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Abigail Jean Lauten-Scrivner
University of Montana, Missoula

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IS GROWING FOOD WASTING WATER? STORIES FROM A SURGE OF
GROUNDWATER REGULATIONS IN CALIFORNIA

By

ABIGAIL JEAN LAUTEN-SCRIVNER

Bachelor of Science in Journalism, California Polytechnic State University, San Luis
Obispo, CA, 2019

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Approved by:

Scott Whittenburg, Dean of The Graduate School
Graduate School

Dennis Swibold, Chair
School of Journalism

Keith Graham
School of Journalism

Brian Chaffin
College of Forestry and Conservation

Is growing food wasting water? Stories from a surge of groundwater regulations in California

Chairperson: Dennis Swibold

Abstract

This long-form feature story examines how the nascence of California's new era of groundwater regulation is playing out for the farmers, families and agencies who must adapt to a sweeping new law against the backdrop of climate change.

California became the last state in the west to adopt a statewide management plan for the invaluable natural resource when it first embarked on a path toward groundwater sustainability in 2020. Known as the Sustainable Groundwater Management Act (SGMA), the 20-year plan requires California's most depleted groundwater basins to become sustainable by 2040.

When SGMA matured in 2020, California's next drought began the same year. Groundwater use represents about 40% of statewide water consumption during normal years and ascends to 60% during drought. While dry spells are a normal feature of California's climate, drought cycles are becoming more frequent, longer and severe. The demand for groundwater increased over the years while recharge dwindled, creating a time where both the need for and strain upon groundwater has never been more poignant. The drought that began in 2020 has since hit record breaking levels of heat and dryness. Groundwater use in many parts of the state will be slashed over the next 20 years to preserve the resource for the future, as well as halt harmful consequences to drinking water, wildlife and the environment. The region that will feel these changes most is California's Central Valley – a relatively small area that grows food for the entire world while also experiencing the state's worst drought conditions. Just two years into the two decade journey toward sustainability, SGMA is already causing Valley residents who hold groundwater precious to worry about the future of their economy, land and livelihood.

This story relays the hopes, fears and experiences of those who are feeling the impacts of SGMA and climate change. It is told through the lens of those who are working to steward groundwater sustainability into the best possible future for all stakeholders. The narrative explores the concerns the act both addresses and raises, possible equity issues arising from the act's implementation and opportunities for solutions. It is a snapshot into the early days of California's new era of groundwater regulation.

Sidebar

The Sustainable Groundwater Management Act (SGMA, pronounced like the Greek letter sigma) was signed into California law in 2014. Before SGMA, California systematically managed surface water but had no statewide plan regulating groundwater. Groundwater can be thought of as surface water that has sunk into underground basins. Basins become overdrafted when more water is pumped out than is recharged through precipitation. The 2012-16 drought forced lawmakers to address the reality of more frequent and severe dry years, catalyzing a policy shift to actively manage groundwater sustainably via SGMA. Many of the state's basins had become overdrafted, setting off a chain reaction of environmental, economic and public health concerns. Overdraft can cause groundwater levels to sink deeper or become depleted, land to subside, drinking water to degrade and seawater to intrude into fresh water in coastal regions. Each outcome is labeled an "undesirable result" to be rectified by SGMA.

The act defines sustainability as managing groundwater to meet today's drinking, farming and environmental needs while not impeding future generations' ability to do so. SGMA doesn't prescribe a path to sustainability, but assumes groundwater is best managed locally with state oversight. The act established a new body of decision-makers by creating local Groundwater Sustainability Agencies (GSAs) tasked with managing the state's overdrafted basins. GSAs are formed from existing regional agencies like irrigation districts, county boards and city governments. Decisions are made by a board of directors comprised of members of those regional agencies, and sometimes citizen stakeholders representing agricultural, environmental and domestic interests. Since groundwater basins don't fit neatly into jurisdiction boundaries, basins are often managed by multiple GSAs. Over 340 GSAs have been formed for 142 basins.

GSAs managing California's 21 most "critically overdrafted" basins were given until January 2020 – six years from SGMA's passage – to submit a Groundwater Sustainability Plan (GSP) to the state Department of Water Resources (DWR) outlining how to reach sustainability by 2040. GSAs for lower priority basins have until January 2022 to submit GSPs that achieve sustainability by 2042. Basins managed by multiple GSAs must coordinate and submit all GSPs together. The DWR finished reviewing the first 21 plans in 2021. Thirteen were deemed incomplete due to deficient planning and sent back to the GSAs for revision within 180 days. If GSPs continue to be rendered incomplete, the State Water Resources Control Board will step in to take control of the basin.

