# MAIN STREAM MAGAZINE

**Brought to you by the New Mexico Interstate Stream Commission**

**FEATURING**



**Welcome to the first edition of Main Stream Magazine, brought to you by the Office of the State Engineer and the New Mexico Interstate Stream Commission.**

Main Stream Magazine features articles and interviews with water leaders. We hope the insights and solutions in these pages inspire possibilities and shed light on our shared water future.

New Mexico's water needs you.
Thank you for reading.

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MAIN STREAM NEW MEXICO

## LETTER FROM HANNAH RISELEY-WHITE, New Mexico Interstate Stream Commission Director:

The last 20 years have been the driest stretch in the American West in more than 1,200 years. In these times of drought and uncertainty, it becomes very clear: water is about connection and compromise and working together to make something precious last.

In these pages, you will hear from some of New Mexico's most dedicated water leaders; people who have spent their careers protecting, preserving, and caring for New Mexico's water future — the lifeblood of our communities. Alongside interviews with inspiring leaders, we also share some "essentials" highlighting the water realities that are important for every New Mexican to know.

We hope these articles invite action and enliven solutions, building on Governor Michelle Lujan Grisham's 50 Year Water Action Plan and the Water Security Planning Act of 2023. Now is the time to come together as neighbors to protect and preserve water for today, tomorrow, and for future generations.

In service to you,

Hannah Riseley-White

# WHAT'S INSIDE:




**Brought to you by the New Mexico Interstate Stream Commission**

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# ‘WALKING WATER DROPS’:

## An Interview with Phoebe Suina on The Role of Science, Culture, and Community in Stemming New Mexico’s Water Crisis

Photography by LeRoy Grafe

“I think in water,” Suina says. “I see water everywhere. I look at people, and I’m like, oh, there’s a bunch of big water drops walking around.”

Like any passionate scientist, water engineer Phoebe Suina can't help but take her work home with her. In gathering storm clouds, she sees differential equations. On floodplain trail runs, she geeks out estimating roughness coefficients.

"I think in water," Suina says. "I see water everywhere. I look at people, and I'm like, oh, there's a bunch of big water drops walking around." (Our bodies are 60 percent water, after all.)

But here in arid New Mexico, where climate change and dwindling water resources are throwing our hydrological cycles out of balance, even Suina says it'll take more than mathematical models and smart policy to correct our course. Avoiding a water shortage will require all of us and a lot of creative solutions.

**Avoiding a water shortage will require all of us and a lot of creative solutions.**

## GET EVERYONE TO THE TABLE

Suina is a Dartmouth College-trained engineer, a New Mexico Interstate Stream Commissioner and the owner of environmental consulting firm High Water Mark, LLC. She's also a member of Cochiti and San Felipe Pueblos. So for her, finding balance in nature is a cultural imperative handed down from her elders.

The history of water planning in New Mexico is in some ways a history of exclusion, Suina says. Inviting everyone to the table – especially representatives from communities whose New Mexico roots extend back several millennia – will make for a much richer conversation.

**The history of water planning in New Mexico is in some ways a history of exclusion, Suina says.**

In her consulting business, Suina calls on both her scientific training and the wisdom of her people to solve problems. She and her colleagues may spend hours building complex models, but Suina also finds herself looking skyward to analyze cloud patterns and rain density, communing with elders, and feeling the soil to gauge moisture levels. Her models are more robust, she says, thanks to cultural knowledge and hard-earned intuition.

"The model in my head can't be peer-reviewed," she says. "But it still has essential data and assumptions and understanding and data points, and these data points have been gathered for thousands of years."

## 'MEANT TO BE DIFFICULT'

Suina's ancestors, the Ancestral Puebloan people, have lived in the Four Corners region for thousands of years – through droughts and floods, through times of scarcity and abundance. Persisting within nature's swinging pendulum taught Suina's ancestors lessons in gratitude and humility.

Living in the high desert "was meant to be difficult," Suina says. "But that's OK because it teaches us not to take things for granted, and to always remember to be in that balance."

Today, thanks to climate change and decades of overuse, New Mexico's hydrological system is out of balance. Scientists predict a water shortage of 750,000 acre-feet within the next 50 years. That's enough water to fill something like 6 billion bathtubs.

**Today, thanks to climate change and decades of overuse, New Mexico's hydrological system is out of balance.**

Suina and her colleagues are “waving red and yellow flags,” she said. Still, sometimes she feels unseen.

“What do I need to do?” she asked. “Do I need to jump on the table, light my hair on fire? That’s what’s happening with climate change now. Mother Nature is on the table, lighting her hair on fire.”

## THE POWER OF ‘WALKING WATER DROPS’

Science can empower policy makers by providing justification for sweeping changes. But for Suina, it’s the power of community that ultimately will heal the earth.

As “walking water drops,” people are part of our water system, Suina says. And just as a downpour floods a river, a collective change in behavior can transform and shape the future.

Even small changes – like turning off the tap when you’re brushing your teeth, taking shorter showers, or watering plants in the early-morning hours instead of at midday – can help restore balance, so long as we undertake them together.

**Just as a downpour floods a river, a collective change in behavior can transform and shape the future.**

“If you don’t have multiple drops of water participating, it will never happen,” Suina says. “It’s accepting responsibility and acknowledging that we each have our drop of water to contribute to that shift.”



# TUMBLE DRY ON HIGH:

## A Primer on 'Aridification' in New Mexico

Photography by Christi Bode

It's 7:30am, and you just realized you forgot to move that load of damp laundry from the washing machine to the dryer. With just an hour to spare before it's time to head to work, you throw handfuls of soggy clothes into the tumbler and set the heat to high.

After all, it's scarcely a secret that intense heat is the trick to fast-drying laundry.

