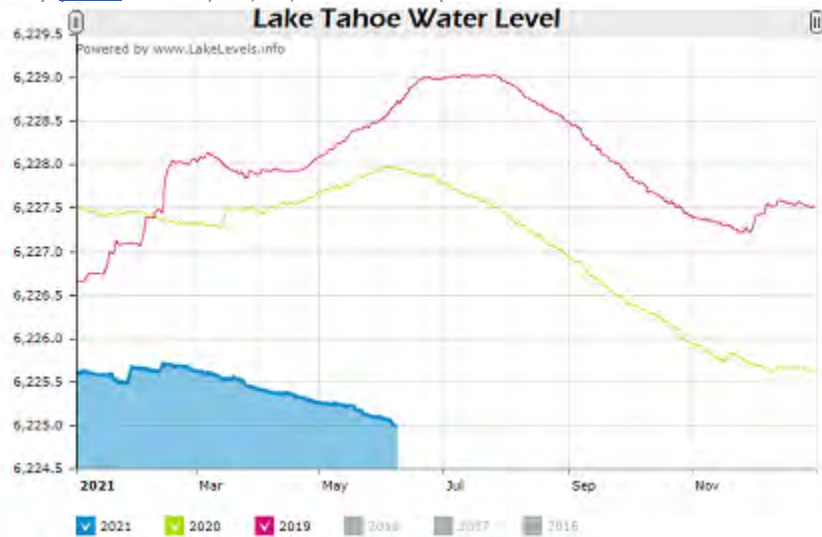


Whose water is it? Lake Tahoe water levels dropping quickly as demand increases

Submitted by [paula](#) on Tue, 06/08/2021 - 4:23pm



By Paula Peterson

LAKE TAHOE, Calif./Nev. - Those watching the level of Lake Tahoe know it is dropping quickly, and it's not just because of a lack of snowfall this year and another year of drought.

Understanding why the lake drops, and who causes it to drop (yes, there is a person - the watermaster), is key to knowing why the lake should be at its natural rim of 6,223 feet above sea level by the beginning of August. As of June 8 the lake is two feet above that rim.

The surface of Lake Tahoe is 22 miles long and 12 miles wide and 191 square miles. The shoreline length is 75 miles and with an average depth of 1,000 feet, there is a lot of water in this jewel of the Sierra, 36.15 cubic miles or 39,000,000,000 (trillion) gallons of it, in fact.

So much surface water that 360,000 acre-feet of water evaporate from Lake Tahoe in an average year - enough water to flood 360,000 acres of land to a depth of one foot or supply water to about 360-720 families for a full year (California households use between one-half and one acre-foot of water per year for indoor and outdoor use).

The lake fills every year from snow and precipitation that falls on its surface and comes through the streams in the Tahoe Basin watershed.

Water is let out at the one outlet at the dam at Tahoe City which is under the control of the Federal Watermaster. But how much, and why?

Every gallon that leaves Tahoe is spoken for and is divided up through court decrees with input through a consortium of sorts of those who have a piece of the water pot.

The Truckee River Operating Agreement (TROA) was implemented in 2015 that provides the management of the water and summarizes the water and hydrologic data needed to send the water from Tahoe on its way to those downstream. TROA meetings are held monthly with all partners, the Pyramid Lake Paiute Tribe, State of California, State of Nevada,

Washoe County (Reno, Sparks), City of Fernley, Truckee Meadows Water Authority, and the federal government. They work out the water use for the region.

Things changed in the drought year 2015 as water recipients didn't want water stranded in Lake Tahoe since once the lake hits its natural rim, the dam won't flow. Prior to TROA, Tahoe water was stored for Nevada, and now California can store it in Tahoe. TROA was the culmination of decades of "deliberative and careful water resource planning designed to address concerns over future water supply. TROA replaces the rigid and inflexible water management system for the Truckee River," according to the Truckee Meadows Water Authority 20-year water plan. It replaced the decades-old court decrees originally designed to serve agriculture, small hydroelectric plants, now defunct paper mills, and a small, rural community. Now they can adapt to future variability of climatic, hydrologic, and economic conditions while taking advantage of unused storage space in federal reservoirs.

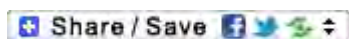
2021 is a drought year, and all demand for water is coming from Lake Tahoe, according to Chief Deputy Water Master Dave Wathen. Reservoir levels are dropping across California and those who have rights to Tahoe water want it now before it's too late.

Parties of TROA can get credit for water they don't use in a year, and there has been accumulated water credit in Lake Tahoe over the last few years. Wathen said they don't want their water trapped in the Lake Tahoe Basin when the dam closes and they want it now. Plus, they'd like it before evaporation takes what they can use. More water is lost to evaporation that is released at the dam.

Release at the dam will remain high. Full demand is 500 cubic feet (CSF) per second and the release has been averaging at closer to 400 CSF. There will also be plenty of water left in Tahoe when you think about the average depth is 1,000 feet and the dam not functioning when the lake is below the natural rim.

There is not much water in other storage areas like Boca and Prosser reservoir. Wathen said a lot with credits want to move them to Boca and Prosser for the future so they don't have to only get water when the dam flow allows it.

The water rights through TROA are scheduled to change all the time just as the amount of water available changes. Wathen said everyone works together under an operating agreement where people have a right to establish credits and they also share expectations and work on the plans. In California, there is also another monthly meeting of the Truckee River Watershed Council that covers local interests including recreation, fisheries, and the environment through multi-agency collaboration.





ALL THINGS DROUGHT

RESOURCES, TIPS AND THE LATEST INFORMATION ON THE 2021 DROUGHT GRIPPING THE WEST

This page is a resource for all things drought – where you can find real-time reservoir levels, drought severity maps, special reports, a newsfeed of current developments and general background on droughts in California and the West, as well as answers to common drought questions and tips for how you can save water at home.

What is Drought?

Drought – an extended period of limited or no precipitation – is a fact of life in California and the

West, with water resources following boom-and-bust patterns. During California's 2012-2016 drought, much of the state experienced severe drought conditions: significantly less precipitation and snowpack, reduced streamflow and higher temperatures. Those same conditions reappeared early in 2021, prompting Gov. Gavin Newsom in May to declare drought emergencies in watersheds across 41 counties in California.

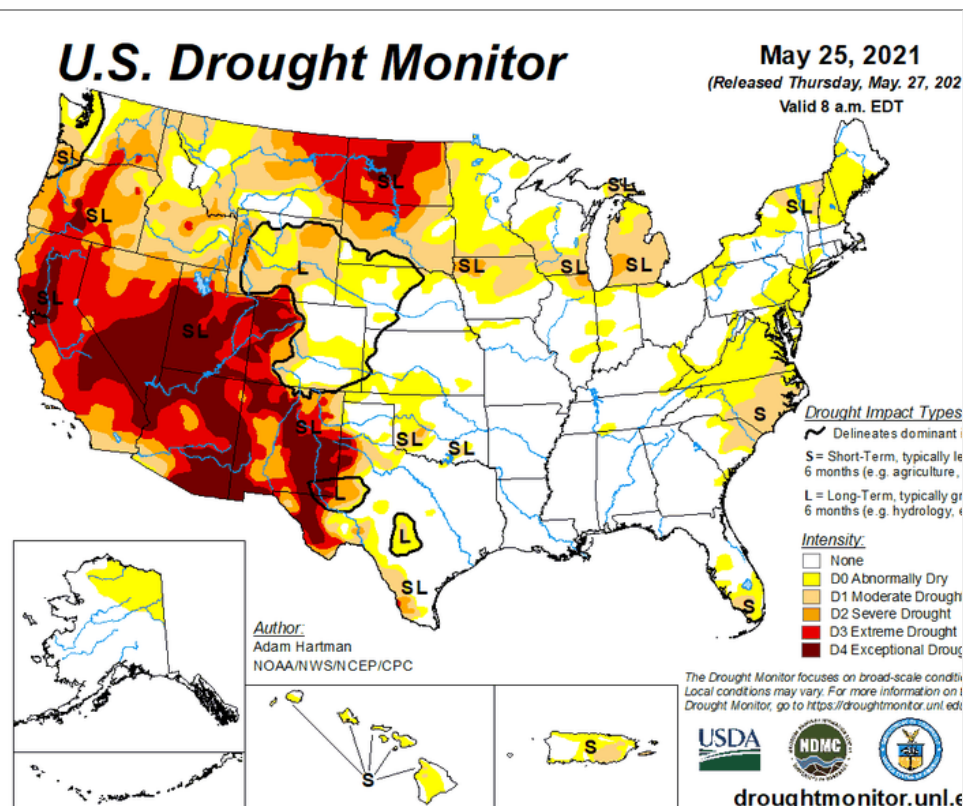
No portion of the West has been immune to drought during the last century and drought occurs with much greater frequency in the West than in any other region of the country. Between 2000 and 2020, the Colorado River Basin experienced the driest 21-year period in the 115-year historical record. **Read more** about droughts and their impacts in [Aquapedia](#), our online water encyclopedia

Find the latest news on drought in California and the West in **our newsfeed devoted to the topic.**

See how drought is changing weekly across the West:



[Lake Oroville shows the effects of drought in 2021.](#)



Drought FAQs:

- [All Your Drought Questions Answered By The Water Education Foundation](#)

Real-Time Reservoir Storage:

- Department of Water Resources: [Daily Reservoir Storage](#)
- DWR: [California Major Reservoir Levels \(interactive\)](#)
- Bureau of Reclamation: [Daily Central Valley Project Storage](#)
- Bureau of Reclamation: [Lower Colorado River Reservoirs](#)
- NOAA: [Colorado River Basin Reservoirs \(map\)](#)

Water Supply Forecasts:

- DWR: [Water Supply Forecast](#)
- NOAA: [Colorado Basin River Forecast Center](#)
- NOAA: [Western Water Supply Forecasts \(NOAA\)](#)

Drought Resources:

- DWR: [Drought Page](#)
- State Water Board: [Drought Page](#)
- US Geological Survey: [California Drought Page](#)
- NOAA: [National Integrated Drought Information System](#)

Other Water Resources:

- USGS: [National Water Dashboard](#)
- USGS: [Water Alert/Map](#)
- NOAA/Desert Research Institute: [Western Regional Climate Center](#)

Water Conservation Advice:

- [State Water Board Water Conservation Portal](#)
- [Save Our Water Portal](#)
- Water Education Foundation Tips:
 - [How to Save Water Inside and Outside Your Home](#)
 - [Food Facts: How Much Water Does It Take to Produce...?](#)
 - [Up Close and Personal: Water Use At Home](#)

Reports & Studies:

California Department of Water Resources

- [California's Most Significant Droughts](#)
- [Drought in California](#)
- [Countywide Drought and Water Shortage Contingency Plans](#)

Bureau of Reclamation

- [Water Reliability in the West: 2021 SECURE Water Act Report](#)
- [Colorado River Basin August 2020 24-Month Study](#)



[Gov. Gavin Newsom discusses drought-response funding on May 10, 2021, at San Luis Reservoir in Merced County.](#)

Research Centers

- [Public Policy Institute of California Water Policy Center](#)
- [Stanford University's Water in the West](#)
- [Colorado River Research Group](#)

Water Education Foundation **Western Water Articles:**

- California Weighs Changes for New Water Rights Permits in Response to a Warmer and Drier Climate: [Read article.](#)
- Milestone Colorado River Management Plan Mostly Worked Amid Epic Drought, Review Finds: [Read article.](#)
- Questions Simmer About Lake Powell's Future As Drought, Climate Change Point To A Drier Colorado River Basin: [Read article.](#)
- Can a New Approach to Managing California Reservoirs Save Water and Still Protect Against Floods?: [Read article.](#)

[Go here](#) to see all of our *Western Water* articles on all key water issues.

A Final Thought on Drought:

“And it never failed that during the dry years the people forgot about the rich years, and during the wet years they lost all memory of the dry years. It was always that way.”

~John Steinbeck, in “East of Eden”

Have a resource to add to this page? Contact Doug Beeman, our news and publications director, [via email](#).

REFERRING PAGES

POSTS

Drought FAQs

California is no stranger to drought. When conditions become dry, water storage declines and water conservation mandates make news headlines; questions from the public often surface about what appear to be easy solutions to augment the state's water supply. But the answers can be complicated and, in the end, there is no silver bullet to ensure a resilient water supply, especially during drought.

We explore “frequently asked questions” often posed by the public and provide answers below. Simply click on the question for the answer to appear.





FOR IMMEDIATE RELEASE**PRESS RELEASE**

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STATE AGENCIES CALL ON WATER MANAGERS TO PROMOTE WATER CONSERVATION

SACRAMENTO, June 9, 2021 – With California experiencing its second consecutive dry year, the California Public Utilities Commission (CPUC), the State Water Resources Control Board (State Water Board), and the California Department of Water Resources (DWR) called on local and regional water suppliers to increase their conservation efforts, develop a contingency plan in the event of water supply problems, and urge Californians to save water amid ongoing dry conditions.

Sustained preparation and drought planning are critical to meeting the challenges posed by ongoing dry conditions, which have been exacerbated by the effects of climate change. Most of California's water systems were able to manage drought impacts and maintain the high quality of water delivered to their customers during the last drought by taking actions early.

With widespread drought or near-drought throughout many portions of the state, Governor Gavin Newsom has declared a state of emergency for 41 counties – representing 30 percent of the state's population – and the state is moving urgently to address acute water supply shortfalls while comprehensively building water resilience.

In response to Governor Newsom's emergency proclamations, the State Water Board sent [notices to public water utility managers](#) yesterday encouraging water source contingency and conservation planning as we head into summer and face the possibility of another dry year in 2022.

Water systems that project they will face water shortages and be unable to meet demands should contact the appropriate State Water Resources Control Board Division of Drinking Water District Office. For a map of district offices and their contact information, visit waterboards.ca.gov/drinking_water/programs/districts.

DWR is using its [household water supply shortage reporting system](#) and other tools to track where domestic wells are going dry and coordinate response efforts, including urgent financial assistance. DWR and other state agencies are also partnering with local water suppliers to promote conservation tips and messages through the [Save Our Water campaign](#), which remains a trusted information source on using water wisely.

To encourage Californians to reduce water use and conserve supplies, the CPUC is [calling on](#) water utilities under its jurisdiction to remind consumers of water conservation best practices learned from the 2012-16 drought and encouraged water utilities to promote water conservation programs. For additional information about the CPUC's work to prepare for drought, lessons learned from the 2012-16 drought, and information regarding voluntary water conservation efforts, please visit www.cpub.ca.gov/droughtinfo.

To learn more about current conditions, the state's response, and informational resources, please visit the state's drought preparedness website: <https://waterresilience.ca.gov/drought-preparedness>.

How is the Western U.S. drought impacting the power grid?

by Lauren McLaughlin, North Carolina State University



Credit: Pixabay/CC0 Public Domain

The western United States is currently experiencing severe drought, particularly in [California and the Southwest](#). As of June 10, [88.5%](#) of the West was in moderate to exceptional drought, compared to 42.17% at the same time last year.

Drought is often associated with an [increase in wildfires](#), which were seen across the region in 2020. However, it can also impact the nation's electrical system, potentially leaving millions of people without air conditioning and other essential services.

We reached out to Jordan Kern, an assistant professor of forestry and environmental resources at the College of Natural Resources, to learn more about the drought and its potential impact on the power grid. Check out the Q&A below for expert commentary from Kern, whose research focuses on water and energy systems analysis.

What is causing the drought?

The drought is mostly being caused by abnormally low precipitation (i.e. snow). Across the West Coast and in the Southwest, the availability of surface (river, lake) water is determined primarily by how much it snows/rains in the winter. Winter snow melts during the spring, and the snowmelt flows downstream from higher altitude areas until it is captured by dams and reservoirs, which are used to store the water and deliver it gradually to the people and places that need it (farmers, urban areas).

When it doesn't snow or rain much during the winter, less water flows in rivers and into reservoirs. Especially if multiple consecutive years experience low precipitation levels, water availability in reservoirs can become very low.

Large year-to-year swings in precipitation are normal out West, and these ups and downs tend to be "noisier" and more extreme than the longer-term trends we might observe. But there is growing evidence that climate change is causing the West to experience a gradual decline in snowmelt and surface water availability.

How is the drought impacting power sources in the West?

The most direct impact of hydrologic drought on the power sector is a loss of hydropower. The less it snows, the less water there is behind hydroelectric dams, and the less "fuel" there is for producing hydropower.

During drought, hydropower that is "lost" has to be replaced by something, and that is almost always electricity that is produced by a natural gas and/or coal-fired power plants. This results in higher carbon dioxide emissions, and higher electricity prices in wholesale power markets. In other parts of the U.S. drought can also negatively influence thermal power plants (coal, natural gas and nuclear) that rely on water from rivers and lakes as a coolant. But those issues are much less common in the West.

In addition, if drought years are associated with higher air temperatures (this is sometimes the case out West), those higher temperatures can simultaneously increase people's demand for electricity for cooling (air conditioning). Low water may also impact demand for electricity in other sectors, including how much pumping energy is used to move water from one place to another and/or irrigate crops.

Apart from these impacts, one of the biggest concerns in a place like California is that the drought will increase the risks of wildfire, which can then be triggered by malfunctioning electrical equipment. In recent years, California's largest electric utility, PG&E, was forced to declare bankruptcy due to financial obligations related to wildfires caused by its equipment. During high-risk fire periods, large portions of the state's grid are also pre-emptively shut down to avoid accidentally starting a fire.

Are consumers and industry likely to be affected by these impacts on the power grid?

In electricity markets, drought reduces the supply of relatively inexpensive hydropower and forces utilities and system operators to rely on more expensive, fossil fuel alternatives. In the short term, this does tend to increase market prices for electricity, and the resultant higher costs borne by some utilities can be passed down to consumers. It can vary widely how quickly utilities are able to pass on those costs to consumers in the form of higher retail electricity prices.

Wildfire related costs for electric utilities are a bigger, messier issue. In some cases, states might prohibit utilities from passing those costs on to customers if a utility is found liable.

When is the drought's impact on the power grid likely to end?

The effects of the drought on the power sector will mostly impact the grid this summer, which is when hydropower would normally be abundant during the snowmelt period. Late summer and fall is always the driest period of the year out West, and hydropower is in short supply even in a non-drought year. It may not be until winter that the region has an idea of whether the drought will also stretch into 2022 or beyond.

What can western states do to prepare for future drought-related impacts to the power grid?

For states that rely a lot on hydropower, drought will always be a risk for the grid, but it's one that can be managed by building extra power capacity of other types (e.g. natural gas) that can ramp up production during dry years. In states where drought poses water shortage risks for thermal (coal, natural gas and nuclear) power plants, one option is to change the type of cooling system that these plants rely on to newer systems that can remain operational even when less water is available in rivers and lakes.

Provided by [North Carolina State University](#)

Citation: How is the Western U.S. drought impacting the power grid? (2021, June 14) retrieved 12 July 2021 from <https://phys.org/news/2021-06-western-drought-impacting-power-grid.html>

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PFAS Action Act clears House energy committee

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JUNE 16, 2021

WASHINGTON – Today, a House Energy and Commerce Subcommittee advanced the PFAS Action Act, which directs the Environmental Protection Agency to quickly reduce and remediate the toxic “forever chemicals” known as PFAS.

The PFAS Action Act of 2021, introduced by Michigan Reps. Debbie Dingell, a Democrat, and Fred Upton, a Republican, would create a national drinking water standard for select PFAS chemicals, designate PFAS as hazardous substances, limit **industrial discharges** (<https://www.ewg.org/interactive-maps/2020-suspected-industrial-discharges-of-pfas/map/>) and provide \$200 million annually to assist water utilities and wastewater treatment facilities.

“We need deadlines to ensure that the EPA will take the necessary steps to reduce PFAS releases into our air, land and water, to filter PFAS out of tap water and to clean up legacy PFAS pollution, especially near Department of Defense facilities,” said **Scott Faber** (<https://www.ewg.org/news-insights/our-experts/scott-faber>), EWG’s senior vice president for government affairs. “We applaud Reps. Dingell and Upton for continuing to make PFAS pollution a priority.”

PFAS are manufactured chemicals that have so far been found in the drinking water of more than 2,000 communities. They are persistent, bioaccumulative and toxic. These chemicals have been linked to harmful human health effects, including cancer, reproductive and developmental harms, and weakened immune systems.

To protect our air, land and water from harmful PFAS contamination, the PFAS Action Act would:

- Require the EPA to establish within two years a national drinking water standard for the two most notorious PFAS chemicals – PFOA, formerly used to make DuPont’s Teflon, and PFOS, formerly an ingredient in 3M’s Scotchgard – that protects public health, including the health of the most vulnerable populations.
- Designate PFOA and PFOS chemicals as hazardous substances within one year and require the EPA to determine whether to list other PFAS within five years.
- Designate PFOA and PFOS as hazardous air pollutants within 180 days and require the EPA to determine whether to list other PFAS within five years.
- Require the EPA to place discharge limits on industrial releases of PFAS and provide \$200 million annually for wastewater treatment.
- Prohibit unsafe incineration of PFAS waste and place a moratorium on the introduction of new PFAS into commerce.
- Require comprehensive PFAS health testing.
- Create a voluntary label for PFAS in cookware.

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and more than 200 million Americans.

In January 2020, the House passed an earlier version of the PFAS Action Act by a vote of 247 to 159, with backing from 24 Republicans. But then-Senate Majority Leader Mitch McConnell (R-Ky.) blocked consideration of the bill.

“It’s time for the EPA to act,” Faber said. “The EPA has known PFAS were toxic since at least 1998 but has failed to protect us.”

###

The Environmental Working Group is a nonprofit, non-partisan organization that empowers people to live healthier lives in a healthier environment. Through research, advocacy and unique education tools, EWG drives consumer choice and civic action.



The American West is drying out. Things will get ugly

Analysis by [Zachary B. Wolf](#), CNN

Updated 4:42 PM ET, Sun June 20, 2021

A version of this story appeared in CNN's What Matters newsletter. To get it in your inbox, sign up for free [here](#).

(CNN) — The incredible pictures of a depleted [Lake Mead](#), on the Nevada-Arizona border, illustrate the effects of drought brought on by climate change.

Later this year, the US government will almost certainly declare the [first-ever water shortage](#) along the Colorado River. Maps show more than a quarter of the US is in "[exceptional drought](#)," underscoring the scope of a decades-long dry-out.

Stories are popping up across the West of possible rationing, coming restrictions and looming standoffs between farmers and the government over the most precious natural resource.

DROUGHT AND CLIMATE CRISIS

- Take a look: [The West's historic drought in 3 maps](#)
- The United States' largest reservoir is draining rapidly. The shocking numbers behind [the Lake Mead drought crisis](#)
- [An eighth of the US population is sweltering under a record-breaking heat dome](#). Climate change is making it worse

Restrictions. States like Arizona and Nevada are almost guaranteed to have their water allotment from the Colorado River cut back, which through a complicated drought contingency tier system [agreed to by states in 2019](#) will affect farmers first. But the warning signs are there for urban areas and surrounding states to conserve and evolve.

In the San Francisco Bay Area, served by a different water system, [residents are being asked to reduce water usage by 15%](#) compared to 2019. Houseboats were removed from the state's second-largest reservoir because the water level fell so low. The hydropower plant at the same reservoir may be [forced offline for the first time because of low water](#).

Standoff. To the north, there's a sharp disagreement in Oregon between farmers cut off from water to irrigate their potatoes and federal officials trying to save an endangered species of fish.

When CNN's Lucy Kafanov reported from the Klamath Basin last week, she did her live shot from the [parched bottom of a lake that should be feet deep](#).

The farmers set up shop in a tent outside the canal headgate and were all but threatening to break in and open the gates themselves, like they did 20 years ago.

The most visible and striking effect of the heat and drought is at Lake Mead, which is at its lowest levels since it was filled during construction of the Hoover Dam in the 1930s.

Now for an aside on the Hoover Dam, government spending and climate change.

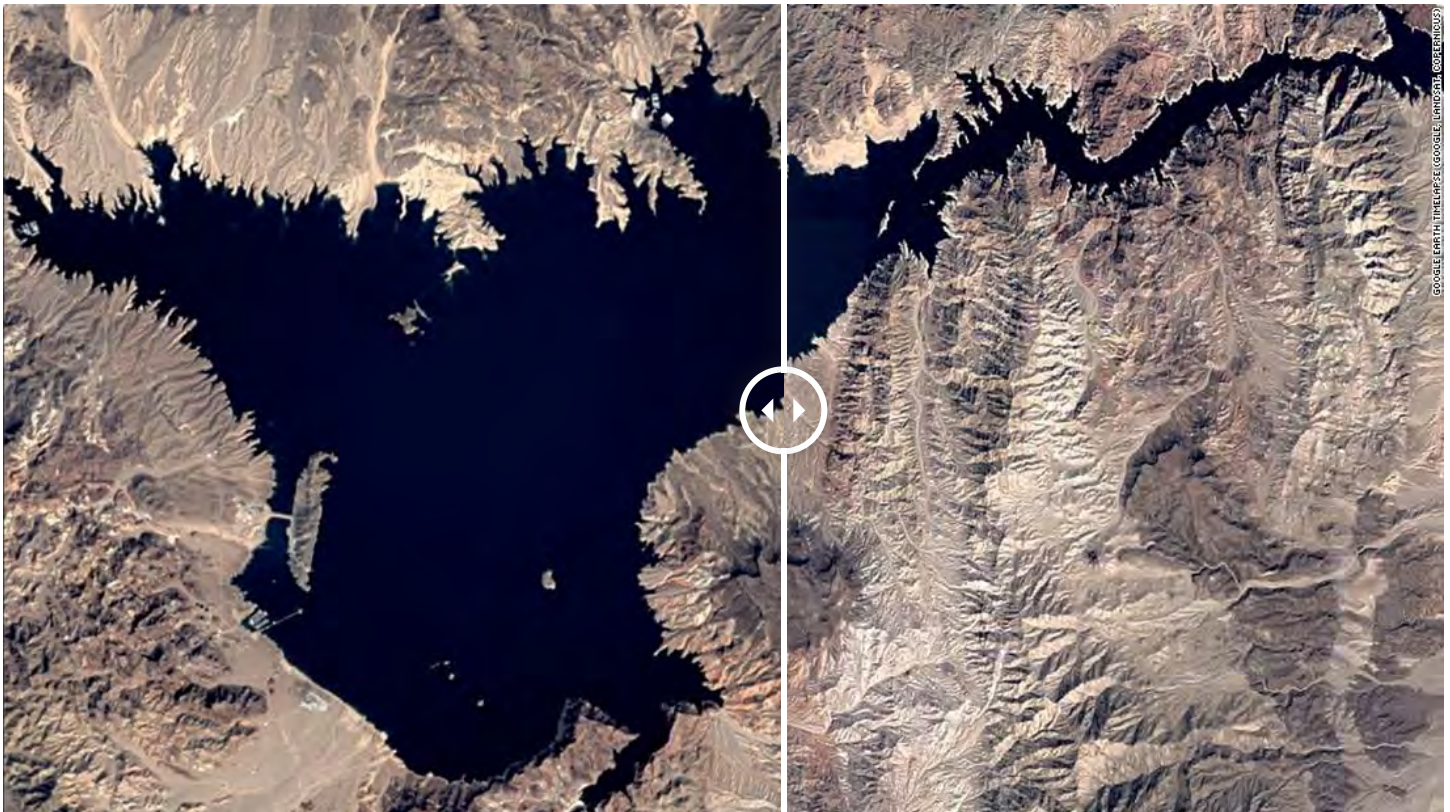
The dam: Talk about an infrastructure project! President Joe Biden came to office promising a New Deal-level investment in infrastructure. That'll be pared back by three quarters if he's to get any Republican help passing it,

Government spending: The latest bipartisan proposal includes \$5 billion to help address the Western water shortage, although larger pots of money are meant to improve water and power infrastructure; the dam, with less water behind it, is producing less energy.

Climate change: But while lawmakers are happy to find a way to spend money on infrastructure as long as they don't raise taxes, there's zero agreement with Republicans to do anything directly about climate change, which is helping this drought along. Democrats may try to go it alone and pass a much larger infrastructure bill that seeks to address climate change, but it's not clear they'll have the votes.

Long time coming. The water at Lake Mead has been slowly falling for years. In 2015, [CNN went to see St. Thomas](#), a former town of 500 people that was bought out by the government and submerged under 60 feet of water for the sake of Lake Mead. St. Thomas emerged from the depths as the water lowered. And kept lowering.

The 2000 vs. 2021 image comparison is incredible.



GOOGLE EARTH TIMELAPSE (GOOGLE, LANDSAT, COPERNICUS)

Remember, 40 million people living across seven Western states and Mexico get their water from the Colorado River system.

The entire West is dry. CNN's climate team put together [three maps to bring perspective to the historic drought](#).

The current drought map shows the 88% of the Western part of the country in some shade of red and the East almost entirely unfazed.

They could have added a fourth with this heat map as the [West bakes in record temperatures](#).

