agency's progress. The progress report also outlines the actions EPA plans to take in the upcoming year, including proposing national drinking water standards for PFOA and PFOS, moving forward with the regulatory process for CERCLA hazardous-substance designations, improving the availability of data on PFAS, and further restricting upstream PFAS discharges.

FOR INFO https://www.epa.gov/newsreleases/epa-highlights-important-progress-protecting-communities-pfas

FEDERAL POLLUTION STDS WA

CONSUMPTION RULE

The US Environmental Protection Agency (EPA) announced on November 15th, 2022 a final rule to reestablish federal water quality standards for the State of Washington. The agency's final rule follows the science to help protect the health of Washingtonians and Tribal members who eat fish and shellfish caught in the state.

"Under the Clean Water Act, EPA has taken significant action to ensure our precious waters are safe for all to enjoy," said EPA Administrator Michael S. Regan. "This final rule utilizes the latest scientific knowledge and brings us one step closer to delivering safe swimmable, fishable bodies of water that the people of Washington deserve."

"The Makah Tribe appreciates that EPA has made good on its commitment to restore water quality standards in Washington," said Patrick DePoe, vice chair of the Makah Tribal Council. "This is an important step toward protecting water quality, ensuring health of our treaty resources, and supporting the exercise of our Treaty rights to harvest fish and marine mammals. We have relied on marine and freshwater resources for thousands of years and we need those resources to be clean and safe in order to survive and thrive as a people. We hope that we can work with the United States and the State of Washington to build on this effort for continued improvement of water quality, and expect our federal and state partners to move forward based on sound science and fulfillment of their trust obligation to Tribes."

Under the Clean Water Act, states, or EPA when necessary, set limits (called "human health criteria") for pollutants in water bodies that pose risks to human health through the consumption of locally caught fish and shellfish. On November 15th, EPA finalized limits for 72 different pollutants in Washington waters based on the comparatively large amount of fish and shellfish consumed by people in the state. These stricter limits will better protect Tribal fish consumers as well as all Washingtonians.

The agency's final rule supports EPA's commitment to protect water resources that

support public health, economic development, cultural activities, and subsistence practices.

Over the objections of state and Tribal leaders, the Trump Administration rolled back protective water quality standards established by EPA in 2016. As a result of that rollback, water quality standards being implemented in Washington were inadequate to protect human health. The final rule announced follows through on EPA's June 2021 and March 2022 commitments to restore protective, science-based human health criteria in the state.
FOR INFO EPA website at www.epa.gov/wqs-tech/federal-human-health-criteria-washington-state-waters

WRANGELL WASTEWATER AK

EPA STRICTER LIMITS

The EPA is proposing stricter limits on the amount of pollution Wrangell's wastewater treatment plant will be allowed to release to Zimovia Strait.

The discharges from the Wrangell facility are not consistently disinfected, contain high levels of fecal coliform and enterococcus bacteria, and require large mixing areas to meet Alaska's water quality standards for bacteria. The new EPA permit will contain more stringent bacteria limits that will require upgrades to the existing plant. The plant will have five years to comply with the new requirements.

Most municipal wastewater treatment plants in the US are required to conduct "secondary" treatment, which is a combination of physical and biological treatment requirements; the effluent quality for secondary treatment is defined in terms of biological oxygen demand, total suspended solids, and pH. However, in limited circumstances, Section 301(h) of the Clean Water Act authorizes EPA — with concurrence from the state — to issue discharge permits requiring less than secondary treatment.

Congress mandated that the last year communities could apply for a waiver from secondary treatment requirements under Section 301(h) was 1982, with re-application required every five years. To qualify for renewal of a 301(h) waiver, applicants must satisfy specific criteria designed to maintain and protect the receiving water and ensure compliance with state water quality standards.

Since the 1980s, EPA has issued permits modified by 301(h) waivers for several other southeast facilities, including Haines, Ketchikan, Petersburg, Sitka, and Skagway. The permits were last reissued between 2000 and 2002.