Sure enough, when the machine dings 50 minutes later, you pull out a warm, dry shirt, slip it on and scoot out the door. Little do you know, you've demonstrated one of the processes at play in New Mexico's changing climate.

### WHAT IS ARIDIFICATION?

Over the past 40 years, average temperatures in New Mexico have ticked up by 2.7 degrees Fahrenheit, and scientists project another 5- to 7-degree increase by 2070. This change in our climate means our state's surface water, soil and plants, just like those shirts, will lose more water to the atmosphere – and that, in turn, will mean less water will flow into rivers or recharge our groundwater supplies.

In other words, as New Mexico's climate heats up, there will be less and less water to go around.

**As New Mexico's climate heats up, there will be less and less water to go around.**

In the long term, this cycle of higher temperatures and increased evapotranspiration (that is, evaporation of water from the soil combined with transpiration of water from plants) leads to aridification, the process by which an already arid region becomes even more arid.

It's a transformation that promises to impact every aspect of life in New Mexico.

### REPERCUSSIONS: WATER AND BEYOND

It's no secret that New Mexico is already an arid state. We get our water in the form of rain and snow, and then most of it – 96.6 percent – returns to the atmosphere. That leaves a mere 3.4 percent (on



average 3.2 million acre-feet of water each year) to replenish rivers, streams, reservoirs and groundwater reserves.

So, small changes to New Mexico's average annual temperature have a huge impact on water availability: If warmer days cause an increase in evapotranspiration of just one percentage point, our incoming annual water supply will decrease by nearly one-third.

And, in fact, that's exactly what some researchers predict. Studies project a decrease in surface-water flows of between 20 and 40 percent over the next 50 years.

**Studies project a decrease in surface-water flows of between 20 and 40 percent over the next 50 years.**

Aside from dwindling water resources, what else will happen as New Mexico becomes more arid? Here are a few impacts researchers expect, provided precipitation continues to follow existing historical patterns:

- Drier soil and lower stream flows will lead to lower agricultural production.
- Some species of plants will struggle to survive in more arid soil.
- Dry fuel (i.e. thirsty vegetation) will mean more frequent, more intense wildfires.
- Rising temperatures, coupled with a lack of vegetation, will prompt some animals to relocate to cooler climates.
- Erosion will accelerate, increasing air pollution and stream sedimentation, and compromising freshwater habitats.

### PLANNING BEYOND THE DROUGHT

It's easy to blame the Southwest's decades-spanning mega-drought for our water-scarcity issues, but experts say aridification is a longer-term threat. Precipitation levels are bound to change year to year, they say, but aridification is only heading in one direction: up.

So without a way to entice the clouds to open their spigots, we're left to find innovative means to collectively conserve what we have – to use less now in order to protect our future, and to plan ahead.

**We're left to find innovative means to collectively conserve what we have.**

The New Mexico legislature passed the Water Security Planning Act of 2023 to engage residents in doing just that – because unlike laundry, it'll take more than 50 minutes and the push of a button to solve our water crisis.

# THE LAW OF THE RIVER:

## Aaron Chavez and the Future of Water in Northwest New Mexico

Photography by LeRoy Grafe

To watch it flowing or to hear it babbling or rushing or trickling along, Chavez says, can be a comfort – or a call to action.

Some days, a peek at the San Juan River is all Aaron Chavez needs to plan out his to-do list.

**In a region where surface water is the only game in town, water availability is something everyone can see.**

As executive director of the San Juan Water Commission, it's Chavez's job to manage water delivery to city and rural water users throughout Northwest New Mexico. And in a region where surface water is the only game in town, water availability is something everyone can see. To watch it flowing or to hear it babbling or rushing or trickling along, Chavez says, can be a comfort – or a call to action.

Chavez, who's based in Farmington, New Mexico, regularly visits the two rivers that converge in town. The San Juan and Animas rivers, both carrying water down from the Rocky Mountains, provide all of the region's water. "If the rivers are starting to show a lot of rocks and slowing down, it makes me nervous," he says. "That means everyone's going to start suffering. And when they're bank-to-bank, I'm wishing we were able to store more of that water."

New Mexico's geography is varied, and so, too, are its water systems. In the arid southeast, water is hidden below ground in aquifers. Cities like Santa Fe and Albuquerque tap multiple water sources from a portfolio of supply. But in Chavez's district, river flows alert everyone to the water that's available for use. They show the changing of the seasons and the warming of the climate. The rivers' flows are a constant reminder of a resource that needs careful stewardship.

**The rivers' flows are a constant reminder of a resource that needs careful stewardship.**



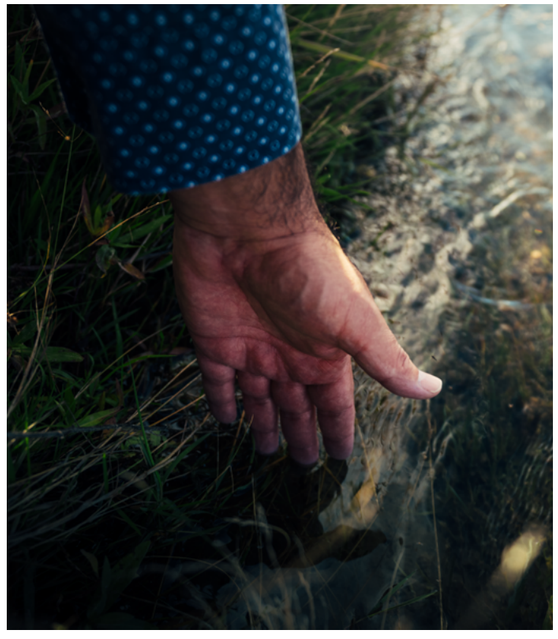


## BALANCING NEEDS IN THE BASIN

The northwest region of New Mexico is part of the Colorado River Basin, a vast system of tributaries that extends into seven western states, irrigates 5.5 million acres of land, and provides water to 1 out of every 10 people in the United States. Managing that water supply and balancing needs among states, Native American tribes, and our downstream neighbor Mexico, has proven challenging — especially in times of drought.