Is growing food wasting water? Stories from a surge of groundwater regulations in California

A vein of towns run down California, beginning at its dry, crooked elbow and heading south to its dusty wrist. Cities reach for each other between farmland connected by Highway 99 – a lawless freeway that some say is the deadliest four lanes of potholed asphalt in the nation. Mile after mile, outsiders deem the Central Valley a blight on the Golden State. Too hot, too dull, unsafe. A place to brake for cheap gas while speeding from LA to San Francisco. Folks outside of California scarcely spare a thought for this place that fills their tables with its harvest.

Yet this overlooked valley will determine the fate of water in California. No place has more to gain or lose as the state grapples to save groundwater for the future via a nascent 20-year plan that must navigate politics, economics and the changing climate.

Water stored beneath the ground's crust is like the reserve fuel left in the tank when a car's gas light flicks on. As the reserve supply saves the car from sputtering out before the next station, groundwater tides California's over between droughts when surface water runs low. Cached deep below in aquifers, this buried treasure rises from nearly 40% of the statewide water supply to 60% during drought.

Dry spells, a cyclical feature of California's climate, are becoming intensified by climate change into more extreme and dangerous patterns. So far, this is the driest year in 128 years of record keeping. Three multi-year droughts have withered the land since the turn of the 21st century compared to just one during the preceding 22 years. The new century also triggered a new trend: each of the state's 58 counties declared emergencies during each drought, reflecting the unavoidable impacts of a warming climate upon California's coasts, valleys and mountains. The outcome is that year after year, the state became more dependent on shrinking levels of groundwater.

“The state took an extremely long time to put any actual management of groundwater in place. For a very long time it was the wild wild west in the Central Valley, where agriculture got to pump and pump and pump,” says Nataly Escobedo Garcia, a water policy coordinator with Valley-based advocacy group Leadership Counsel for Justice and Accountability. Unlike California's complex system of surface water rights, which dictate who can use the resource and how much, groundwater was left largely up to the discretion of property owners entitled to pump however much they wanted or could afford.

For decades, government turned a blind eye toward the precarious levels of water below, its gaze fixed upon slaking California's thirsty \$50 billion agricultural economy. The cost is that the Central Valley is literally sinking. As NASA data shows, in the worst places, the earth's surface is now 30 feet lower than it was just 100 years ago. Known as subsidence, this happens when more water is pulled out of the ground than sinks back in. Groundwater basins, made from layers of aquifers, collapse.

Besides irreversibly degrading groundwater storage, subsidence destroys infrastructure like roads, bridges and levees. Hundreds of millions in taxpayer dollars have been spent repairing subsidence-caused damage since the 1960s, including a \$187 million project that broke ground in January to restore a canal. Since its construction in 1951, over half of its flow capacity has been lost to subsidence.

Yet in a time when the political left, right and center rarely see eye to eye on whether water is wet, over-pumping for the sake of the economy provides a rare middle ground. “This is a perfect example of bipartisan resource exploitation,” says Jim Brobeck, a water policy analyst with Chico-based advocacy group AquaAlliance. “It can’t last.”

Better known for Bay Area tech and Hollywood movies, California quietly produces about 13% of the nation’s agriculture. Over a third of the country’s vegetables and two-thirds of its fruits and nuts are grown here, according to the state Department of Food and Agriculture. Most comes from the quilt of fields and orchards in the 450-mile-long Central Valley. Modern water infrastructure capitalized on the Valley’s fertile soil and extended growing season, transforming the Mediterranean landscape into one of the most agriculturally lush parts of the world. Dairy, almonds, walnuts and grapes flourished here on large industrial farms that sapped the ground of water. Now that precious supply is shrinking and sinking, falling further out of reach.

When drought struck, those able to pay the tens of thousands of dollars to drill deeper or construct new wells adapted by tapping into that receding supply. Rural households and small farms that couldn’t bear the cost turned to the mercy of their more fortunate neighbors or waited in a queue for trucks to arrive hauling heavy tanks of liquid gold. Groundwater recharge requires consistent, plentiful cycles of rainfall and snowmelt. Between over-pumping and droughts that are more frequent and severe, California has been driving with the gas light on for years. Now, the reserves are running close to empty.