Over the next several months EPA also will propose new Clean Water Act permits for Haines, Ketchikan, Petersburg, Sitka, and Skagway that would require their treatment plants to also significantly reduce releases of bacteria to local waters within five years.
FOR INFO www.epa.gov/npdes-permits/proposed-permit-wrangell-wastewater-treatment-plant-alaska

CO RIVER MOU WEST

REDUCE DEMANDS

On November 16th, more than 30 water agencies and providers committed to take additional actions to reduce water demands and help protect the Colorado River system.

Through a Memorandum of Understanding (MOU) that was delivered to Bureau of Reclamation Commissioner Camille Touton, municipal and public water providers in the Upper and Lower Colorado River Basin affirmed their commitments to implement comprehensive and innovative water conservation programs, initiatives, policies, and actions within their communities, including:
• Expanding water efficiency programs for indoor and outdoor water use
• Implementing programs and policies reducing and replacing non-functional, decorative grass by 30 percent while protecting urban landscapes and trees canopies
• Increasing water reuse and recycling programs where feasible
• Implementing water efficiency strategies and best practices, such as water loss controls, conservation-based rate structures, industrial and commercial conservation, land use coordination, and other suitable conservation strategies within each community

Under the MOU, each participating water provider will implement the conservation actions, programs and/or policies most appropriate for its individual communities and water efficiency goals. While these water agencies primarily represent urban water uses, which is only a small fraction of the Colorado River's total water consumption, the conservation strategies outlined will help reduce demands and protect water levels in lakes Powell and Mead.
FOR INFO www.mwdh2o.com/press-releases/

STORMWATER PROGRAM CA

NPDES GENERAL PERMIT

The California State Water Resources Control Board Construction Stormwater Program has posted the adopted Statewide NPDES Construction Stormwater General Permit (Order No. 2022-0057-DWQ) on the NPDES Construction Stormwater General Permit Reissuance webpage (www.waterboards.ca.gov/water_issues/programs/stormwater/construction/general_permit_reissuance.html). Additionally, the adopted permit can be found on the State Water Board's Adopted Orders page.
FOR INFO SWRCB Stormwater Webpage at: www.waterboards.ca.gov/water_issues/programs/stormwater/

USDA FOREST SERVICE US

$20.5 MILL IN GRANTS

On November 17th the USDA Forest Service announced $20.5 million in grants to help states or federally recognized tribes establish temporary bridge programs to protect water resources during forest-related operations and to assist wood processing facility owners to establish, reopen, retrofit, or expand. The grants are focused on sawmills or other wood processing facilities that purchase and process byproducts from forest restoration activities in areas of severe fire risk and insect or disease infestation.

The funds, made available by President Biden's Bipartisan Infrastructure Law, support the US Department of Agriculture's efforts to ensure tribes and historically marginalized or underserved communities receive equal access and opportunities to funding and programs, and to support community efforts vital to forest health. This funding opportunity also follows through on President Biden's Executive Order directing USDA to scale up rural economic development and Agriculture Secretary Tom Vilsack's direction to the Forest Service to find new ways to use byproducts from landscape improvement and wildfire mitigation projects to enhance carbon sequestration while creating jobs and economic opportunities.

The $20.5 million being committing in fiscal year 2022 includes:
• $12.5 million targeted as financial assistance for owners of facilities that purchase and process byproducts from forest restoration projects including thinning, wildfire resilience activities, and habitat management. Owners must identify how their work will use byproducts from areas of high or very high risk of severe wildfire or insect and disease infestation based on the high priority firesheds identified in the Forest Service ten-year Wildfire Crisis Strategy or by using the Wildfire Risk to Communities and National Insect and Disease Risk maps.
• $8 million is available to states and tribes to support the establishment of temporary bridge rental, loan or cost-share programs to protect water resources and reduce water quality degradation during forest-related operations.