The first 20+ years of the 21st century have been the driest stretch in the American West in more than 1,200 years, and aridification caused by a warming climate has sapped even more moisture from the air – and from our surface water supplies. Reservoir levels have fallen to perilous lows. (Lake Powell dipped to 23 percent of its full capacity in 2023, for example.)

The rules governing the Colorado River Basin are collectively called The Law of the River and build upon statutes developed more than 100 years ago, long before the mega-drought of the past two decades. The Colorado River Compact, signed in 1922, splits 15 million acre-feet of water annually between Upper Basin states and Lower Basin states. As Upper Basin states, it falls to New Mexico, Wyoming, Colorado, and Utah to deliver water to their downstream neighbors: California, Arizona, and Nevada. The trouble is: River flows have decreased by at least 25 percent since the compact's adoption.



"In dry years, the Lower Basin states still get their full allocation, and we have to rely on snowpack. So if it doesn't snow, we're shorted automatically." That's in part because Lower Basin states have some insurance against drought. Lake Mead and Lake Powell are massive human-made reservoirs that deliver water downstream. Though their levels have fallen off over the past two decades, their reserves help ensure the taps don't run dry even if the clouds and the riverbeds do.

That mammoth storage capacity is a solution Upper Basin users don't have. As rivers in Northwest New Mexico run dry thanks to drought, users can feel the difference — and see it. In 2002, the Animas River dried up near the confluence of the San Juan River, Chavez remembers. "That sparked interest. People said, 'What's going on?' 'What are we doing to prevent this from happening again?'"

Dozens of residents participated in regional planning, and public perception of the importance of water storage in the area began to shift. Residents realized its importance.

"We can talk policy until we're all blue in the face, but when you actually see the water flowing, it makes a difference. Surface water is our lifeline, and I think everyone realizes the importance of it, so we put our differences aside. We work together and communicate and come to a solution."

**"We can talk policy until we're all blue in the face, but when you actually see the water flowing, it makes a difference."**

## BETTING ON STORAGE

As he looks to a drier future, Chavez says he'll be dreaming up ways to protect Northwest New Mexico even further. The solution, he thinks, lies in storage. Chavez was instrumental in the final phases of the Animas-La Plata water project, a storage infrastructure solution green lit in 1956 and finished in 2013. Located just southwest of Durango, Colorado, it allows

for the banking of 57,000 acre-feet of water (that is, enough water to supply all of Santa Fe's water use for over 6 years).

The Animas-La Plata project was controversial — and expensive, costing at least $500 million. Chavez says more storage solutions like this could help offset the impacts of climate change in the region. Scientists anticipate New Mexico will see a decrease in surface-water flows of between 20 and 40 percent over the next 50 years. Despite those projections, Chavez said he can't help but be optimistic. His region is undertaking a new round of regional planning now, and neighbors are stepping up yet again to find creative ways to steward the region's most existential resource.

For Chavez, the solution will always lie in compromise. "We want to make sure everyone shares the pain, and we need to come together as a community, as a river basin, and come up with solutions that maybe not everyone's happy with but that everyone can live with."



**"We want to make sure everyone shares the pain, and we need to come together as a community, as a river basin, and come up with solutions that maybe not everyone's happy with but that everyone can live with."**

# TRADING POLICY MEETINGS FOR TRACTOR RIDES:

## An Interview with Former State Engineer Mike Hamman

Photography by LeRoy Grafe

“Water is about connection and compromise and working together to make something precious last.”

Mike Hamman's first lessons in water management took place along a Taos acequia when he was fifteen years old.

Hamman, who until recently served as New Mexico's State Engineer, still remembers it well. His parents owned El Pueblo Motor Lodge, a roadside inn on the north end of town. When the time came to irrigate the large property, Hamman's father would send him out to the ditch.

"I had to figure out a way to negotiate with folks and to make sure that when it was our time, we were able to get the water," Hamman says. "I called it 'ditch bank politics.'"

## The water business is really a people business

Those early negotiations drove a lesson home for Hamman that he has carried with him throughout his career: the water business is really a people business. From his early work on water infrastructure projects to the office of the State Engineer and, now, to the two-acre plot that he farms in retirement with his wife and adult children, he's realized that water is about connection and compromise and working together to make something precious last.

### A BETTER FUTURE FOR FARMERS – AND FOR ALL OF US

About a decade ago, Mike Hamman and his family purchased a plot of land on the northside of Corrales, New Mexico, in hopes of one day starting a small family farm. Now newly retired, Hamman has thrown himself into farming, trading policy meetings for tractor rides.

He grows berries, melons, corn, and chile and watches stone fruits ripen in the orchard. Thanks to his career, Hamman knows water is not a resource to squander, so he's set up what's called a conjunctive use agreement on his property. Think of it as a promise to balance your use of groundwater and surface water in the most responsible way possible. In times of drought or when surface water dwindles late in the season, you reserve the right to draw on groundwater. In times of plenty, you use surface water instead, giving aquifers a chance to replenish.





Conjunctive use agreements are good for the planet, but they can be time-consuming and expensive to set up – a fact that Hamman laments. They require permits and infrastructure improvements and the use of multiple water systems, including wells, rainwater catchment, and ditches and canals. Hamman knows farmers need access to reliable water sources, especially in the face of a worsening climate crisis, but a solution isn't viable if it's too expensive for most farmers to implement.