Meanwhile, over-pumping and one of the worst droughts in recent history worked in tandem to parch thousands of shallow household wells. The long, hot dry spell brought California’s water crisis to a boiling point in 2014, when then-Gov. Jerry Brown signed the Sustainable Groundwater Management Act (SGMA). The swoosh of his pen made California the last state in the West to officially manage its groundwater. The law still didn’t kick in for another six years. Finally in January 2020, regions with the most depleted supplies – mostly in the Central Valley – embarked on a 20-year voyage to manage the resource sustainably by 2040.

The next drought started that same year. It hasn’t let up since.

The abruptly dry skies caught many Californians unaware – a fact that some water policy experts say borders on naivety. “We have been warned since the beginning that we will have another drought,” Garcia says. “It was not if but when.”

It also presented the state with a quandary: How can groundwater use be cut amid drought, the very time it's needed the most?

How California answers that question will decide the winners and losers of SGMA. In the Valley, where some of the state's poorest members of the working class live alongside some of the nation's richest agricultural producers, the stakes are higher than anywhere.

Anyone with stereotypes of California hippies should visit a Valley town. There's a phenomenon where lifelong residents twang like Texans. It's not wholly inappropriate, given the pastures and farmland.

Lloyd Pareira, a generational dairy farmer and elected Merced County supervisor, speaks in that drawl. His county straddles the 99 in the very center of the Central Valley. Dirt roads contrast with the sparkle of UC Merced – the University of California's newest institution. Miles from the city limits, the state-of-the-art university known for its science and engineering programs is nestled between almond orchards in one of California's most productive dairy counties. Yet, the university offers no undergraduate agriculture major. For farmers, that omission is an alarm bell.

Merced's juxtaposition underscores the changes in many of the Valley's disparaged counties. Locals gripe about traffic and out-of-towners – transplants from more glamorous parts of California who swarmed the Valley to escape egregious costs of living and crowding, overwhelming one-horse towns where developers seldom used to invest. Longtime residents of the last affordable corners of the state watch their rents inflate while builders scramble to construct more apartments. As these last pieces of the Golden State's final frontier are settled and developed, the process looks to many locals like gentrification.

For those with deep Valley roots like Pareira, SGMA is an important part of that change. He took on a new role as chairman of the Merced Subbasin Groundwater Sustainability Agency (GSA) when the act matured in 2020. The role has become another part-time job. Formed from regional agencies like water and irrigation districts or city and county governments, these local groundwater advisory boards are responsible for developing and implementing Groundwater Sustainability Plans (GSPs) under SGMA.

Pareira frequently puts in 20 hours weekly between researching, planning and attending local meetings and conferences with the state. It's a full time job for new county staffers hired because of the act. Pareira's county alone has already applied for \$8 million in grants to cover the staff hours, administration, reports and projects needed to ensure its groundwater can provide for current and future needs.

Up and down the 99, other regions are doing the same. California's 2021-22 budget set aside \$171 million in grants to help those counties, with another \$60 million coming in the next two budget cycles. The state Department of Water Resources (DWR) has granted

nearly \$260 million in SGMA funding so far. Plus, a state funding package secured \$5.2 billion for drought response and long-term water sustainability. “There's nothing like this,” Pareira says of the act. “I’ve been in ag and I've been in California all my life, really. I’ve never seen anything like this.”

Pareira knows groundwater use must be curbed for the sake of preserving his county’s farming economy long-term. He knows the law could help the environment and his grandkids all have a better future. Subsidence is plunging some areas near Merced County down by about two feet annually, NASA reports. Of 42 household wells that dried up in Merced County within the last year, state records show only five have been fixed. But Pareira also dreads what might happen to his county, and his country, if the act liquidates California agriculture.

A 2020 study by UC Berkeley estimates that SGMA-caused cuts combined with surface water restrictions will retire one million acres, or one fifth, of Valley farmland within the next two or three decades to halt the consequences of over-pumping. The grim projection accompanies an annual loss of \$1.9 billion in income for farmers and \$7.2 billion in farm revenue. Fresno and Kern Counties would feel these changes most painful, with estimates adding to over \$600 million farm income lost annually in each.

Merced County farmers are expected to lose \$69 million in operating income while 41,054 acres are fallowed. It’s no wonder that Pareira sometimes feels he is staring down calamity.