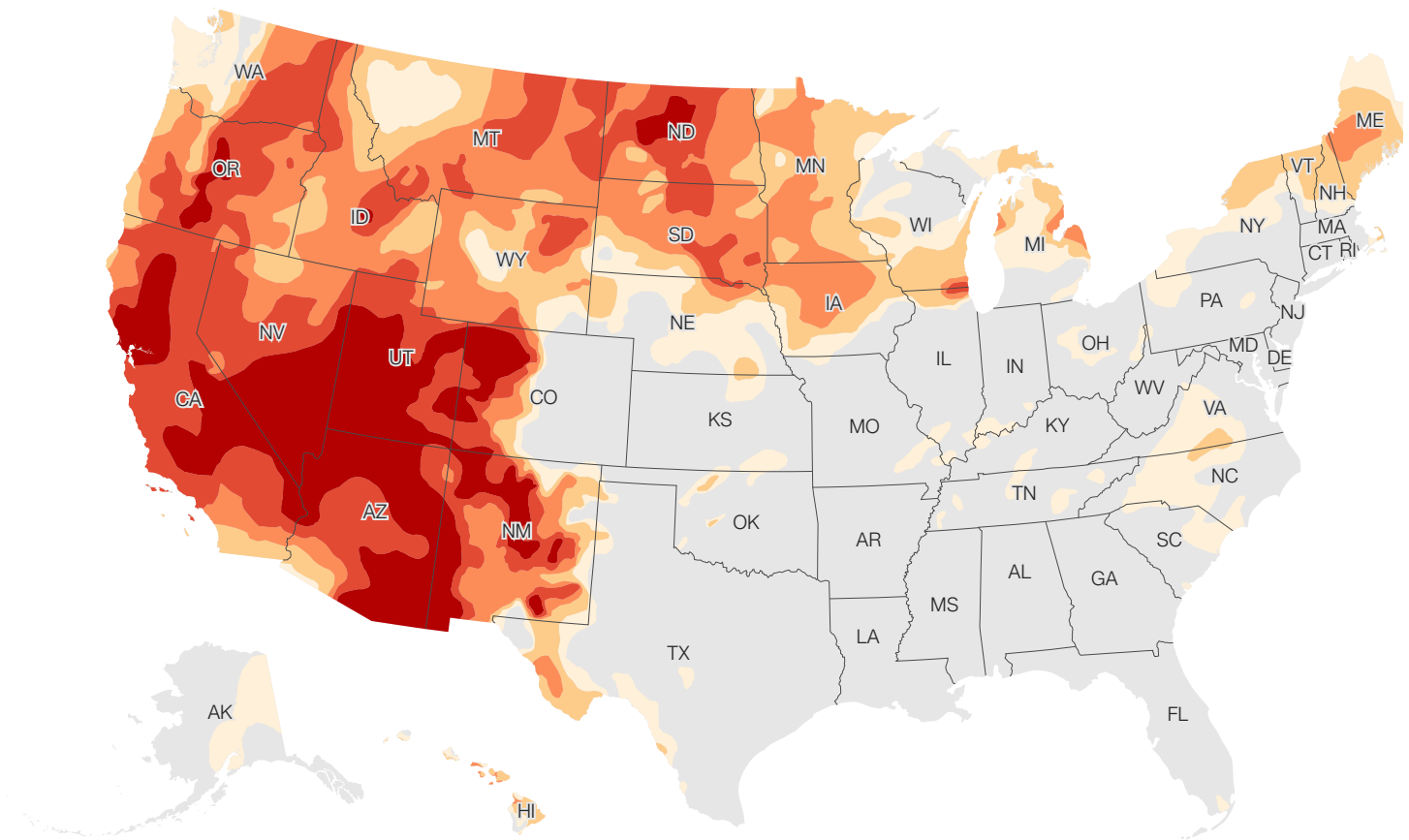
Decades of drought. The Intermountain West -- between the Rockies, the Cascades and the Sierra Nevada Mountains -- has technically been in a drought for decades, since 2000. It's a vicious cycle: Hot weather leads to drought, and drought leads to hot weather.

Drought envelops the US West

Weather forecasters fear exceptional drought conditions observed in Western states could lead to severe fire conditions.

Abnormally dry
Severe drought
Exceptional drought

Moderate drought
Extreme drought



Data is reported weekly. Map updated Thursday, July 8 and represents analysis as of Tuesday, July 6.

Source: US Drought Monitor

What makes a drought "exceptional?" It's interesting to look at what goes into these maps, which are quite alarming with all the deep red. The data is maintained by the [University of Nebraska-Lincoln](#) in partnership with government agencies. They have very specific criteria that's unique to each state for delineating between "extreme drought" and "exceptional drought."

The criteria they list for "exceptional drought" in California is not far from apocalyptic:

- *Many recreational activities are affected*
- *Fish rescue and relocation begins; pine beetle infestation occurs; forest mortality is high; wetlands dry up; survival of native plants and animals is low; fewer wildflowers bloom; wildlife death is widespread; algae blooms appear*
- *Policy change; agriculture unemployment is high, food aid is needed*
- *Poor air quality affects health; greenhouse gas emissions increase as hydropower production decreases; West Nile Virus outbreaks rise*
- *Water shortages are widespread; surface water is depleted; federal irrigation water deliveries are extremely low; junior water rights are curtailed; water prices are extremely high; wells are dry, more and deeper wells are drilled; water quality is poor*

We know the short-term effects of this drought will be restrictions and new rules. What's harder to see is the longer-term effects, although it's a broader look at water and drought that makes the dire predictions of [climate refugees fleeing parts of the country](#) that become too hot or arid, or the breakdown of water sharing systems and agreements.

That seems both a long way off as humans turn their attention toward using less water and finding new ways to capture it, store it and reuse it. But those far-fetched predictions seem all too close when the nation's largest reservoir is literally drying up.

CORRECTION: An earlier version of this story misstated the location of Lake Mead. It sits on the Nevada-Arizona border.

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Another Dry Year On The Colorado River Could Force States, Feds Back To Negotiating Table

KUNC | By [Luke Runyon](#)

Published June 23, 2021 at 5:21 PM CDT



Lake Mead's bathtub ring is growing larger this year, as the nation's largest human-made reservoir declines to its lowest level on record.

Colorado River water managers could be pulled back to the negotiating table as soon as next year to keep its biggest reservoirs from declining further.

The 2019 Drought Contingency Plan was meant to give the U.S. and Mexican states that depend on the river a roadmap to manage water shortages. That plan requires the river's biggest reservoir, Lake Mead, to drop to unprecedented levels before conservation among all the lower basin states -- Arizona, Nevada and California -- becomes mandatory. California isn't required to conserve water in the reservoir until it drops to an elevation of 1,045 feet above sea level.

Lake Mead is currently at its lowest level since it was first filled in the 1930s, at roughly 1,069 feet. Lake Powell is projected to hit its lowest level this summer.

"Right now we're in an unprecedented time," said Michael Bernardo, the federal Bureau of Reclamation's Lower Colorado Basin river operations manager.

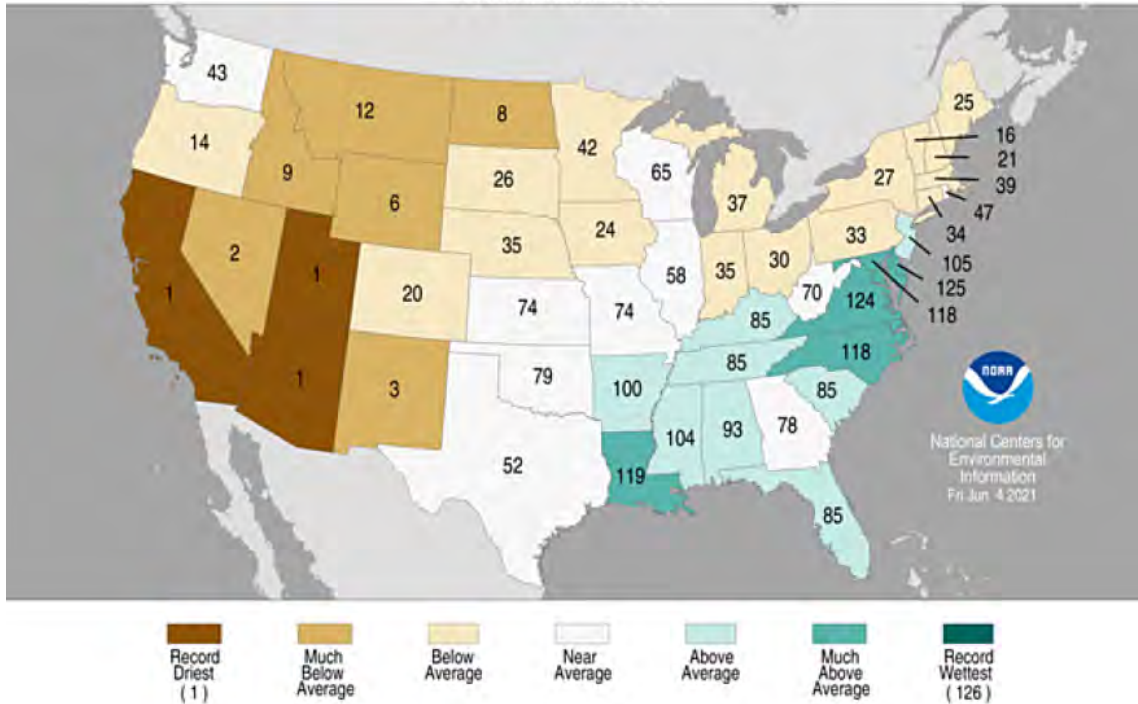
The last 12 months, from June 2020 to May 2021, have been the driest on record in three of the basin's seven U.S. states: California, Arizona and Utah. That same period was the second driest for Nevada and third driest for New Mexico.

Another consecutive dry year will amplify the alarm bells already ringing in the basin, Bernardo said.

"Should 2022 be as dry as 2021 is currently, I think you'll start to see a lot more activity in the basin states and the senior principals in the federal government to get together to work on the next proactive agreement to reduce risk further," Bernardo said.

Statewide Precipitation Ranks

June 2020 – May 2021
Period: 1895–2021



Climate change is altering the water cycle in the Colorado River basin. Rising temperatures diminish Rocky Mountain snowpack, increase evaporation from streams and reservoirs, and sap moisture from the ground. Those factors combine to reduce the region's overall water supplies. A failure to reduce demands at the same magnitude has left the region facing imminent shortages.

The Upper Basin Drought Contingency Plan was recently [put in action](#) to develop guidelines for reservoir releases to be made to prop up Lake Powell. [A conceptual program](#) called demand management, which would create a market to pay large users not to divert their legally-entitled share of water, is not yet functional. Water officials in Colorado have assured skeptical farmers that the program's establishment is "not a foregone conclusion," and that participation would be voluntary.

The Drought Contingency Plan was billed as an overlay to the Colorado River's existing guidelines, established in 2007 and set to expire in 2026. Without the drought plan, [federal officials said](#) during its development, the system that supplies 40 million people in the Southwest faced risk of failure.

"I think that it's way too early to say whether the drought contingency plans work," Bernardo said. "I don't think it has gotten a chance to work yet. And I think we're going to have to go into these lower lake elevations to actually see these increased water savings contributions."

A first-ever federal water shortage declaration in the river's lower basin is expected this August.

This story is part of ongoing coverage of the Colorado River, produced by KUNC and supported by the Walton Family Foundation.

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Luke Runyon

As KUNC's reporter covering the Colorado River Basin, I dig into stories that show how water issues can both unite and divide communities throughout the Western U.S. I produce feature stories for KUNC and a network of public media stations in Colorado, Utah, Wyoming, New Mexico, Arizona, California and Nevada.

[See stories by Luke Runyon](#)



A distribution center under construction in North Las Vegas on Wednesday, March 29, 2017. In cities, heat is amplified by manmade materials. (Jeff Scheid/The Nevada Independent)

Indy Environment: When record-breaking summer heat hits, the effects of warming are far from equal

Good morning, and welcome to the Indy Environment newsletter.

In case you missed it: We published an in-depth piece about the planned Thacker Pass mine [on Sunday](#). Over the past few months, photojournalist David Calvert and I spent several days in the communities closest to the mine, and we talked to local residents about their concerns.

A brief programming note: I'll be taking a little time off next week, so the newsletter will be on a hiatus. As always, we want to hear from readers. Please let us know what you're seeing on the ground and how issues are affecting you. Email me with any tips at daniel@thenvindy.com.

If you received this from a friend, [sign-up here](#) to receive it in your inbox.

Climate change is making hot summer days more common and more pronounced. Last week, Las Vegas broke heat records for mid-June, as did Reno. But each new record only tells a part of the story. In reality, heat is not static, and it is not equally distributed across a city. The way we experience hot summer days goes beyond any one number.

As a warming climate drives up temperatures, certain neighborhoods of Las Vegas and Reno experience heat more intensely than other areas due, in part, to how cities were developed and what is known as the urban-heat island effect. In urban settings, heat is absorbed and amplified by our infrastructure — things like buildings, roads and parking lots.

And urban heat varies across a city, creating a differential. Parks, vegetation, open space and shade work to help offset the heat-island effect — and those features are often more predominant in affluent areas.

“When it’s reported that it is 115 [degrees] in Las Vegas, that’s a single measurement at a single location,” said Kristen Averyt, the state’s climate policy coordinator and a research professor at UNLV who is studying urban sustainability. “But at any given time, temperatures can be upwards of 10 degrees warmer or 10 degrees cooler depending on where you live in town.”

Combining satellite imagery and census tract data, researchers have mapped this in multiple studies. New research, published by Nature Communications in May, found that in most major U.S. cities, low-income populations and communities of color, on average, are exposed to higher levels of summer urban heat than white and wealthy populations.

Glenn Sheriff, a co-author of the paper, said that going in, researchers believed income would likely be a driving factor of heat inequality. Sheriff, an assistant research professor at Arizona State University with a background in economics, assumed that home prices would be more expensive in cooler neighborhoods. The results turned out to be more complicated.

The study found, across the United States, that the intensity of urban heat for a person of color, on average, is “practically identical” to the heat exposure of a person living below poverty.

In Las Vegas, the study found that people living below the poverty line, on average, have more heat exposure than people living two times above the poverty line. At the same time, people of color, on average, have more exposure to urban heat in Las Vegas. In Reno, the same was true.

But when researchers compared the intensity of urban heat for people of color with people living below the poverty line in Las Vegas and Reno, they came to different conclusions.

In Las Vegas, those living below the poverty line experienced more heat exposure, on average, than people of color by a margin considered statistically significant.

Reno, on the other hand, looked more like the rest of the country. People of color, on average, experienced slightly more exposure to urban heat (by about 0.4 degrees Celsius) than people living below poverty.

That raises a serious question: What are the drivers behind the data? Researchers are still studying the issue, and there could be a range of intertwined answers, from historic (and often discriminatory) housing policies to where local governments made public investments.

“The heat is not seeking out a demographic,” said Jake Dialesandro, a Ph.D. candidate studying thermal inequality at the University of California, Davis. “But it does get amplified in these areas that have high impervious surfaces, a lower tree canopy and a lack of green space.”

Last year, Dialesandro co-authored a paper that looked at the unequal distribution of urban across the Southwest, including in Las Vegas and Reno. The paper identified some of the widest disparities in California’s Inland Empire and Palm Springs. But it also found heat disparities in low-income and Latino neighborhoods across Nevada’s two major cities.

Findings related to income differences and thermal disparities are particularly concerning in a warming environment with more days of extreme heat. What it means, Dialesandro said, is that “populations with the least amount of resources to mitigate heat see the most unequal burden.”

“If you are poor and worried about paying your rent, you don’t have that luxury of taking the monetary resources you have and distributing it to your electric bill,” Dialesandro said.

Compared to other natural disasters, heat is often overlooked and underreported. Heat waves can be slow-moving, and their effects can compound over time. But experts and activists in Nevada are increasingly looking at the disparate way heat interacts with urban environments as one of the most prominent climate issues in the arid Southwest.

Audrey Peral, an environmental justice organizer at Make the Road Nevada, which works with Latino immigrant communities, said climate-driven warming is a major priority for the group.

“It intersects with every single issue that we work on,” she said.

Extreme heat intersects with everything from housing to health care. It’s important, she said, to ensure that landlords are providing safe conditions and air-conditioning. Outdoor workers, Peral noted, are particularly vulnerable to heat, especially when they lack access to health care.

Peral said that, in the past, “our communities have often been left out of these conversations around climate issues and environmental issues as a whole.”

“In reality, something like climate, something like environmental justice, they are issues that all of us are impacted by — and our communities at a disproportionate rate,” she said.

Addressing heat disparities can be a challenge because so many layers of government are involved in the mechanics and inertia of urban planning. Still, Averyt, the state's climate coordinator, stressed it was important that policymakers consider both climate change and equity — and think about the future differently than they thought about the past.

“Challenges like the urban-heat island, dealing with water resources and economic development are all interlinked,” Averyt said. “It requires different people at the table than we’ve had maybe in the past. It also necessitates a different way of thinking about the future because the future is not going to look like anything we’ve experienced in the past.”

More reporting on the effects of heat:

- “Stay safe from heat as the sizzling Las Vegas summer begins” ([Las Vegas Sun](#))
- “Scorching hot in Phoenix: What it’s like to work in 115 degrees” ([New York Times](#))
- “Las Vegas cooks amid blazing heatwave – and it’s going to get worse” ([The Guardian](#))



A view of Hoover Dam is seen from the Mike O'Callaghan-Pat Tillman Memorial Bridge on Wednesday, Aug. 28, 2018. (Jeff Scheid/The Nevada Independent)

WATCHING THE DROUGHT

Yes, the drought is that bad: Heather Hansman [writes about it in Outside Magazine](#).

The drought is affecting hydroelectric power supplies, including at Lake Mead, Katherine Blunt and Jim Carlton [write for The Wall Street Journal](#).

Nevadan nominated to lead water agency: President Biden picked Camille Touton, a UNLV graduate and Nevadan, to lead the U.S. Bureau of Reclamation. The agency operates water infrastructure across the West and will play a major role in Colorado River negotiations. ([AP](#))

PUBLIC LAND

Growth and a limited water supply: Reporter Sam Metz, with *The Associated Press*, [writes about the Clark County Lands Bill](#), which would allow for more development on public land.

RECREATION

Outdoor recreation agency head testifies: “Colin Robertson, head of the state’s Division of Outdoor Recreation, called for more federal funding for land management along with investment in rural communities to help better manage resources stressed by the pandemic, which drove more campers to remote areas even as jobs decreased in outdoor recreation,” [my colleague Humberto Sanchez reported last week](#).

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JUNE 24, 2021

Are zebra mussels eating or helping toxic algae?

by Emilie Lorditch, Michigan State University



Zebra mussel. Credit: Jeffrey White

While invasive zebra mussels consume small plant-like organisms called phytoplankton, Michigan State University researchers discovered during a long-term study that zebra mussels can actually increase *Microcystis*, a type of phytoplankton known as "blue-green algae" or cyanobacteria, that forms harmful floating blooms.

"*Microcystis* literally means small cell, but numerous cells cluster together in colonies that can float to the surface to form scums," said Orlando Sarnelle, a professor emeritus with the Department of Fisheries and Wildlife within the College of Agriculture and Natural Resources. "It is one of the most common causes of nuisance algal blooms in nutrient-enriched waters, including Lake Erie where it is a concern for municipal water supplies."

In the 1990s, researchers observed the appearance of dime-sized zebra mussels in Gull Lake, Michigan. Shortly after the mussels arrived, the researchers noticed an increase in *Microcystis*, which was surprising because the lake has low levels of phosphorus and *Microcystis* has a well-documented need for high-nutrient waters.

"Lakes colonized by zebra mussels tend to have about three times more *Microcystis*," said Stephen Hamilton, a professor at the W.K. Kellogg Biological Station and the Department of Integrative Biology within the College of Natural Science, who was also curious to see if there was a relationship between the *Microcystis* and zebra mussels.

"We observed that zebra mussels can filter out the *Microcystis* with other particles, but then they spit out the *Microcystis* because evidently it is unpalatable to them," Hamilton said.



Microcystis. Credit: Orlando Sarnelle

Sarnelle collaborated with Hamilton on a multiyear study that was part of the National Science Foundation's Long-Term Ecological Research Network. Forty years ago, the NSF recognized the need for research studies that lasted more than a few years and launched the LTER Network. This study is one of five projects highlighted in a recent issue of the Ecological Society of America's journal, *Ecosphere*.

"Long-term measurements are essential to our understanding of many ecological phenomena," Sarnelle said. "There are many things you can't answer in the typical two- to four-year grant cycle."

The researchers suspected the zebra mussels were consuming competitors of *Microcystis*, which paved the way for the cyanobacteria to flourish under lower nutrient availability than it usually needs. In 2010, an unexpected summer die-off of zebra mussels in Gull Lake during prolonged warm temperatures provided a whole-lake test of the relationship, an opportunity that scientists sometimes call a "natural experiment."

"Normally, *Microcystis* thrives in warmer water," said Jeffrey White, who was a graduate student advised by Sarnelle at the time and is now a faculty member at Framingham State University in Framingham, Massachusetts. "Instead, we saw an 80% decrease in the Gull Lake *Microcystis* population when the zebra mussels died despite optimal temperatures for its growth."

The researchers were able to use the long-term study data to confirm their hypothesis.

"This fortuitous observation following years of sampling strengthens the argument that there is a cause-and-effect relationship, and not just a correlation, between zebra mussels and increased *Microcystis*," Hamilton said. "Multiyear studies can catch slow, unusual or extreme events that could be making important changes resulting in long-term lasting effects in the ecosystems."

More information: Christie A. Bahlai et al, Cascading effects: insights from the U.S. Long Term Ecological Research Network, *Ecosphere* (2021). DOI: [10.1002/ecs2.3430](https://doi.org/10.1002/ecs2.3430)

Journal information: [Ecosphere](#)

Provided by [Michigan State University](#)

Citation: Are zebra mussels eating or helping toxic algae? (2021, June 24) retrieved 12 July 2021 from <https://phys.org/news/2021-06-zebra-mussels-toxic-algae.html>

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Landmark water deal secures 49 billion gallons of water for Lake Mead



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Arizona's water stewardship efforts received a major boost with an announcement by two water groups that they have achieved a \$38 million funding goal to conserve 150,000 acre-feet of water (nearly 49 billion gallons) to shore up declining water levels in Lake Mead through the Colorado River Indian Tribes system conservation project.

The announcement was made by Business for Water Stewardship and the Environmental Defense Fund and represents the single-largest multi-sector collaborative drought response effort ever completed in Arizona.

Funding was made possible with the support of private sector businesses and foundations, including Intel Corp.; Google; Microsoft; Procter & Gamble; Reformation; Keurig Dr Pepper; Ecolab; Cascade; Cox; The Coca-Cola Foundation; Silk; Target; Brochu Walker; and Swire Coca-Cola, USA. Key Philanthropic funders included the Walton Family Foundation and Water Funder Initiative.

"This partnership represents an important next step for Arizona's water story: one where political leadership and the business and philanthropic communities come together to assure long-term water security for Arizona," said Percy Kirk, Senior Vice President & Southwest Region Manager, Cox Communications. "We are proud to support the state's efforts to plan for a sustainable future that preserves water for community, business and ecological uses."

The news comes as the state nears an anticipated first-ever Tier 1 federal shortage declaration, with Arizona preparing for an 18% reduction in the amount of water it receives from Lake Mead and the Colorado River.

READ ALSO: Here's how Valley utilities protect water supply amid rapid growth

(<https://azbigmedia.com/business/heres-how-valley-utilities-protect-water-supply-amid-rapid-growth/>)

"How we use, manage, and value water will dictate our future," said Todd Reeve, CEO of Bonneville Environmental Foundation and Co-Founder of Business for Water Stewardship. "Today is a major milestone made possible by collective impact. We're redefining how businesses work collaboratively with tribes, community and policy stakeholders, philanthropy, and nonprofit partners to advance solutions that ensure that the people, economies, and ecosystems along the Colorado River have enough clean water to flourish."

The funding announcement is a critical step in implementing the state's forward-looking Drought Contingency Plan, in which Arizona and the six other Colorado River Basin States agreed to proactive water conservation actions to help prevent impacts associated with declining water levels in Lake Mead and Lake Powell. Arizona will likely face immediate water reductions in 2022 with the potential for deeper cuts in 2023.

The landmark funding partnership directly supports the Colorado River Indian Tribes and their extraordinary water conservation commitments to bolster water levels at Lake Mead.

"The importance of the DCP cannot be overstated as drought conditions persist," said Amelia Flores, Chairwoman of the Colorado River Indian Tribes. "CRIT is proud to play a key role in mitigating water shortfalls facing Arizona. We are able to do so by careful conservation that benefits Arizona while protecting our water rights. The partnerships and alliances that have been forged across all levels of government as well as corporate and nonprofit entities demonstrate the level of commitment needed to solve this crisis."

Recent collaborations among diverse corporate partners in Arizona show that businesses are leading the way with solutions and using their brands and tremendous capacity, influence and resources to pave the way for long-term water security in Arizona.

"Today's announcement is the latest in a long history of Intel's commitment to Arizona," said Elizabeth Shipley, Director of Public Affairs for Intel in Arizona. "We're proud of our investments in water conservation and commend the organizations supporting the CRIT system conservation project. Intel is committed to continuing to support projects and programs that benefit Arizona's community, economy, and ecosystem as part of our goal to achieve net-positive water use by 2030."

"Through our water positive commitment, Microsoft is focused on improving water conditions for people, nature, and society in water-stressed locations around the world," said Paul Fleming, Microsoft Global Water Program Manager. "We've supported the CRIT project because of its tangible benefits to the community and because it has helped to coalesce and scale the activities of individual entities into a collective action framework. By aligning state government, tribal government, the non-profit and philanthropic communities, and the private sector, the CRIT project provides an example of how we can work together to steward a resource that sustains us all."

Learn more at www.businessforwater.org. (<http://www.businessforwater.org>)

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Why water levels in megadrought-impacted Southwestern states have some experts concerned

Water has arguably become the most precious commodity on the West Coast.

By [Julia Jacobo](#)

June 26, 2021, 8:13 AM • 18 min read

California was once the site of a gold rush.

But now arguably one of the most precious commodities in parts of the state and in the Southwest is something else entirely -- water -- as the region grapples with a decades-long megadrought that experts say has been spurred on by a warming Earth.

Farmers struggle to water their crops. Less snowpack feeds rivers, streams and lakes in areas surrounding the mountains. And what little runoff there is from snow in the spring is immediately sopped up by the arid soil before it can reach important bodies of water.

A [February report](#) from the California State Water Resources Control Board, for instance, said the question is not whether warming will occur, but the "magnitude of warming" instead and says the state is facing the "threat of greater scarcity of water supplies, increased water demand, and limited water supply reliability." The report said the state said it has taken "bold" actions to reduce the effects of climate change as well as increase water resilience such as the expansion of recycled water.

And the [Southern Nevada Water Authority](#), which gets 90% of its water from the Colorado River, acknowledges it is "facing the worst drought in the basin's recorded history" and has been working to address the drought's impact on water supply for 20 years, including using 23 billion fewer gallons in 2020 than 2002, despite a massive population growth.

Water levels in major bodies of water in the Southwest -- both natural and manmade -- are approaching historic lows as the drought is exacerbated by heatwave after heatwave during a dry season that started earlier this year.

"The American Southwest has always been at risk for this, but climate change even pushes that risk much, much higher," Brad Udall, climate research scientists at Colorado State University's Colorado Water Institute, told ABC News.

While some water variation level is cyclical, experts fear that prolonged warming, combined with diversion and other human activities, are putting the region at risk. The Southwest is "particularly dependent" on surface water, so "even a small increase in temperature -- which drives evaporation -- or a decrease in precipitation in this already arid region can seriously threaten natural systems and society," the Environmental Protection Agency said.

The region, which is normally hot and dry, has experienced temperatures above the long-term average, with some areas 2 degrees warmer, over the past 20 years and some parts are "experiencing long-term reductions in mountain snowpack," according to the EPA.

The depletion of these water sources could be disastrous as it affects the supply for drinking for tens of millions of people and agriculture, ruins local biodiversity by eliminating crucial habitat and negatively impacts billion-dollar economies, experts say.

Here is how the ongoing megadrought is affecting five major bodies of water in the West:

Lake Mead, Nevada and Arizona

Earlier this month, Lake Mead, the massive reservoir formed by the Hoover Dam on the Colorado River, [hit its lowest water levels](#) since the lake was created in 1935.

About 25 million people are served by the reservoir -- either by electricity, water supplies or both. Officials expect the water levels to continue to decline until November when the wet season starts, U.S. Bureau of Reclamation spokeswoman Patti Aaron told [The Associated Press](#).

Water levels at Lake Mead -- and Lake Powell on the other side of the Grand Canyon, the second-largest reservoir in the U.S. -- are headed toward being 30% less than what they were 20 years ago at the start of the most recent warming period, Udall said.

"There are huge, big bathtub rings very visible at both Lake Mead and Lake Powell," Udall said, referring to previous high water levels.

Minor cutbacks in water deliveries are expected next year if water levels in Lake Mead do not rebound. Another couple of bad years would result in a "major shortage," Udall said.

If water levels drop low enough, it would be the first-ever official water shortage declared in Arizona and Nevada, and the governments could order cutbacks.

The Bureau of Reclamation is expected to release an official projection in August, which will determine the water deliveries to Arizona, California and Nevada in 2022. Water levels should begin to rebound in November, Aaron said.

[MORE: 'Megadrought' in West directly linked to climate change, experts say](#)

Folsom Lake, California

One of California's largest reservoirs, [Folsom Lake](#), is crucial to providing water to the more than 40 million residents in the Golden State but is also in danger of drying up.