## Hamman knows farmers need access to reliable water sources, especially in the face of a worsening climate crisis

As State Engineer, Hamman advocated for New Mexico's family farmers, pushing for solutions that make it easier to weather times of scarcity – things like farm-to-farm leasing programs that allow water rights owners to lease unused water to neighbors or borrow from neighbors when they're in need.

## "We have to fundamentally change our agricultural policies, both from a climate and carbon-footprint perspective and also in thinking about food supply as the water situation becomes more dire."

"We have to fundamentally change our agricultural policies, both from a climate and carbon-footprint perspective and also in thinking about food supply as the water situation becomes more dire," Hamman says. (In New Mexico, experts anticipate a 25 percent reduction in available water over the next 50 years.)

Farmers need other options, too, he says. Grant money shouldn't only be available to "the big dogs" who have the time and resources to apply. Hamman

also points to the federal Agricultural Conservation Easement Program, which protects land for agricultural use and pays farmers to implement more conservation measures, such as letting marginal cropland lie fallow to improve soil quality and crop yield.

The solutions, Hamman says, are there. It's just a matter of building awareness and increasing access. That, he says, is where regional planning will make all the difference.

**The solutions, Hamman says, are there.**

### 'WHERE THE RIVER MEETS THE ROAD'

When Gov. Michelle Lujan Grisham appointed Hamman to the post of State Engineer in 2022, he immediately set to work on what he would later describe as his crowning achievement, the New Mexico Water Policy and Infrastructure Task Force. The project brought together water stakeholders from all over the state to identify challenges and present solutions.

A key recommendation: the revival of regional planning. Hamman had taken part in the state's regional planning effort in 1987. It looked a bit different back then, he says. Most notably, it was underfunded and understaffed.

This time around, thanks to the Water Security Planning Act of 2023, regional planning is a robust, multi-step process with a goal of engaging every New Mexican in finding and then implementing local solutions.

In so many ways, as Hamman is harkening back to his early days on the banks of that Taos acequia, the state's water planning process is, too, with neighbors coming together to give and take, making water last.

**Regional planning is a robust, multi-step process with a goal of engaging every New Mexican.**

Water runs through everything, and right now, water is one of the biggest challenges we face in New Mexico. Our water supplies are declining. Use is continuing to grow. And rather than wait, in New Mexico we're learning from each other, getting more creative, and connecting through the challenge. Now is our moment to find solutions together.

# UNDERSTANDING GROUNDWATER

## Geology, Data, and Planning for the Future of New Mexico's Groundwater

Photography by LeRoy Grafe



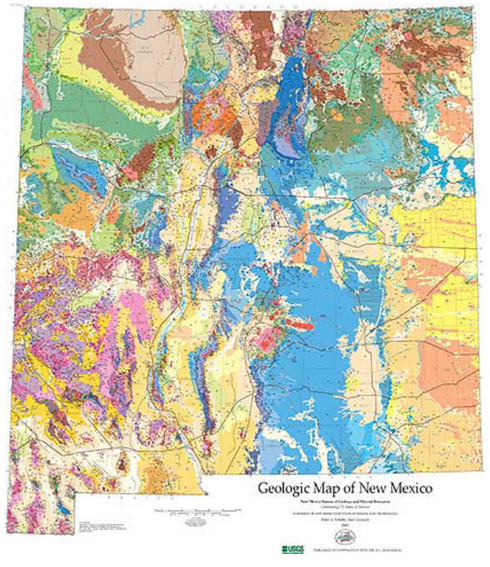
Photographed: Stacey Timmons

**We've covered some of the context of the current and projected water realities in New Mexico. Here we'd like to turn our attention to some of the helpful tools (and people) who are supporting effective water planning across the beautiful, arid, complex landscape we call home.**

To the right is New Mexico's geologic map. It has a beautiful array of colors; blues and pinks, greens and purples, and our fair share of tans, yellows, and browns. When a geologist looks at a map like this, they see a story about the character of the land and how water moves — not just on the surface, but underground, too.

Understanding underground water resources is particularly important in a state like ours – where nearly ¾ of household use annually depends on groundwater and the demand for groundwater is growing each year.

**The demand for groundwater is growing each year.**




Not every state is so colorful. Geologic maps in some places (we're looking at you Nebraska...) have less complexity. This means their water situation (at least in geologic terms) is more straightforward. New Mexico, as you can see, is a different story. We're still learning more about what lies under the surface.

So what tools are there to understand groundwater in your area? To find out, we turn to experts Stacy Timmons and Rachel Hobbs at the NM Bureau of Geology & Mineral Resources. Spoiler alert: there are a lot of helpful tools currently available or in the works through the collaborative New Mexico Water Data Initiative.

### UNDERSTANDING NEW MEXICO'S WATER COMPLEXITY:

Sustaining life in a desert environment requires a nuanced and delicate balance between how much water we need and how much water is available. But that data hasn't always been easy to find or easy to understand, especially for those of us who don't have experience with data analysis (let's be real, that is most of us). That is changing, says Hobbs. "We're working towards a future where anyone, from researchers and policymakers to concerned citizens, can access the data they need to make informed decisions about our water resources." This is happening through The New Mexico Water Data Initiative.

The Water Data Initiative got its start in 2019 with partners that include the New Mexico Bureau of Geology & Mineral Resources, the Office of the State Engineer

**"We're working towards a future where anyone, from researchers and policymakers to concerned citizens, can access the data they need to make informed decisions about our water resources."**

and Interstate Stream Commission, the New Mexico Environment Department, and the New Mexico Energy, Minerals and Natural Resources Department. Together they are working to consolidate scattered data points into a centralized place for easy and accurate access.