In his worst-case scenario, he imagines the act triggering a domino effect of catastrophes that could end the life that he, and his parents and grandparents before him, have known. He envisions produce becoming almost exclusively imported from places like Mexico, where bans on pesticides and herbicides are lax. California farm workers lose their jobs. He fears more people will rely on the government for support while tax revenues slip. As the nation relies on other countries for more of its food, he sees heightening national security risks and a potential food shortage if relations with import countries turns sour. “Everybody thinks we’re not vulnerable to these types of things,” Pareira says, trailing off and letting his words hang in the air with an unspoken warning.

In a more optimistic vision, Pareira is more concerned than scared. If estimates come to fruition and as much as 20% of Valley farmland is put out of production, it won’t be farmers like Pareira who suffer but the laborers who work for him.

“Well, my kids are still going to go to college. I'm still going to survive,” Pareira says. “But 10 of the families that are working for me are going to lose their jobs.”

His blunt words sound troubled in Pareira’s honeyed drawl. A devout Christian, Pareira often begins meetings with a prayer for those who are struggling with mental health, illness or poverty. He appeals to those in a position to help their community. Those 10 families who might lose their jobs, many of them migrant workers and undocumented

immigrants, frequent his thoughts and prayers. Pareira may be largely unaffected by SGMA, but he says he wants to be part of the solution.

Garcia says she wishes more agricultural advocates' attitudes aligned with Pareira's sense of responsibility for his workers. But her activism with Leadership Counsel for Justice and Accountability has shown her that Pareira is in the minority.

To Garcia, the farm owner's lament that SGMA will hurt laborers most is a form of "economic blackmail" that borders on insulting. She sees it as an attempt by those in power to distract the vulnerable from the groundwater crisis, pitting their economic needs against the human right to water. "(Farm owners) are asking someone to choose between a job and the water in their homes," Garcia says. "They're failing to take responsibility."

Garcia comes from a long lineage of agrarian workers. Her family had a farm in Mexico until the country's financial emergency in the 1980s, when they sold the property and moved to California. Many of her kin have labored in the fields since. Many feel exploited and would choose to do something else if they could, she says. Garcia's hope for SGMA is that it creates an inflexion point for laborers like her relatives to transition into better careers. "We don't want people to lose their jobs, but we don't want people to be exploited," she says.

Pareira says the county is working to create new, higher paying employment. Many of those jobs aren't in the agricultural sector, though. The beacon of opportunity is the long-neglected former Air Force base that was abandoned in the '90s, taking with it people's jobs and livelihoods. After a long campaign to reinvent it, Google now leases land there to test self-driving cars. The success of that program has other tech companies expanding similar ventures.

Hailed as a cutting-edge new frontier for Merced County, the futuristic self-driving car business and the jobs it creates couldn't be further from working the land. While Pareira acknowledges that the tech companies have brought hope for his county, there's a feeling that this way of life is going the way of the former Air Force base.

That fear is tempered by the unshakeable cultural pride rural Californians hold for their agrarian lifestyle. The resiliency of agriculture is murmured like an invocation throughout the Valley. Weathering uncertain drought spells and sudden surface water cuts dictated by "the folks in Sacramento" is seen as a strength, a testament to endurance, innovation and adaptability. The answer to farmers' problems, though, has long been to pump more groundwater.

Two years into SGMA, that culture hasn't changed. Growers across Merced's southern border in Fresno County learned in March that the irrigation district canceled its planned surface water deliveries entirely, with no plans to release any in the foreseeable future. In an interview with ABC30 though, the irrigation district manager reassured readers that growers could still pump groundwater to farms and ranches.

A similar situation occurred on a statewide scale that week when the DWR announced the State Water Project, a network of reservoirs and canals that delivers water all over California, would cut allocation from an expected 15% to 5% of requested supplies. There's little doubt growers will reach deep into their pockets for groundwater to cover that loss.

Pareira points to this as a double standard, asking how the state can enforce SGMA's groundwater cuts while also withholding surface water. "The number one tool to mitigate groundwater over-pumping is surface water," he says. "The state wants to take it away from us."

When asked whether he feels more optimistic or worried for the future though, Pareira returns to his litany of faith. "My experience is that farmers tend to get stuff done," he says.

Two hundred miles up the 99, farmer and crop consultant Steve Gruenwald is less certain about how long agriculture's resiliency can last.