Severe drought conditions in the West have left barely any snowpack on the neighboring Sierra Nevada Mountains, contributing to record lows in the reservoir, which is used for drinking water, fisheries in the American River, which feeds the lake, and farming and agricultural purposes, Rich Preston-Lemay, the sector superintendent for Folsom Lake Park, told ABC News.

The lake is 68 feet lower than it was last year -- the equivalent of a five-story building, ABC San Francisco station KGO reported earlier this month. Memorial Day visitors were surprised to find that only one of the lake's 13 boat ramps was operating over the holiday weekend, the station said, and there has been zero precipitation so far in June, according to the Bureau of Reclamation.

The water has receded so much that a plane that crashed in 1986 was visible from the bottom of the lake, the Placer County Sheriff's Office announced on June 16. Despite the drought, the lake is not at a record low. That came in 1977 after the Great Drought at 347.57 feet. Its current elevation is 388.61 feet.

Officials are in a "race against time" to protect communities and other natural resources from the effects of climate change, California Natural Resources Secretary Wade Crowfoot told ABC News.

"Climate change impacts have become a matter of protecting communities in California -- worsening wildfire risk, worsening drought, extreme heat," he continued. "We used to think about preparing for climate change impacts as sort of a future planning exercise for coming decades. Now, we're actually responding to it as the public safety imperative."

Lake Tahoe, Northern California and Nevada

Variability in water levels is typical at Lake Tahoe, a 22-mile-long and 12-mile-wide lake on the border of California and Nevada -- dropping during the summer and rising during the early part of the year, Geoffrey Schladow, director of the Tahoe Environmental Research Center at the University of California, Davis, told ABC News.

But the combination of less snowpack, drought and increased usage by humans has left the water just about 2 1/2 feet above the natural rim of the lake at the start of the dry season -- and it will only continue to empty as the season goes on, Schladow said.

Come October, the water will likely be at the rim, which means water will no longer naturally flow out of the lake and into the Truckee River, the sole outlet of Tahoe and an important source of irrigation along adjacent valleys, Schladow said. The Truckee River also feeds into Pyramid Lake, which supplies water for the city of Reno.

The water level was already lower due to a relatively dry year in 2020 that added little volume to the lake, Schladow added.

In May, water levels in Lake Tahoe were so low that some boats could not be launched from ramps and docks. The City of South Lake Tahoe even closed a boat ramp to motorized boaters for the 2021 due to the low levels, ABC Sacramento affiliate [KXTV](#) reported.

Despite the drop, the communities surrounding Tahoe likely won't suffer as much as those who depend on reservoirs elsewhere in the West that supply water to millions of people, Schladow said. Lake Tahoe, by contrast, is massive and serves just tens of thousands of residents, rather than millions.

Scientists and lawmakers who monitor the lake are not yet overly concerned about the water levels in Tahoe because fluctuations are normal -- the last time water levels went below the rim was in 2016. However, if the trend were to continue over the next few years, and the region continues to experience dry winters, concerns may be raised, Schladow said.

"We're not in any imminent or real danger of not being able to supply in basin water needs, at least not for the next few years," he said.

[MORE: At California's Folsom Lake, a stark image of state's drought disaster](#)

Great Salt Lake, Utah

The Great Salt Lake, the largest saltwater lake in the world and the eight-largest terminal lake -- with no natural outlets -- has lost at least half of its water since the first settlers arrived in the region in 1847, a 2017 study published in *Nature Geoscience* found.

The decline is mostly a result of humans redirecting the water from streams and rivers that feed the lake for use in homes, farms and industries, the study found, with levels dropping 11 feet over the past 150 years -- despite a peak elevation of 4,211.6 feet in 1986-87. The usage has been aggravated by drought and climate change, leaving water levels at near-historic lows, Laura Vernon, Great Salt Lake Coordinator for the Utah Department of Natural Resources, told ABC News.

The lake levels are currently at three-tenths of a foot away from the historic low set in 1963, Vernon said, adding that she expects that barrier to be broken within weeks. Experts and lawmakers in the region are currently coming to terms with "what that means exactly," she added.

The drops are even more significant considering the size of the lake. At 1,700 square miles, "it takes a lot of water to make a change," Vernon said, adding that it was likely "something continuous over time" to make a difference in the water levels.

The economic impacts of a drying Great Salt Lake could be devastating. In 2012, the Salt Lake Advisory Council valued the annual economic industry from the lake at \$1.3 billion, Vernon said. Depending on how low the water levels were to get, there could be a \$1.69 billion to \$2.17 billion economic loss every year for the brine shrimp harvesting and mineral operations, the products of which would dwindle as the lake recedes, she added.

The skiing industry could be affected as well, as the lake effect snow that is created as a result of the moisture over the lake would cease to exist, Vernon said. And if the snowpack on the mountains doesn't stay frozen, it will all rush down at once and fail to consistently provide water to the surrounding communities, Vernon said.

Human health can take a toll as well as water recedes, exposing more of the lake bed embedded with decades worth of heavy metals and toxic substances within the sediment. When the bed dust is exposed for long periods of time, the particles can end up in the air and can pose a danger as residents breathe it in, experts say.

The biodiversity the lake promotes would dwindle as well. About 10 million birds stop over at the lake every year to rest and feed during their migration routes -- such as the Pacific Flyway route before they head to South America, Vernon said.

Colorado River

Water flow in the Colorado River, which supplies water to more than 40 million people and feeds into the two largest reservoirs in the country -- Lake Mead and Lake Powell -- has decreased by about 20% over the last 100 years, according to a [2020 study](#) by U.S. Geological Survey scientists. Other half is attributed to warmer temperatures, which then lead to higher evaporation and water use by plants, Udall said.

Several scientists said that if evaporation goes up slightly, river flow and decline precipitously," Udall said. "So, roughly speaking, a

increase in evaporation can lead to a 5% decrease in river flow."

The Colorado River system is one of the most important in the country. As the river begins in the Rocky Mountains and wraps across the Southwest before it feeds into the Gulf of California, water is diverted to major cities such as Denver, Los Angeles, Las Vegas, Phoenix, Tucson, San Diego and farms to the south in Mexico. About a quarter of the water in Lake Mead and Lake Powell comes out of the Colorado River system, Udall said.

Recent droughts have been so severe that even in years when the Rocky Mountains experience a high snow pack, the arid soil in the region is so parched that it absorbs up any moisture as soon as it melts and flows down, Udall said.

For instance, in any given year, 50% the water from a full snowpack would be expected to be runoff, Udall said.

Despite the warming temperatures, the region saw an 85% snowpack last year -- described by Udall as "not a bad year." But only about 30% of runoff water made it to the river, Udall said.

"On any given day, it's now likely to be hotter. We have a longer growing season, so more days for it to be hot. And the atmosphere, because it's warmer, actually wants to absorb or suck up more moisture," Udall said.

The new trends are "basically our future," Udall said, adding that scientists have predicted a worst case scenario of a 40% flow loss by 2050.

"It's very worrisome," Udall said.

ABC News' Lindsey Griswold, Anthony Rivas and Jon Schlosberg contributed to this report.



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Underground reservoir to help California utility balance water demands

📅 June 30, 2021

Connections Article, Publications

San Diego County water officials will be better able to regulate untreated water flows to retail member agencies with a massive underground reservoir now under construction. And once it's nished, È outdoor enthusiasts who traverse the area will never know it's there.

The San Diego Water Authority (SDWA) is building a 4.88-million-gallon flow regulatory structure in Mission Trails Regional Park, a vast open space popular with hikers and mountain bikers. The \$42 million Mission Trails Flow Regulatory Structure II, financed by bonds and cash, has been in the works for almost 20 years as a way to increase reliable water delivery to treatment plants serving the central and south sections of San Diego County.



(Construction photo at left courtesy of SDWA)

"This is purely operational, like the shock absorbers on your car," said Brent Fountain, principal engineer at SDWA. "Without it, we run the risk of spilling over or not meeting demands temporarily. This project improves our ability to reliably serve ratepayers."

When there's an uptick in demand, SDWA can use the structure to immediately release more water, backfilling the tank with water from upstream. And if there's a sudden decrease in demand, such as a major treatment plant outage, SDWA has a place to store excess water.

“Right now, it’s a balancing act with our operational folks,” said Fountain (*pictured right*). “We’re able to make do, but there have been a few times that we were running thin in the aqueduct. Or if they have a sudden drop in demand, we’ve had a spill at one of our control structures. And we don’t want that happening.”



SDWA has other flow regulatory structures for untreated and treated water, but at nearly 5 million gallons – enough to fill seven Olympic-sized swimming pools – this is one of the largest. The new concrete tank was originally planned to hold 18 million gallons, but as per capita potable water use in the region decreased nearly 50% between fiscal years 1990 and 2020, planners re-evaluated the need for such a large tank.

“As demands went down, we right-sized the tank to match today’s demands,” Fountain said.

The project has been a massive effort, with giant concrete pillars, pipes and valves stretching above the rugged terrain of the regional park. Fountain said SDWA regularly consults the American Water Works Association’s (AWWA) standards for design and construction specifications, making sure the project adheres to the most current best practices. Ë



The new tank will be near the Mission Trails Regulatory Flow Structure I, an underground tank built in the 1990s that does the same job for treated water. SDWA has worked in the craggy hills and valleys of the 8,000-acre Mission Trails several times in the past, on pipe rehabilitation projects and now this major effort, and has spent a lot of time building goodwill and public trust

as courteous neighbors. (*Construction photo at left courtesy of SDCWA*)

“We’ve worked extensively with the community around this big regional park to make sure that once it’s finished, it’s out of sight, out of mind,” Fountain said.

SDWA created an online interactive map of trail closures and has maintained close communication with the Mission Trails community task force during planning and construction. Once the project is complete in 2023, the area will be leveled to its previous contours and revegetated with native plants, many seeded from plants within the park itself.

Ultimately, the tank will help balance flows in the water system, helping SDWA better serve its customers.

“Our current focus is maintaining the reliability of our system,” Fountain said. “We want to make sure that when people turn on their taps to run water in their sinks, they’ll have the water they need.”

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Governor Sisolak, Reno Mayor Schieve and Washoe Commission Chair Lucey Team Up to Become the First in the Country to Track Real-Time Carbon Emissions in Effort to Fight Climate Change

The State of Nevada, Washoe County and The City of Reno are teaming up with Ledger8760 to enable real-time energy and emissions tracking.

Contact

Meghin Delaney
Communications Director
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Reno, NV - July 01, 2021

In an effort to fight climate change, Governor Steve Sisolak, Reno Mayor Hillary Schieve, and Washoe County Commission Chair Bob Lucey are teaming up with [Ledger8760](#), a software startup that has developed ground-breaking carbon mapping technology already being used in the private sector, to share real-time carbon emission data and to track it against emission reduction targets outlined in the Paris Agreement on Climate Change, which are now mirrored in Nevada state law through Senate Bill 254 from the 2019 Legislative Session. Using this data, the State, City, and County plan to identify key areas of energy efficiency, track emissions reduction efforts, and inform new environmental initiatives.

"Nevada is a global leader in renewable energy, and we will now be a leader on how governments around the world track and reduce their carbon emissions to meet the goals set in the Paris Climate Accord," **said Nevada Governor Steve Sisolak.** "This innovative technology can help us to accurately measure and track our carbon emissions in order to work to reduce them. As we continue to battle drought, diminishing water supplies and wildfires across the West, we are reminded daily of how critical our fight is to slow climate change. If we can accurately measure our impact in real-time, we can more efficiently reduce our carbon output. This is how we fight climate change and protect our state."

Ledger8760 will be tracking real-time energy and emissions from various state buildings, including the Nevada State Capitol, the Nevada Department of Motor Vehicles, and the Nevada Department of Transportation, as well as for the City of Reno and Washoe County.

"As the first county in the country to initiate real-time tracking of our carbon footprint using the standards established by the Intergovernmental Panel on Climate Change, Washoe County is proud to join our local partners and serve as pioneers to track our Greenhouse Gas emissions," **said Washoe County Commission Chair, Bob Lucey.** "By being transparent with our energy usage and subsequent impact, we will craft policies to limit climate change and improve our community."

The City of Reno joins Washoe County and the State of Nevada as the first city in the country to undertake real-time carbon tracking established by the Intergovernmental Panel on Climate Change (IPCC).

"This partnership will allow for real-time tracking of GHG emission data and progress toward the goals set forth in the Paris Climate Accords. Using the standards established by the Intergovernmental Panel on Climate Change (IPCC), the City of Reno will be able to more closely monitor its emissions profile," **said Reno Mayor Hillary Schieve.** "The first phase of the project will provide the City of Reno with an accurate baseline of our emissions in a form that complies with IPCC reporting - establishing the City of Reno as a leader in meeting the transparency aspirations of the Accords. The ongoing, real-time data analysis will capture successes to demonstrate the City of Reno's progress over time toward its mitigation climate goals, while also identifying data-driven practices and opportunities to accelerate its mitigation effort. This effort is crucial for the City to reach its goals set forth in our adopted Sustainability & Climate Action Plan."

Ledger8760 is pioneering sustainability transparency practices for businesses and government agencies. The sustainability company, which displays the "8760" marker as a nod to the number of hours in a calendar year, separates itself from other tools that merely serve as reporting platforms because it measures greenhouse gas production in real time and on demand with unprecedented accuracy, capable of managing emissions data on an hourly or sub-hourly basis. This SaaS startup measures real-time energy, emissions, and utility information from thousands of public and proprietary data points and helps companies and government agencies reduce their costs and measure their carbon footprints.

"Our motto is 'You can't change what you can't measure.' Up until this point, organizations have had limited access to a data set of their emissions and energy usage, and they haven't been able to see the full picture," **said Adam Kramer, CEO of Ledger8760.** "Through the data sets tracked with Ledger8760, leaders and stakeholders can now have a single dashboard with a full visualization of their energy and emissions output, along with the related costs, across their organization that will be both accurate and actionable."

For more information, visit www.ledger8760.com.

84°

WEATHER ALERTS / Excessive Heat Warning: **Central Sacramento Valley, Lassen-Eastern Plumas-Eastern Sierra Counties, Motherlode,...**

lake clean by being 'citizen scientists'

New app asks Lake Tahoe residents, visitors to keep lake clean by being 'citizen scientists'

by: [Melanie Townsend](#), [Katelyn Stark](#)



SOUTH LAKE TAHOE, Calif. (KTXL — Thousands of visitors and residents are likely to make Lake Tahoe a part of their July 4th celebrations, but scientists with the University of California, Davis want people to take more action to keep the lake clean this weekend.

While it's shaping up to be a busy Fourth of July weekend at the beaches of Lake Tahoe, for natives, more visitors mean more trash in the lake's precious, blue waters.

"Every day in the evening it is just covered in trash," said a local resident named Nick. "There are a lot of locals like us and friends who pick up trash every morning."

Interactive Map: Celebrate Independence Day with . rework celebrations in our region →

Environmentalists like Anne Graham with the UC Davis Tahoe Environmental Research Center share the same concerns as locals.

That's why Graham and members of the League to Save Lake Tahoe are recruiting more people to become what they call "citizen scientists."

"You look out and see how beautiful Lake Tahoe is, we want everyone to feel a responsibility and a sense of duty to keep it this beautiful," Graham told FOX40.

To do this, UC Davis TERC scientists have developed [the Citizen Science Tahoe app](#).

While people are out kayaking or hiking along the lake, they can use the app to report any cloudiness, invasive algae or litter.

"Select any concerns that you see," Graham explained. "So maybe you see litter and overflowing trash cans."

"Other plastic food or drink containers, microplastics and plastics breaking down are a big concern in our area," Graham continued.

The app works in even the most remote places in Tahoe.

'We're all breathing it in': San Joaquin Valley air quality officials ask residents to not use personal fireworks →

"They're using the images that citizen scientists upload or observations that they make to see where there might be new area around the lake where algae's occurring or where that kind of water quality and clarity is decreasing," Graham said.

For out-of-towners like Caroline Gallow and her husband, having the power to be environmentalists at their fingertips is another way of keeping Lake Tahoe a sought-after getaway.

"This is what's needed," Caroline Gallow said. "We all need to be aware of litter and take it out. If we bring it in, you take it out. It's wonderful."

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News Release

USDA Partnership Requests Landowner Input on Drought Conditions

 [Email This Page](#)


Release No.: 2021-07-001

Contact: Scott Oviatt, Snow Survey Supervisory Hydrologist
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USDA Partnership Requests Landowner Input on Drought Conditions

Portland, Ore., July 1, 2021 - The U.S. Department of Agriculture's (USDA) Climate Hubs, in collaboration with the National Drought Mitigation Center and the National Integrated Drought Information System, request input from states, tribes and others to collect Condition Monitoring Observer Reports (CMOR) on droughts impacting landowners across the country.

The CMOR tool is used to collect on the ground observations from landowners to help inform drought monitoring research. These local drought observations are important, as they provide input into the U.S. Drought Monitor process and inform agencies that make decisions based on dry and wet conditions.

Landowners can provide input through the online [reporting form](#) .

The reporting form is mobile friendly and accepts photos. Landowners can comment on crop impacts, livestock impacts such as poor pasture conditions, and whether they are observing low or dry wells.

Landowners are not required to send in data on all aspects but can choose from the impact areas where they have the most direct knowledge. Contact information will not be shared publicly. View examples of submitted drought reports [here](#) .

Please note that this form is **not part of the process to apply for drought assistance**.

Learn more about the [Drought Monitor](#) and how the USDA uses the map as a trigger for programs that help agricultural producers recover from drought and other natural disasters.

Read more about [Condition Monitoring Observer Reports](#) (CMOR) and what to report.

Drought Assistance – Available Funding

Environmental Quality Incentive Program - Conservation Incentive Contract (EQIP-CIC)

Producers, ranchers and private forestland owners experiencing drought impacts are encouraged to apply to EQIP-CIC by **July 12, 2021**. EQIP-CIC funding supports the following resource concerns: soil quality limitations, wind and water erosion, source water depletion, fire management, degraded plant conditions, and livestock production limitations. To learn more about EQIP-CIC, visit the [webpage](#) or [contact your local NRCS field office](#).

#

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Stunning drone photos show severity of drought at Lake Shasta



Boats tied up at a Lake Shasta marina, hundreds of feet below where they are usually moored, as water levels continue to drop due to persisting drought conditions. (Brian van der Brug / Los Angeles Times)

By BRIAN VAN DER BRUG | STAFF PHOTOGRAPHER | TEXT BY ASSOCIATED PRESS

JULY 2, 2021 5 AM PT

Droughts are common in California, but this year's is much hotter and drier than others, evaporating water more quickly from the reservoirs and the sparse Sierra Nevada snowpack that feeds them.

The state's more than 1,500 reservoirs are 50% lower than they should be this time of year, according to Jay Lund, co-director of the Center for Watershed Sciences at UC Davis.

Last year was the third-driest on record in terms of precipitation. Temperatures hit triple digits in much of California over the Memorial Day weekend, earlier than expected. State officials were surprised earlier this year when about 500,000 acre feet of water they were expecting to flow into reservoirs never showed up. One acre-foot is enough water to supply up to two households for one year.

Currently Lake Shasta, the state's largest surface water reservoir, is at 38% of capacity, according to the U.S. Bureau of Reclamation.



A houseboat is beached at Lake Shasta. (Brian van der Brug/Los Angeles Times)

Brian van der Brug has been a staff photojournalist at the Los Angeles Times since 1997.

Associated Press

The Associated Press is an independent, not-for-profit news cooperative headquartered in New York City.

Warming Climate, Low Sierra Snowpack, Evaporating Runoff Extend California Drought

July 4, 2021 at 1:00 pm Filed Under: [California Drought](#), [California Drought 2021](#), [Climate change](#), [Drought](#), [USGS](#)

Scientists use clues from trees to put the current drought into persp...

Scientists use clues from trees to put the current drought into persp...



MENLO PARK (CNN/CBS) — Skiers and snowboarders pray for snow so they can shred the slopes. Climatologists and hydrologists have an entirely different and more critical reason to cross their ngers for the “white gold.”

The West’s historic drought has many impacts, including water shortages, more severe wild re seasons and unprecedented heat waves, to name a few. Intense droughts are a result of many factors, one of which scientists have recently begun to analyze with more scrutiny: snow drought.

Though the impact is most intense in the summer months when rain is sparse and temperatures are high, droughts actually start to take shape during the winter.

One of the West’s largest and best water reservoirs is snow on mountaintops. Water falls as snow in the winter and stays frozen (ideally) through late spring. When the snow melts, the water runs into rivers and lls human-made reservoirs, just in time for the summer heat.

Snow runoff is a critical fresh water source around the world; around a sixth of Earth’s population uses runoff for drinking, farming, power and other uses, according to the National Oceanic and Atmospheric Administration.

A snow drought in the West appeared early last winter, according to the National Integrated Drought Information System. The paltry snowpack, paired with well-below-normal rainfall and extreme heat, is at the core of the region’s water-supply concerns.

On Thursday, the U.S. Drought Monitor reported 93 percent of the West is in drought, the most expansive drought in that region in modern records.

The snowmelt runoff is particularly critical in California, where snow on the Sierra Nevada provides about 30 percent of the state’s water and one of the areas hardest-hit by snow drought this year was the Sierra range.

California has three major reservoir types, said Claudia Faunt, a hydrologist for the California Water Science Center: Surface reservoirs — such as Oroville and Shasta — groundwater and snowpack, which “melts and feeds the surface water system.”

Faunt told CNN the amount of water in the snowpack and the timing of when it melts is critical for surface reservoirs.

“Reservoirs are managed to have water available to meet the demands of farming and also recreation and municipal supplies,” Faunt said. “If there’s not much snowpack or it melts a lot earlier, it impacts how reservoir operations are done and how much water is pumped from groundwater.”

Michael Dettinger, a hydrologist for the U.S. Geological Survey, said this year’s snowmelt runoff was bad on several fronts.



The Los Angeles Aqueduct carries snowmelt from the Sierra Nevada mountains. (David McNew/Getty Images)

The first was the snow drought itself. By April 1, winter precipitation was just 50 percent of normal and the snow that did fall contained 40 percent less water than it normally does.

The second problem was that the air in California has been so dry, the runoff evaporated before it reached the reservoirs.

“After April 1, when the snow that was there started to melt in earnest, the runoff that you would normally expect to show up just didn’t,” Dettinger said. He added that, even with the low snowfall, “if runoff had been normal ... we’d be in a drought but maybe one that was only half as bad.”

Snow that is typically sustained well into the summer was gone months before it should have been, Dettinger said. Now, all of California’s major reservoirs are well below their historical averages.

Shasta Lake, the state’s largest reservoir by volume, is about to break its low-water record. The current record was set in the 1924 water year, according to the National Weather Service.

The water shortage is just one of the impacts of California’s snow drought. The wildfire season is starting earlier and ending later each year, largely due to climate change.

“Warmer spring and summer temperatures, reduced snowpack and earlier spring snowmelt create longer and more intense dry seasons that increase moisture stress on vegetation and make forests more susceptible to severe wildfire,” according to Cal Fire.

So far this year, more than 3,500 wildfires have sparked across California. That’s more than 1,000 higher than what was normal over the past five years. Fires are also starting more frequently and much earlier.

Faunt says that one of the biggest problems Californians are facing is the ability to adapt to the changes in runoff due to the climate crisis.

“The increase in temperatures like we’re having right now tends to make drought more severe and changes the type of precipitation to where we have a lot more heavy downpours,” says Faunt. “The atmospheric rivers deliver most of California’s annual rainfall and they’re tending to become more intense as the atmosphere warms up.”

Heavy downpours may sound like a good thing but Faunt said that it’s much more difficult to efficiently manage the downpours in California’s water infrastructure to be able to make the water useful.

What’s needed is an efficient way to conserve the available water sources and better utilize steady sources like snowpack in years it is plentiful.

As the climate changes, the consistent, reliable nature of snowpack becomes more important. But warmer average temperatures and extreme heat waves are melting what is left of the California’s snowpack more rapidly and drier air is evaporating the runoff.

Water supply issues will continue to escalate as long as careful monitoring of snowpack and extreme heat events aren’t considered in water management plans, according to NOAA’s Climate Program Office. As research expands into the types and impacts of snow drought, the understanding of one of the West’s most important water resources will broaden with time.

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How the drought is affecting Northern California business

FOR THE NORTH BAY BUSINESS JOURNAL

July 5, 2021, 11:45AM

Order Article Reprint

KATHRYN REED



SLIDE 1 OF 6

McLean & Williams, water well specialists in Napa, is dealing with more demand than it can handle with limited equipment and available labor force. (Photo courtesy Jamie Reagan)

Drought can gradually parch the coffers of companies, while for others it's an economic boon. For some, it's driving innovation.

One hair salon is using biodegradable towels, water well drillers are turning away potential clients, drought-resistant plants are all the rage, and watersports proprietors are figuring out how to survive with less water to play in.

In spite of this resiliency, things could get worse before they get better because the rainy season is still months away.

According to the government's U.S. Drought Monitor, extreme conditions are more widespread throughout the West than they have been at any time in the last 20 years. About three-quarters of California is listed in "extreme" drought conditions. A year ago only 3% of the state was in the "extreme" category.

And summer has just officially begun.

Less waterto play in

The Russian River in Sonoma County has long been a popular place for locals and tourists to play in. During droughts, recreation activities can be impacted because of an ever-decreasing ow of water.

"As long as there is water and not any dry land areas, we will continue to put people on the river," said Rochelle Collier, manager of River's Edge Kayak and Canoe Trips in Healdsburg. "The only negative impact that we have is with the low water levels because people are getting out of their boat a half-dozen times over a five-mile stretch. Normally this would (happen) at the end of August."

With weekends being sold out at River's Edge, the lack of water is clearly not a deterrent for the kayakers, canoeists and standup paddleboarders.

This season, new owners Kim and David Lockhart have implemented other attractions to keep people coming to their business no matter the water levels. Fridays, Saturdays and Sundays there is live music, and chairs are available for rent to enjoy the beach atmosphere.

Such positive alternatives, though, are not possible at all businesses.

Off the Hook Fly Fishing, based in Napa, can no longer offer daylong excursions because the water is too warm in the latter part of the day. The company fishes a number of waterways throughout Northern California. Locally, those include the Napa River, Putah Creek and Russian River.

"Trout especially are very susceptible to warm water. They need cold water," explained Mike Copithorne, who owns the company. "At about 60 degrees they start dying. With catch and release, the mortality rate increases if you handle them too often, especially in the heat of the day."

He said offering only half-day outings because of the drought has caused a 10% reduction in bookings. However, the revenue loss is about one-quarter to one-third this season.

"Our guides are definitely turning down business because of the warmer temperatures," Copithorne said. Not everyone wants to fish a half day, he said.

At Lake Sonoma Marina in Geyserville, the water level is what it might normally look like in late October, according to harbor master Larry Cenicerros.

"This will probably set a record for the water depth for the end of the season," he said. "The lake is still really big. In the beginning, the marina was below where we are at now and people were doing recreation then and boating. We still have about 30 feet until we get back down to that level."

The no-wake zone has been expanded as a safety precaution so boaters don't hit trees that are protruding. While this means more boaters are in the main part of Lake Sonoma, Cenicerros said congestion has not been an issue.

That could be in part because the marina has seen a decrease in users this season.

"It's a little bit of a hike to get to the water, which is hard for campers. The lake is probably down 45 to 50 feet," Cenicerros said. "Boat-in campsites are accessible; you have to hike and really want to go, so that deters a lot of people."

Still, Cenicerros remains optimistic, relaying that "the history of the lake has a good problem of getting too much water too quickly. In the beginning, they thought it would take three years to fill and one massive storm filled it in seven days." He's hoping one massive storm next winter brings the lake up to its rim.

While recreation and tourism are economic drivers for Sonoma and Napa counties, neither tourism bureau had information about how the drought affects those industries.

"We don't have any data or economic figures to share around the impact of drought past or present on tourism," said Janette Maack, senior manager, public relations and content marketing at Visit Napa Valley.

Claudia Vecchio, CEO and president of Sonoma County Tourism, said much of the same thing. However, that agency has a blog post about what to expect when visiting during the drought. It mentions the low water levels at recreation areas, the need to turn off the tap while washing dishes and brushing teeth, and encourages shorter showers and reusing towels.

Drought can be good for some businesses

Laundry facilities, plumbers and well diggers are some of the industries that can financially benefit from droughts.

"Our largest washing machine washes 80 pounds of laundry at one time. It uses 67 gallons of water to do this. To wash 80 pounds of laundry at home, it would require eight loads in the standard washing machine you would find in a typical suburban garage and this would use approximately 350 gallons of water," explained Gaeton Tamo.

He and his sons, Mario and Dante, operate 14 coin laundries in Guerneville, Healdsburg, Santa Rosa, Sebastopol, Rohnert Park, Sonoma, Napa, Oakland and Brentwood. Each facility has about 20 washing machines.

When people start looking at how to curtail water use at home, going to a laundromat can be a saver in water and time.

Herb McKay has been in the laundry business for 48 years, with storefronts in Vacaville, Winters, Woodland and Richmond.

"We have very energy-efficient machines. They can get more done with less water than with a home washing machine," McKay said.

McKay didn't own any of his current laundromats during the last drought, so he doesn't have a price comparison for water/sewer bills in normal times vs. drought. His busiest location in Richmond comes with a water bill ranging from \$4,000 to \$4,500 a month, and a sewer bill of \$5,000. Each location is with a different water/sewer company.