The Initiative recently launched the New Mexico groundwater map, an interactive map that pulls data on groundwater measurements from federal, state, and municipal sources, showing where water levels are going up, staying steady, or declining. This ground-water map, which is still evolving, is a great example of how the Water Data Initiative is streamlining a wealth of information from various sources into an interactive and accessible tool, all in service to effective water planning.

## CHALLENGES AND THE PATH FORWARD:

When it comes to groundwater, both Timmons and Hobbs are sure to note that New Mexico has challenges ahead. Many regions are observing declining water levels due to ongoing use of groundwater and slow recharge from drought conditions. Well drilling technology was nearly non-existent until the late 1940's, but since that time roughly 2,000 wells have been drilled each year.

**Many regions are observing declining water levels due to ongoing use of groundwater and slow recharge from drought conditions.**

So what comes next? Timmons says the initiative is now working on a statewide water quality map. She says, "we want to make water quality data accessible, so no one has to hunt it down from 18 different places." As the initiative continues, they will be expanding the toolset, following the data needs of water planning efforts across communities in New Mexico.

To learn more, visit: newmexicowaterdata.org.





## More wells means more groundwater depletion


New Mexico Groundwater Map, courtesy of The New Mexico Water Data Initiative


# TO SOLVE THE PROBLEM, UNDERSTAND THE EQUATION

## Aron Balok and the Roswell Artesian Basin

Photography by LeRoy Grafe

“How can you start to solve the problem if you don’t understand the equation?”

When he gets behind the wheel, the dusty flatlands of Eastern New Mexico stretching out before him, Aron Balok gets to thinking. “Windshield time,” he calls it

He might think about the cattle ranch where he grew up, about 60 miles south of Gallup, where he learned to appreciate the good years, when the rains came. Years when the cows were fat and the grass grew tall enough to stain his boots in the stirrups.

But more often than not, he is thinking ahead — planning for the worsening drought conditions predicted by climate experts and wondering what the future will hold.

**He is thinking ahead — planning for the worsening drought conditions predicted by climate experts**

Balok is the superintendent of the Pecos Valley Artesian Conservancy District (PVACD) – which is a fancy way of saying he helps manage the use of a vast basin of groundwater beneath the soil of southeastern New Mexico. The Pecos Valley is groundwater-reliant and heavily agricultural, dotted with ranches, pecan and fruit orchards, and farms. Balok understands what’s at stake — and how important it is to make that water last.

## A CONSERVATION HERITAGE

The Pecos Valley Artesian Conservancy District was formed in 1932. By the mid-1950s, aquifer levels were falling fast. The district had over 150,000 irrigated acres. Water use was unmonitored and unregulated. That’s when district officials took action, implementing, over the course of decades, a series of forward-thinking — albeit sometimes controversial — policies that have stood the test of time and positioned PVACD to handle the impacts of climate change better than most.

The groundwater Balok and the team manage is what’s known as a confined aquifer. In some ways that makes it the perfect testing ground for understanding the policies PVACD’s leaders and board members have implemented over the years. It’s relatively straightforward to measure fluctuations in this particular aquifer’s water levels — and to know how rainfall and the rate of human use is impacting those levels.

Understanding water in and water out is central to many of the policies PVACD has implemented over the years. After all, Balok asks, “How can you start to solve the problem if you don’t understand the equation?”

**Understanding water in and water out is central to many of the policies PVACD has implemented over the years.**

Here's what they did:

- In conjunction with the State Engineer, they measured water use in the district and used those measurements to help define users' water rights.
- Then they pulled nearly 20,000 acres out of production over the course of 20 years.
- They metered every well and capped agricultural use at 3 acre-feet per acre per year. (That's about three swimming pools full of water.) "You can't manage what you don't measure," Balok says.
- District officials initiated a low-interest loan program that helps fund improvements — ditch lining, field leveling, installation of more water-wise irrigation systems.

**"I think we as a society are going to have to decide what's important to us."**

## WHAT'S AHEAD

"We are constantly bombarded with, 'The end is near.' That within the next 50 years, we're going to be looking at 25 percent less water," Balok says. "And if that happens, it can't be understated. But it's not hopeless. I think we as a society are going to have to decide what's important to us."

Balok and his team continue to focus on conservation. In a controversial move, they sometimes buy up water rights and hold onto them instead of reselling them to new users.

"I don't know how you can reduce every farm by 25 percent," he says, referencing that 50-year prediction. "That's not something anyone's going to be interested in. So that means you're going to have to reduce acreage by 25 percent."

Taken together, PVACD's policies have set the district on a path of sustainability, Balok says — especially given the statewide policies already in place.

New Mexico follows the doctrine of prior appropriation — that is, the rule that gives the oldest water-rights holders seniority. That somewhat simple rule, Balok says, lays a strong foundation for water districts





statewide. And in recent years PVACD has used it creatively to reduce water use by reducing acreage.

"We've got a really good system in New Mexico," he says. "It's one of my biggest frustrations that we get a bunch of well-meaning individuals together to discuss water policy, and we all feverishly set to work to invent the wheel. We've got one. We just need to use it."

**"We all feverishly set to work to invent the wheel. We've got one. We just need to use it."**

During his "windshield time," Balok has found himself thinking a lot about what to do in the future if New Mexico's multi-decade drought dissipates or climate predictions prove darker than reality.

He envisions a time when, thanks to PVACD's forethought, the district has amassed enough water rights to consider doling them out again. If that happens, it will validate PVACD's years of conservation planning. And according to Balok, that possibility is not so far-fetched.

"If we learn from our mistakes and learn from our successes, there's certainly a pathway forward," he says. "It might be difficult, but it's not impossible. It's within the realm of possibility."