The funding is to help states and tribes create a program that provides portable skidder bridges, bridge mats or other temporary water crossing structures to loggers and others working in forests areas. These bridges will minimize damage from trucks and other equipment in forested areas, especially sensitive wetlands.
FOR INFO www.fs.usda.gov/news/releases

DEFENDING BEARS EARS UT

TRIBAL INTERVENTION

Hopi Tribe, Navajo Nation, Ute Mountain Ute Tribe, and the Pueblo of Zuni moved to intervene in two lawsuits in Utah on November 18th, citing the need for advocacy for sacred lands. The lawsuits threaten to remove protections from the Bears Ears National Monument for which Native peoples advocated for many decades. "Bears Ears sustains life. Bears Ears provides food, medicine, cultural items, and ceremony sites," said Zuni Pueblo Lieutenant Governor Carleton R. Bowekaty. "As sovereign nations and Bears Ears National Monument co-managers, we have the right to intervene in these lawsuits. As stewards and people of this land, we hold a responsibility to protect Bears Ears."

The two lawsuits, *Garfield County v. Biden*, filed by the state of Utah and two Utah counties, and *Dalton v. Biden*, filed by recreationalists and a mining company, seek to overturn President Biden's 2021 proclamation that reaffirmed Bears Ears National Monument's original boundaries. Through the proclamation, President Biden sought to correct action taken by then President Trump, who issued a 2017 proclamation purporting to divide the monument into two much smaller parcels, which exposed 85% of the original monument to vandalism and exploitation by extractive industries, according to the Native American Rights Fund (NARF), which represents the Hopi Tribe, Ute Mountain Ute Tribe, and the Pueblo of Zuni in the motions to intervene. "The two lawsuits seek to eviscerate the Antiquities Act and deprive Bears Ears of the protections it so desperately needs," said NARF Deputy Director Matthew L. Campbell. "The tribal governments will fight to protect these places."

During the four years between the Trump and Biden proclamations, private interests lined up to exploit a region that has drawn people to it for more than 13,000 years. Hard rock miners staked claims that threaten the health and welfare of local Indigenous communities, perpetuating the tragic legacy of uranium mining in the region. The oil and gas industry flooded the Bureau of Land Management with requests to exploit 60,000 acres within original monument boundaries.

Looting, vandalism, and Western development began desecrating these lands, and Native people struggled to protect the buttes. To protect the ongoing use and historic past of this sacred landmark, tribes organized the Bears Ears Inter-Tribal Coalition and sought the support of the Native American Rights Fund. "At Bears Ears, the Hopi, Ute Mountain Ute, and Zuni tribal governments continue their efforts to protect a shared natural treasure against destructive private interests benefiting a few at the expense of Indigenous peoples and the public writ large," said NARF Staff Attorney Jason Searle.
FOR INFO NARF website at: https://narf.org/cases/bears-ears/

COLORADO OPERATIONS WEST

RECLAMATION SEIS

Secretary of the Interior has directed the Bureau of Reclamation (Reclamation) to prepare a Supplemental Environmental Impact Statement (SEIS) to the December 2007 Record of Decision associated with the Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead (referred to as the 2007 Interim Guidelines).

The announcement is contained in the agency's Notice of Intent To Prepare a Supplemental Environmental Impact Statement for December 2007 Record of Decision Entitled Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations For Lake Powell and Lake Mead and includes additional information about the purpose and need for the SEIS, alternatives, and public involvement opportunities.

Reclamation is initiating efforts to revise operating guidelines for the operation of Glen Canyon and Hoover Dams in 2023-24 operating years in order to address the potential for continued low-runoff conditions in the Colorado River Basin. Reclamation has concluded that the potential impacts of low runoff conditions in the coming winter (2022-2023) pose unacceptable risks to routine operations of Glen Canyon and Hoover dams during the interim period (prior to January 1, 2027) and accordingly, modified operating guidelines need to be expeditiously developed.

The draft supplemental EIS is anticipated to be available for public review in Spring 2023 and the final supplemental EIS is anticipated to be available with a Record of Decision, as appropriate, in late Summer 2023. This schedule will allow decisions to become effective for 2023-2024 operations.
FOR INFO Dedina Williams, dfwilliams@usbr.gov or https://www.usbr.gov/ColoradoRiverBasin/SEIS.html

$91 MILLION IN GRANTS US

AMERICA THE BEAUTIFUL

Biden-Harris Administration and National Fish and Wildlife Foundation (NFWF) joined public- and private-sector partners to announce nearly $91 million in grants through the America the Beautiful Challenge (ATBC) to support locally led projects that conserve, restore, and connect habitats for wildlife while improving community resilience and access to nature. The 55 new grants announced will support landscape-scale conservation projects in 42 states, three U.S. territories and for 14 Tribal Nations, leveraging $50.7 million in matching contributions to generate a total conservation impact of about $141.7 million.