Those amounts are in "normal" times, with McKay expecting them to go higher if people start doing their laundry outside their home because of the drought.

"We advertise that it helps lower their bill and consumption. You are using less water at a laundromat than you would at your home," McKay said.

Another way for homeowners to be proactive is to repair leaky faucets and water lines.

The Environmental Protection Agency reports, "The average household's leaks can account for nearly 10,000 gallons of water wasted every year, and 10% of homes have leaks that waste 90 gallons or more per day. Household leaks can waste nearly 1 trillion gallons of water annually nationwide. Fixing easily corrected household water leaks can save homeowners about 10% on their water bills."

Christian Macauley, who with brother Sean, owns American Leak Detection in San Rafael, said calls are up 20% because of the drought.

"People are more frantic than ever," Macauley said. He understands the need for conservation. He uses a bucket in his shower to capture the cold water before it gets hot and then uses that container for irrigation.

Macauley's company works on main lines, irrigation and most kinds of pipes underground. A number of recent calls are from pool owners noticing the water level decreasing and thus suspecting a leak, he said.

"With the pools we are finding with these winds and with the dry environment, (they) are losing a quarter inch a day because of evaporation," Macauley said. "My recommendation is people get pool covers, if possible."

The Hamilton Community Pool in Novato knows all about evaporation, which is why the lone significant drought protocol there is to cover the pool each night.

The drought is causing the phone to ring off the hook at Irwin Well Drilling in Fulton in Sonoma County and at McLean & Williams, water well specialists in Napa. The problem is neither company can keep up with demand; there is only so much drilling equipment and manpower to do the jobs.

Gonzalo Salinas, president and co-owner of McLean & Williams, said call volume is up 60% because of the drought. These are locals, regional prospects and people out of state.

He expects to drill 40 wells this year, which is about normal —normal being 35 to 40 wells a year. It takes specialized equipment to drill, and Salinas only has so much of that specialized equipment. So, a lot of work gets turned away.

"In most cases, 90% of the time, it's new wells," Salinas said. "A small percentage can be redrilled deeper." He said well drilling costs between \$15,000 and \$20,000 for an average domestic system.

Geological formations in Napa County vary, meaning the wells do as well. Some are 150-feet deep, others more than 1,000 feet down.

Nolan Irwin, who is a third-generation owner of Irwin Well Drilling, believes the drought has affected the perception of well owners more than anything. It's as though they want to know they have access to a large amount of water even if they don't need it or use it. It's a mentality similar to when people began hoarding toilet paper and cleaning wipes at the height of the pandemic.

Calls have tripled this year, Irwin said. People in Santa Rosa are calling wanting wells dug even though they have city water. Irwin attributes this to a heightened awareness of water issues, but not for a real need for that underground water.

"If there were two or three more years of drought, then we would really find out what is dire need and what is perceived need," Irwin said.

His company, which mostly works in Sonoma County, drilled 62 wells in 2020 and expects business to be the same this year even though demand is greater. Irwin said it's a dangerous business and he won't chase a dollar to risk injury to his employees.

The state Department of Water Resources reports, "As many as 2 million water wells tap California's groundwater, with approximately 7,000 to 15,000 new wells constructed each year. They range from hand-dug, shallow wells to carefully designed large-production wells drilled to great depths. Groundwater supplies approximately 40% of California's total water supply in average water years, and in some regions of the state, up to 60% in dry years."

Landscaping can be a dilemma

The drought is apt to impact everyone when it comes to landscaping. Many nurseries have been proactive with ordering more drought-resistant plants, while designers are also turning an eye toward conservation.

“We are seeing a lot of interest in drought-tolerant plants, and we are putting out a lot more education about how mulch can help,” Aileen Carroll at Van Winden’s Garden Center in Napa said. “It can save up to 40% of water in a garden. It can be bark, wood chips, straw, pine needles. Leaf mulch is really nice stuff. It should be at least 3 inches deep; 6 inches is great.”

Realizing the drought was inevitable, she stocked up on succulents for the summer. While those are the plants most people think of for being hardy in times like these, Carroll stressed there are plenty of other choices.

At Armstrong Garden Center in Novato, workers are arriving at 6 a.m. to start watering at the nursery to ensure the plants remain healthy. This is something manager Linda Leathers says homeowners need to pay attention to as well—to not water in the heat of the day.

Prickett’s Nursery in Healdsburg is so accustomed to droughts that it now promotes drought-tolerant plants in wet and dry years.

Co-owner David Kinney said a number of customers have been seeking advice this year because of the drought. Displays are at the nursery to show people what drought-tolerant vegetation looks like, plus there is a wealth of information on the company’s website.

For those wanting help with what to do in their yard, there are a plethora of designers in the North Bay.

“We do get a lot of calls from people who are either removing or reducing their lawns,” said Becky Kover, lead designer with Hall Landscape Design in Napa. Solutions include hardscape items, and drought and fire-resistant plants.

Susie Dowd Markarian Landscape Design in Santa Rosa is struggling to keep up with the demand from people inquiring about doing something more water conscientious with their yards.

“I have nine active clients and four contracts just came in, and calls come every day,” owner Susie Markarian said.

A popular device she uses for homeowners is called a submeter or flowmeter or flume. It determines how much water is going into the landscape. It helps people chart their water use.

Impacts on a variety of businesses

Bennett Valley Golf Course in Santa Rosa is anticipating water restrictions will be in its future.

Rob Neal, who works in the pro shop, said in the last drought there were “plenty of dry areas.” “We put a little bit of water on tees and greens and not on fairways. I suspect come September or October it will be the same,” Neal said.

With the 40% reduction mandated by Marin Municipal Water District, the Mill Valley Golf Course is making a concerted effort to make sure the greens, tees, approaches and collars get as much water as possible, while the rough and fairways are being sacrificed.

“It almost adds another level to the game because (the ball) bounces and rolls farther than it used to. So, perhaps it makes it a little more challenging,” said Peter Torre, parks supervisor for the city of Mill Valley.

He is confident this nine-hole municipal course will recover. “It will take a lot of work and some effort and some TLC to bring it back.”

Mill Valley is also rejiggering water allotments on ballfields and ornamental landscaping.

At Body Kinetics Health Club, which has locations in Novato, San Rafael and Mill Valley, customers are being held to a five-minute limit on showering.

Rock Paper Scissors hair salon in Santa Rosa is making sure the spigot is not on while shampooing or applying other hair products. Owner Katie Enfield also relayed that on occasion, and primarily with men, a stylist will ask to spray a person’s hair to get it wet instead of shampooing.

While Magnolia Avenue Salon in Larkspur had been using a towel service, owner Karen Davis recognized the amount of water needed to clean them was astronomical. She goes through 2,000 towels a week.

That’s why, as of June 24, the five shampoo stations are now stocked with biodegradable towels. They then go into a compost bin provided by the garbage company.

“They are really soft, black and hold seven times their weight in water,” Davis explained. “They turn to dirt in 90 days.”

Hide Reader Comments



PHOTOS: Drought arrives at Little Washoe Lake

By ThisIsReno | July 6, 2021



Low water levels at Washoe Lake State Park in early July 2021. Image: Ty O'Neil / This Is Reno

Photos by Ty O'Neil

Drought conditions are gripping Nevada and the West. After a less than stellar winter with below normal snowpack, conservation and water officials said a “[Miracle March](#)” could help turn things around a bit. That didn’t happen.

In late May, officials at Truckee Meadows Water Authority warned residents that [watering restrictions were coming](#). TMWA Senior Hydrologist Bill Hauk said that with a snowpack at 68% of normal, conditions were “just like” 2015, another drought year.

Today, TMWA reports on its [Daily Water Update](#) the Truckee River Basin is at 71% of average for snow water equivalent. The Truckee River flow is rated as “low,” flowing at 497 cubic feet per second at Farad and just 281 cubic feet per second in Reno. The flow is managed via the dam at Tahoe City where the water level is still more than one-and-a-half feet above Lake Tahoe’s natural rim.

Elsewhere, water is disappearing. The conditions seen in Washoe Valley in 2017, when Washoe Lake nearly overflowed its banks, are just a memory. This Is Reno’s Ty O’Neil documented low water levels Little Washoe Lake over Fourth of July weekend, where hundreds of fish are dying from lack of water. Take a look at the gallery below.

For more information on water restrictions and current data, visit

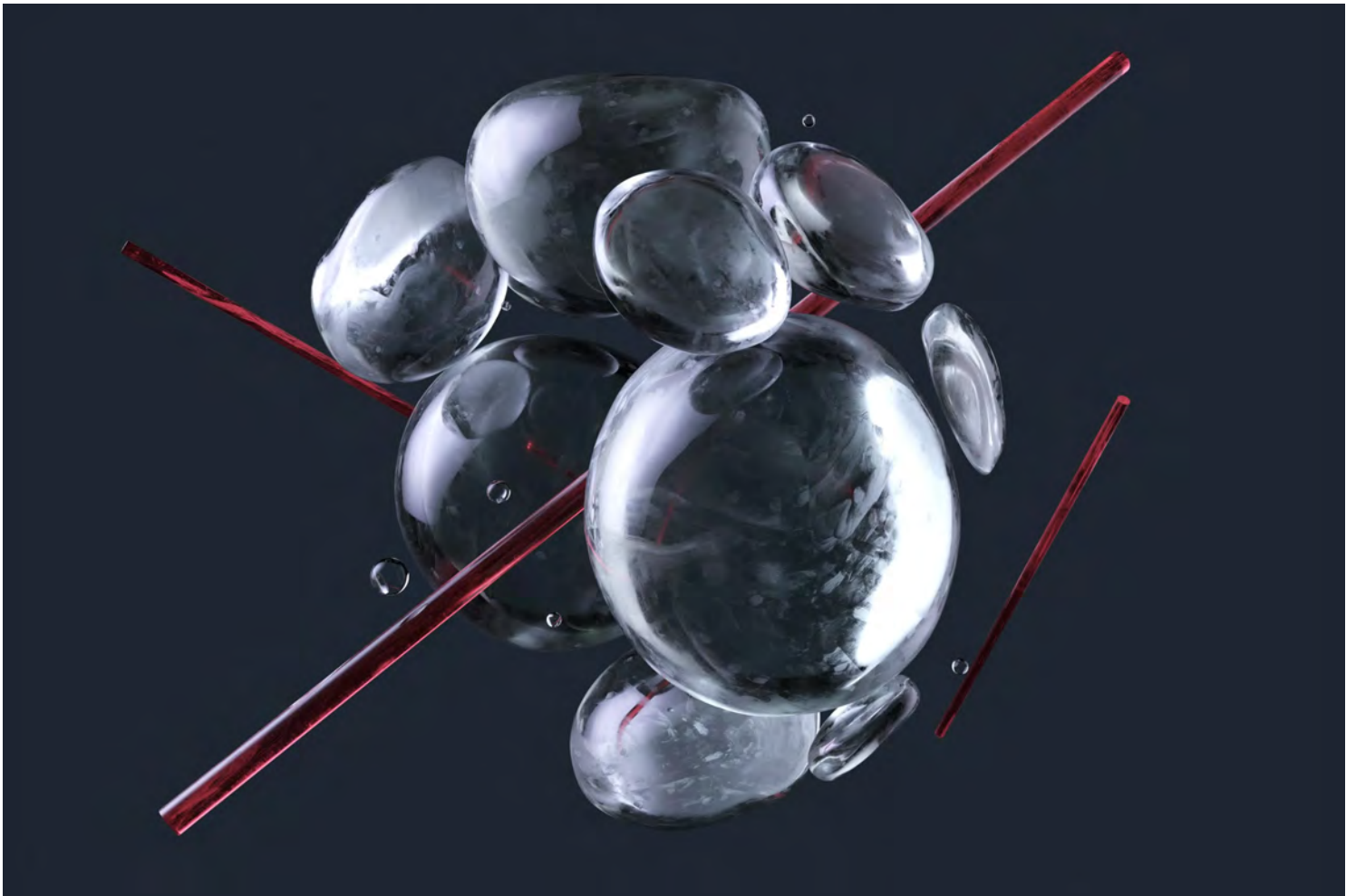
<https://www.smartaboutwater.com/#dashboard>.



MATT SIMON SCIENCE 07.07.2021 07:00 AM

A Massive Water Recycling Proposal Could Help Ease Drought

Members of Congress from Western states are pushing for \$750 million to turn wastewater into pure water. Here's how that works.



PHOTOGRAPH: ANDRIY ONUFRIYENKO/GETTY IMAGES

LAKE MEAD, WHICH provides water for 25 million people in the American West, has shrunk to 36 percent of its capacity. One rural California community has run out of water entirely after its well broke in early June. Fields are sitting

fallow, as farmers sell their water allotments instead of growing crops, putting the nation's food supply in peril.

As the West withers under extreme drought, legislators in the US House of Representatives have introduced HR 4099, a bill that would direct the Secretary of the Interior to create a program to fund \$750 million worth of water recycling projects in the 17 western states through the year 2027. (The bill, which was introduced at the end of June, is currently before the House Committee on Natural Resources.)

“This is beginning to be our new normal—88 percent of the West is under some degree of drought,” says Representative Susie Lee (D-Nevada), who introduced the bill. “Lake Mead is at the lowest level it has been at since the Hoover Dam was constructed. And the Colorado River has been in a drought for more than two decades.”

All the while, the population and economy in the western US have been booming, putting tremendous pressure on a dwindling water supply. “We have, I guess, more people—one. And there's an increase in the agricultural area—two,” says Representative Grace Napolitano (D-California), who introduced the bill. “And then climate change is exacerbating the problem.”

Part of the solution, the legislators say, is to fund the construction of more facilities that can recycle the wastewater that flows out of our sinks, toilets, and showers. You may think that's gross and preposterous, but the technology already exists—in fact, it's been around for half a century. The process is actually rather simple. A treatment facility takes in wastewater and adds microbes that consume the organic matter. The water is then pumped through special membranes that filter out nasties like bacteria and viruses. To be extra sure, the water is then blasted with UV light to kill off microbes. The resulting water may actually be *too pure* for human consumption: If you drank it, the stuff might leach minerals out of your body, so the facility has to add minerals back. (I once drank the final product. It tastes like ... water.)

The recycled H₂O can be pumped underground into aquifers, then pumped out again when needed, purified once more, and sent to customers. Or it may instead be used for non-potable purposes, like for agriculture or industrial processes.

Basically, you're taking wastewater that'd normally be treated and pumped out to sea—wasting it, really—and putting it back into the terrestrial water cycle, making it readily available again to people. “Part of what makes it so important as an element of water supply portfolios is its reliability,” says Michael Kiparsky, director of the Wheeler Water Institute at the University of California, Berkeley. “To the extent that urban centers exist and produce wastewater, it can be treated. It gives a reliable source of additional water supply—even in dry years when supply is limited and developing alternative sources would be difficult or impossible.”



The WIRED Guide to Climate Change

The world is getting warmer, the weather is getting worse. Here's everything you need to know about what humans can do to stop wrecking the planet.

BY KATIE M. PALMER **AND** MATT SIMON

Recycled water is also bankable, in a sense: Injecting it underground to recharge aquifers stores it up for use during droughts. This is likely to be particularly important in the American West, because climate change is both making droughts more punishing *and* futzing with the dynamics of rain. [Modeling from climate scientists](#) shows that future storms will be more intense, yet arrive less often. And by the end of the century, the mountain snowpack—which normally banks much of the West's water until it melts into the spring runoff—is predicted to shrink by about half.

“Our hydrologic cycle is going to get more unpredictable,” says Rafael Villegas, program manager of [Operation NEXT](#) at the Los Angeles Department of Water and Power, which has been recycling water since the 1970s for non-potable reuse. “Coupled with population growth, not only here in California, but where the water comes from—Nevada, Arizona, and Northern California—you can expect that there's going to be additional demand on those systems. So we're at the end of the straw, right? We have to then start thinking, how do we become more efficient with the water that we *do* have?”

Currently in California, about 10 percent of wastewater in municipal and industrial usage is recycled. The goal of Operation NEXT is to upgrade the Hyperion Water Reclamation Plant so that it recycles 100 percent of its wastewater by 2035, producing enough purified water to sustain nearly a million households in LA.

The technology is there—it's just a matter of deploying it all over the West. “This isn't a moonshot, if you will,” says Brad Coffey, water resource manager at the Metropolitan Water District of Southern California, which has partnered with the Los Angeles County Sanitation Districts on a [water recycling demonstration facility](#). “This is really putting the building blocks together that have been tested and proven in many other facilities, and applying it to a regional scale.”

While water recycling is not a newfangled technology, it's not a simple or cheap process, either. It takes time to retrofit a wastewater facility for efficient recycling, and the tab for building one from scratch can run into the billions. And once a

facility is up and running, it takes a good amount of energy to push all that water through the filtering membranes and other equipment, which is also expensive.

Still, says Villegas, the bigger cost would be running out of time. “If we wait to act, we’re going to be too late,” says Villegas. While the bill would fund \$750 million for projects over the next six years, it will take longer to actually build those facilities and bring them online. “A program like this is going to take multiple decades,” he continues. “So if you react a couple of decades later, then you’re already behind the eight ball.”

Water recycling is only one strategy for adapting the American West to a climate emergency that has created a water emergency. Since the 1980s, per capita water use in Southern California has plummeted by 40 percent, thanks in large part to changes in building codes, but also to behavioral changes among residents, like replacing lawns with drought-tolerant native plants. Cities are also adapting. For example, the LA Department of Water and Power has been experimenting with turning medians and roadsides into [green catchment zones](#) that direct stormwater into tanks underground, so LA doesn’t have to import as much water from Northern California and the Colorado River.

While these individual and local efforts help reduce demand and increase supply, \$750 million from the Feds would be a huge stimulus for building out the recycling infrastructure that’ll help the West survive climate change. “The magnitude of changes that we’re seeing with climate change, and with long and persistent droughts—that’s not about how many gallons per flush a toilet is,” says Coffey. “It’s really a broader issue that we have to attack from the supply side as well.”

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[Matt Simon](#) is a science journalist at WIRED, where he covers biology, robotics, cannabis, and the environment. He’s also the author of [Plight of the Living Dead: What Real-Life Zombies Reveal About Our World—And Ourselves](#), and [The Wasp That Brainwashed the Caterpillar](#), which won an Alex Award.

STAFF WRITER

TOPICS WATER CLIMATE CHANGE

Drought-Stricken Western Districts Plan New Ways to Store Water

Current surface and groundwater storage infrastructure is not adequate for future weather conditions, water managers say.

By [Leslie Kaufman](#)

July 7, 2021, 4:00 AM PDT



Sites Reservoir Project is slated to sit near the Sacramento River an hour north of California's capital. *Source: Sites Authority*

Driving through the Sacramento valley an hour north of California's capital, most travelers notice nothing but a few cows grazing on grass scorched brown by the heat. But Jerry Brown, the executive director of the Sites Reservoir Project, sees the future of California's water system.

"I believe scientists are correct and we are going to see wetter wet periods and drier dry spells. California's current infrastructure is not built for those future conditions," he said, "But Sites Reservoir is, and that's why we need it."

The project, which is still in its design phase, is slated to sit near the Sacramento River and in periods of heavy flooding, it could syphon off some of that extra water and store it for later use. If Sites had been up and running in 2017, California's last period of flooding, Brown estimates there would now be 1 million extra acre-feet of water to help farmers through the current brutal drought.

This current crisis has emptied massive reservoirs and is reopening a conversation about water storage in the West. Sites is just one of hundreds of new projects being urgently pushed by districts, whose officials see that climate change is irrevocably changing their water equation.

“Our Western water infrastructure is crumbling and insufficient to meet growing water demands and more extreme climate events,” said Daniel G. Keppen, executive director of the Family Farm Alliance, one of 220 agriculture and water management groups that have come together to lobby Congress to spend \$49 billion over the next 10 years for repairs for old and crumbling dams, as well as new infrastructure including water recycling and reuse projects.

“The current drought clearly underscores the urgency to expand usable supplies to avoid water curtailments and conflict over water supplies in the future,” he added.

From the early 1900s to the late 1960s, America built mammoth water management projects across the West, including the iconic Hoover Dam. But those projects seem outdated as climate change is altering traditional water cycles radically.



Previous water level markings at the Hoover Dam on Lake Mead in Boulder City, Nevada on June 16. *Photographer: Kyle Grillot/Bloomberg*

Snowpack used to reliably act as a kind of additional reservoir space for much of the nation, slowly releasing meltwater throughout the year. Now snow is declining and even disappearing in certain altitudes in some years. Meanwhile rains are now arriving earlier in the season and in more concentrated bursts.

Old-fashioned dams on rivers are not handling the change well. In 2017, that last big flood year in California, Oroville Dam nearly collapsed under water pressure and 180,000 residents needed to evacuate. Meanwhile, the state's Department of Water Resources estimated that 48 million acre-feet of water flowed out under the Golden Gate Bridge, roughly seven times the amount of water exported by the State Water Project annually to meet the agricultural needs of the Central Valley and homes in Southern California.

California passed a law in 2014 that allowed \$7.1 billion in bonds for water projects, roughly \$2.7 billion for storage specifically. There are currently seven projects under consideration. Water managers are looking to new projects that can absorb the rare intense outflows and store them for the long dry spells in between; the term of art is “water banking.” This means designing reservoirs like Sites that don’t sit on rivers, but adjacent to them, and only fill during moments of intense outflow. It also means pumping water back underground to be stored in natural aquifers which have been drained by overuse. Underground storage replenishes ground water and allows for much less evaporation than its surface counterpart, but it is far more energy intensive.

Southern California is demonstrating the advantages that such investments can bring. Since the early 2000s, water managers there put more than a billion dollars toward water banking infrastructure, both above- and below-ground. As a result, at the beginning of May, despite the drought ravaging the rest of the state, the area had a record 3.2 million acre-feet of water in reserve.

Such projects take time and lots of money, however, which makes some skeptical as to whether they are really the best way to ease water shortages. David Freyberg, a hydrologist and water resource specialist at Stanford University, is cautious. He argued there is still lots of low-hanging fruit in water conservation—everything from planting crops at different times to changing outdated rules of how dams can function.

“Many dams operate on rules that were put in place when they were built up to 50 or 60 or more years ago when we knew less,” he said. For example, “you often have to release water in the winter to make sure that you have space available for melting snow. But now we don’t have as much snow and there’s nothing to wait for—but the rules haven’t changed. So we need to better manage our storage.”

California, which has a lot of experience with prolonged drought, is farther ahead of other Western states when it comes to building next-generation water infrastructure, but other states are making progress. Even states that have typically had ample rain have had to wrestle with insufficient water as they try to manage a growing population and also endangered species that require additional water.

Washington state’s Kittitas Reclamation District is one of those areas. It is part of the Yakima River Basin Project, which consists of five reservoirs and was built in the 1930s. It currently waters \$4.5 billion in agriculture crops annually and is home to a struggling salmon fishery. A decade ago the various interests in the community were at each other’s throats fighting for water, said Urban Eberhart, who manages the district. But the realization that climate was changing brought everyone together.

“Multiple climate change models showed that in the future, we will not be receiving an orderly melting snowpack,” he said.

So the Yakima community put together a 30-year, \$4 billion adaptation strategy that includes everything from raising one local dam three feet to adding groundwater storage and watershed conservation. The dam elevation is under construction now.

But Eberhart says that even before that goes up, they are already lining all the old local canals to make them leak less. And they are using the canals in new ways. In the dry season, they still take water from the basin, but in flood season they now pump it back into the many rivers and streams that have been going dry for a century.

“We’re now rehydrating them,” he said. “We’ve actually been doing this since 2015. It’s really new, innovative way of thinking and dealing with climate change.”

2020 Lake Tahoe Clarity Report

Trends Holding but Threats Remain

by UC Davis News and Media Relations/Tahoe Regional Planning Agency | July 08, 2021



Katie Senft, a researcher with the UC Davis Tahoe Environmental Research Center, lowers a Secchi disk to measure lake clarity in June 2021. Center researchers take dozens of such measurements throughout each year. (Alison Toy/UC Davis TERC)

Lake Tahoe's water clarity measurements, which are indicators of the health of the watershed, averaged 62.9 feet through 2020, the UC Davis Tahoe Environmental Research Center and the Tahoe Regional Planning Agency announced today. Lake Tahoe's clarity peaked in February 2020 when it was deeper than 80 feet. It was at its lowest in mid-May when it measured at slightly more than 50 feet. These readings were within the average range of the last decade. Average clarity in 2020 was just slightly better than the previous year's average of 62.7 feet.

Clarity has been measured by UC Davis researchers since the 1960s as the depth to which a 10-inch white disk, called a Secchi disk, remains visible when lowered through the water. Because lake clarity measurements vary from day to day and year to year, managers and scientists remain focused on long-term trends as an indicator of the lake's health.

Measurements show Lake Tahoe's annual clarity has plateaued over the past 20 years. Despite this progress, summer clarity continues to decline by over a half-foot per year.

"While there is a good understanding of how fine clay particles and tiny algal cells reduce clarity, the biggest challenges are in reducing their presence in the surface water," said Geoffrey Schladow, director of the UC Davis Tahoe Environmental Research Center. "Here climate change, and in particular the warming of the surface water, is exerting an undue influence."

The clarity of Lake Tahoe's cobalt blue waters tends to peak during the wintertime. (Brant Allen/UC Davis TERC)

A recent review of clarity data by the [Tahoe Science Advisory Council](#) reaffirmed the understanding of main drivers of clarity loss. The council commissioned a panel of scientists from regional academic

and government research institutions, which concluded that fine sediment particles and algae continue to be the dominant variables affecting Tahoe's clarity.

They recommended that water quality agencies continue to focus on reducing fine sediment and nutrient loads.

Past UC Davis research and the [council's report](#) pointed to several other factors affecting Tahoe's famed clarity. Climate change is altering precipitation and snowmelt patterns and increasing the temperature of the lake and impeding deep lake mixing. Such mixing in late winter can bring cold, clear water up from deep in the lake, which improves clarity. In 2020, the mixing was extremely shallow and contributed to the lack of improvement.

"Adaptive management is crucial when confronting evolving threats like climate change, invasive species, and expanding visitation rates in the Tahoe Basin, but it is an approach that requires targeted data to assess response to changing conditions and management actions," said Alan Heyvaert, past Tahoe Science Advisory Council co-chair and Desert Research Institute associate research professor. "This council report demonstrates the value of continued investment and innovation in sustained monitoring and assessment at Tahoe."

How is clarity measured and why?

Lake Tahoe is known around the world for its water clarity and cobalt blue color. Historically, clarity averaged about 100 feet. A development boom in the mid-20th century brought about unintended environmental impacts, including reduction of the lake's pristine clarity. For decades, researchers have been documenting changes in the lake, and the research has informed policymakers and stakeholders on management strategies to protect the lake and stabilize its decline in clarity.

In 2020, UC Davis scientists took 27 individual readings at Lake Tahoe's long-term index station. Using technology beyond the Secchi disk, researchers continue to refine their understanding of lake physics and ecology to determine the evolving causes of clarity change.

The states of California and Nevada, which share Lake Tahoe, are actively working to restore average lake clarity to its historic 100 feet. Under the Clean Water Act, the Lake Tahoe Total Maximum Daily Load is a science-based plan to reduce the amount of fine sediment and nutrients entering the lake by reducing pollution through improved roadway maintenance and erosion control on roadways and private properties.

More than 80 organizations, including government agencies, nonprofits, and research institutions, are working collaboratively with scientists to improve Lake Tahoe's water clarity and ecological health under the Lake Tahoe Environmental Improvement Program, or EIP, which is one of the most comprehensive, landscape-scale restoration programs in the nation.

"Regaining Lake Tahoe's water clarity is a commitment we all share, and together we are making a difference," said Joanne S. Marchetta, executive director of the Tahoe Regional Planning Agency. "While the long-term clarity trend shows we are on the right track, we need to remain vigilant about restoration while we look to understand more about the role climate change and other threats are playing."

Media Resources

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Report: Water quality is good in the Truckee Meadows

By ThisIsReno | July 8, 2021

The Truckee Meadows Water Authority (TMWA) this week released its [annual water quality report](#), required by the Environmental Protection Agency (EPA).

This report, which is based on data collected in the 2020 calendar year, contains information about source of TMWA's drinking water and how it compares to drinking water standards established by the EPA.

]

following systems operated by TMWA: Lightning W, Old Washoe Estates, Stampmill, Sunrise Estate West Reno.

Water quality in the region is good and meets all EPA standards.

"Every drop of water that you receive from TMWA is treated with expertise," said General Manager Mark Foree. "We take pride in the high-quality water delivered to our customers. The Water Quality Report is a welcome opportunity to show our community the stringent safety standards that our ski staff adheres to in ensuring high-quality water on a daily basis," Foree said.

In order to ensure the region's water meets safety standards, TMWA performs more than 1,000 laboratory tests every month on more than 200 samples taken from various locations throughout its distribution system.

In addition to the report, TMWA customers are invited to attend several tours of the Chalk Bluff Water Treatment Plant in August and September to learn more about the water treatment process. Visit <https://tmwa.com/meeting/> for more information.

If you would like a print copy of the water quality report mailed to you, contact Water Quality and Environmental Permitting Supervisor Kelli Burgess at 775-834-8117 or email her at kburgess@tmwa.com.