That learning process is well underway in New Mexico. And with the passage of the Water Security Planning Act of 2023, policymakers are engaging New Mexico residents in the planning. To get involved, visit mainstreamnm.org/get-involved.

**"If we learn from our mistakes and learn from our successes, there's certainly a pathway forward"**

# WHY BOUNDARIES MATTER

## Boundaries Are Important — Especially When it Comes to New Mexico's Water

Photography by Christi Bode

Water is the lifeblood of New Mexico's communities — but we face a future with less water. This means that the vitality of our cities, towns, agriculture, and ecosystems depend on us planning and taking action today. But what does this look like in practice? How are water plans created? Who decides what infrastructure is built or repaired? And how are those projects funded?

**The vitality of our cities, towns, agriculture, and ecosystems depend on us planning and taking action today.**

These are really important questions (vital even), and with the help of Angela Bordegaray, a seasoned water planner and native New Mexican with over 20 years of experience in desert water systems, we're here to put some of the pieces of this puzzle together.

### WHERE WATER PLANNING AND INFRASTRUCTURE PROJECTS BEGIN: WATER REGIONS

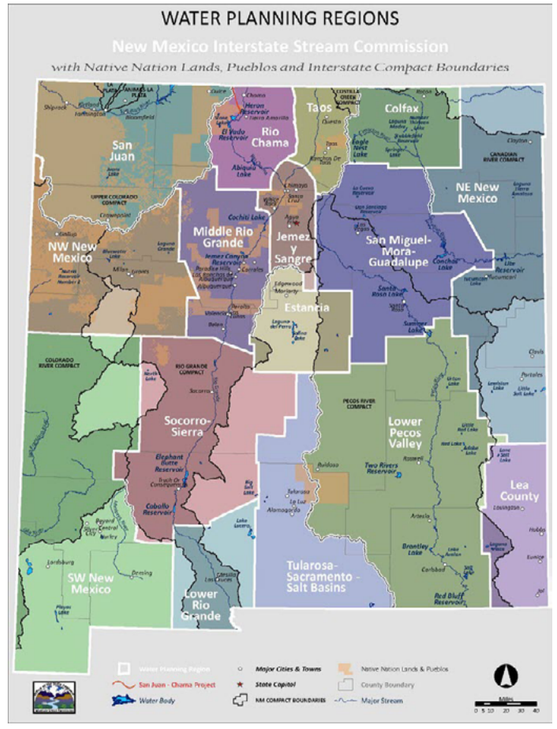
Water resources vary a lot across a state as large and diverse as New Mexico. What works in the arid southwest looks different than what works in the mountainous northeast or on sovereign tribal land. That's why water plans and infrastructure projects in New Mexico need to start from the ground up. They come from within each community, and this is done through New Mexico's 16 water regions.

Angela suggested imagining water regions like mini-governments; they are often composed of a mix of elected officials and water or community leaders who work together to make decisions that directly impact people and communities on the ground. Angela explains, "Regions guide... They create the plan, make decisions about what is needed, and pursue and receive funding for projects that help meet those needs."

New Mexico's 16 regions (as of 2024) were drawn up decades ago. In most cases, they follow political boundaries (counties, cities, etc) or watersheds and rivers. Political boundaries are useful when it comes to project funding, facilitating federal and state funds for localized water projects. Watersheds and rivers, on the other hand, create intuitive borders based on natural resources.

When describing today's water regions, Angela was sure to note: "There's no right answer about how water regions and boundaries should be drawn." Like any map, it will never match the territory, and when it comes to water, there are not only political and natural resource considerations, there are cultural dimensions. Angela emphasized, "Culture plays a significant role in water management, particularly in New Mexico, where various stakeholders have significant influence." Effective water regions need to consider the values, norms, and traditions of the communities they represent alongside political and hydrological factors.

**Effective water regions need to consider the values, norms, and traditions of the communities they represent.**




New Mexico's water regions as of 2024.

### SO, WHAT IS NEXT FOR NEW MEXICO'S REGIONS?

While a water region can never be perfectly drawn, New Mexico is revisiting regional boundaries based on public input. In 2025, New Mexico will define the rule and guidelines that will govern regional water planning efforts into the future. This important process is happening through the Interstate Stream Commission's implementation of the Water Security Planning Act. Public engagement is at the center.

So, when it comes to the question of who decides the future of New Mexico's water infrastructure, the answer starts with you.

Now is the time to get involved and voice what matters to you. To learn more visit mainstreamnm.org.

**Now is the time to get involved and voice what matters to you.**

# FROM CRISIS TO CONSERVATION:

## Lessons Learned in Santa Fe When the Wells (Almost) Ran Dry

Photography by Christi Bode

**During the spring of 2002, Santa Fe faced a mounting water crisis.**

After decades of groundwater overuse and years of intense drought, the city's water supply was dwindling, and fast. As officials rushed to enact restrictions on water use, residents bickered about whether or not to follow them, pointing fingers at golf courses and neighbors with thirsty lawns. Times were tense, and no one knew when — or if — summer storms would roll in to wash away their fears.

"I remember at that time my mom was showering standing in buckets so she could keep her garden alive," said Jesse Roach, a Santa Fe native who today serves as the director of the city's publicly owned water utility.

But in the two decades since that crisis — and likely, in part, because of it — Santa Fe's water reality has changed substantially. Despite the city's 25 percent population growth since 1995, the city has reduced total water use by 30 percent, making Santa Fe a national story of success in water conservation.

"For better or for worse, going through that period of scarcity and contention and anger — we came out the other side with a very powerful ethic of water conservation," Roach said. "We have a population who buys it because many of them lived through that crisis."