To streamline and centralize access to these funds, NFWF and partners worked together to establish the ATBC in May 2022 as a "one stop shop" competitive grant program for landscape-scale conservation and restoration projects that implement existing conservation plans across the nation. The 2022 ATBC request for proposals received an unprecedented response, with applicants submitting 527 proposals requesting a total of $1.1 billion. About one-third of the 2022 grants and funding will support projects implemented by Tribes, representing an unprecedented level of funding dedicated to Tribally led projects for a single grant program at NFWF in recognition that Tribal land stewardship is invaluable to conservation.
FOR INFO https://www.doi.gov/

EPA FINANCE CENTERS US

FUNDS FOR INFRASTRUCTURE

EPA announced the selection of 29 Environmental Finance Centers (EFCs) that will help communities across the country access federal funding for infrastructure and greenhouse gas reduction projects that improve public health and environmental protection.

The EFCs will deliver targeted technical assistance to local governments, states, Tribes, and non-governmental organizations to protect public health, safeguard the environment, and advance environmental justice. The selected EFCs will help underserved communities that have historically struggled to access federal funding receive the support they need to access resources for water infrastructure improvements.

EPA will award up to $150 million in grants to EFCs over the next five years, once all legal and administrative requirements are satisfied.

The Bipartisan Infrastructure Law provides $98 million of the total investment through EPA's Clean Water State Revolving Fund (CWSRF) and the Drinking Water State Revolving Fund (DWSRF), with the remainder of funds coming from EPA appropriations.

The newly selected EFCs will work to strengthen communities through projects focused on drinking water, wastewater, stormwater, solid waste, clean air, greenhouse gas reduction, and toxic substances — and a focus of their work will be supporting overburdened and underserved communities. EPA will be engaging with the selected grantees to ensure communities in need receive this critical technical assistance

Through the EFC grant program, technical assistance providers will help communities develop and submit project proposals, including State Revolving Fund (SRF) applications for Bipartisan Infrastructure Law (BIL) funding and greenhouse gas reduction projects through the Greenhouse Gas Reduction Fund. EFCs will support underserved communities with technical assistance to identify sustainable infrastructure solutions. These entities will provide states, Tribes, and local governments or water systems with technical assistance services to advance equitable health and environmental protections.

The 2022 selected recipients for the Environmental Finance Center Grant Program are:

Category 1 – Regional Multi-Environmental Media EFCs:
- Low Impact Development Center Inc.
- Michigan Technological University
- National Rural Water Association
- Rural Community Assistance Corporation, West Sacramento
- Syracuse University
- University Enterprises, Inc. dba Sac State Sponsored
- University of Maine System
- University of Maryland
- University of New Mexico
- University of North Carolina at Chapel Hill
- Urban Sustainability Directors Network
- Wichita State University

Category 2 – Regional Water Infrastructure EFCs:
- Delta Institute
- Hawaii Community Foundation
- National Rural Water Association
- Rural Community Assistance Corporation, West Sacramento covering EPA Region 9
- Rural Community Assistance Corporation, West Sacramento covering EPA Region 10
- Southeast Rural Community Assistance Project, Inc.
- Syracuse University
- University of Maine System
- University of Maryland
- University of New Mexico
- University of North Carolina at Chapel Hill
- Wichita State University
- WSOS Community Action Commission, Inc.

National Water Infrastructure EFCs:
- Moonshot Missions
- Rural Community Assistance Partnership, Washington, DC
- Sand County Foundation
- U.S. Water Alliance

FOR INFO www.epa.gov/waterfinancecenter/efcn

LEAKY TOILETS CA

WATER SAVING TECHNOLOGY

Millions of gallons of water are lost every year to a common, yet easily preventable, cause of water waste: leaky toilets. That's why the Sustainability Partner for the Americas (SPA) recently co-funded a pilot project to install water-saving technology in three multi-family buildings in Los Angeles. The tech takes aim at common leaks — like toilets that keep running water when not in use — which add up. The pilot is on track to save 6.4 million gallons of water a year in the L.A. watershed where it operates, supporting their commitment to replenish 120% of the water they consume, on average, across their offices and data centers by 2030. The pilot project came together with partners from the California Water Action Collaborative (CWAC).