Gruenwald too is frustrated by the twofold tension of surface and groundwater scarcity. But he's more blunt about the problem. His hopes for increased surface water from the state or SGMA cultivating a better future is mitigated by a cynicism reinforced by drought and climate change. "If we don't have rain, it's all moot," he says.

Every few dozen miles between Merced and Gruenwald's Tehama County, sun-bleached billboards display the pale face of a little boy. Seemingly perplexed, he scratches his blonde head, dimmed eyes staring down drivers as they're confronted with the question: "Is Growing Food Wasting Water?" Interspersed between those signs are others that beseech viewers to "Pray for Rain" and "Stop the Politician-Created Water Crisis." The billboards rattle by on the bumpy 99 like an echo chamber resounding the questions, hopes and fears that keep drought-struck California up at night.

Gruenwald runs a little 160-acre diversified farm. He mostly grows "ammonds," as said in the particular dialect of this region, but also has some walnuts, corn and pumpkins. The latter two crops become a haunted corn maze and you-pick pumpkin patch each autumn. For over two decades, Gruenwald's land has welcomed the gleeful shrieks of children celebrating Halloween with the sweet smell of hay and caramel apples.

He now also serves on his local groundwater advisory board. Like Pareira, Gruenwald knows something must be done. But the dread he feels is more personal.

"The very large farms are getting larger every year. I think it is coming at the expense of family farms, like mine," Gruenwald says. "I think there's going to be more consolidation into larger growers, as the smaller growers are not able to make it in this environment."

Those growers are selling out. They're saying, 'We're done, family farms can't continue this way.'"

Gruenwald has seen small, diversified operations like his replaced by large swaths of thirsty monocrop almond, walnuts and pistachio orchards that can pay to pull water up from down deep, often over a thousand feet. Almonds alone have more than doubled in the last two decades, according to the Almond Board of California. The U.S. Department of Agriculture reported in 2020 that statewide acreage rose over 5% to about 1.6 million acres. Those orchards have replaced both perennial and annual crops, including less thirsty corn, tomatoes and fava beans. That same year, California's overall farming economy decreased by 3.3% while exports increased by 3.4%, according to the state Department of Food and Agriculture. Among the top five exported commodities were almonds, pistachios and walnuts.

At first glance, it seems a paradox that lower-demand crops are swapped for water-hungry orchards under SGMA. The enigma clears with a second glance at the economy. Less accessible groundwater supply means more expensive groundwater. The looming financial consequences of the act for the agricultural industry encourages farmers to make up the loss the best they can. The resiliency of agriculture has turned farmers to the less labor-intensive, higher yielding profitability of almonds, pistachios and walnuts.

"Almonds have proven to be very profitable crops. We cannot prescribe the crops people grow," says Josue Medellin-Azuara, a UC Merced environmental engineering professor who oversees the Merced Water Systems Management Lab. As long as watering ravenous nut orchards make good business sense, they'll continue to grow, he says.

Meanwhile, Gruenwald's neighbors' shallow domestic wells, only a couple hundred feet deep at most, go dry. Nearly 140 Tehama County household wells have stopped pumping in the last 365 days. Three have been fixed.

This year's record precipitation dearth came as an additional blow. Little to no groundwater recharged – a desperate fact for small farms or households unable to drill deeper. Even those who can afford to pump from further below may think better of it, as the temporary fix comes at the cost of exacerbating subsidence. "We can't continue to mismanage the groundwater the way we have done. It's kind of the Wild West in terms of who can dig the deepest well," Gruenwald says. "That's got to end."

One way that could happen is to pay farmers to take their land out of commission. The state's Multibenefit Land Repurposing Program would do just that. Leveraging \$50 million, the program reimagines farmland as solar fields or parks and restores floodplains and other wildlife habitat that patchworked the Valley before being lost to urban and agricultural development. The hope is that the hundreds of thousands of agricultural acres retired could transform into benefits for community's health, economy, water supply, habitat and climate, while reducing groundwater use. The program also aims to avoid creating conditions that, between drought and fallowed land, could lead to another Dust Bowl.

But which farmlands would be retired? Will being paid to repurpose their business appeal more to big agricultural producers or to humble-sized farms like Gruenwald's that are already feeling the heavy weight of SGMA?

Joshua Viers, a watershed scientist and UC Merced professor, projects that hobby farmers and small agricultural operators will take the check first. It will be in the interest of the big-money farms to hold out, he says. The result would be that less farmland is in production, but most of it is owned by a few large businesses with monocrop, water-intensive orchards. "I think that the peak of California agriculture has happened, we just don't know it yet," Viers says.