**"For better or for worse, going through that period of scarcity and contention and anger — we came out the other side with a very powerful ethic of water conservation."**

### ACEQUIAS AND WELL FIELDS

The story of how Santa Fe arrived at that crucial moment in 2002 mirrors the story of water in many Western U.S. cities. Over the decades, as populations swelled, water use began to outstrip supply.

Since time immemorial, populations in the area have relied on the Santa Fe River. In the 1700s, acequias were built to divert water for domestic and agricultural purposes. And then in the 20th century, as the city grew, engineers dammed the river to build two reservoirs in the Sangre de Cristo Mountains. For a while, water seemed plentiful.

Then came the boom years. Between 1940 and 1990, Santa Fe County's population more than tripled, from 30,000 to nearly 100,000, and water demand increased on a "classic exponential growth curve," Roach said.

By the time the drought hit in the early 2000s, city water lines drew from those two (fast-depleting) reservoirs and from 21 wells located in and around the city. As the drought progressed, water levels fell to frightening lows. "There was almost no water in the Santa Fe River," Roach remembered. "The wells had been mined and overdrafted for the previous decade, and it was suddenly very difficult for the utility to keep up with demand."

**"There was almost no water in the Santa Fe River."**

### 10,000 TOILETS

Something had to change, so officials set to work, enacting restrictions that limited when and how frequently residents could water their landscapes — and purchasing 10,000 low-flow toilets.

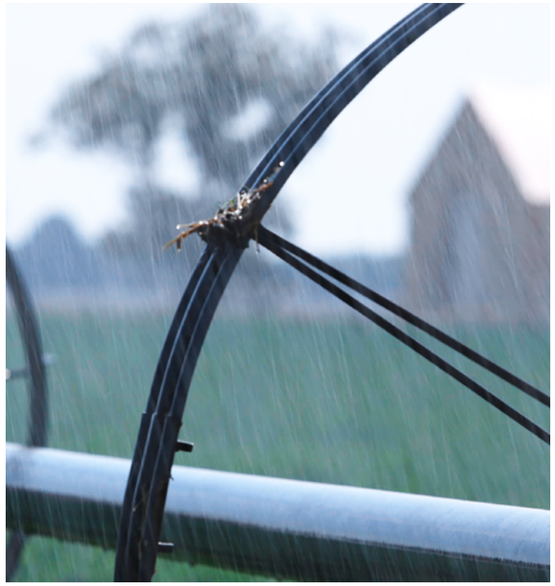
Toilets made before the 1990s often used three times more water than newer low-flow models. By retrofitting existing homes and incentivizing builders to

install efficient toilets in new constructions, Santa Fe officials reduced daily use. The city now incentivizes efficiency in other appliances, too.

Then, in 2007, Santa Fe Water initiated another forward-thinking solution: a two-tiered rate structure. In other words, more water use equaled higher per-gallon rates. “Once you hit that second tier, we’re going to send a strong signal that says, ‘You’re using a lot of water, and you’re going to pay for it on your bill,’” Roach said.

**“Once you hit that second tier, we’re going to send a strong signal that says, ‘You’re using a lot of water, and you’re going to pay for it on your bill,’” Roach said.**

Roach credits those two steps — incentivizing lower-use appliances and implementing a tiered rate structure — along with the strong conservation ethic established during the drought, with helping Santa Fe’s water system come back into balance.



## SAVING FOR ‘A NOT-SO-RAINY DAY’

Today, aquifer levels have bounced back, and the city’s wells mostly serve as a savings account for “a not-so-rainy day,” Roach said. Still, there’s more to be done to prepare the city for a dry, hot future. Experts anticipate New Mexico will have about 25 percent less water in 50 years, and Roach said Santa Fe is already experiencing water shortages as a result of aridification.

Still, he remains optimistic about the future, and he’s committed to using the city’s existing water supply strategically. “Your cheapest next gallon of water is always figuring out how to better use what you already have,” he said.

**“Your cheapest next gallon of water is always figuring out how to better use what you already have.”**

One long-sought-after solution is a plan to get credit for reclaimed water. About two-thirds of the water the city diverts from the Colorado River Basin winds up back in the water treatment plant. Permitting is underway to allow the city to return this treated water back into the river in exchange for credits for more water. If enacted, this plan will stretch a substantial portion of the city’s water three times farther than before.

Roach views the project, known as the San Juan-Chama Return Flow Project, as critical to shepherding Santa Fe through the double-edge sword of climate change and prolonged drought. Environmental groups and some down-stream residents worry about reduced water flows, and the quality of the treated wastewater being returned to the Rio Grande.

## IN SEARCH OF SOLUTIONS

In some ways, Santa Fe’s success might be hard to replicate. It’s uncommon for a city of its size to have so many water sources (Santa Fe River water, diverted Colorado River Basin water and groundwater from two well fields). Santa Fe is also unique in that it is not home to water-heavy industries like large-scale agriculture or manufacturing.

Though there are stories of success in Santa Fe, Roach reminds us that much of the city’s progress came from struggle. “Building that conservation ethic was something that occurred because we went through a really tough time,” he said. “I don’t wish that on other communities.”

Avoiding those tough times will take all of us. New Mexico’s geology is varied, and there’s no one-size-fits-all solution. That means individual communities will need to come together in search of tailor-made solutions that will work for them.

**“Building that conservation ethic was something that occurred because we went through a really tough time,” he said. “I don’t wish that on other communities.”**

# WATER'S ROUTE 66... AND AN AQUIFER THE SIZE OF LAKE SUPERIOR?

## Separating Myth from Reality in Albuquerque's Water System

Photography by LeRoy Grafe

This is the story of Albuquerque's water — where it comes from, how it's used, and how, together, we are making it last.