Los Angeles Department of Water and Power estimates that the average household loses up to 10,000 gallons of water every year to leaky toilets. While leaky toilets can be hard to detect, they're easy to fix. For the pilot project, CWAC members Pacific Institute and Bonneville Environmental Foundation worked on three low-income multi-family housing buildings operated by nonprofit organizations, working alongside the Metropolitan Water District of Southern California and other local water utilities. Toilets were equipped with small, low-cost, low-power sensors. When a toilet leaks, the sensors alert building management in real time that a toilet needs repairs. The fix is usually as simple as readjusting or replacing the toilet flapper.

This simple intervention resulted in serious savings of water, money, and energy, according to estimates from the nonprofit Pacific Institute:
- Water: The pilots reduce building water use by an estimated 15% to 25%. The expected savings of 6.4 million gallons of water per year is equivalent to the total annual water use of about 40 single-family homes.
- Cost: The water savings translate into cost savings on water and wastewater bills of the same 15% to 25%, amounting to tens of thousands of dollars a year. The nonprofit building operators can use savings to make building improvements, passing the savings along to residents.
- Energy: Southern California imports water from hundreds of miles away, requiring a lot of energy to pump water over the mountains and treat it for household use. By reducing demand, the project cuts back on energy and associated greenhouse gas emissions embedded in the water system.

Residents don't have to do anything — the non-invasive system detects problems and notifies the building. Facility managers see the likely reason for the leak, which helps them fix it faster. The nonprofit building operators focus on more urgent issues and reduce time tracking down leaks.

Taking this pilot to other places is now underway. Work is being funded to bring this solution to a 225-unit building in San Francisco, with the expectation of saving over 1 million gallons of water a year, based on the savings found in L.A.

In New York City, this approach is being explored in a building where the expectation is also a savings of roughly 1 million gallons of water a year. While this region is not currently in a drought, the system could save significant amounts of energy, as New York City imports its water long distances. Additionally, this project can help reduce pressure on New York's combined waste- and stormwater system, which overflows into clean waterways during heavy storms.

FOR INFO https://wateractionhub.org/projects/1694/d/advancing-water-efficiency-for-low-income-multifamil/

CALENDAR

December 15 WEB

Transforming the Water Workforce of the Future: Webinar Series, Presented by US EPA Office of Water & Office of Wastewater Management; Attendance is Free. For info: Jim Horne, EPA, horne.james@epa.gov or www.epa.gov/sustainable-water-infrastructure/water-sector-workforce-webinars

December 15-16 CA

CEQA 18th Annual Conference: New Developments & Practice Challenges for 2022, San Francisco. Grand Hyatt Hotel. For info: CLE International: 800/ 873-7130 or www.cle.com

January 4-7 CO

Sustainability & Ski CLE: Environmental, Land Use & Natural Resources Law Conference, Vail. Grand Hyatt Vail. For info: CLE International: 800/ 873-7130 or www.cle.com

January 10-12 TX

Ten Across Summit: The Future is Here, Houston. Hotel Zaza Museum District & Asia Society Texas Center. RE: Critical Issues & Solutions Impacting the Region. For info: https://na.eventscloud.com/website/21653/

January 11 OR

Clean Water Conference. World Forestry Center. For info: https://elecenter.com/conferences/clean-water-conference-2023/

January 15-19 India

13th International Water Association Conference on Water Reclamation & Reuse, Chennai. Hall Barria at the Euskalduna Congress Palace. For https://iwareuse2023.com/

January 16-19 ID

Idaho Water Users Association's 86th Annual Convention, Boise. The Riverside Hotel. RE: Reclamation Funding, Road Construction & Water Infrastructure, Modernizing the Boise River & Idaho's Domestic Exemption Status; Plus Updates From Reclamation, Idaho Dept. of Water Resources & Water Supply Outlook. For info: https://www.iwua.org/86th-Annual-Convention