A monopolized, monocrop future is concerning for the environment and economy, but some advocates view the descent down from agriculture's peak as an opportunity. While the shrinking appears increasingly inevitable, the impact to the state may not be as acute as farmers warn. Agriculture's \$50 billion output represents about only 2% of the state's goliath economy, which is bolstered by even stronger manufacturing, transportation, technology, entertainment and construction industries.

The myth of the West as a land of unlimited opportunity fostered unfettered economic ambition at the expense of finite resources. The Central Valley looms large in California but is only small dip in the globe. Rather than asking, "Is Growing Food Wasting Water?" the question, perhaps, should be whether it's too big of an ask to task this little region with feeding the world.

Brobeck, his colleagues at AquAlliance and other advocacy groups think it is. Their hope for SGMA is that it will force California's economic ambition to better align with the Valley's actual output ability.

"If we continue to think we can feed the world by the agricultural pursuits in the Central Valley, if we overextend ourselves, the whole system could collapse," Brobeck says. "California can certainly feed itself. If the whole system collapses, then we won't."

Where farmers' warnings ring true isn't on a statewide scale, but regionally in the already disenfranchised Valley. More than half of its residents live in some of the most socially and economically disadvantaged areas of California, falling into the Healthy Places Index's bottom quarter. The index assigns a score to neighborhoods based on health community conditions, assessing factors including economics, education, transportation, access to healthcare, housing, and air and water quality.

Proponents of leveraging SGMA to shift farm laborers to more promising careers must address the question of how to make that transition without causing the mayhem Pareira imagines. Farm work generates about 400,000 Valley jobs, not including food manufacturing, packaging and transportation. "Where it gets complicated is there aren't a whole number of alternatives for the Valley," Viers says.

Viers and a team at UC Merced are working out how to enable the best possible transition by bringing alternative jobs to the Valley. Although the university offers no basic agriculture degree, it does have an agricultural technology program in the college of engineering. To Viers and other like-minded educators, this is the future. The Valley's farm labor force must adjust to the mechanization of agriculture to survive by bringing agricultural technology innovations to the communities that grow the food, he says. The program recently received an initial investment of \$30 million from the state.

"It's this weird bending of worlds toward each other," Viers says of agriculture and technology. "And the Valley will have to be part of this solution."

Anne Dawson resides just over the county line from Gruenwald in Butte on a modest three-acres dappled with native Valley Oak trees. Although technically retired, Dawson fills her days serving on the Vina GSA Stakeholder Advisory Committee as a domestic well representative.

Dawson was never involved with public policy before SGMA. She initially volunteered for the committee to be a voice for domestic well owners, without any sort of agenda. Dawson, a proponent of Valley agriculture, speaks with pride about how the bounty her community grows feeds the world. But as meetings went by, Dawson felt her sense of comradery with her farmer neighbors wilt.

"I suppose I was pretty naive, thinking that most of the time I would be voting with the farmers, because I think water for food production is really pretty important," Dawson says. "But I was soon disillusioned, because my impression of the farming approach is that it's, 'Pump as much as I want. Let the water go down as much as I can, and to hell with the future,' which really surprised me."

Dawson's well dates to the 1950s, when groundwater was cached less than 20 feet below. Last fall it was 80 feet down. The Vina groundwater plan submitted to the state allows it to sink another 60 to 80 feet – a historic low – before being deemed an "undesirable result" that could trigger state intervention. Hundreds of shallow domestic wells would be dewatered as high-volume ones keep drilling to the bottom. The price to drill last year was about \$100 per foot. Between the cost of labor, infrastructure and drilling, projects often add up to \$30,000, far beyond what many domestic users can afford. "That's a huge chunk of money," Dawson says. "I think that is grossly unfair."

Those who'd rather pray for winter rain and hope enough falls to replenish their existing wells have another option. Water tank companies are busy during Valley summers, trucking thousands of gallons to rural homes waiting, sometimes weeks, for their turn.

Delivery and fill-up costs ran about \$200 for 2,000 gallons in Dawson's community last year – a decent rate, she says. But that water isn't drinkable. It must be boiled or treated. Many choose to buy bottled jugs from the store, another expense. Then the tank runs low

after a couple months. The average American household uses over 300 gallons of water per day, according to the Environmental Protection Agency. So comes another water delivery, and another, as the summer shines on. Well owners eye the forecast, uncertain whether rain and recharge will even come. What adds up in cost is doubled in inconvenience.