You can also look up specific water quality information about your neighborhood by using the online map-based reference tool, which provides the latest water quality data by geographic location. Sample data is updated quarterly for turbidity, pH, chlorine residual, hardness and arsenic. You can find your neighborhood's sample data on TMWA's Water Quality Lookup page at www.tmwa.com/water_quality

Source: TMWA

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SNWA urging summer water conservation

by Steve Wolford

Thursday, July 8th 2021

Las Vegas (KSNV) — As we head into the hottest weeks of the summer, the Southern Nevada Water Authority is once again encouraging homeowners to conserve water, especially when it comes to landscaping, and they're backing it up with education, incentives, and enforcement.

For Water Waste Investigators like Perry Kaye, who pulled into a neighborhood Thursday morning to spot multiple violations, it means staying busy. "We drove up on this property," Kaye said. "They had what we call misaligned sprinklers, basically water shooting into the street."

Since the homeowner had a previous violation for a different offense, Kaye simply issued a warning, left the documents in the garage door, and placed yellow lawn flags next to two malfunctioning sprinklers.

Kaye says the emphasis of his job is more about education than issuing fines for violations. "I know irrigation very well, and most of the investigators do," he said. "We're here to help. So, if you have an issue, we're here to tell you what you need to fix to avoid being warned or fined by us."

According to SNWA's Beth Moore, wastewater violations start with a warning. Repeat offenders then face fines of \$80, which double for each subsequent offense, to nearly \$1300.

However, Moore says they can easily be avoided with some diligence on the part of the homeowner. "By simply changing your watering clock four times a year on each season, the average homeowner can save approximately \$300 on their watering bill," said Moore. "So, during the summer months, you're only supposed to water up to six days a week, and never from 11 AM to 7 PM."

Moore says Southern Nevadans can also enjoy additional savings by taking advantage of an offer by SNWA to replace grass with landscaping that doesn't require much if any water.

Moore says, "the best way to conserve water is to remove useless grass. If you're only on it to mow it, get rid of it, and the Southern Nevada Water Authority will pay \$3 per square foot to upgrade to water-smart landscape."

"A lot of people think that water-smart landscape is just rock and cactus," Moore added, "but they can actually be a lot more beautiful and appealing than just grass itself. The Springs Preserve has a garden where there's some great examples of beautiful lush Water Smart landscapes that can save you time on maintenance, and save you money on your watering bill."

Moore says the SNWA is also encouraging Southern Nevadans to report water waste, so its investigators can facilitate corrective action and save water. This can easily be done using the "lvwd" smartphone app, or on its website, <https://www.snwa.com>. The Water Authority's website also has information on watering days and other conservation tips.

News Center



Why Remote Work Might Worsen Southwest Water Woes

Research by UNLV economists finds that pandemic stay-at-home orders put a strain on already tight water resources.

A

s concerns flare over record-low water levels at Lake Mead, a new UNLV study shows that COVID-19 pandemic stay-at-home orders — and a subsequent societal shift to remote work — may be exacerbating the problem.

The study, recently published in the *Journal of Environmental Economics and Management*, found that Las Vegas Valley residential water use soared during the pandemic, outpacing even combined pre-pandemic usage across Southern Nevada's three main property types (residential, commercial, and schools).

That may not seem surprising, considering the intense focus on precautionary public health measures such as sheltering in place and frequent hand washing during the pandemic. But given drought conditions brought on by the already-meager water levels within Lake Mead and its Colorado River tributary, a team of UNLV economists says the data has potentially dire implications.

As more companies and institutions opt for business and educational learning models that embrace the pandemic's reliance on virtual connections, researchers say the increase in hybrid or completely remote work and school environments might strengthen the strain on the region's water resources.

RESEARCH | JULY 12, 2021 | BY KEYONNA SUMMERS |

MEDIA CONTACT: KEYONNA SUMMERS KEYONNA.SUMMERS@UNLV.EDU (702) 895-0898

They called on government leaders to implement better infrastructure or water conservation processes to accommodate the prospect of people spending even more time at home.

“While intuitive, these results are important as it highlights the potential effects of a permanent shift toward remote working, even post-COVID-19, that may potentially strain water resources in areas already facing scarcity,” the authors wrote. “Such a strain on water resources, especially in the Western United States, will likely pose additional challenges as people begin to relocate away from the coasts to the interior of the country.”

The study, jointly authored by UNLV Lee Business School economics professors [Nicholas Irwin](#) , [Ian McDonough](#) , and [Shawn McCoy](#) , is the first publication that convincingly estimates the impact of the COVID-19 pandemic on water usage across property types.

The team examined residential, commercial, and school customer bills from the Henderson Water District — the Las Vegas Valley’s second-largest municipality and a microcosm of the larger multi-state region that draws water from the Colorado River — from 2017 through September 30, 2020. Residential users comprise 98% of Henderson’s total user base.

Aggregated across all users, the Silver State’s stay-at-home order led to an increase in net water usage between 32 to 59 million gallons over the first 30 days, findings show. Five months after the lockdown, these aggregate effects increased to approximately 491 million gallons of extra water consumed each month.

Nearly 90% of the Las Vegas Valley’s water is drawn from Nevada’s portion of Colorado River water rights, which entitles the state to 300,000 acre-feet (97.76 billion gallons) per year. This water allocation was assigned in 1922, when Nevada’s population was just about 80,000 — less than 3% of its current population of 3.1 million residents.

Census estimates show that Idaho, Arizona, Nevada, and Utah are the top four Western states with the largest population increases from 2019 to 2020. Except for Idaho, all of them source water from the Colorado River — along with New Mexico, Wyoming, California, and Colorado.

The strain on water resources is multifold. For example, California Gov. Gavin Newsom recently asked all state residents — including those who operate industrial commercial and agricultural businesses — to voluntarily reduce their water usage by 15%, and the Southern Nevada Water Authority has been lobbying state lawmakers to enact water conservation measures such as the prohibition of water-intensive decorative turf within medians, along roads, and in business parks.

“Given the condition of Lake Mead and the observation that many are still continuing to work from home, we think there are significant and broader implications for policymakers on regional and national scales,” researchers said.

“Policymakers in states facing such shortages must be cognizant of the effects from more and more corporations allowing workers to permanently shift towards remote work and increases in population from residential mobility, all of which may require renewed efforts to encourage water conservation,” they said. “Without adjusting their water consumption habits or preferences in moving from water-rich to water-poor parts of the United States —i.e. installing low-flow and/or highly efficient home appliances or converting landscaping to drought-tolerant species — the added pressures of this increased population may serve as a tipping point into severe water restrictions if not mitigated.”

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Wildfires in the West and water supplies: More at risk than you know

Utah and other states tackle critical restoration projects

By Amy Joi O'Donoghue | @Amyjoi16 | Jul 14, 2021, 10:00pm MDT



Dead and fallen trees are pictured near Soapstone Basin in Uinta-Wasatch-Cache National Forest on Saturday, July 10, 2021. | Jeffrey D. Allred, Deseret News

Utah's Dollar Ridge Fire in 2018 was an ominous knock at the door for water supply managers trying to keep water flowing to a million residents.

That fire led them to invest in a \$28 million upgrade to the Duchesne Valley Treatment Plant after debris and sediment washed into Starvation Reservoir.

"We were able to treat the quality of water, but it brought to our attention another process that would be more protective," said Tom Bruton, assistant general manager of the Central Utah Water Conservancy District, explaining various filtration systems.

An Interior Department report notes that 80% of the nation's water supply originates on forested lands — areas that are under increasing assault due to catastrophic wildfires that especially plague the West and threaten water quality.

Like Utah, Colorado and other states in the West have had to invest millions in water treatment plant upgrades in the wake of devastating fires that could choke off residents' only source of water.

The fixes in the aftermath of a fire are expensive, so land managers, water districts, state forestry agencies and other partners are heavily involved in a proactive, preemptive program to target high-priority areas with proven strategies to minimize risk.



U.S. Forest Service firefighters Andrew Johnson and Zach Bearman pile wood near Soapstone Basin in Uinta-Wasatch-Cache National Forest on Saturday, July 10, 2021. The wood piles will be burned this winter. | Jeffrey D. Allred, Deseret News

It's called Shared Stewardship, and back in 2019, Utah became only the third state in the country to embrace this partnership with the U.S. Forest Service. Since then, the program has ballooned to include more than two dozen states across the nation.

"We can do all our work on the other side of the fence, but fire and insects don't know boundaries," said Tim Garcia, acting deputy regional forester for Intermountain Region 4 of the U.S. Forest Service headquartered in Ogden.

Since its inception, Utah has chipped in \$6.5 million for the Shared Stewardship program, while the Forest Service has contributed \$14 million for projects. Water conservancy districts are also contributing money and other resources to tackle projects to minimize risk.

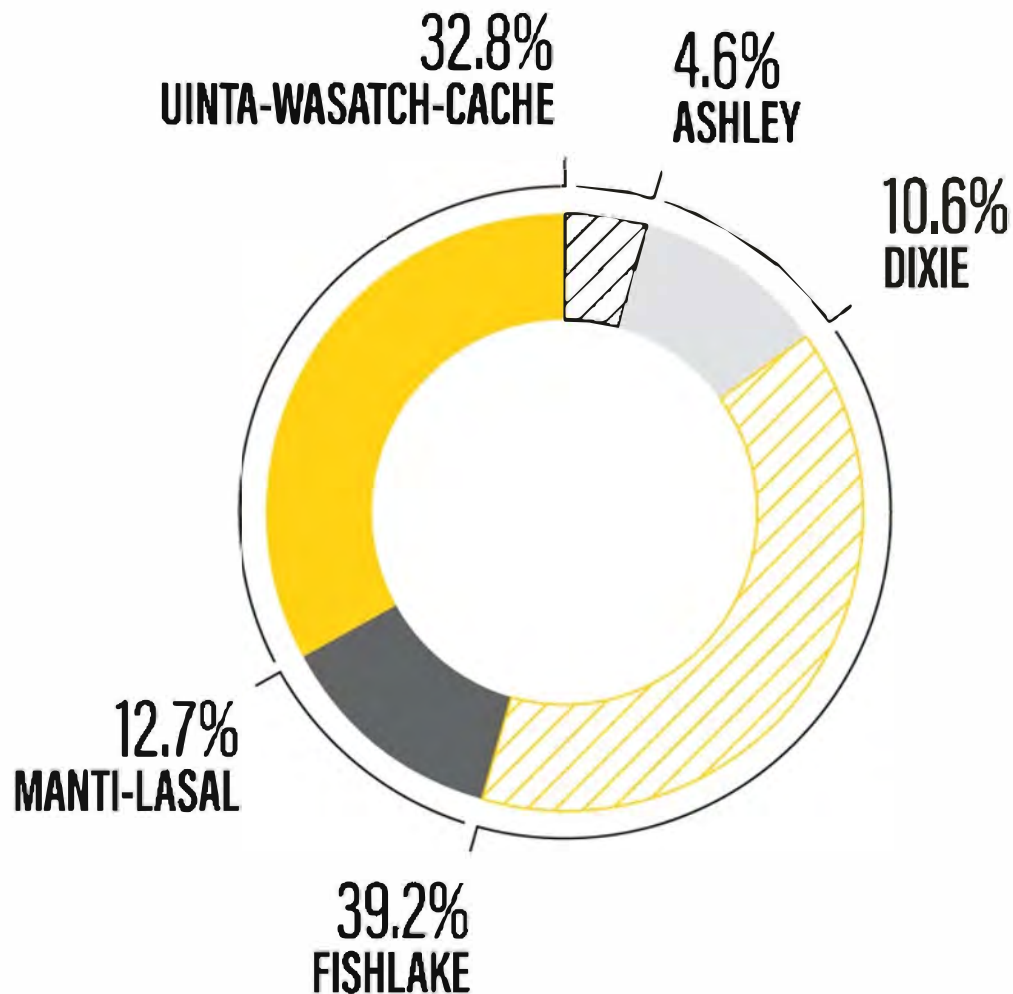
Bruton is meeting with Forest Service supervisors of each of the forests within the district's boundaries to map out ways to combat threats to vital water treatment and delivery systems.

"We're trying to gain a better understanding of the measures that can be taken to preempt catastrophic wildfires," Bruton said. "The need is far greater than the monies that are available."

It's a race against time, against the strong hand of Mother Nature.

Bruton said that last year, the Range Fire came within a couple hundred yards of a critical water treatment plant in Orem that serves hundreds of thousands of people. And a 90,000-acre fire burned out the basin above Upper Stillwater Dam in the High Uintas in Duchesne County. Bruton said it remains to be seen if storms this season will wash debris into the dam and cause potential problems.

Project funding by national forest in Utah



NOTE: Numbers may not add up to 100% due to rounding.

SOURCE: U.S. Forest Service





Soapstone Basin in the Uinta-Wasatch-Cache National Forest is pictured on Saturday, July 10, 2021. The U.S. Forest Service is working in the area, stacking dead wood for later burning due to fire danger. | Jeffrey D. Allred, Deseret News

His district is working with the Forest Service on a Shared Stewardship project targeting the upper Provo River above Jordanelle Reservoir, a chief water source for the Wasatch Front.

The work through the program is more than just controlled burns but a strategic combination of lopping heavy forest growth, putting in fire breaks and increasing defensible space.

Phase Four of the project has been completed, involving 1,155 acres. It created shaded fuel breaks along 22 miles of forest road and improved lodgepole pine stands.

Another phase targeting 1,967 acres is halfway complete and expected to wrap up in October. In part, it is using mechanical equipment to reduce fuel loads.

A contract for 1,934 acres should be awarded soon for another stage of the project which also involves targeting more than 250 acres to protect the water supply for the town of Kamas.

Bruton said these important projects will help avert problems down the road.

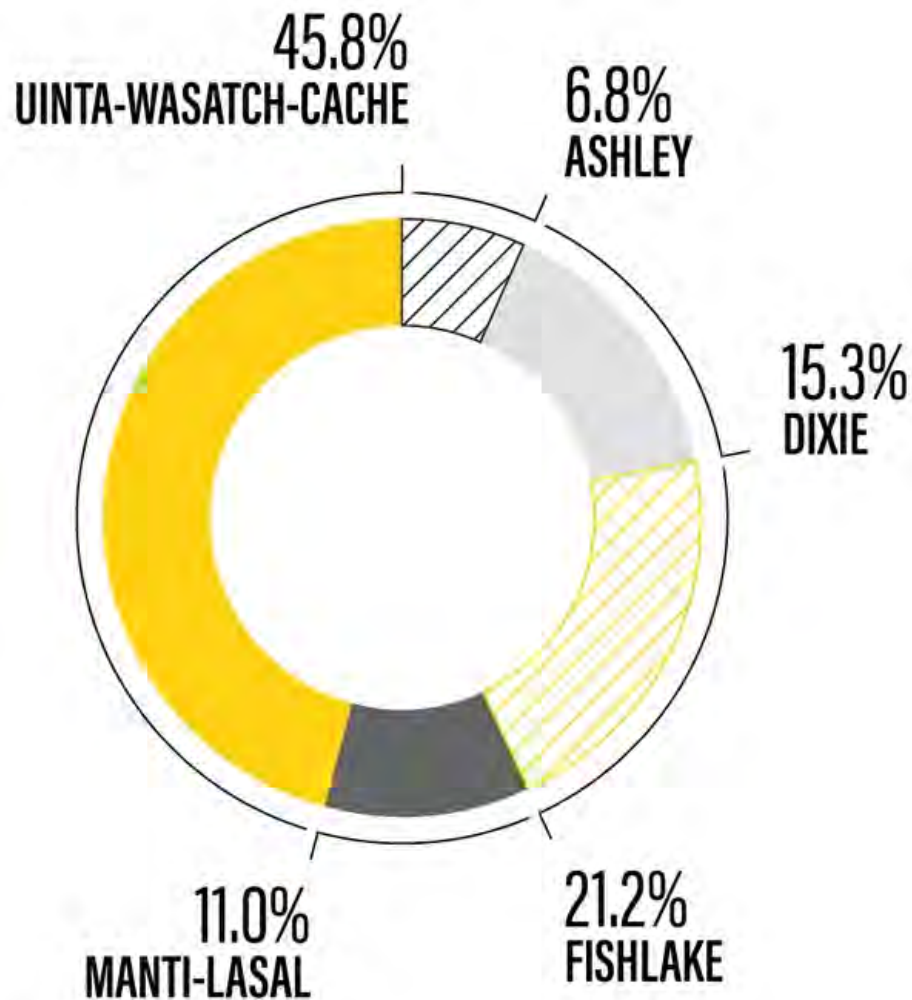
“We have not had a catastrophic fire above Jordanelle, but we have learned our lessons,” Bruton said. “We are doing everything we can to keep the water flowing and safe.”

Bruton noted that other water conservancy districts — Jordan Valley and Weber Basin— are also participating in Shared Stewardship projects.

“They say water and fire don’t mix, but in this case water and fire do have to mix in order to control catastrophic wildfires,” Bruton said.

Across the United States, the Forest Service has identified 80 million acres at above-average risk for wildfire due to insect infestations, dead trees and in need of some type of restoration. On top of that, the federal agency says there are now 44 million homes within the wildland urban interface nestled among shrubs and trees that are a ticking tinderbox.

Priority areas (top 20%) by national forest in Utah



NOTE: Numbers may not add up to 100% due to rounding.

SOURCE: U.S. Forest Service

When it comes to Utah's Shared Stewardship targets, nearly 46% of "high-priority" areas are within the Uinta-Wasatch-Cache National Forest that in part abuts the Wasatch Front.

Garcia says those priority areas are determined by an extensive review using technical specialists and GIS mapping.

The Utah Shared Stewardship [website](#) shows the level of those priorities, and as Garcia pointed out, it is like a sinuous spine that tracks along population centers as well as critical infrastructure that may be surrounded by unhealthy forests.

"The spine of where there are populations, water quality and risk all align," he said.

"The prevention work we are doing is good governance. It is the right thing to do for our citizens and our resources."

The teamwork and partnerships inherent in the Shared Stewardship program may seem like a given — after all land, water, homes and businesses are all intertwined.



U.S. Forest Service firefighters Andrew Johnson and Zach Bearman pile wood near Soapstone Basin in Uinta-Wasatch-Cache National Forest on Saturday, July 10, 2021. The wood piles will be burned this winter. | Jeffrey D. Allred, Deseret News

But Garcia says it is more nuanced than that.

He recalls a time when he worked as a district ranger in Kamas about two decades ago and remembers the work the Forest Service was doing.

“We would work with local communities, but it was kind of a myopic view. We were not including everyone in those strategic discussions,” he said. “It is like looking over your fence and wondering what your neighbor is doing without really coordinating. This is a heck of a lot more efficient.”

In the forests and the mountains above the crowded cityscapes that make up the Wasatch Front, the quiet work of watershed restoration and fire prevention unfolds.

It goes on in the heat of summer and extends into the fall. In the spring, it resumes, as wildfire experts look to the coming season and weigh risk and threats.

Utah gets about 95% of its water from snowpack that melts, is stored in reservoirs or trickles to the valleys through streams, creeks and rivers. The water is then turned on at the tap after it has moved through a complex delivery system made up of pipes, aqueducts and importantly, water treatment plants.

The Shared Stewardship program is all about keeping that flow uninterrupted and that resource safe.

“It’s all about the water,” Garcia said.



Signs warn campers for fire danger near Soapstone Basin in Uinta-Wasatch-Cache National Forest on Saturday, July 10, 2021.

| Jeffrey D. Allred, Deseret News

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WEATHER

Lake Tahoe Could Drop Below Natural Rim This Fall

Lake Tahoe only rose about 1.5 inches from April 1 until the peak.

Thursday, July 15th 2021, 5:01 PM PDT

Updated: Friday, July 16th 2021, 8:15 AM PDT

By **Paul Nelson**

Lake Tahoe is a very popular place during the summer months and that is no different this year. Sand Harbor is filling up with people from all over the country.

"Mid-80s, crystal blue water, family here, wind in your face, there's nothing better than Lake Tahoe. Especially, for us out-of-staters," Russ Larson, Highland, Utah resident said.

The lake is about 1.5 feet above its natural rim. It is dropping at approximately an inch per week in July but it has evaporation has increased by four times in the last couple of days.

"Over the past few years, it's just gotten hotter and hotter," Vincent Portocarrero, Novato, California said. "The sun beats down harder and it's just gotten lower and lower. When I was a kid, it was so much higher."

The forecast shows that the lake will drop below its natural rim by mid-October, mostly because of evaporation. 370 cubic feet per second are flowing through the Tahoe City Dam. At that rate, it would take 200 days for the lake level to drop one foot.

This year had the lowest increase in lake levels in recorded history. It usually rises 1.3 feet from April 1 until the peak. This year, it only rose 1.5 inches. Between October 1 and the peak, the lake will typically rise 2.25 feet but it actually dropped by about six inches this year.

People understand that the water levels fluctuate each year. The lake has been below its natural rim many times before.

"I've been in drought before at Lake Tahoe and the water level was much lower," Scott Portocarrero, Novato, California said. "It just seems like it's only dropped like two or three feet."

The Sand Harbor boat ramp will close for the season, Sunday at 8:00 p.m. Officials say the last time the ramp closed was in 2014.

"We had a guess that we were going to have a pretty lean year and the water wasn't going to rise like it normally would after a good year," Allen Wooldridge, Park Supervisor of Lake Tahoe Nevada State Park said.

One reason for the closure is to protect the lake's ecology. The water is so low that people have to back their trailers into the lake, past the end of the concrete ramp. The more of the trailer and truck that go into the water, the bigger impact it will have. The other reason is because boats and trailers are getting damaged in the process of loading or unloading.

"There's often times when they get out too far and they go off the ramp and they come back out," Wooldridge said. "Especially, at the end of the day when they're loaded, we've actually seen axles being ripped off."

Most of northern Nevada is in an extreme drought, including Lake Tahoe. It will require a heavy snowpack this winter to fill the lake to capacity. That's what locals and visitors are hoping for.

"I've seen it worse but it's pretty bad and I'm pretty bummed that they're closing the boat ramp," Laura Haley, Reno resident said. "That has an effect. I like to jump off the rocks and stuff and so it's kind of sad when it's too low. You can't do any of that."

Other reservoirs are also low. Boca Reservoir can hold 40,000 acre-feet of water but it is currently holding nearly 24,000. Prosser Reservoir is right around 50 percent of capacity. Stampede Reservoir can hold 226,500 acre-feet but it is down to just 87,000.

Officials say the Truckee Meadows has plenty of drought reserves for day-to-day water use. The drought is having a much bigger impact on agriculture and power generation.

Indy Environment: Extreme heat is here, but not everyone has access to an essential service: A/C

Good morning, and welcome to the Indy Environment newsletter.

As always, we want to hear from readers. Let us know what you're seeing on the ground and how policies are affecting you. Email me with any tips at daniel@thenvindy.com.

If you received this from a friend, [sign-up here](#) to receive it in your inbox.

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Record-breaking temperatures swept across the West last week. On Saturday, Las Vegas tied its [all-time temperature record](#) of 117 degrees. As of Tuesday, the National Weather Service in Reno reported 12 days of temperatures over 100 degrees to date this year, far exceeding the previous record of seven days. Death Valley again [hit 130 degrees](#).

Extreme heat, made worse by climate change, is a public health issue, often underreported and hidden from public view in a way that other natural disasters are not. It is a slow-moving crisis. Heat can [increase hospitalizations](#) as high temperatures worsen underlying conditions.

And extreme heat can be fatal. Oregon and Washington [have reported](#) a death toll of nearly 200 people during the record-breaking heatwave. In areas like the Pacific Northwest, with temperate weather and less air-conditioning, the consequences of extreme heat can be even greater.

Still, in cities such as Las Vegas, where summers are historically warm, extreme heat poses major public health risks. [8 News Now recently reported](#) that heat was a primary factor in 124 deaths last year and 12 deaths so far this year, according to the Clark County Coroner.

From July 7 and July 11, the Clark County Fire Department said that it responded to 85 incidents categorized as heat or cold exposure, though that number likely undercounts what in reality was a higher number of calls. A spokesperson for the department said in an email that other calls, categorized as “unknown problem” or “unconscious people,” were heat-related.

If extreme heat can be life-threatening, access to cool spaces can often be life-saving, and increasingly so, as temperatures rise. But for many, there are

significant barriers to accessing cool spaces, whether inside their homes or at work. This summer, that fact has been exacerbated by A/C supply chain and workforce issues.

With different geographies and average temperature, the situation is different in Las Vegas or Reno. But in both of Nevada's metro areas, some groups — low-income households, renters, outdoor workers, elderly populations, homeless individuals — are at a greater risk of not being able to access indoor cooling or shade.

In Reno, which has seen a nearly seven-degree increase in average annual temperatures over the last 50 years, city officials recognized this [in their climate plan](#). They wrote: "Extreme heat creates public health impacts when vulnerable populations, such as the homeless, seniors and low-income residents, don't have air conditioning or other options for relief."

The next line was a harbinger of what's to come as the climate changes: "Extreme heat events are projected to increase in magnitude and frequency."

It's important for policymakers to begin thinking about these issues now and in a "holistic way," said Dylan Sullivan, a Reno-based senior scientist for the Natural Resources Defense Council who recently wrote [a post on extreme heat that included recommendations for policymakers](#).

Sullivan's background is in energy efficiency, and he notes that the conversation is not only about A/C. Homes that are inefficient tend to trap heat and stay warmer. **Although there is funding for ["weatherization" programs](#) to retrofit and upgrade older homes, the current programs do not go far enough (the infrastructure bill being debated in Congress looks at releasing more weatherization funding).**

"Putting in place policies that make it really easy for customers — and really cheap or free for low income customers — to weatherproof old buildings and keep cool air indoors is really important for long-term climate adaptation in Nevada," Sullivan said.

But ensuring access to indoor cooling is also a big part of the equation. Sullivan said "there's a big role for the electric utility" in helping customers install efficient A/C systems.

In NV Energy's Las Vegas service territory, an average market profile for the residential sector, using 2016 data, shows central A/C saturation at about 88 percent, [according to a report](#) that the utility filed with state regulators as part of a resource planning process. Other residential customers have room A/C-units, air-source heat pumps or rely on evaporative cooling.

Compare that to Northern Nevada. In NV Energy's northern service territory, which serves Reno and a large swath of the northern part of the state, central A/C saturation is closer to 57 percent and room A/C saturation is 12 percent, according to the same report.

The utility currently offers discounts for replacements or upgrades in Las Vegas but not in the northern part of the state. Sullivan said he would like to see the program expanded.

“The company should be operating a program like that in the North,” he said.

But even for people with A/C units, repairs can be costly and challenging, especially for renters. A backlog of work orders or resistance from a landlord can leave customers without A/C for days, sometimes during the hottest parts of the year.

Under Nevada law, landlords are required to provide renters with essential services. The list includes things like a functioning door lock. It also includes heat and air-conditioning.

“It's clear there in the statute that air conditioning is an essential service that's required to be provided by a landlord,” said Aaron MacDonald, a staff attorney for the Legal Aid Center of Southern Nevada.

Most of the issues, he said, are resolved before they come to his office. But if a landlord does not fix the issue, then renters approach the Legal Aid Center. If the issue persists, a renter may obtain cooling services and deduct the cost up to one month's worth of rent, obtain other housing, sue the landlord or withhold rent with no late penalty.

But there are some caveats that stem from another crisis: COVID-19. You cannot withhold rent if you are behind on rent — and many renters are behind on their rent because of the economic fallout of the pandemic. Making matters worse, the state has been [slow to disburse rental assistance](#).

And “if they are evicted, then they are going to be out in the heat homeless,” MacDonald said.

On the landlord side, a supply-chain shortage related to the pandemic has slowed A/C repairs in certain cases. Susy Vasquez, who leads the Nevada State Apartment Association, said that her members try to do what they can, sometimes opening model units for renters to ensure they have A/C. But she said that without rental assistance, small landlords are being hit too.

“There are people that are struggling, and there are people that haven't been able to make their mortgage payment because their rent isn't coming in,” Vasquez said. “And they don't have the funds to fix their air conditioner.”

Issues with access to cool spaces are not only limited to the indoors. They play out in a work environment too for many outdoor workers. After a farmworker died in Oregon last month, the state's governor [directed regulators to adopt emergency rules](#) that would protect outdoor workers with water, shade and rest breaks.

Do you have a personal experience with extreme heat? How has heat affected you? How have you seen temperatures change? I'm working on covering this issue in more depth,

and you can [read more about our reporting plan here](#). Please send us your stories at daniel@thenvindy.com.

Here's what else I'm watching this week:



Little Washoe Lake in Washoe Valley on Tuesday, July 13, 2021. (David Calvert/The Nevada Independent)

What happened to Little Washoe Lake? The parched landscape is tragic and staggering. A lake outside of Reno, home to largemouth bass, carp and catfish has dried up rapidly over the past few weeks. *Nevada Independent* photographer David Calvert documented the exposed lakebed and the drying landscape — [see his sobering Twitter thread](#).

The region is facing extreme drought. Even in a year with a moderate snowpack across parts of Nevada and the West, less water ran off the mountains — filling rivers and lakes — because it was absorbed by dry soils. At Little Washoe Lake, dry conditions decreased the amount of water that ran off into the lake. But it's not the only climate-related cause of the low-level declines.

The impacts to Little Washoe Lake were sudden and extreme, as if someone pulled a plug out from underneath the lake. For those who had watched the lake in the last drought, the

effects seemed extreme, even for the dry conditions we have been experiencing this year. Officials with the Nevada Department of Wildlife began investigating the situation.