January 19 UT & WEB

Westerm Water Law 101: Not Broken and Ready to Meet the Moment - Wallace Stegner Center Event, Salt Lake City. University of Utah College of Law. Hybrid Event: In-Person and Online; 12:15pm-1:15 pm MST. For info: https://sjquinney.utah.edu/event/utah-water-lecture-series-utah-water-law-101/

January 23-24 WEB

Cybersecurity for Water Utilities: Most Common Threats, Counter Measures, & More - Online Course, For info: www.euci.com or 303/770-8800

January 24-26 CA

American Water Summit: Re-Thinking Water, Los Angeles. Los Angeles Airport Marriott. RE: Global Climate Challenge in Water + Wastewater Infrastructure. For info: https://americanwatersummit.com/

January 25-27 CA

Navigating Unchartered Waters: CASA 2023 Winter Conference, Palm Springs. Hilton Palm Springs Hotel. California Association of Sanitation Agencies Conference. For info: https://casaevents.memberclicks.net/winter-conference

January 25-27 CO

Colorado Water Congress 2023 Annual Convention, Aurora. Hyatt Regency Aurora-Denver Convention Center. For info: https://www.cowatercongress.org/

January 26-27 WA

30th Annual Endangered Species Act Conference, Seattle. Crowne Plaza Seattle Downtown; In Person, Live Webcast or On Demand. For info: The Seminar Group: 206/ 463-4400, info@theseminargroup.net, https://www.theseminargroup.net/

January 26-27 WEB

Electric Power in the West Conference, Live Interactive Online Broadcast. For info: Law Seminars Int'l, 206/ 567-4490, registrar@lawseminars.com or www.lawseminars.com

February 2 UT & WEB

Colorado River: Crisis or Opportunity? - Wallace Stegner Center Event, Salt Lake City. University of Utah College of Law. Hybrid Event: In-Person and Online; 12:15pm-1:15 pm MST. For info: https://sjquinney.utah.edu/event/colorado-river-crisis-or-opportunity/

February 7-9 DC

Rural Water Rally 2023, Washington. Hyatt Regency Washington on Capitol Hill. Presented by National Rural Water Association; Brings Utility System Reps to Capitol Hill to Support Funding Programs, Training & Technical Assistance. For info: https://nrwa.org/annual_events/

February 16 UT & WEB

Measuring Water Use: The Good, The Bad, and The Ugly - Wallace Stegner Center Event, Salt Lake City. University of Utah College of Law. Hybrid Event: In-Person and Online; 12:15pm-1:15 pm MST. For info: https://sjquinney.utah.edu/event/measuring-water-use-the-good-the-bad-and-the-ugly/

February 16-17 VA & WEB

Environmental Law 2023, Arlington. In-Person & Webcast Event. Environmental Law Institute Co-sponsored With ALI CLE. For info: https://www.ali-cle.org/course/ce008p; or www.eli.org

February 20-23 TN

2023 Membrane Technology Conference & Exposition, Knoxville. Knoxville Convention Center. Presented by American Membrane Technology Association & American Water Works Association. For info: www.awwa.org/Events-Education/Membrane-Technology

February 23-24 NV

Family Farm Alliance 2023 Annual Conference - A Wake Up Call for America: Why Farms, Water and Food Matter, Reno. Silver Legacy Resort. For info: www.familyfarmalliance.org/events

February 28-March 2 DC

ACWA DC 2023 Annual Washington, D.C. Conference, Washington. St. Regis Hotel. Presented by Association of California Water Agencies. For info: www.acwa.com/events/

March 2 UT & WEB

Considering Wildlife in Water Management - Wallace Stegner Center Event, Salt Lake City. University of Utah College of Law. Hybrid Event: In-Person and Online; 12:15pm-1:15 pm MST. For info: https://sjquinney.utah.edu/event/considering-wildlife-in-water-management/