Dawson warned the groundwater plan could perpetuate this cycle for domestic well owners. The Board heard her but didn't listen, she says. Part of the issue, she believes, is a difference in perspective between herself and a majority of its agriculturally minded members.

“For domestic well owners, water is a utility,” Dawson says. A dry well is like a power outage that can last for seasons. It disrupts everything. “Whereas farmers think of their wells primarily in agricultural terms,” she says. “This is their livelihood. No water, no crops, no money. The domestic well is kind of a secondary issue (for them).”

Three of the five-person Vina groundwater board are individuals with direct or indirect ties to agriculture. It's no wonder a farming community would form a local board dominated by agriculturally inclined folks. Boards throughout the Valley, including Merced, look similar. While they reflect the historic and economic interests of the region, residents such as Dawson feel they overlook the everyday needs of residents like her.

Domestic well owners are further underrepresented because ordinary citizens lack the organizational structure that's long existed in agriculture. Farmers belong to well-oiled county, state and national interest groups like the Farm Bureau, Agricultural Council of California, American Dairy Products Institute and Almond Board of California. These organizations had SGMA on their radar long before isolated household well users. As Dawson found, few people like her were prepared, able or willing to volunteer their time. Since the act grew teeth in 2020, domestic well Facebook pages have cropped up for members to share news and resources. But these grassroots groups have significant catchup to do.

Albeit better organized than everyday folks whose entry into SGMA was the plight of their household water, environmental groups say they're also struggling to be heard. Brobeck serves alongside Dawson on the Vina GSA Stakeholder Advisory Committee representing environmental interests. His priorities are different than Dawson's, but his experience is similar.

“I'm very concerned that SGMA is masquerading as something to protect the environment, to protect groundwater users, while catering to the people in position to take advantage of this emerging water landscape,” Brobeck says. By people in position to take advantage, Brobeck means those already well placed in the political and agricultural world. “They're continuing this unending thirst trying to figure out how to squeeze more water out of the system.”

While Dawson advocates for her property's well, Brobeck speaks for her Valley Oaks. The same plan that threatens to dewater her well could choke the trees, as groundwater descends out of their roots' reach. These oak forests are home to 67 nesting bird species, more than any other known California habitat, according to the U.S. Forest Service. Two years of operating at historic lows permitted by the Vina plan would kill the urban oak forest, Brobeck says. "These magnificent icons of California botany would be eliminated."

As with Pareira, SGMA's rollout often provokes Brobeck's thoughts to spiral into a worst-case future. He fears it won't go far enough soon enough to protect groundwater. Brobeck envisions saltwater intrusion contaminating depleted groundwater basins on the coast, turning coastal freshwater marshes salty. Further inland, his beloved Valley Oaks and other trees starve as groundwater sinks, exacerbating California's desertification. The dead, dry land further degrades the Valley's already noxious air quality and Valley Fever, a disease caused by soil fungus that gets into the lungs and causes fever, fatigue, a headache, sometimes death.

If SGMA is a coin, on one side is Pareira's economic catastrophe and on the other Brobeck's environmental collapse. Since the state flipped it in 2020, each man has held his breath, watching it tumble in the air, waiting to see which side is up once it lands in 20 years. Perhaps each is praying that, miraculously, it lands on its side.

While Pareira has faith in agriculture's resiliency, Brobeck's anxieties are quelled by conviction in the planet. In a more optimistic scenario, Brobeck sees the groundwater crisis as a disturbance cycle, like a fire ripping through a forest and regenerating new life. The process is destructive, but serves as a necessary reset once the ashes settle. "Maybe what we're experiencing in this millennia, maybe this disturbance has some role to play in the regeneration of our planet," Brobeck says. "I feel optimistic that earth abides. If I pray, I pray for a soft landing."

Environmental groups like Brobeck's AquAlliance aren't going to leave SGMA's fate to the heavens, though. The group filed a lawsuit against the Vina proposal and two others in February. The suit asserts the plans represent a threat to an unsuspecting public dependent on groundwater, as well as the rivers, trees and species that are supported by healthy aquifers.

By the time the act's 20-year timeline concludes, it'll be rare to find a plan without a similar suit against it. The way those suits take shape will carve the path of groundwater's future.