If you live in Albuquerque, there's a good chance some of the water flowing from your tap journeyed quite a ways to get there.

It started out as snow that collected on the slopes of the San Juan Mountains in southern Colorado. In early spring, as our part of the world warmed, your tap water dripped and trickled its way into tributaries of the Colorado River, building speed as it joined other, larger flows along the way.

Then, about 25 miles outside Chama, New Mexico, something rather marvelous happened to your water. It found its way beneath the towering mountains of the Continental Divide near the Colorado-New Mexico border, rushing through a series of human-made downhill tunnels. This engineering marvel, known as the San Juan-Chama Project, is a kind of Route 66 for water — a fast track to the high desert. Constructed in the 1960s and '70s, it delivers essential water resources, which otherwise would have emptied into the Pacific Ocean or the Sea of Cortez, to people in cities, pueblos, and rural areas in parched Northern New Mexico.

Of course this is just one of the ways water journeys to your tap. Albuquerque, like other large Western cities, can't rely on a single source of water — especially as

**This engineering marvel, known as the San Juan-Chama Project, is a kind of Route 66 for water**

climate change promises to reduce both surface water and groundwater supplies by about 25 percent over the next 50 years.

This is the story of Albuquerque's water — where it comes from, how it's used, and how, together, we are making it last.

## THE TRUTH ABOUT ALBUQUERQUE'S AQUIFER

Today, more than half of Albuquerque's drinking water comes from the San Juan-Chama Project, and the rest comes from underground. But that wasn't always the case. Until 2008, the Duke City relied entirely on its storied aquifer.


Albuquerque's aquifer is the stuff of legend. In the mid-20th Century, geologists and city planners thought it held as much water as Lake Superior. And so, perhaps understandably, burqueños consumed it as such, flushing high-flow toilets with abandon and watering enough lawns to transform Albuquerque into a veritable high-desert oasis.

In the words of then-Mayor Martin Chavez, "If you think you have an infinite resource, using all you want is not wasteful."`

Then, in August 1993, the United States Geological Survey published a study that changed everything. Not only was Albuquerque's aquifer much smaller than originally thought, the city was using water 2-3 times faster than the aquifer could recharge, resulting in drastic drop-offs of the aquifer's level — 140 feet in some areas — in just a few year's time.

"That was an aha moment," says Mark Kelly, the water resources division manager for the Albuquerque-Bernalillo County Water Utility Authority. "We realized we needed to get more serious about conservation, and we needed to diversify our portfolio of water sources."

**"That was an aha moment. We realized we needed to get more serious about conservation"**

The answer, of course, was staring the city in the face. The San Juan-Chama Project had come online in 1971. At the time, many folks in Albuquerque considered the project a boondoggle. With such a vast aquifer, why did the city need more water?

In 2004, construction began on the San Juan-Chama Drinking Water Project, a $450 million infrastructure investment that delivered San Juan-Chama water from the Rio Grande River to a water treatment facility in Albuquerque. Since the project came online in late 2008, Albuquerque's aquifer has recovered by 40 feet in some places, Kelly says.

"We're doing really well," he says. "We're only 84 feet below pre-development levels after 100 years of pumping, and we're on the rise. The goal now is to utilize our aquifer within our working parameters, and we have a lot of cushion there."

**"The goal now is to utilize our aquifer within our working parameters"**

## 'A LEADER IN THE WEST'

But additional availability alone can't save Albuquerque's water future. Conservation and planning are equally critical. Despite a slow start in the aftermath of that shocking 1993 USGS report, Albuquerque residents and city leaders have risen to the occasion.

In 1995, the city set a goal of reducing per-capita water consumption from about 250 to 175 gallons per person per day (GPCD). In the nearly 30 years since, the city has met and exceeded that goal, decreasing consumption to about 125 GPCD.

"We've conserved very well," Kelly says. "If you look at our GPCD, we're a leader in the West, and that's all thanks to the customers and the efficacy of our conservation program."

The Water Authority's current goal is to reach 110 GPCD by 2037. Kelly admits it's getting harder and harder to find ways to reduce our use, in part because ongoing outreach campaigns and rebate programs that incentivize swapping out high-use appliances for greener models have been so effective. To get there, the Water Authority is working hard to promote xeriscaping and the elimination of "nonfunctional" turf grass — that is, grass that's purely ornamental.

"A lot of the low-hanging fruit has already been picked," he says. "It's hard to find a high-flow toilet to replace anymore."

In 2016 the Water Authority developed Water 2120, a plan that envisions Albuquerque's water future. In a bid to ensure a stable availability of water despite an uncertain future, the plan prioritizes ongoing conservation and education, water reuse, and Aquifer Storage and Retrieval (in which unused surface water is stored below ground for future use). The plan is set to be refreshed next year to account for updated climate-change modeling and population-growth projections.

For Kelly, Water 2120 is both a reminder of the need to conserve and evidence of the Water Authority's commitment to a sustainable future. It should serve as both a call to action and a comfort — because the idea that our water outlook is dire simply isn't true.

"The public has worked hard to conserve water," he says. "And yes, we should be concerned about drought and climate change, but no one needs to stop showering or anything like that. We want to make sure the public trusts us and realizes we do have a good plan for utilizing our water resources."

**For Kelly, Water 2120 is both a reminder of the need to conserve and evidence of the Water Authority's commitment to a sustainable future.**

Public engagement was a cornerstone of Water 2120, just as it is a cornerstone of New Mexico's regional water planning process.



Thank you to the New Mexico Interstate Stream Commission planning team including Andrew Erdmann, Sara Fox, Amanda Nezzie, and Maggie Fitzgerald for your role in creating this magazine. Deep gratitude to all NMISC Commissioners, including those featured in these pages.

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