March 2-5 OR

"Reconnecting and Transitioning Together" - Public Interest Environmental Law Conference, Eugene. University of Oregon School of Law. 41st Annual Presented by Land Air Water Environmental Law Society. For info: http://pielc.org/

March 5-8 GA

38th Annual WateReuse 2023 Symposium, Atlanta. Marriott Marquis Atlanta. For info: https://watereuse.org/news-events/conferences/

March 8 WEB

Benefits From the Application of Hydraulic Modeling for Small Water Systems - AWWA Webinar, 11:00am-12:30pm Mountain Time Zone. Presented by American Water Works Association. For info: www.awwa.org/Events-Education/Events-Calendar

March 9-10 CA

Sustainable Water Investment Summit, Palos Verdes Peninsula. Terranea Resort. Water Finance From Risk Management to Water Transfer & Storage Strategies; Presented by Brownstein & WestWater Research. For info: https://www.sustainablewaterinvestment.com/

March 10 CA

Contaminated and Distressed Properties Seminar, Los Angeles. TBA. For info: The Seminar

Group: 206/ 463-4400, info@theseminargroup.net, https://www.theseminargroup.net/

March 14 NE

Nebraska Floodplain Management Workshop, Lexington. Dawson County Opportunity Center. For info: https://dnr.nebraska.gov/floodplain/training-and-workshops

March 14-16 CO & WEB

Contaminants of Concern - AWWA Conference, Denver. Online & TBA. Presented by American Water Works Association. For info: www.awwa.org/Events-Education/Events-Calendar

March 16-17 UT & WEB

Wallace Stegner Center 28th Annual Symposium: The Future of the Great Salt Lake, Salt Lake City. University of Utah College of Law. Hybrid Event: In-Person and Online. For info: https://sjquinney.utah.edu/event/the-future-of-the-great-salt-lake/

March 22-24 NY

UN 2023 Water Conference - Our Watershed Moment: Uniting the World for Water, New York City. UN Headquarters. For info: https://sdgs.un.org/conferences/water2023

March 28-31 CA

The Utility Management Conference, Sacramento. SAFE Credit Union Convention Center. Presented by American Water Works Association & Water Education Foundation. For info: www.awwa.org/Events-Education/Utility-Management

April 6 UT & WEB

Bears Ears - Landscape of Refuge and Resistance: Wallace Stegner Center Event, Salt Lake City. University of Utah College of Law. Hybrid Event: In-Person and Online; 12:15pm-1:15 pm MST. For info: https://sjquinney.utah.edu/event/bears-ears-landscape-of-refuge-and-resistance/

April 11 UT & WEB

Corresponding With the Young Wallace Stegner - Wallace Stegner Center and Tanner Humanities Center Presentation, Salt Lake City. University of Utah College of Law. Hybrid Event: In-Person and Online; 12:15pm-1:15 pm MST. For info: https://sjquinney.utah.edu/

April 16-18 CA

CMUA 2023 Annual Conference, San Diego. Rancho Bernardo Inn. Presented by California Municipal Utilities Association. For info: https://www.cmua.org/calendar_list.asp

April 16-19 MN

Sustainable Water Management Conference, Minneapolis. Hyatt Regency Minneapolis. Presented by American Water Works Association. For info: www.awwa.org/Events-Education/Sustainable-Water-Management

May 2 CO

2023 WateReuse Colorado Conference, Boulder. SEEC Bldg., University of Colorado - Boulder. Presented by WateReuse. For info: https://watereuse.org/

May 7-10 AZ

National Association of Environmental Professionals Annual Conference , Phoenix. Sheraton Phoenix Downtown Hotel. Annual Conference & Training Symposium. For info: www.naep.org/

May 8-10 NE

Water for Food Global Conference, Lincoln. Nebraska Innovation Campus Conference Center. Presented by the Daugherty Water for Food Global Institute; Innovative Ways to Improve Water & Food Security by Increasing Farmers' Resiliency to a Changing Landscape. For info: https://waterforfood.nebraska.edu/

May 9-11 CA

ACWA 2023 Spring Conference & Exhibition, Monterey. TBD. Presented by Association of California Water Agencies. For info: www.acwa.com/events/