What they found is what the agency's spokesperson described to me as a "story of extremes." The lake's decline is the aftermath of extreme swings in weather, something that researchers predict becoming more and more common as the climate changes.

Heavy rain in 2017, the same year the [Truckee River flooded](#), washed out a diversion that fed water into the lake. An extreme on one side of the spectrum. Now we are facing an extreme in the other direction: drought. The washed-out diversion, combined with the extreme drought, have contributed to the severe situation at Little Washoe Lake, the wildlife agency said.

We'll continue reporting on this story and recovery plans for the lake.

Firefighters battle blazes in extreme conditions: Over the weekend, firefighters in northern California and Nevada faced dry and hot fire conditions. The Beckwourth Complex fire, not far from the Nevada border, grew to be the largest fire burning in California, prompting evacuation orders, including in Washoe County, over the weekend. Noah Berger, a photojournalist for the Associated Press, [took striking photos of the fire and the response](#).

- In Washoe County, fire crews quickly responded to the Garson Fire, which broke out Sunday evening near Verdi. As of Tuesday, the fire was [about 85 percent contained](#).
- *The Mercury News*' Paul Rogers on how [bad this year's fire year could become](#). One quote that stuck out to me: "We're seeing fire activity that we would normally be seeing in September and October already," Chief Thom Porter, Cal Fire's director said. "And we have a very long rest of the peak season to go. It's concerning."

An Oregon wildfire, a heat wave and an NV Energy alert: NV Energy, along with California's grid operator, asked customers to conserve power over the weekend. The utility's goal was to bring down overall demand amid a heatwave that added strain to the Western grid and a wildfire in Southern Oregon that threatened regional transmission lines. *The Los Angeles Times*' Sammy Roth has an [excellent piece looking at the grid dynamics in California](#).

- **How much did NV Energy's request to customers help reduce demand?** NV Energy sent this note out to customers Tuesday: "Working together with our smart thermostat program participants and many of our largest customers, you were able to help reduce our energy demand by approximately 300 megawatts."
-



The Lake Mead bathtub ring measures 150 feet at Hoover Dam on June 25, 2021. (Jeff Scheid/The Nevada Independent)

Watching the Colorado River: Reporter Luke Runyon talked to people across the Colorado River Basin about what they are expecting in a watershed where there is less to go around. It's a [thoughtful and in-depth piece](#) on one of the most important issues facing the Southwest right now. Among the issues facing Colorado River water managers is what shape negotiations will take for deciding how to operate the river after a current set of guidelines expire in 2026.

Critical to that discussion is who will be at the table. In the past, tribes have been left out of the negotiations over the river, despite having rights to a share of one-fifth of the [river's average flows](#). The *Associated Press*' [Felicia Fonseca wrote an important piece](#) looking at the role that the Colorado River Indian Tribes have played in Arizona's recent Colorado River negotiations.

"We were always told more or less what to do, and so now it's taking shape where tribes have been involved and invited to the table to do negotiations, to have input into the issues about the river," Amelia Flores, the chairwoman of the Colorado River Indian Tribes, told the *AP*.

As we have reported, the Southern Nevada Water Authority has focused its efforts on taking out turf, conservation and enforcement. [The Guardian's Oliver Milman](#) went on patrol with a water investigator and wrote more about what the water authority is doing.

And this morning, a coalition of elected officials (County Commissioner Tick Segerblom, Boulder City Mayor Kiernan McManus), a director for the Imperial Irrigation District and conservationists are holding an event at the Hoover Dam. The group is expected to call for a moratorium on new dams and diversions on the Colorado River.

Governments are looking at higher taxes for the mining industry: This is not just happening in Nevada. Rhiannon Hoyle and Ryan Dube [cover the issue in the Wall Street Journal](#).

An important Thacker Pass hearing is coming up next week: A federal District Court judge in Reno is expected to listen to arguments next week in a case that challenges the approval of the Thacker Pass lithium mine in Humboldt County. Environmental groups challenging the project are asking the court for a preliminary injunction while the case moves forward. I've started going through the court documents and there are some interesting declarations. Last month, [we wrote about the opposition to the project](#) from Indigenous and local communities around the mine.

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COLUMNISTS | Opinion *This piece expresses the views of its author(s), separate from those of this publication.*

Water is not a constraint to growth in Reno-Sparks | Mike Kazmierski

Mike Kazmierski

Published 12:00 p.m. PT Jul. 15, 2021

This column was submitted by Mike Kazmierski, president and CEO of the Economic Development Authority of Western Nevada.

With the summer heat, dire drought warnings and climate change concerns, it is an excellent time to review our status as a region regarding water. I often hear or read in the newspaper's editorial section comments about growth and our "lack" of water. There is usually a reference to being in a desert climate and concern about "allowing" this growth to continue. The good news is that for the Reno-Sparks area, managed by Truckee Meadows Water Authority, there is little reason to be concerned about water. Water availability is one of our competitive advantages as we look at continued growth and economic prosperity.

We are experiencing a mega-drought in the West. A 2020 study found that the current Western drought, which started in 2000, is now a mega-drought — the second-worst in 1,200 years.

"As far as the drought goes, this is the big one ..." says Daniel Swain, a climate scientist at the University of California Los Angeles. "By a lot of metrics, it is the most severe drought on record."

However, this is not the case for our region as this is only our second year of drought. In fact, since the year 2000, Lake Tahoe — by far the largest source of supply for our region, has filled or come within six inches of filling in three of the last five years.

How much water do we have and how much do we use? TMWA's existing water resources include Truckee River water, surface water reserves stored in six upstream reservoirs, and 89 production wells. According to the 2020 TMWA Water Resource Plan, we currently use around 83,000 acre-feet of water a year, *about the same amount we used 20 years ago*. Yet, the TMWA service area population has increased by nearly 50% since 2000. During these same 20 years, TMWA has added capacity to the system by acquiring the other

half of the storage rights in Donner Lake, the acquisition of additional Truckee River water rights, and groundwater development. We now have more than 140,000 acre-feet available annually (*70 percent more than we currently use*) and expect to add even more water sources over time. Our water use in the winter averages 35 million gallons a day, while in the summer, close to 140 million gallons a day. That means in the summer almost 100 million gallons a day, triple our winter daily water use, goes *primarily to residential and commercial landscaping* — all those pretty green lawns.

We are well-prepared for any drought. The 2020-2040 Water Resource Plan analyzed possible future water resources for the community, considered climate change, and projected adequate water resources for continued growth in the region for decades to come. TMWA modeled three scenarios to explore TMWA's water supply and operational strategies through the end of the century. The results show that TMWA's water supply is resilient enough to withstand both a repeat of any major drought on the Truckee River system on record, as well as simulated climate change scenarios that include population increases projected over the next 50 years.

What does this mean for economic development? Any company that is a low or moderate water user and residents *do not have to worry about access to water or unreasonable price increases in the future* like those likely in most other places in the Southwest. In short, thanks to decades of planning and water acquisition, “we are special” when it comes to water in the West.

Water is still a treasured resource we must conserve. That does not mean we can be careless or irresponsible with our water. You still have watering days and are encouraged to be a reasonable water user. Additionally, as you get out of the TMWA service area, there are potential issues with water availability. However, EDAWN will continue to discourage high water users from coming to the region, and water conservation remains essential to sustaining our resources in the years ahead. It is nice to know that even as the next drought looms, our community is postured for success, thanks to responsible management and the proximity of the Sierra Nevada.


Mike Kazmierski is president and CEO of the Economic Development Authority of Western Nevada.

Have your say: How to submit an opinion column or letter to the editor

Drought-Stricken California Hasn't Mandated Statewide Water Restrictions. Here's Why



LISTEN

By [Ezra David Romero](#)  Jul 16



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A boat dock surrounded by dry ground at Lake Mendocino on June 11, 2021. *(Beth LaBerge/KQED)*

After two consecutive dry winters and a series of early summer heat waves, the vast majority of California is gripped by drought.

Water levels in reservoirs like Lake Oroville, Shasta Lake and [Lake Mendocino](#) are dangerously low. [Wells in parts of the San Joaquin Valley](#) and along the Russian River are drying up, and local water officials have mandated water restrictions up to 40% in some areas.

'It's 109 degrees in Fresno today. Imagine having to work outside all day and come home and not being able to shower in your own home. I think it's infuriating, and disappointing and sort of feels hopeless. Have we not learned our lesson here?'

—Veronica Garibay

Already, more than [85%](#) of California is experiencing extreme drought conditions, according to the latest drought monitor released on July 15, and experts forewarn a third year of drought could be on the horizon if the state doesn't see significant winter rain storms.

Former Gov. Jerry Brown required Californians to conserve [25%](#) of their water during the third year of the last major drought. State leaders have not yet taken that step during this year.

Last week, Gov. Gavin Newsom asked for a **15% voluntary statewide water reduction**, noting California isn't what he called a "nanny state."

"We're not trying to be oppressive," Newsom said during a press conference. "Again, these are voluntary standards."

Karla Nemeth, director of the California Department of Water Resources, says one reason for the voluntary restrictions is that Californian's water use is down 16% compared to the last

drought. That's when many people ditched their grassy lawns in favor of native plants and rock gardens. Others have installed home graywater systems.

~~disable them~~ Nemeth says water officials are pursuing a more targeted approach this time around, relying on regional restrictions to reduce water waste, with the recognition that water supplies vary across the state.

But, she says, if the rains don't fall, the state could require water savings again.

"By the end of this year, if we're preparing for another extraordinarily dry year, then we could see California move towards mandatory water reduction," she said.

During the last drought, the state asked for water conservation before requiring it, but many Californians shrugged off that ask.

Nemeth says she expects more compliance this time around. "I actually believe that we are going to see some better results from voluntary water conservation this year than we did during the [last] drought," she said.

Even with all that California is facing — heat waves, wildfire risk and lack of rain — **UC Davis water resources expert Jay Lund** says requiring places that don't need to conserve as much water right now, like Los Angeles and San Francisco, would "make them less receptive to being told later on when you really need to conserve a lot of water to do so."

Lund says the slow rollout of drought emergency declarations and restrictions is about "retaining" the public's trust, recognizing that conditions could stay dry for a long time.

"I think particularly in this era where [people are] a lot more distrustful of government, we really need to be careful with the public's trust and to treat that as a scarce resource," Lund said. "In this case, there's a lot of precedent for not pressing urban water conservation too hard, especially when most of the state is in fairly good shape — at least most of the population."

Rethinking How California Manages Water

But for many people who live in places like the San Joaquin Valley where wells are going dry, the light water restrictions feels like a gut punch, says **Veronica Garibay**, co-executive director with the Leadership Counsel for Justice and Accountability.

"It's 109 degrees in Fresno today," she said over Zoom during the second week of July.

"Imagine having to work outside all day and come home and not being able to shower in your own home. I think it's infuriating, and disappointing and sort of feels hopeless. Have we not learned our lesson here?"

Garibay's group advocates for communities in the Central Valley and the Coachella Valley where the drought is making existing inequities worse. She hopes existing legislation will help bring drought relief to communities dealing with the worst of the drought.

“Why is the burden on communities and people of color in particular, who have the least access to safe water and are disproportionately impacted by dry wells and access to safe drinking water to begin with?” she asked.

With the most vulnerable in mind, **Faith Kearns**, a scientist for the California Institute of Water Resources, says it's time officials started thinking of drought as a chronic issue, as opposed to an acute idea where California could be saved by rain each year.

“I think the set of actions we might take will start to look a little bit different,” she said. “I don't totally know what those are yet. Maybe those voluntary water reductions are permanent.”

Whether the current reductions become part of our permanent California way of life is still to be determined, but scientists like Kearns say climate change is stressing the state's water system.

Solutions for future dry times in California may require the state to rethink how it manages water, Kearns says, beyond measures needed to get the state through this drought. Water managers need to consider that the state is experiencing a "drier, hotter climate."

“It's not an acute issue where we're having a drought emergency, but one where we're really going, ‘No, this is the long-term trend, and we need to be long-term adapting to it,’ ” she said.

Blessed With a Wet Winter? 'It's Equally Likely That We Won't Be'

Stanford University's **Noah Diffenbaugh** says people should adhere to the 15% voluntary restriction as if it were mandatory.

“We don't have drought relief on the horizon and we can expect these conditions to intensify,” he said.

Diffenbaugh has authored scientific papers with titles like “**Anthropogenic warming has increased drought risk in California.**” But, he says he still didn't expect the state to be “in this severe drought, this soon.”

"But we shouldn't be surprised," he said. "And there's not a lot of reason to expect that we'll

The last multiyear drought lasted from 2011 to 2017. If it is any indicator of what could happen this time around, then all water restrictions should be taken seriously. That's because

the outlook for a wet winter is likely still less than 50-50, says UCLA climate scientist **Daniel Swain**.

“The situation is arguably more precarious than last time,” he said. “Now we could be blessed with a wet winter, but it's equally likely that we won't be and that we could see another dry winter. There's a decent chance that things actually get worse still before they get better. And that's pretty concerning, because they're already quite serious.”

But Swain says a wet fall would be contrary to the trend: California is having shorter rainy seasons, more concentrated in the winter. And some scientists consider California's current dry period as part of the West's **megadrought**, the first to be driven by human-caused climate change.

“My fervent hope is that we see some early onset to the rainy season this year,” he said. “It's possible. There's no indication of it, but it's hypothetically possible.”

UNR, national laboratory to partner on research initiatives with a focus on climate change



Daniel Rothberg

July 20th, 2021 at 4:43 PM

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University of Nevada, Reno on Friday, Oct. 23, 2020. (David Calvert/The Nevada Independent)

Top administrators from UNR and the Pacific Northwest National Laboratory announced a new partnership Tuesday afternoon, a collaboration aimed at improving regional research into the effects of climate change, sustainable energy and water scarcity.

Leaders from both of the institutions said the agreement was complementary, bringing together a research university with a national laboratory under the U.S. Department of Energy. The agreement, they said, would provide for joint faculty-appointments, create more research opportunities for students, access to specialized research tools and facilitate workshops.

“The complexity of challenges such as climate change, water scarcity and energy resilience demand that we forge partnerships between states, between organizations and agencies, between research disciplines,” UNR President Brian Sandoval said during a virtual meeting Tuesday commemorating the agreement, which was signed in March.

“This also demands that we ask more of ourselves to broaden our perspective and to involve more voices from the academic and scientific community in what we are doing,” he added.

Although climate change is a main priority of the partnership, UNR officials who detailed the plan Tuesday afternoon said other common research could focus on quantum information science, machine learning and national security.

On Tuesday, Mridul Gautam, UNR's vice president for research and innovation, said the collaboration was designed to be interdisciplinary, bringing together faculty from across both institutions. He said the approach would encourage "new thinking, new ideas, new solutions."

One collaboration, looking at the intersections of climate change, water and land management, is already underway. The research aims to study the e

When snow melts, it runs o
is a

ensuring reliable water supplies but also for the broader forest ecosystem — and how we manage the land.

"The wicked water problem that we're trying to address here is the connection between our water supplies and our forests," Adrian Harpold, an associate professor at UNR who is leading the project, said on Tuesday. "How we manage our forests a our water supplies."

Harpold said the existing paradigm for forest management, including how we control wild management of water supplies. He said the new paradigm should look at the connections between water supply and forest health to reduce extreme

The project with the national laboratory will study a section of the Sierra Nevada that overlaps with the Truckee River watershed, a primary source of drinking water for the Reno area. The project, with funding from the U.S. Forest Service, as [part of an initiative](#) to improve restoration within the central Sierra Nevada, which includes the forests that surround Lake Tahoe.

In particular, the research will look at how management, including forest thinning, might affect the water supply. The researchers will then send their data to economists, who will look at the issue from an economic perspective. The study will rely on a model that was developed by Mark Wigmosta, a chief scientist for watershed hydrology at the national laboratory.

"What really excites me about this collaboration is it's already paying dividends with this new project," said Wigmosta, who is also serving as an adjunct faculty member at UNR.

The Pacific Northwest National Laboratory is based in Richland, Washington and has about 5,000 employees. The facility, one of 17 Energy Department labs, focuses on a range of subjects, from fundamental science to energy and national security.

"The U.S. government right now could not be more committed to understanding and mitigating the impacts of climate change," Tony Peurrung, a deputy director for science and technology at the national laboratory. "So the aims of this partnership are timely and noble."

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Steamboat Ditch saga isn't over

While the dust has settled on the Steamboat Ditch piping fiasco, potential ethics and criminal consequences are being investigated. Ethics complaints have been filed against Washoe County Water Conservation District board members who voted to sponsor the project last August. In addition, at least one criminal complaint has been lodged with Nevada's attorney general. Although a letter to the U.S. secretary of Agriculture from several property owners along the ditch asking for an internal investigation went unanswered, Nevada's NRCS state conservationist recently stated that the agency no longer has an interest in reviving the project. (NRCS, which is a part of the Department of Agriculture, provided the funds for design and engineering, to be followed by millions for construction.) The Nevada Commission on Ethics determined it has jurisdiction over the actions of the Water District board members; and has conducted a panel review. The commission expects to issue findings this summer, which could result in letters of admonishment, multiyear probation, and even fines. Property owners on the ditch and the hundreds of trail users, as well as county residents, are due aggressive action by the state and local government to deter similar behavior by public officials. As our region attempts to build a newer, better image, it would be prudent to take a harder line on government malfeasance, rather than reaffirming an old rule, "Don't get caught."

Jerry Wager, Reno

The wrong person just left

Re: "Douglas County librarian who drafted BLM letter of support resigns," July 16: *She* says the public library serves everyone. *He* says I won't serve and protect you unless you share my political opinion ... and *she* resigns? It's a weird world.

Charlotte Voitoff, Reno

'Entitlements' already have been paid for

Re: "Paving the high-priced road of good intentions," July 18: When are politicians and former politicians going to stop referring to Social Security and Medicare as "entitlements"? They should not be considered entitlements. They've been bought and paid for, by every working citizen of this country, their entire working lives, yet these politicians continue to demonize them. Answer me this, Mr. Hickey: Are you not drawing Social Security and on Medicare? You appear to be of age. If so, judging by your column, you must be returning those checks, right ... ?

Richard McRoberts, Reno

CALIFORNIA

Drone photos reveal the shocking truth of California's parched landscape



Boat slips lie stranded on dry land as water levels recede at drought-stricken Folsom Lake. (Brian van der Brug / Los Angeles Times)

BY BRIAN VAN DER BRUG | STAFF PHOTOGRAPHER TEXT BY HAYLEY SMITH | LOS ANGELES TIMES

JULY 21, 2021 UPDATED 11:03 AM PT

As the West descends [deeper into drought](#), climate and water experts are growing increasingly alarmed by California's shriveling reservoirs.

Photos of Lake Oroville, Folsom Lake, Trinity Lake and Lake Shasta, taken by Times photographer Brian van der Brug using a drone, unveil the harsh reality of the Golden State's not-so-golden drought.

On Wednesday, Lake Shasta — the largest reservoir in the state — held a scant 1.55 million acre-feet of water, according to the [U.S. Bureau of Reclamation](#), or about 34% of its capacity. Jeffrey Mount, senior fellow at the Public Policy Institute of California's Water Policy Center, said "everybody should be concerned" by what they're seeing.

"The reservoir levels we're looking at are near-record low, with all the prospects that they will actually be record low by the end of the summer," he said. "The mountains are dried out. The sponge is completely dry."

Many scientists studying California's drought point to the drought of [1976-'77](#) as a "worst-case scenario" benchmark. That drought brought Lake Oroville to its all-time record low of 646 feet above sea level.

On Wednesday, the lake sat just over 658 feet above sea level, or 27% of its total capacity, according to the [California Department of Water Resources](#).

— Lake Oroville —



Boats are moored in a shrinking arm of Lake Oroville, which stands at 33% full and at 40% of its historical average. (Brian van der Brug / Los Angeles Times)



A truck crosses the Enterprise Bridge at Lake Oroville. (Brian van der Brug / Los Angeles Times)

Officials said plummeting reservoir levels could soon force Oroville's hydroelectric [power plant offline](#). The plant, which opened in the late 1960s, has never been forced offline by low lake levels before.

The most recent rain year, which ended in June, was the [seventh-driest](#) in Los Angeles' 144 years of records, according to Golden Gate Weather Services, and the third-driest on record in the Northern Sierra region.

But officials in March warned that already low snowpack levels were dwindling during what they anticipated would be a [critically dry year for the state](#). By June, the Department of Water Resources found that the statewide snowpack was at a grim 0.1 of an inch, or [0% of normal](#).

Already, farmers in the state have faced such dry conditions that many have begun [fallowing fields](#), pulling out vines and trees, and leaving empty land that once flourished.


The drought conditions have grown so worrisome that Gov. Gavin Newsom this month asked Californians to voluntarily [cut back on water consumption](#) by 15%.

The governor also issued a regional drought state of emergency in 50 California counties, or roughly 42% of the state's population.

Brian van der Brug has been a staff photojournalist at the Los Angeles Times since 1997.

(https://www.ktvn.com/story/44318890/evacuations-in-effect-in-butte-plumas-counties-due-to-dixie-fire)
BREAKING NEWS: Dixie Fire Explodes in Size, Prompts New Evacuations

Weather Alert: Excessive Heat, Lake Wind, Lake Wind,...

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 **4**

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WEATHER

TMWA: Plenty Of Water Supply Despite Drought

The drought will cause Truckee River flows to drop in August but that will not effect daily water supply for TMWA customers.

wednesday, July 21st 2021, 4:40 PM PDT

Updated: Wednesday, July 21st 2021, 4:42 PM PDT

By **Paul Nelson**

The 2020-2021 winter brought a sub-par snowpack and an inefficient spring run-off. That is being felt in our reservoirs. Lake Tahoe is expected to drop below its natural rim by mid-October and other area reservoirs are right around half of capacity. Officials say that shouldn't affect our daily water supply though. There is still plenty of upstream drought reserves.

"From a drought perspective, this community is in great shape, right now," Bill Hauck, Water Supply Supervisor for the Truckee Meadows Water Authority said. "We have more drought reserves in storage upstream than ever."

Hauck says there are currently 50,000 acre feet of drought reserves. A big reason why is the Truckee River Operating Agreement. That took effect in late 2015. It gives TMWA already had water rights in Lake Tahoe and Boca Reservoir but now it has rights in Stampede, Donner, Independence and Prosser Lakes.

"We've basically been able to double our drought storage, pre-TROA to here we are now coming into this drought," Hauck said.

The Truckee River is expected to drop substantially in mid-August, when reservoir levels drop too low to supplement natural river flows. At that point, TMWA will release enough water to provide its customers with their normal supply.

"It's not a good situation to be in but from a drought supply perspective, again, this region couldn't be in better shape," Hauck said.

TMWA is used to dealing with fluctuations in water resources. The last time reservoirs fell short of supplying the river with 500 cubic feet per second during the summer was in 2015, when the Truckee River slowed to a trickle.

"We live in a desert," Hauck said. "We have this cyclical water supply cycle, big snowpack years, low snowpack years. It's just a fluctuation of living in this region."

TMWA has an idea of what the water outlook will be in the future.

"We've actually modeled 80 years into the future to the end of the century and we've looked at historical droughts and potential droughts under climate change," Hauck says.

Hauck says there will be plenty of water supply for the region even with population growth.

Water usage in the winter is about 35 million gallons per day in the Truckee Meadows. That jumps to 140 million gallons per day during the summer when people water their lawns. TMWA is not asking people to cut back on their water usage, despite the drought.

"We're just asking them to continue to water responsibly," Hauck says.

TMWA is sending more "water watchers" out into neighborhoods to keep an eye on wasteful water use and to educate the public. Customers are encouraged to water their grass on their designated days but not between 11 a.m. and 7 p.m.

During normal years of precipitation, TMWA only uses about three percent of the river's water.

"On an annual basis, TMWA only uses about three percent of what's flowing down the river normally, so in a drought year we use a bigger portion of the pie, in a big water year a little bit less," Hauck says.

Along with the reservoirs, TMWA will also start pumping groundwater. During some years, it also diverts Truckee River water into the ground for future use.



Companies
16

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BARMATEC
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The important role of women in the water sector: past, present and future



The recognition of women's social and labour rights has been and is a long and difficult process; historically progress has been made through strikes, mobilisations and demonstrations, with the ultimate goal of achieving what seems fair and obvious: **gender parity**.

The fight for fairness reached a major milestone in 1893. That year New Zealand became the first country in which women had the right to vote without restrictions. The United States joined in 1920 through the Ninth Amendment to the Constitution (almost 30 years later). In Spain at the time the situation was paradoxical: women were allowed to be members of the parliament, but they did not have a right to vote. This democratic anomaly was finally resolved in 1933 thanks to the contribution of Clara Campoamor, champion of the suffrage movement.

Another milestone in history was achieved in 1911, when the first International Women's Day was celebrated, albeit unofficially, as a way to support the courage and determination of women. The initiative was seeking equal civil rights and academic opportunities for women, but it was not until March 8th 1977, 66 years later, when the UN was able to mark "Women's Day" in the calendar. In 2015, February 11th was established as a second date to support gender equality, with the "International Day of Women and Girls in Science". The UN's initiative "Planet 50-50 by 2030. **Step It Up for Gender Equality**", started that same year. **With it, the expectation is that by 2030, the workplace will be fully balanced, with equal opportunities regardless of gender; it calls on governments to tackle the difficulties that hinder the progress of women and girls, so that they can reach their full potential.**

“ Today, 80% of Spanish companies have less than 50% women in their workforce and, in 46% of these, there are only between 1 and 10% of women in positions of responsibility.

The visibility of women in today's marketplace

The first universities originated in the 11th century. It is surprising to learn that women did not have the opportunity to enter a university until the 20th century, with a few exceptions only in more developed nations. Today, data from multiple studies show that women are as well prepared and trained as men, if not more. They have a lower school dropout rate and the number of women graduates in higher education reaches 53% in Spain, compared to 43% of men. **In fact, 38.4% of women between the ages of 24 and 64 in Spain currently have a university degree, compared to 33% of men.**

Despite the growing number of female graduates, the presence of women in technical areas is still low. Women's access to and participation in the field known by the acronym STEM (Science, Technology, Engineering, and Mathematics) has stalled. According to the Spanish Ministry of Education, in Science participation is around 10%, and in Engineering and Technology, 7.5% are women compared to 14.5% of men, according to the report "Científicas en Cifras" [Women Scientists in Figures].

One of the main reasons why a girl does not choose a study related to the STEM field is not money, but the lack of female role models who serve as an example at a professional level. Except perhaps for Marie Skłodowska-Curie, women scientists and experts hardly appear in textbooks and the media. And if they are mentioned at all, they are presented as "strange" people, completely dedicated to their work and with little personal life, or emphasizing that physical appearance and intelligence cannot go together. It is therefore very likely that young women do not feel identified with these pioneers. If these girls were to dig into history, they would find great women who managed to advance society, against all odds and with great difficulties. Prominent references to take into account are: Ada Lovelace, creator of the first computer program; Elisa Leonida Zamfirescu, engineer who stood out for being one of the first women in the world in that profession; Hedwig Eva Maria Kiesler, known as Hedy Lamarr, actress and inventor of the first version of the spread spectrum that would allow long-distance wireless communications; Valentina Vladimirovna Tereshkova, the first woman to go into space, having been selected from over four hundred applicants to pilot the Vostok 6; M^a del Pilar Careaga Basabe, Spain's first qualified engineer; Margarita Salas Falgueras, Spanish biochemist who continued Severo Ochoa's studies on DNA; Ángela Ruiz, creator of the Mechanical Encyclopaedia, what today can be considered the forerunner of the electronic book.

“ The simple fact of involving women can increase the effectiveness of water projects by six or seven times compared to those that did not.

Unfortunately, this lack of role models continues today. Only male names resonate in the media as synonymous with success: Jeff Bezos (creator of Amazon), Elon Musk (creator of Tesla), Mark Zuckerberg (creator of Facebook), Reed Hastings (creator of Netflix), Richard Dawkins (biologist and science communicator), Stephen Hawking (physicist), Donald Knuth

(computer scientist), and many others. The names of successful women are not usually promoted or brought to light. It is important to make their talent and presence known so that they can be a motivation for other women. Making female talent visible is a key element to promote the STEM area, among others. Shafi Goldwasser (computer scientist, Turing Award 2012 for laying the foundations of cryptography), Grace Murray Hopper (creator of the COBOL language), Sheryl Sandberg (chief operating officer of Facebook), Julia Hartz (creator of Eventbrite), Melanie Perkins (creator of Canva), Isabel Aguilera (president of Google Iberia 2006-2008), are names that we should highlight and keep in mind.

Fortunately, more and more women are studying these traditionally male degrees, and as a consequence, the number of women in all kinds of positions is increasing. But women's higher education is not reflected in the labour market to the fullest extent. Today, 80% of Spanish companies have less than 50% women in their workforce and, in 46% of these, there are only between 1 and 10% of women in positions of responsibility.

Recent studies have concluded that companies with equal participation of men and women are more productive and sustainable, compared to those with predominantly male-dominated workforces and positions. A great example to support this study is reflected in a specific moment in recent history. In 2008 Iceland went through a severe economic crisis that led to a re-founding of the hitherto male-dominated state structures and economic powers, led by two women, Elín Sigfúsdóttir and Birna Einarsdóttir. Their different approaches and differences in thinking about what should matter most in decision-making solved what an all-male team was unable to. This fact shows the importance of parity in any field, both business and political, where different points of view can reach in conjunction and harmony the optimal solution to a problem or promote new ideas. We must therefore in today's world achieve gender equality in educational, work and socioeconomic settings.