Dawson hopes either the law or the state will help household wells, and Brobeck wishes the same for the trees. The DWR is still reviewing groundwater plans, but those turned in earlier offer some optimism. The state sent over half of the groundwater plans submitted in 2021 back to local boards for revision, often because they didn't adequately protect domestic wells. Whether household well owners – or the state – find those revisions sufficient remains to be seen.

In the meantime, drought and descending groundwater continue to starve thousands of wells throughout California. And that means Evelyn Soltero is busy.

A self-described “bootstraps kind-of-gal,” Soltero is a one-woman show. She runs her business All About Wells from her Nevada County home, about 70 miles northeast from Dawson and ascending 1,000 feet up into the Sierra Nevada Mountains. A handwritten sign, penned in highlighter on printer paper, is taped to Soltero’s bathroom wall, right above the toilet roll. “Please only flush if you go number two. Water is a precious resource,” it reads. Water occupies her every moment.

Soltero moved from the Bay Area in 2003 to her 10-acre, four-horse, three-dog, two-well property to teach high school science. Soon she heard students lamenting problems with their family’s wells – an issue Soltero didn’t expect downhill from the Sierra’s snowmelt-rich peaks. “And then my wells started to run dry,” she says. “I knew we had a bigger issue here.”

Already equipped with a biology degree, Soltero went back to school for a master’s in geoscience from California State University, Chico, specializing in hydrogeology. She learned how to diagnose and treat her own wells’ malaise, but that wasn’t enough. Soltero says she knew too much to keep it to herself. In 2013, in the midst of the last big drought and one year before SGMA’s inception, Soltero started her business.

Now, Soltero is a home-visit doctor for wells. She does a couple house calls a week to properties needing care, typically reporting symptoms of muddy water or no water at all. Each are side effects of groundwater sinking beyond a well’s grasp.

Her process begins with a well test to gauge its distress. Then she walks the land, identifying whether the troubles can be ameliorated through a few adjustments to the property or the client’s lifestyle. If not, she reluctantly recommends the more surgical option of drilling deeper or constructing a new well in a better, wetter location.

People contact Soltero to doctor a specific problem, but she uses the relationship to teach preventative care. Many folks, some formerly from the Bay Area like her, move to the rural county without any sense of the logistics that come with remote life. Newcomers use precious groundwater to pressure wash driveways or fill manmade ponds, then run out of water to drink and call Soltero in a panic.

Soltero preaches how to make a well system resilient by using the natural landscape to capture precipitation, allowing it to seep into the ground and recharge a well. Most importantly, she encourages clients to shift their thinking away from “owning a well” to “living with a well.” That shift from ownership to relationship is key to sustaining a well’s life, she says.

A bit of a lone wolf in temperament and trade, Soltero knows no one else who does what she does. She anticipates a busy summer. “Drought is good for me,” she says, a sardonic edge to her tone. “I get an influx in business.”

Soltero refers to her wells as “kids,” often lapsing into a collective “we” that includes both herself and the two underground pits. Last year, Soltero’s own home became one of her patients again when the two kids got sick, each pumping only a trickle. “We’re not recharging,” she says. “It’s like 2014 all over again ... This doesn’t look very good. I may have two dry wells this year.”

Rather than tunnel deeper, Soltero is “babysitting” the wells and letting them rest, hoping for recharge. Meanwhile, she’s living off a 4,000-gallon tank that lasts two, maybe three, months. She treats the drinking water but despises it, apologizing for the “horrible bleach taste.” The flavor may seem unremarkable to a visitor, but to those accustomed to the purity of fresh snowmelt, it’s downright offensive.

Most people lack the knowledge or time to undertake the effort Soltero does tending to her wells. Most opt for the less complicated option of digging deeper or building a new one. But with groundwater descending and drought continuing, many of Soltero’s clients are paying up to \$40,000 and burrowing over 800 feet down. She’s watched some customers dig a few hundred feet, never hit water, and give up because they couldn’t afford to go further.

Drilling and Soltero’s preferred method of working with the land are each becoming less feasible. But asked if there could come a point when she’d give up and abandon her property, Soltero says, “There will never be an end to the benefit of stewarding the land, even if adaptability ends.”

Soltero may know of no other individual with a job like her’s, but her mission and optimism are reflective of what SGMA is trying to do at a larger scale. Whether it is up to the task is a question that begs to be answered by those who stand to gain and lose most.