May 16-17 TX

Environmental Trade Fair & Conference, Austin. Austin Convention Center. Presented by the Texas Commission on Environmental Quality; Agency Staff Leads Over 100 Courses & Discussions. For info: https://www.tceq.texas.gov/p2/events/etfc/etf.html

June 11-14 Can

ACE 23: The World's Premier Water Conference, Toronto. Enercare Centre, Beanfield Centre, & Headquarter Hotel. Presented by American Water Works Association; Long-Term Vision of the Future of Water - Chart a Course for a Sustainable Water Sector. For info: www.awwa.org/ace

June 13-15 CO

Universities Council on Water Resources (UCOWR) Annual Conference, Fort Collins. Colorado State University. Critical Water Issues Facing the Western US, the Continent & Globe. For info: https://ucowr.org/conference/

June 26-28 CO

Western Governors Association Meeting, Boulder. TBD. For info: www.westgov.org

July 17-19 CO

American Water Resources Association 2023 Summer Conference, Denver. Hyatt Regency Denver Tech Center. For info: www.awra.org

July 20-22 UT

69th Annual Rocky Mountain Mineral Law Institute, Salt Lake City. Grand America Hotel. Presented by The Foundation for Natural Resources and Energy Law (formerly Rocky Mountain Mineral Law Foundation). For info: https://www.fnrel.org/programs

September 10-13 PA

Water Infrastructure Conference & Exposition, Philadelphia. TBD. For info: https://www.awwa.org/Events-Education/Water-Infrastructure

September 11-13 CA

CASQA 2023 Annual Conference, San Diego. Paradise Point. For info: California Stormwater Quality Association, www.casqa.org

September 20-22 TX

2023 WateReuse Texas Conference, Frisco. Hyatt Regency Frisco. Presented by WateReuse. For info: https://watereuse.org/

September 25-27 CO

WaterPro Conference, Aurora. Gaylord Rockies Resort & Convention Center. Industry Event for Networking, Technology & Education. For info: https://www.waterproconference.org/

September 25-28 Saskatchewan

WTW 2023 Annual Conference & Exhibition, Saskatoon. TCU Place, Hilton Garden Inn. Presented by Working Together for Water. For info: https://www.wcwwa.ca/page/AnnualConf

October 3-5 NV

WaterSmart Innovations Conference & Trade Show, Las Vegas. South Pointe Hotel & Casino. Founded by Southern Nevada Water Authority (SNWA). For info: www.awwa.org/Events-Education/WaterSmart-Innovations

November 5-7 CA

2023WateReuse California Annual Conference, Indian Wells. TBD. Presented by WateReuse. For info: https://watereuse.org/

November 5-9 TX

Water Quality Technology Conference, Dallas. TBD. Presented by American Water Works Association; Practical Forum for Water Technology Professionals to Exchange Latest Research & Information. For info: www.awwa.org/Events-Education/Water-Quality-Technology

November 6-9 Netherlands

Aquatech Amsterdam, Amsterdam. RAI Amsterdam. World's Largest Trade Exhibition for Water Technology. For info: Annelie Koomen, Aquatech, a.koomen@rai.nl or www.aquatechtrade.com/amsterdam/

November 28-30 CA

ACWA 2023 Fall Conference & Exhibition, Indian Wells. TBD. Presented by Association of California Water Agencies. For info: www.acwa.com/events/

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CALENDAR

December 5-7 CO

North American Water Loss Conference & Exposition, Denver. Colorado Convention Center. Presented by American Water Works Association. For info: https://www.awwa.org/Events-Education/Water-Loss

December 13-15 NV

Colorado River Water Users Association 2023 Conference, Las Vegas. Paris Las Vegas Hotel. For info: www.crwua.org/future-conferences.html

March 10-13 CO

39th Annual WateReuse Symposium, Denver. TBD. Presented by WateReuse Trade Association. For info: https://watereuse.org/

July 18-20 NM

70th Annual Rocky Mountain Mineral Law Institute, Santa Fe. TBA. Presented by The Foundation for Natural Resources and Energy Law (formerly Rocky Mountain Mineral Law Foundation). For info: https://www.fnrel.org/programs