Theoretically, women and men are equal before the law in developed countries, but even so, much remains to be done to achieve real equality in practice. There are a number of reasons that prevent women from climbing the ladder to top positions, and it is difficult to pinpoint a single obstacle. In a recent survey, 49% of respondents cited motherhood as the first barrier, followed by lack of work-life balance (47%), a male-dominated culture in the industry (47%), a male-dominated culture in companies (45%), lack of ambition (17%) and lack of knowledge (13%).

Motherhood is a major obstacle today for millions of women who wish to pursue a career in management. **Having children complicates the balancing of work and family life, making it more difficult for them to have extra time to further their training and networking, causing women to set limits and even abandon their professional careers.** Women should not have to choose between being a mother and growing professionally. Unshared family responsibilities imply a greater burden of responsibility for women, something that prevents them from accessing the labour market on equal terms. To this we must add the salary gap between men and women, which reaches 23% in Spain, as another major difficulty that plays an important role when it comes to one of the two parents taking on more of the family burden. A recently published study found that if you compare the salaries of men and women doing the same job, women work without pay one month out of every year. If being a mother and being a father are understood to have the same responsibilities, as is the case in other countries (mainly in northern Europe), being a mother will no longer hinder women's professional development. Flexible working hours, without reducing staff responsibility, or telecommuting whenever possible, help ensure a work-life balance for everyone, not just women. These and other aspects have already permeated the policies of our companies, but effectively, awareness is low and many indicators show that we are far from gender parity.

“ *Theoretically, women and men are equal before the law in developed countries, but even so, much remains to be done to achieve real equality in practice.* ”

As a measure to increase the presence and participation of women in management positions, management committees and boards of directors in the coming years, the Spanish Ministry of Health, Social Services and Equality has launched the initiative "More women, better companies". This initiative seeks to encourage companies to implement various actions in their organizations to try to eliminate the obstacles that still limit the professional promotion of women. Acciona, Agua de Alicante, Aguas de Barcelona, Empresa Metropolitana de gestión del ciclo integral del agua, Aqualia, FCC and Iberdrola are just a small sample of the Spanish companies that have joined this initiative.

To avoid possible discriminatory biases, the Spanish Women's Institute for Equal Opportunities has launched a project to promote the use of anonymous or blind CVs, where there is no information about gender, only personal achievements and training. **This project also aims to raise awareness among companies and organizations about the existence of gender biases, sometimes unconscious, and how to detect and combat them.**

The importance of the female presence in the water sector

Traditionally, the water sector has been a predominantly male sector. In part, because it is closely linked to science, engineering and technology, training paths with little female presence. Fortunately, for some years now, other professional profiles related to HR and administration in wastewater treatment, drinking water treatment or more general water management issues, which allow the formation of multidisciplinary teams, are in demand. However, it is a pending task to promote the recruitment of women technicians and engineers to achieve real parity in all positions.

Studies over more than two decades have concluded that the role of women in the water sector implies more substantial improvements in leadership, transparency and sustainability of water supplies when men and women are equally involved, compared to cases in which women are marginally or not involved at all. In fact, an evaluation conducted by the World Bank, showed that **simply involving women can increase the effectiveness of water projects by six to seven times over those that do not.** One example is in Balochistan, Pakistan, where an all-women team proposed reusing a new water tank on unused land to provide water for non-functioning public pipelines. This plan was not only more cost-effective than the original plan developed by a group of men, but led to better water management and improvements in quality of life. Four years later this village built a new school for girls, investing in female empowerment and encouraging women's presence in politics. Research also shows that women share water more equitably than men, especially in times of scarcity.

“ *In Spain, the presence of women in the water sector is beginning to make itself felt more and more, albeit slowly. More and more companies in this sector rely on female professionalism and hire staff regardless of their gender.* ”

It is therefore a fact that women's contribution to water management is clearly fundamental. In order to promote the entry of women in this sector, international conferences have been held, highlighting and making internationally known the importance of women as leaders, experts and mediators in the equitable access to water for all uses. Notable examples include the United Nations Water Conference in Mar de Plata (1977), the International Drinking Water and Sanitation Decade (1981-90) and the International Conference on Water and the Environment in Dublin (1992). At the latter, women were recognized for their central role in the management and control of environmental resources.

At the political level, the role of women in water administration and management can help advocate, legislate and fund policies that enact inclusive water policies in all aspects of water resources planning, development and management. A good example of this is Maria Mutagamba, Uganda's State Minister for Water, who developed five-year gender strategies for the water sector. These strategies enabled women to occupy key positions in decision-making committees and provided guidance for integrating women's concerns into the water and sanitation sectors. With the implementation of the first round of strategies, Ugandans' access to safe drinking water increased from 51% to 61% in just two years. These examples highlight how critical it is that inclusive policies come from mainstream organizations. However, building equity in legislatures takes time and effort. Barriers to overcome include social stigmas about female leadership and partisan political groups (primarily in underdeveloped countries) that are unwilling to include women among their ranks.

“ The integration of women in water resources management in first world countries is clearly encouraging, due to the high social awareness of women's rights.

Recently, in 2018, in response to the underrepresentation of women in this industry, the first "H₂O Women Conference" emerged in California for women leaders in the water sector to collaborate, coordinate, educate and support each other. This event is for women only and by invitation only. The conference showcases leading women professionals, their work and their contributions to advancing the water industry. A second edition of this conference was planned for October 2020 in Santa Barbara.

In Spain, the female presence in the water sector is starting to make its presence felt more and more, albeit slowly. More and more companies in this sector rely on female professionalism and hire staff regardless of their gender. An example of this is the company Aqualia, as part of the aforementioned initiative "More women, better companies". 21.72% of the workforce in 2015 were women, with 40% of girls in the Innovation and Technology (R&D) department. Barmatec is also a good example of this inclusivity in the water sector, with 50% female staff (50% with degrees in physics and engineering), and with Lidia Piqué as the general manager. Another example is the Spanish Association of Water Supply and Sanitation (AEAS), where there is a real balance in the number of women and men in the staff: 5 women and 6 men. It should be noted that, in AEAS, two women hold positions of responsibility: Cristina Berasategui in charge of communications and Gari Villa-Landa in charge of international affairs. Gari Villa-Landa is a current role model in the water sector. Apart from being AEAS representative in the European Federation of National Associations of Water Services (EurEau) and the International Water Association (IWA), she is a member of the Steering Committee of the OECD's "Water Governance Initiative".

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The integration of women in water resources management in first world countries is clearly encouraging, due to the high social awareness of women's rights. On the other hand, this is not the case in countries considered to be third world countries. With regard to water and environmental management, in underdeveloped countries, in rural areas, women are responsible, in addition to cultivating crops, for fetching water and using it for domestic tasks such as cleaning, cooking and washing. This simple fact makes them the main water decision-makers at the family and daily level. In this type of country, they have been able to stand out favourably in relation to water management. When they manage water, their communities have measurably better outcomes: better functioning water systems, increased access to water, economic and environmental benefits. For example, in India, women have recently been trained and licensed as hand pump mechanics. Their clients rate them as more accessible and responsive than male mechanics, because many of these women understand that a broken hand pump causes girls and women to have to travel longer distances to collect water, lose productive time, and increase risks to their personal safety. As a result, in areas served by female mechanics, there is more preventive maintenance and fewer failures. In Malawi, water committees composed primarily of women monitor the condition of water pipes along the paths they use several times a day, reporting water leaks and the need for repairs. Women in the Magelang district of Java, Indonesia, ended up solving the problems in the existing water system themselves due to a lack of commitment from political authorities. Their solutions became the basis for a complete overhaul of the water system, and these women are now active participants in the management of the community's water systems. Yet today women represent less than 17% in the water sector in these countries.

A 2014 report by the International Water Association found that 15 developing countries were understaffed in the management, accounting, finance, and engineering professions. This report concluded that when women filled these vacancies, they demonstrated their potential as managers, finance professionals, collection specialists, water engineers and marketers of a product they know well due to the fact that they are mainly the ones in charge of its administration in the family nucleus and aspects such as safety, time optimization, economic savings accept cooings and future forecasts. Conclusions about the role of women in this sector that had already been proven in the first world 20 years ago, and that are being repeated again.

We can conclude that **women alone show great aptitudes in the water sector, as can be seen in the various cases exemplified**, whether in the first world through access to higher education, equality policies, social awareness for parity, or in underdeveloped countries through the necessary administration of water due to their socio-cultural situation. In addition, globally, women have proven their worth in any water-related job. The next step is to raise the profile of these women so that they can be role models for the next generation and we therefore realise an ideal society in which gender does not matter, but the capacity of the person in the sector he/she wants to work in.

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Public officials violated ethics laws over nixed Steamboat Ditch project

By Jeri Chadwell | July 23, 2021



Google Earth image of the Steamboat Ditch in south Reno, Nevada.

Two members of the board of directors for the Washoe County Water Conservation District (WCWCD), have been hit with ethics violations following an attempt to secure \$25 million in federal grant funding for a controversial project that has since been scrapped.

An ethics complaint was made in January against Louis Damonte and Cory Casazza, as well as two WCWCD board of directors members.

A Nevada Commission on Ethics (NCOE) review panel in June determined sufficient cause existed the Commission to render an opinion in the matter regarding their alleged violations of Nevada Rev Statutes governing the code of ethical standards for public officers.

Reno resident Michael Barnes submitted a complaint against Damonte and Casazza—both of whom are officers of the private Steamboat Canal and Irrigation Company. He also included in his compla the director of the Orr Ditch and Extensions Water Company John Capurro and Truckee Meadows Water Authority (TMWA) Senior Hydrologist Bill Hauck, both of whom also sit on the WCWCD boa The commission found neither of them violated ethics laws.

In his complaint, Barnes said he was “informed during the beginning of January of 2021 that there a proposed plan put into motion by several local water irrigation ditch and canal companies to obtain Federally funded grant for improvements to their privately owned canal/ irrigation ditches.”

He is referring to the plan to use U.S. Department of Agriculture Natural Resources Conservation Service grant funding of up to \$25 million to study, develop a plan, and [implement improvements to Steamboat Ditch canal—including replacing approximately 15 miles of open canal with pipelines](#). The full canal runs for 34 miles through open canals and existing pipelines and is owned by the Steamboat Canal and Irrigation Company.

The federal grant money was awarded to the Steamboat Canal and Irrigation Company—but the company needed a local government agency or entity to serve as its sponsoring local organization (SLO) to gain access to it.

WCWCD voted to approve becoming the SLO for the company in August of 2020. The application for grant funding was thereafter initially approved, with plans for an environmental study of the ditch to inform proposed improvements set to take place through the fall of 2022. However, it was announced in the spring of this year that those plans had been put on hold following public outcry.

Barnes noted that in the minutes from the August 2020 WCWCD meeting, during which the board directors approved the agency serving as the SLO for the project, neither Damonte nor Casazza mentioned a potential conflict of interest or attempted to recuse themselves from the process.

During the meeting, legal counsel for the Steamboat Canal and Irrigation Company, Michael Pagni—who also represents WCWCD—said the reason for the project was to “improve agricultural water management by converting open channel canal to pipe. This will conserve water, improve efficiency and reliability of irrigation operations, and reduce flood risk among other benefits.”

Barnes in his complaint said the statement showed that Damonte and Casazza “would have direct personal, financial and business benefit from such a project as they are also private officers and owners of the Steamboat Canal and Irrigation Company (the beneficiaries of the federal grant).”

He further alleged that Hauck has an interest in the Steamboat Canal and Irrigation Company through his affiliation with TMWA—and that Capurro was in violation of the law too because he indicated during the meeting that he would seek the same grant funding for the Orr Ditch and Extensions Water Company.

“I remember saying it, but it wasn’t in the minutes. It only counts if it’s in the minutes. I have disclosed during other meetings that I was on the board for Steamboat Ditch, also.”

– Cory Casazza



Only Casazza and Damonte were found to be in violation of NRS's code of ethical standards for public officers, its requirements regarding disclosure of conflicts of interest and abstention from voting because of them, and statutory contract prohibitions for public officers. Specifically, the men violate 281A.400 sections 1, 2, 3 and 10; NRS 281A.420 and NRS 281A.430.

The NCOE panel decided that the violations of both men "may be appropriately addressed through corrective action under the terms and conditions of a deferral agreement instead of referring the allegations to the Commission for further proceedings."

Both will need to comply with ethics laws for two years from the date of the commission's approval their deferral agreements, without being the subject of another complaint arising from alleged ethical violations substantiated by the commission.

They will need to make "proper disclosure sufficient to inform the public of the extent and effect" their private interests have on matters at hand. They will also need to abstain from voting on matters where they have conflicts of interest.

Both men will need to "attend and complete ethics training within six months from the date of the Commission's approval" of their deferral agreements.

The USDA's Natural Resources Conservation Service confirmed to This Is Reno that the contract with WCWCD and the irrigation company for the federal grant funding was canceled.

This Is Reno attempted to contact Damonte and Casazza. We did not hear back from Damonte.

Casazza said he is entering into the deferral agreement with the NCOE. He added that he was certain that he's an officer on the board of the Steamboat Canal and Irrigation Company during the meeting when the WCWCD agreed to be the SLO for the company in its bid for federal dollars.

"I remember saying it, but it wasn't in the minutes. It only counts if it's in the minutes. I have disclosed during other meetings that I was on the board for Steamboat Ditch, also," he said.

Casazza added that he thinks public outreach to explain the project to the public could have been handled better.

"I think it just got a bad rap. ... I don't think we did, or the government did, a good job of explaining the project and what the benefits were to the public. There were no benefits to the Steamboat Ditch use very much to the ditch company," he said. "I think we were just looking forward to the study to find what the best solution was for the ditch company and for the community."

Jeri Chadwell City Editor & Lead Reporter

Jeri Chadwell came to Reno from rural Nevada in 2004 to study anthropology at the University of Nevada, Reno. In 2012, she returned to the university for a master's degree in journalism. She is a former associate and news editor of the Reno News & Review and is a recipient of first-place Nevada Press Association awards for investigative and business reporting. Jeri is passionate about Nevada history, politics and communities.

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'Long overdue': Lawmakers propose \$6.7 billion to bring clean drinking water to Indian Country

Debra Utacia Krol and Jan James Arizona Republic

Published 6:00 a.m. MT Jul. 25, 2024

Two Democratic senators have introduced legislation that would dramatically scale up funding to build new water infrastructure in Indian Country, seeking to address a backlog of needed projects and finally bring clean drinking water to communities that have been living with scarcity and toxic contamination for generations.

The bill, introduced by Sens. Michael Bennet of Colorado and Martin Heinrich of New Mexico, would provide about \$6.7 billion for a variety of water infrastructure projects, the largest amount of additional funding to date to address the longstanding injustice of the lack of clean drinking water in many Indigenous communities across the country.

In a recent report, researchers with U.S. Water Alliance and DigDeep found that race is the "strongest predictor" of water access and that Native American households are 19 times more likely than white households to lack complete plumbing.

"This is long overdue," Hopi Tribe Chairman Timothy Nuvangyaoma said in an interview.

"We are First Nations here, yet we're the last nations to be really recognized. So it's just an imbalance in equity."

Many people in Hopi communities have tap water contaminated with toxic arsenic. Some live in homes without running water and must drive to communal wells to fill tanks for bathing and cooking.

The situation is also dire in the Navajo Nation. A report by the House Natural Resources Committee in 2016 cited estimates that 30-40% of people living in the Navajos' 27,000-square-mile reservation have no access to running water. Many tribal members use tanks mounted on pickup trucks to haul water, often waiting in line to fill up at spigots.

Navajo Nation President Jonathan Nez praised the new legislation, calling it "the first step to ensuring that Native people across the United States have access to clean drinking water."

"The proposed funding will address a water crisis, create jobs, and pave the path towards social and racial equity," Nez said in a statement.

In areas of the Navajo Nation where there are few sources of clean drinking water, some people resort to collecting water from windmill-powered wells. The report said water testing showed more than 12% of the unregulated water sources on the reservation exceeded federal drinking water standards for uranium or other radioactive contaminants, with some more than 20 times higher than the limit.

Uranium mining on the Navajo Nation in the 1940s and 1950s left behind an estimated 1,200 mine sites, along with piles of radioactive waste. Some water sources also are tainted with other hazardous contaminants such as bacteria or arsenic.

Tribes have waited decades for solutions

Efforts by tribal governments to fix and expand inadequate water systems have long been hampered by inadequate funding.

The Tribal Access to Clean Water Act would provide \$3.4 billion for the federal Indian Health Service to address needs for water infrastructure projects. This would cover the agency's existing list of projects, while also providing an additional amount to enable the agency to scale up its work.

Other funds under the bill would go toward water infrastructure programs overseen by the Environmental Protection Agency, the Bureau of Reclamation and the Department of Agriculture.

Heinrich said it's shameful that many Indigenous communities, including in New Mexico, don't have clean drinking water. Bennet called the situation unacceptable and said the comprehensive legislation would deliver solutions to "reduce this disparity."

The 17,000 enrolled members of the White Mountain Apache Tribe have for decades coped with water shortages and contaminated water problems.

Chairwoman Gwendena Lee-Gatewood said during an April webinar on water-supply issues that tribal leaders have been trying for about 40 years to bring a new rural water system to fruition.

"Water lines are antiquated. They're from the early 1980s, and so we have wells, and when certain areas can't have enough water brought to them, it adds to the wells running out," Lee-Gatewood said. "That's been a challenge for us."

At times, people in parts of the reservation have no water for showers or hand washing, Lee-Gatewood said. Some homes don't have any faucets, she said, and others have water contaminated with manganese that comes out looking gray.

"It creates a serious health and safety hazard, especially for our elders," she said. "The data clearly shows that those homes without potable water continue to suffer from infectious diseases, and especially during COVID-19."

Legislation that passed in 2010 quantified the tribe's water rights and authorized funding to address these water challenges, Lee-Gatewood said.

"It's going to provide safe, dependable, secure, good-quality water supply for our communities," Lee-Gatewood said. "But it's years away from completion. And unfortunately this pandemic has slowed the work of the rural water system. But the tribe, we're moving forward as expeditiously as possible."

The Inter Tribal Association of Arizona, which represents the interests of 21 of the 22 tribes in the state, wrote to Senate Majority Leader Chuck Schumer and Minority Leader Mitch McConnell in June in support of funding clean water and wastewater infrastructure in Indian Country.

"The need for reliable water and wastewater infrastructure has never been more apparent than during the COVID-19 pandemic that disproportionately impacted Indian Country," wrote Maria Dadgar, executive director of the association. "In Arizona, the pandemic dealt a devastating blow to our Tribal communities, including the loss of Tribal members, employees and family members. By all accounts, the pandemic has had an even more disproportionate impact on Tribal communities due to inadequate access to clean drinking water and the aging infrastructure that supports water and wastewater systems on Tribal lands."

The association's sister organization, the Inter Tribal Council of Arizona, has provided technical support to tribes across the United States on drinking water and wastewater systems for more than 40 years wrote Dadgar an enrolled member of the Piscataway Tribe of Accokeek, Maryland. "This work has given the Inter Tribal Council's subject matter experts keen insight into the infrastructure needs throughout Indian Country and it is clear that critical investments are required."

Dadgar said that investing in water infrastructure is critical to ensuring the lives and safety of Native American people today and in the future.

Although the CARES Act allowed tribes to use part of the relief funding to build or repair infrastructure, huge gaps remain.

Supporters of the legislation cite estimates that 48% of homes on Native American reservations don't have access to clean drinking water, reliable water sources or adequate sanitation.

The Indian Health Service has a \$3.1 billion backlog of needed projects awaiting funding nationwide.

Calls for a 'whole of government' approach

"It's a dire need and it exists all over the country," said Anne Castle, co-leader of an initiative on Universal Access to Clean Water for Tribal Communities. "It's a problem that has existed for decades, but it has been too frequently ignored."

Although other legislation under discussion in Congress also would bring significant funding for clean water infrastructure, the details haven't been working out, Castle said. She pointed out that these other bills don't focus on the multiple agencies that address tribal water infrastructure the way the Bennet-Heinrich bill does. The initiative on water access was started by the Colorado River Basin Water & Tribes Initiative, which Castle also helps advise.

Daryl Vigil, co-facilitator of the Water & Tribes Initiative, said the new legislation had its roots in the work of two groups: the Ten Tribes Partnership, a consortium of the tribes that border the Colorado River, and the tribal initiative, which includes the other 19 tribes whose lands lie within the Colorado River Basin.

"We recognized that there was a momentum being built already with the Ten Tribes Partnership and through a tribal water study," which was written in 2019, said Vigil, a member of the Jicarilla Apache Nation.

Leaders of tribes in the West have also been working to collaborate with government entities on water issues, and have sought to have their voices included in discussions about managing the Colorado River, which has been depleted by severe drought, overuse and the effects of climate change.

Castle said addressing the lack of clean drinking water in tribal nations is "an issue that connects all of the primary priorities of the Biden administration, on COVID recovery and economic recovery and racial equity and climate change."

The goal through the legislation, Castle said, is to capitalize on that focus on infrastructure and racial equity "to implement solutions, real progress on the ground."

Castle is a senior fellow at the University of Colorado Law School's Getches-Wilkinson Center for Natural Resources, Energy and the Environment. She previously worked as the Interior Department's assistant secretary for water and science during the Obama administration.

She noted that the federal government has a special trust responsibility to Indian tribes.

"The promise was made that the tribal lands would be a permanent livable homeland, and you don't have a livable homeland if you don't have clean running water," Castle said.

"We have an opportunity right now to correct this problem," Castle said. "And I'm concerned that if we don't take the opportunity now, this is a once-in-a-generation chance, and it may not come around again for a very long time."

Solutions will depend on the circumstances of each community, and may involve drilling new wells, building treatment systems or running pipes to homes, Castle said, all of which will require coordination among federal agencies.

"That's why our group is advocating for a 'whole of government' approach," Castle said, referring to the initiative's recommendations in a recent report. She said the proposed funding wouldn't completely solve the water problems everywhere in tribal communities, but it would go a long way.

It's the largest amount of money targeted for tribal clean water infrastructure, Castle said.

"And it would address a very significant part of the problem. As a country, we've not focused on ensuring that Native American communities enjoy the same basic services as white communities do."

The needs for basic water infrastructure on Native American lands go beyond the list of projects that federal officials have identified.

On the Navajo Nation, for example, a reservation-wide plan for building water infrastructure includes a list of projects that, according to Rex Kontz of the Navajo Tribal Utility Authority, would cost an estimated \$4.5 billion to complete.

Some tribal leaders have voiced concerns that while the crisis of lead-contaminated water in Flint, Michigan, garnered national attention, their communities' severe and longstanding water contamination problems have received much less attention.

"It's taken a national pandemic to expose the drinking water crisis in Indian Country, but we will keep fighting to secure a clean and reliable water supply for our members," Lee-Gatewood said. "We're in 2021 now, and we still have people hauling water. And it shouldn't be that way."

Arizona legislators support more funding

Sen. Mark Kelly, D-Ariz., said he supports the legislation.

"It's been my priority in the Senate to upgrade and expand tribal drinking water infrastructure to ensure tribal communities across Arizona have access to clean, reliable water," Kelly said in a statement.

Kelly serves on a bipartisan water infrastructure working group, which a spokesperson said advances some of the Bennet and Heinrich bill's priorities as well as other projects.

Arizona Sen. Kyrsten Sinema said in an emailed statement that the federal government "must continue investing in tribal water programs to guarantee access to safe and clean running water, provide adequate sanitation to stop the spread of COVID-19, and build stronger, more durable water systems that will help expand economic opportunities for Native American communities."

Sinema added that she recently secured \$250 million to fund 10 tribal water projects in Arizona each year through the reauthorization of the Indian Reservation Drinking Water Program.

A spokesperson for Sinema, a Democrat, said that she co-sponsored legislation to increase funding for the Indian Health Service's facilities construction fund by \$3 billion, and she supports legislation to provide another \$1.8 billion to other programs. Sinema's spokesperson said she is reviewing the new bill.

'We need water to survive': Hopi Tribe pushes for solutions in long struggle for water

Waiting for water: On Navajo Nation, long lines, scarce resources, a cry for solutions

Nuvangyaoma and other Hopi leaders have been appealing to federal officials for years for more funding to address the glaring deficiencies in water systems. With the Biden administration focusing on the need for infrastructure, Nuvangyaoma said he's hopeful that legislators will support the bill.

"It's time," he said, "the nation invests in its very first peoples."

Six Hopi villages have water contaminated with levels of arsenic exceeding the federal drinking water standard, Nuvangyaoma said. In some areas, tests have shown arsenic levels as much as three to four times over the federal standard, putting those who drink the water at higher risk of cancer, kidney disease, diabetes and other illnesses.

The tribal government has secured \$20.5 million in federal funds for a water project called the Hopi Arsenic Mitigation Project, which is to include a 41-mile pipeline, storage tanks and other infrastructure that will bring clean water to homes. Under the plan, the system will supply water to 869 homes in the areas of First Mesa and Second Mesa, including 778 households that have tap water contaminated with arsenic.

Nuvangyaoma said workers have been out with equipment laying pipelines. But he said other infrastructure needs remain to bring clean drinking water to the Hopi, and he thinks the bill would provide important new funding.

The bill is more comprehensive than other previous proposals and "takes some of the guesswork out of where some of these monies are being allocated to," Nuvangyaoma said.

Some researchers have likened the deficient water infrastructure on the Hopi Reservation to that of developing countries such as Pakistan and India.

About 40 years ago, the Indian Health Service installed water pipes in the village of Mishongnovi, where Nuvangyaoma grew up. But since then, he said, "I haven't seen any real improvements to that water infrastructure."

The pressing needs for basic water infrastructure on Hopi lands, and other Native communities nationwide, he said, "have just been overlooked for too long."

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Drought Depleting Bay Area Reservoirs, Driving Urgent Need For Conservation

By [Devin Fehely](#) July 27, 2021 at 5:06 pm Filed Under: [California](#), [Drought](#), [Morgan Hill](#), [Uvas Reservoir](#), [Water shortage](#)

MORGAN HILL (KPIX 5) — The state's severe drought is transforming the landscape of our streams, lakes and reservoirs as the supply of water is depleted day by day.

The changes at Uvas Reservoir in the hills above Morgan are readily apparent. The waterline has receded significantly as the footprint of the reservoir shrinks.

"We came here last year with the same group and the water was almost up to the top of the ramp here. Driving by, we said we hope there's still some fish in there," says Kurt Ottman during an annual camping and fishing trip near the reservoir with family and friends.

According to the Santa Clara County Water District, Uvas is currently at roughly 20% of its total capacity — basically 80% empty. And a district spokesperson says the situation is bad at all of the county's reservoirs.

"Our reservoirs are at 13% capacity, all ten of them combined. So, that really shows you that our reservoirs are low," said water district spokesman Matt Keller.

The water district declared a drought emergency last month, urging customers to cut water usage by 15%. Conservation efforts, however, have been modest with a 6% reduction since the June declaration.

The campers say the receding lake level drives home the urgent need for conservation.

"Sometimes, we'd leave the tap running at home. But now, we turn it off right away," said camper Riley Purnomo.

Every bit of conservation will help as there are months still to go in the summer before there's any chance of rain to replenish depleted reservoirs.

Water officials say water gets stored in two ways, above and below ground. The below-ground storage in the aquifers isn't as bad as the situation with the reservoirs.

But the two are interconnected since the reservoirs replenish the aquifers, and if they're empty it will impact water availability for future years.

Exploring Our Backyard: Tahoe-Pyramid Trail offers great access to Truckee River

BY SHANNON KELLY
TUESDAY, JULY 27TH 2021

Welcome back to another edition of Exploring Our Backyard, brought to you by Sprad's RV (<https://www.spradsrv.com/>).

This week, we're checking out one of the best trails in our area, the Tahoe-Pyramid Trail (<https://tahoepyramidtrail.org/>), which runs 114 miles from Lake Tahoe to Pyramid Lake. The trail has five sections: Tahoe City to Hirschdale; Hirschdale to Verdi; Verdi to Reno/Sparks; Mustang to USA Parkway; and Wadsworth to Pyramid Lake. The trail is planning to open two sections from Vista Boulevard to Mustang and USA Parkway to Wadsworth in the near future.

Since the trail is so long, we checked out a portion of the section from Hirschdale to Verdi with electric mountain bikes from Stealth Tahoe (<https://stealthtahoe.com/>) and Bike Truckee (<https://www.truckeebikerentals.com/>). You can rent a variety of bikes from Bike Truckee from full-suspension bikes to electric and mountain bikes for a day or a full week. Bike Truckee will even drop off your bike and helmet. The co-owner of Stealth Tahoe, Anthony Zingaro, joined us for our ride on the trail. Stealth Tahoe, a small shop in Truckee, sells a variety of electric bikes and offers demos on all of their options. Zingaro met us in Floriston so we took a ride from that part of the trail to the Fleish Bridge & Dam, which was about 5 miles.



Electric Mountain Bikes from Stealth Tahoe & Bike Truckee (Jenna Holland)

I biked the section from Verdi to the Fleish Bridge & Dam (<https://nevadasportsnet.com/features/exploring-our-backyard/do-you-ever-forget-how-to-ride-a-bike-shannon-kelly-put-the-question-to-the-test>) last spring but didn't bike past that last time, so it was nice to see another part of the trail this time around to compare the experiences. I spoke with the founder and president of the Tahoe-Pyramid Trail, Janet Phillips, about the trail prior to riding it again. Phillips, who has a background in water resources, with the Truckee River as her specialty, came up with the idea in 2003.

"I started this with a public meeting, just to announce the idea to everybody along the river, and it was very well received," Phillips said. "I thought this was a beautiful river. It should have a trail next to it. Since then, we've have had collaboration from two states, five counties, four cities, one Indian tribe and lots of private donors. So the outpouring of support has been really great."

The trail starts at 6,200 feet at Lake Tahoe and ends at Pyramid Lake which is 4,200 feet, but it's not all downhill. There are some pretty steep sections. Most of the sections we rode were pretty flat. The motorized bikes definitely helped on a hot day.

With so many trails in our region, such as the John Muir Trail and Tahoe Rim Trail, I asked Phillips what makes the Tahoe-Pyramid trail so special.

"This is the only one that has so much private land involved, and also the only one that's been built by a volunteer group," Phillips said.

"Most big trails are built by some government agency, so we're really different in that respect. In terms of our local area, this is the longest trail in the Reno area. The Tahoe Rim Trail is longer, and of course the Pacific Crest Trail is way longer."

As a non-profit that relies solely on its volunteers, Phillips said they're crucial to helping maintain the trail, along with more than 200 donors who have contributed over the years.



Blue signs throughout the Tahoe-Pyramid Trail (Jenna Holland)

"They work really hard," Phillips said of her volunteers. "There's a core group of a dozen that do most of the lead tasks. Then every year we have about 50 or 60 people who help maintain the trail. They do that through an adoption program, where they get a little group of friends or colleagues and adopt a section, usually about a mile or less, and they take care of that section. That's a godson because otherwise it would get so overgrown so fast you wouldn't believe it."

Phillips said the section we biked, from Hirschdale to Verdi, is the trail's most popular.

"From Verdi upstream is beautiful, the Truckee River Canyon" Phillips said. "You're right next to the rapids that kayakers like, and it was hard to build, but we succeeded with collaboration from the state of California, and the park district in Truckee. It's not an easy path. Some people think because it's going along the river, it's pretty gradual. That's not the case. It's a lot of a lot of up and down. It's a little hard for me to ride."

Phillips wasn't the only one that thought it was a little difficult. So did my colleague Jenna Holland and I. (We're not experienced mountain bikers.) But, thankfully, we had plenty of guidance from Zingaro. You really can't get lost on the trail, it's marked with blue signs that say "Tahoe-Pyramid Trail."

Once we made it to the Fleish Bridge & Dam, we strolled across the bridge over the rapids. It's such a unique way to connect the trail. I asked Phillips more about it.

"It was an old utility bridge that had been there for decades," she said. "It was pretty rickety, so we collaborated with the Truckee Meadows Water Authority to upgrade that bridge, make it sturdier, more stable. And that is our only bridge across the river that we had to build."



View of the Tahoe-Pyramid Trail from the Fleish Bridge & Dam (Jenna Holland)

I was amazed to see the change of scenery on such a short ride, as one minute you're looking at trees and the next you're riding along the Truckee River in the wilderness.

On Tahoe-Pyramid Trail's website, they have detailed maps for each section of the trail that shows if it's a double or single track and the level of difficulty.

Phillips said the entire trail is suitable for bikers and hikers alike, so whether you want to bring your dog or ride your bike and check it out, you won't regret it.

"We've all driven up and down Interstate 80, hundreds of times, and you don't see the river at all," Phillips said. "If you go on the trail, you see all these great views of the river and it's just so different. I encourage people to just stop their car at one of the pull outs and go for a 10-minute walk. It's beautiful."

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WATER RIGHTS

Montana Water Court decides tribal water rights in first-of-its-kind decision

The more than 800 reserved tribal water rights of the Turtle Mountain Band of Chippewa Indians are established after six years of negotiation.

by Amanda Eggert
07.27.2021



Chief Water Judge Russell McElyea issued a final decree on July 12 clarifying ownership of more than 800 tribal reserved water rights across 12 basins. Credit: Courtesy of Russell McElyea

More than 800 water rights claimed by members of the Turtle Mountain Band of Chippewa Indians have been pulled out of legal limbo following the Montana Water Court's issuance of a first-of-its-kind order this month.

The [final decree is 896-page order](#) that covers 12 water basins across the state. The water rights in question are claimed by the United States on behalf of the tribe.

The order by Chief Water Judge Russell McElyea represents the first time the Montana Water Court has reached resolution on tribal reserved water rights outside of a negotiated compact like the Confederated Salish and Kootenai Tribes water compact, which took [more than a decade to reach final ratification by the Montana Legislature, U.S. Congress and, finally last year, the tribes.](#) The CSKT water compact also has a fiscal component — the creation of a \$1.9 billion trust fund dedicated in part to rehabilitation of the Flathead Indian Irrigation Project— whereas there's no such allocation involved in the Montana Water Court's final decree on the Chippewa claims.

The Montana Water Court has worked on the case since 2015, when the federal government first brought the tribal rights before the state Water Court for adjudication.

“Doing this is kind of like the first space flight to Mars. You can anticipate some of the problems that you’re going to encounter, but you can’t anticipate them all.”

CHIEF WATER JUDGE RUSSELL MCELYEA

“I hope it’s the first step in a tidal wave of similar such decisions,” McElyea said in an interview. “Doing this is kind of like the first space flight to Mars. You can anticipate some of the problems that you’re going to encounter, but you can’t anticipate them all. We’ve tried to think hard about what issues might arise when the final decree is issued and deal with those in the decree itself for the sake of bringing finality to this process.”

McElyea said he hopes having the first such case decided will establish momentum for similar claims. According to a press release issued by the Montana Water Court, more than 80 decrees covering about 250,000 water rights are awaiting adjudication by the court.

In the release, Montana Supreme Court Chief Justice Mike McGrath called the decree a “critical milestone in the adjudication process” that will provide certainty to water users in Montana.

The decree establishes ownership of tribal reserved water rights, which are water rights that are reserved for certain applications like agriculture or grazing on Native American lands held in trust by the U.S. government. In this case, those lands are allotments that stem from the 1887 General Allotment Act, or Dawes Act, which allocated parcels of land to tribal members in an effort to make Native American land ownership more closely resemble the private property system favored by the government.

The Turtle Mountain Band of Chippewa Indians’ reservation is located in North Dakota, but since it’s so small — just 12 miles long by 6 miles wide — Congress authorized members of the tribe to take allotments on approximately 40,000 acres of land in Montana. Those allotments convey ownership to landowners with restrictions on the property’s transfer and use. The land is held in trust for tribal members by the federal government.

It’s generally been understood that the allotments also included water right ownership, but that ownership hadn’t been formally recognized in a legal sense until the Water Court’s July 12 order. McElyea said more than 7,000 allottees stand to be impacted by the order.

The final decree establishes clarity on the amount of water allocated to users in a particular basin. It also establishes what those water rights can be used for and their priority, which determines who’s first in line for available water when demand exceeds a basin’s supply.

“Though this is a first step and there may be appeals, the recognition of tribal water rights pursuant to the reserved water rights doctrine marks a moment in time when a basin can begin to understand the realities of water availability and usage,” said Adell Amos, a University of Oregon School of Law professor experienced in natural resource and water law, in an emailed statement. “The community can hopefully begin to imagine a future that is more sustainable and one that honors these Indigenous rights.”

McElyea said there were between 20 and 30 objections to the water rights the U.S. was claiming on behalf of tribal members. Those objections, raised by individuals, ranch owners and the city of Plentywood, were resolved through negotiation between the parties and the federal government, he said.

An email seeking comment from an attorney representing the city of Plentywood was not returned by press time.

08.04.2021

AMANDA EGGERT

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Billings native Amanda Eggert covers environmental issues for MTFP. Amanda is a graduate of the University of Montana School of Journalism who has written for Outside magazine and Outlaw Partners. At Outlaw Partners she led coverage for the biweekly newspaper [Explore Big Sky](#). Contact Amanda at aeggert@montanafreepress.org.

More by Amanda Eggert

WaterNews

Remarkable Drop in Colorado River Water Use a Sign of Climate Adaptation

June 17, 2020 / in Water News, WEF / by Brett Walton

Arizona, California, and Nevada used less water from the beleaguered river last year than in the mid-1980s.



Downstream of Lake Mead, the Colorado River flows into Lake Havasu, a reservoir on the California-Arizona border. Photo © J. Carl Ganter / Circle of Blue

By Brett Walton, Circle of Blue

Use of Colorado River water in the three states of the river's lower basin fell to a 33-year low in 2019, amid growing awareness of the precarity of the region's water supply in a drying and warming climate.

Arizona, California, and Nevada combined to consume just over 6.5 million acre-feet last year, according to an annual audit [<https://www.usbr.gov/lc/region/g4000/4200Rpts/DecreeRpt/20>] from the Bureau of Reclamation, the federal agency that oversees the lower basin. That is about 1 million acre-feet less than the three states are entitled to use under a legal compact that divides the Colorado River's waters.

The last time water consumption from the river was that low was in 1986, the year after an enormous canal in Arizona opened that allowed the state to lay claim to its full Colorado River entitlement.

States have grappled in the last two decades with declining water levels in the basin's main reservoirs —Mead and Powell — while reckoning with clear scientific evidence that climate change is already constricting the iconic river [<https://science.sciencemag.org/content/367/6483/1252.full>] and will do further damage as temperatures rise.

It shows that the expectation that a growing population and a robust agricultural economy require more water is wrong.” — John Fleck, University of New Mexico

For water managers, the steady drop in water consumption in recent years is a signal that conservation efforts are working and that they are not helpless in the face of daunting environmental changes.

“It’s quite a turnaround from where we were a decade ago and really, I think, optimistic for dealing with chronic shortages on the river in the future, knowing that we can turn the dial back and reduce demand significantly, all three states combined,” said Bill Hasencamp, the manager of Colorado River resources for the Metropolitan Water District of Southern California, a regional wholesaler and one of the river’s largest users.

Observers of the basin’s intricate politics are also impressed with the trend lines for a watershed that irrigates about 5 million acres of farmland and provides 40 million people in two countries and 29 tribal nations with a portion of their water.

“It is an incredibly important demonstration of the fact that we can use less water in this incredibly important water-use region,” John Fleck told Circle of Blue. Fleck is the director of the University of New Mexico water resources program.

Projections for 2020 indicate that conservation will continue, though not quite at last year’s pace. Halfway through the year, the Bureau of Reclamation forecasts [<https://www.usbr.gov/lc/region/g4000/hourly/forecast.pdf>] water consumption to be roughly 6.8 million acre-feet.

An acre-foot is the amount of water that will flood an acre of land to a depth of one foot, or 325,851 gallons.

“I have to give them credit,” Jennifer Gimbel, a senior water policy scholar at Colorado State University, told Circle of Blue about the lower basin states. “They’re working hard to get these numbers.”

Raising Lake Mead

Just five years ago, in 2015, the three states were making use of their entire 7.5-million-acre-foot allotment. By statute and tradition, the basin is divided into a lower basin, where use is higher, and an upper basin, which includes Colorado, New Mexico, Utah, and Wyoming. The basins have different water allocation systems and rules governing its use.

In the lower basin, Arizona’s annual allocation is 2.8 million acre-feet, but last year it used just 2.5 million. Nevada used 233,000 of its 300,000 acre-feet. The big savings were in California, which used only 3.8 million of its 4.4 million acre-feet. California hasn’t used that little water from the Colorado since the 1950s, Fleck said.

The drop in California last year is due in large part to Metropolitan Water District, which consumed only 537,000 acre-feet. Five years ago, the district's tally was around 1 million acre-feet per year. Urban conservation and development of local water sources have played a large role in the decline, but the district's Colorado River water use is also influenced by snow levels in the Sierra Nevada mountains. When more water is available to be imported from the northern part of the state, as it was last year, the district leans less heavily on the Colorado River.

Reclamation's annual audit measures the amount of water consumed by humans, plants, and animals in the lower basin. Consumptive use equals total withdrawals minus any water that is returned to the river system, from irrigation runoff or wastewater treatment plants.

As meticulous as it is, the audit neglects a significant piece of the basin's water budget: evaporation from reservoirs and system losses, which is water consumed by riverside vegetation and absorbed by the ground. Together, these add up to about 1 million acre-feet per year, Jeremy Dodds, water accounting and verification group manager for Reclamation, told Circle of Blue.

This factor is part of the lower basin's "structural deficit," which means that total demand in the lower basin — use by Arizona, California, and Nevada, plus evaporation and required deliveries to Mexico —exceeds the amount of water that flows into Lake Mead, the lower basin's supply source.

Gimbel, who was the principal deputy assistant secretary for water and science for the U.S. Department of Interior from 2014 to 2016, said that despite the conservation efforts reflected in the audit, the lower basin still has much work to do. "They're closing the deficit, but they're not there yet," she said.

The goal of the lower basin's conservation is to keep Lake Mead from a precipitous decline into "dead pool" territory, where the reservoir is too low to send water downstream. The dead-pool threshold is at elevation 895 feet. Not using 1 million acre-feet last year most certainly helped the reservoir. Dodds said that at the current elevation of 1,089 feet, each block of 85,000 acre-feet equals 1 foot of elevation. So last year's conservation added 12 feet to Mead, compared to a scenario in which the three states use their full entitlement.

The conservation tool box that the states have employed has a range of instruments. Cities have provided incentives to remove grass lawns and replace inefficient toilets, showerheads, and washing machines. In Imperial Irrigation District, farmers have lined earthen canals with concrete to prevent seepage and they have agreed to fallow land to save water. Those measures, in both town and country, have helped to reduce demand. Supplies, on the other hand, have been bolstered by more investment in recycling and reuse, groundwater treatment, and desalination. As a whole, the seven states in the watershed came together in 2019 to modify rules for mandatory water-use restrictions that kick in as Lake Mead drops.

The decline in Colorado River water consumption mirrors regional and national trends. In Metropolitan Water District's service area in Southern California, water use per person fell from about 181 gallons per person per day in the mid-1990s to 131 gallons in 2018, a drop of 27 percent. Colorado River consumption on the Colorado River Indian Tribes reservation, in Arizona, is down about 20 percent since 2016.

According to Tom Ley, a water consultant to the tribes, the decline is due to changes in farming practices and participation in a land fallowing program that will see 10,000 acres taken out of production in the next three years. The tribes' decrease in consumptive water use "may look even more dramatic once the 2020 report comes out," Ley told Circle of Blue.

All of these actions amount to a shift in the perception of what's possible, Fleck said.

"It shows that the expectation that a growing population and a robust agricultural economy require more water is wrong," explained Fleck, who is optimistic about the basin's capacity to wield the tools of conservation effectively. Environmental doom is not the inevitable outcome, he says. "We're seeing success in the transition away from the tragedy narrative," he added.

Still, there are minefields to navigate. There are dozens of proposals in the upper basin states to withdraw more water from the river, which, if they were built, would further stress supplies. Some of the water conserved in Lake Mead is stored as a credit that participating agencies can theoretically draw upon in the future. How agencies handle those withdrawals, especially if large requests are made as lake levels plummet, is an uncertainty. On top of that, a warming climate will suck more moisture from the basin, even before rain and snow reach the river.

A hot, dry spring this year in the upper basin is evidence of what aridity can do. Snowpack in the basin's headwaters was roughly average on April 1 and runoff into Lake Powell, a key water supply indicator, was expected to be 78 percent of normal. But then dry conditions arrived in April and May. Combined with dehydrated soils, which took their share of water, the runoff forecast by June 1 had diminished to just 57 percent of normal.

Those climate signals are the counterbalance to the conservation success so far. Water managers, now wary, know the risk.

"Just hopefully we don't get a string of dry years coming back," Hasencamp said.



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Brett Walton

[\[https://www.circleofblue.org/author/brett/\]](https://www.circleofblue.org/author/brett/)

Brett writes about agriculture, energy, infrastructure, and the politics and economics of water in the United States. He also writes the [Federal Water Tap](#)

[\[https://www.circleofblue.org/water-tap/\]](https://www.circleofblue.org/water-tap/), Circle of Blue's weekly digest of U.S. government water news.

He is the winner of two Society of Environmental Journalists reporting awards, one of the top honors in American environmental journalism: [first place for explanatory reporting for a series on septic system pollution in the United States](#)

[\[https://www.circleofblue.org/2016/world/brettwalton/\]](https://www.circleofblue.org/2016/world/brettwalton/)(2016) and third place for beat reporting in a small market (2014). He received the Sierra Club's Distinguished Service Award in 2018. Brett lives in Seattle, where he hikes the mountains and bakes pies.

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Aquifer storage/recharge project moving forward

Jason Chaney  August 03 2021



Work includes completion of a drinking water facility and addition of several wells near the Crook County Fairgrounds

A plan to utilize an aquifer beneath the airport for water storage and recovery is off and running after years of work on the project.

The aquifer is an ancient remnant of the Crooked River that ran directly under the present-day airport before geological events altered the path of the current river. It is a confined aquifer, so water does not pass through it quickly, making it a good candidate for storing water during the winter when demand is low (about 1 million gallons a day) and retrieving it during the summer when demand is highest (about 5 million gallons a day).

Work on the storage and recovery system started about three years ago, according to Prineville City Engineer Eric Klann, when the municipality ran water and wastewater lines from the valley floor near O'Neil Highway to the top of the rimrock.

Once that work was completed, they started injecting water into the aquifer during the winter to test its storage capabilities. During the 2018-19 winter, they injected about 200,000 gallons. When that endeavor succeeded and they were able to retrieve the water in the summer, they injected 34 million gallons during the 2019-20 winter. Again, the city was able to retrieve and use the water, so this past winter, they put 100 million gallons into the aquifer.

Klann said that a lot of water analysis was necessary during the process, ensuring that the water quality and chemistry was sufficient for storage and recharge. Meanwhile, the State of Oregon has been working with the city on permitting and water monitoring. So far, all has gone well.

"I would say we have been in a testing pattern," Klann said. "All of that has been looking good, and now we are starting to get into more of an implementation phase."



JASON CHANEY - The interior of the new drinking water plant, which treats water from several new wells.

In the midst of this new phase, the city has added more drinking water to its supply. Near the Crook County Fairgrounds, the municipality drilled three shallow wells that combined produce about 2,000 gallons per minute. But in order to use that water, they needed to build a small treatment plant.

"One of the issues we have in Prineville is there are some water quality issues," Klann explained. "It's potable water, but it has taste and odor issues."

Those issues, which are not present at every city well location, are caused by ammonia, manganese, iron and sulfur in the water.

"We are taking that water and running it through a series of biological filters," Klann said, "a fairly inexpensive way to treat the water, and we are pumping that into the system. ... That is a pretty big improvement for us. It probably increases our capacity 30% or so."

The addition of the new wells and water treatment, and the implementation of the aquifer storage and recharge system is expected to help the city meet peak water needs for Prineville and do so without having to spend big money to build a large treatment plant.

"It is a very cost-effective way to meet that seasonal demand," Klann concluded.

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News

By **Jessica Gruenling**

August 4, 2021 8:40 PM Published [August 4, 2021 12:53 PM](#)

Colorado Springs Utilities demonstrating innovative water recycling technology



KRDO

COLORADO SPRINGS, Colo. (KRDO)-- Colorado Springs Utilities partnered with the Colorado School of the Mines and Carollo Engineers to create innovative technology that purifies recycled wastewater to drinking water levels.

The PureWater Colorado Mobile Demonstration is used to show a scaled model of the carbon-based direct potable reuse process.

The process takes highly treated water from a public water system's reclamation facility through an advanced purification to make it safe for drinking.

The project was funded by a Colorado Water Conservation Board Grant. The demonstration trailer was created by Mines engineering professors and students. The water source will soon be regulated for use throughout Colorado.

The mobile unit, housed at Colorado Springs Utilities' J.D. Phillips Water Resource Recovery Facility, opens for public tours, including water samples, Aug. 5.

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White House unveils extra \$3 b in local disaster funding

BY ZACK BUDRYK - 08/05/21 05:08 PM EDT



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The White House on Thursday announced more than \$3 billion in extra funding for projects to increase state and local resilience to storms and other climate-related disasters.

White House press secretary Jen Psaki told reporters there would be more than \$3.46 billion in new funding through the hazard mitigation grant program, which funds projects that mitigate disaster risks to people and property.

The Department of Homeland Security later confirmed that under the program, any state, tribe or territory that received a federal disaster declaration during the COVID-19 pandemic will have access to 4 percent of the disaster costs to put toward climate change resilience and mitigation efforts.

"Through this funding, communities across the nation will have the critical resources needed to invest in adaptation and resilience, and take meaningful action to combat the effects of climate change," Homeland Security Secretary Alejandro Mayorkas said in a statement. "This funding will also help to ensure the advancement of equity in all communities, especially those that are disproportionately at risk from climate change impacts."

"Climate change is our country's biggest crisis. Our communities will continue to suffer from losses caused by extreme weather events unless we invest in mitigation efforts to reduce the impacts of climate change," added Federal Emergency Management Agency (FEMA) Administrator Deanne Criswell.

Lead pipe replacement funds in bipartisan deal draw skepticism

Senate budget resolution includes Interior funding after Democratic...

"This new funding is a tangible solution that we can implement today to help prevent against future risk disasters. It will allow us to provide direct aid to states, tribes, and territories to complete mitigation projects, strengthen our infrastructure, identify long term solutions to these hazards and ultimately make a real difference in our communities," Criswell said.

Potential mitigation projects the funds could be used for include funding to protect against climate-related or environmental disasters such as wild fire, flooding, drought or coastal erosion, as well as adapting critical facilities or utilities to better withstand environmental risks, according to the statement.

The announcement comes as meteorologists are projecting an above-average hurricane season and a series of heatwaves and wild fires have devastated western states in recent months.

TAGS ALEJANDRO MAYORKAS JEN PSAKI

California shuts down major hydropower plant as water reservoir falls to record low

“This is just one of many unprecedented impacts we are experiencing in California as a result of our climate-induced drought.”

By Joseph Guzman | Aug. 6, 2021

A California hydroelectric power plant was forced to go offline as extreme drought conditions exacerbated by climate change have resulted in record-low water levels at Lake Oroville, one of the state’s largest water reservoirs.



It's the first time the Edward Hyatt Power Plant, which has the ability to power up to 800,000 homes at full capacity, has been shut down due to depleted water levels since the plant went into operation in 1967.

As of Thursday, Lake Oroville's water level stood at just more than 641 feet, breaking the previous record set in 1977. Officials had previously warned the plant would be forced to go offline if the reservoir fell roughly below 640 feet above mean sea level.

The California Department of Water Resources (DWR) said they "anticipated this moment, and the state has planned for its loss in both water and grid management." The state's power grid is expected to be able to deal with the loss.

"This is just one of many unprecedented impacts we are experiencing in California as a result of our climate-induced drought," DWR Director Karla Nemeth said.

"California and much of the western part of the United States are experiencing the impacts of accelerated climate change including record-low reservoir levels due to dramatically reduced runoff this spring," Nemeth said.

Officials said they are working to preserve as much water in storage as possible.

California has experienced extremely dry conditions and severe heat waves several times this year, straining the state's power grid.

Nearly the whole state is in "extreme" or "exceptional" drought conditions, according to the U.S. Drought Monitor.

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RESEARCHERS LOOK FOR SINKS OF MICROPLASTICS POLLUTION IN LAKE TAHOE

BY BRIAN BAHOUTH August 7, 2021

THE MOST COMPREHENSIVE CHARACTERIZATION OF MICROPLASTICS IN THE LAKE TAHOE BASIN TO DATE

Microplastic pollution is seemingly ubiquitous, and few know this as well as staff research associate with the UC Davis Tahoe Environmental Research Center Katie Senft. Senft, in collaboration with the Nevada Division of Environmental Protection, is looking for sinks of microplastics in Lake Tahoe.

"A sink is a place where the plastics will collect once they enter Lake Tahoe. Based on the work U.C. Davis has done, as well as research done by the Desert Research Institute looking at stormwater samples, we know that plastics are in the lake," said Senft by phone. "The big question now is, where are they going once they get in there."

Senft is looking at five different areas of the lake. The first is surface water.

"A lot of plastics are buoyant and they float. So monthly we've been dragging a net through the northern part of the lake and collecting surface waters, which we analyze back at the lab for plastics," Senft said. "And that's kind of the classic ... when you think of ocean plastic research, the Manta Trawl is what they're towing behind their boats, and that's what we're using on the lake."

Lake Tahoe is nearly 1,700 feet deep. The second area of inquiry is the vertical distribution of microplastics.

"As plastics get colonized with biofilms or algal growth that can change their density and make them a little heavier, they'll settle eventually. So we're looking at water at six different depths from top to bottom."

Senft will also study deep-water sediments.

"There's a lot of deep areas in Lake Tahoe, and we went out and collected sediments from about 400 meters deep in the water. We want to see if the plastics are settling down there and getting locked up and away from fish and other wildlife."

The fourth area of scrutiny is municipal waters. Researchers will collect water from two different water treatment plants in the Tahoe basin on a quarterly basis.

For the current study, the fifth and final area of microplastics inquiry will be two species of nonnative wildlife.

"We'll look at Kokanee salmon guts as well as Asian clams," Senft said.

The kokanee salmon is the landlocked relative of the ocean-going sockeye salmon. According to the U.S. Forest Service, biologists introduced the fish to Lake Tahoe in 1944.

The Asian clam is an invasive species. Each rapidly-multiplying clam filters algae from as many as 5 gallons of water per day for food. Studying the presence of microplastics in bottom-dwelling clams and top of the food chain salmon will likely offer a variety of insights, the upshot is, microplastics are bad for aquatic wildlife.

"Sometimes microplastics cause digestion problems, and they can get so full of microplastics there's no room for their usual food and they can actually starve to death," Senft said.

Microplastics pollution moves up the food chain with a variety of negative outcomes. The tiny particles serve as an excellent pathway or "raft," for chemical toxins and pathogenic bacteria, according to Senft.

"Some of the dangers of that, aside from them just consuming them and causing digestion issues, is when those toxins attach to the microplastics you can have what we call bioaccumulation of toxins up the food web," Senft said. "So you might have a little tiny zooplankton swimming around in the lake, and they might have eaten a piece of the plastic, but then you have the fish that comes by and eats a thousand of the zooplankton, and now that fish has a thousand pieces of microplastics in them. As you move up the food chain, you keep that bioaccumulation of those negative things going."

As alarming as the results can be, an accurate characterization of the presence of microplastics leads to an understanding of its sources, an important first step to being able to solve the problem. And while cleanup is not yet feasible, once identified, the sources can be curbed. Senft said that washing clothing made from synthetic materials is the largest contributor to microplastics pollution, but society also has a serious glitter problem.

"Microplastics, one of the real challenging things about them is, once they get into the environment, they are incredibly difficult, if not impossible, to remove with current technologies.

Manta Trawl Sampling Cup – Researcher Katie Senft holds a sampling cup with particles collected from Lake Tahoe’s surface using a manta trawl. The samples contain many organic materials such as pine needles and insects, so additional processing will be done in the lab to remove them before microplastics can be isolated for analysis – photo: Brant Allen

Petri Dish – Suspected microplastics are removed from manta trawl samples in the lab and mounted on petri dishes for validation using a Raman microscope, which confirms polymer type, giving UC Davis researchers greater insight into potential sources – photo: Steven Sesma

“So every time glitter goes down the drain at your house, if it’s not getting captured by the wastewater treatment plant, if their filtration system isn’t really top notch, that could be expelled into rivers. And once it’s in there, as I said, there is no known way to get it out.

"Glitter is used in everything from cosmetics to inflatable beach toys to put sparkles in them to the craft projects we often do with our children at home. And glitter is what's known as a primary microplastic," Senft said.

There are two types of microplastics, according to Senft. A microplastic is considered a piece of plastic less than five millimeters or smaller, about the size of a grain of rice. Primary microplastics, like glitter, are small to begin with and notoriously difficult to remove from the environment. They don't need to be broken down any more to be considered a microplastic.

Secondary microplastics start out as larger items, so think of water bottles or plastic bags. Ultraviolet light, wind, or waves can fragment these larger items to microplastic size.

Seemingly, wherever researchers look for microplastics, they find them.

"As we all know there is plastic everywhere in our everyday lives. Since 1950, there's been over eight billion metric tonnes of plastic produced. And over half of that has been produced in the last 13 years. So there's plastic everywhere we look," Senft said.

As a researcher who works to accurately characterize the problem in one of the nation's more scenically attractive places, is she optimistic?

"I find a lot of optimism in it actually," Senft said. "One thing I want to say is that plastics, they're not evil. The way it's turned down a bad path is our appetite for single-use plastics. That's very avoidable. I carry a water bottle everywhere I go, and that probably saves hundreds of pounds of plastic from going into the landfill every year, so one of the great things that everyone can do is try to eliminate single-use plastics from your lives."

Top photo caption and credit: Manta Trawl – A manta trawl is towed on the surface behind a UC Davis research vessel to collect buoyant particles sitting on the surface. Some of the particles captured are likely microplastics – photo: Brant Allen

[Previous article](#)

Lyon County Commissioners Approve Naming the Donald J. Trump Justice Complex