

Veles Water Weekly Report

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WATER FUTURES MARKET ANALYSIS

Welcome to ***WATERTALK***

by Joshua Bell standing in for Robin Bieber

CLICK THE LINK BELOW

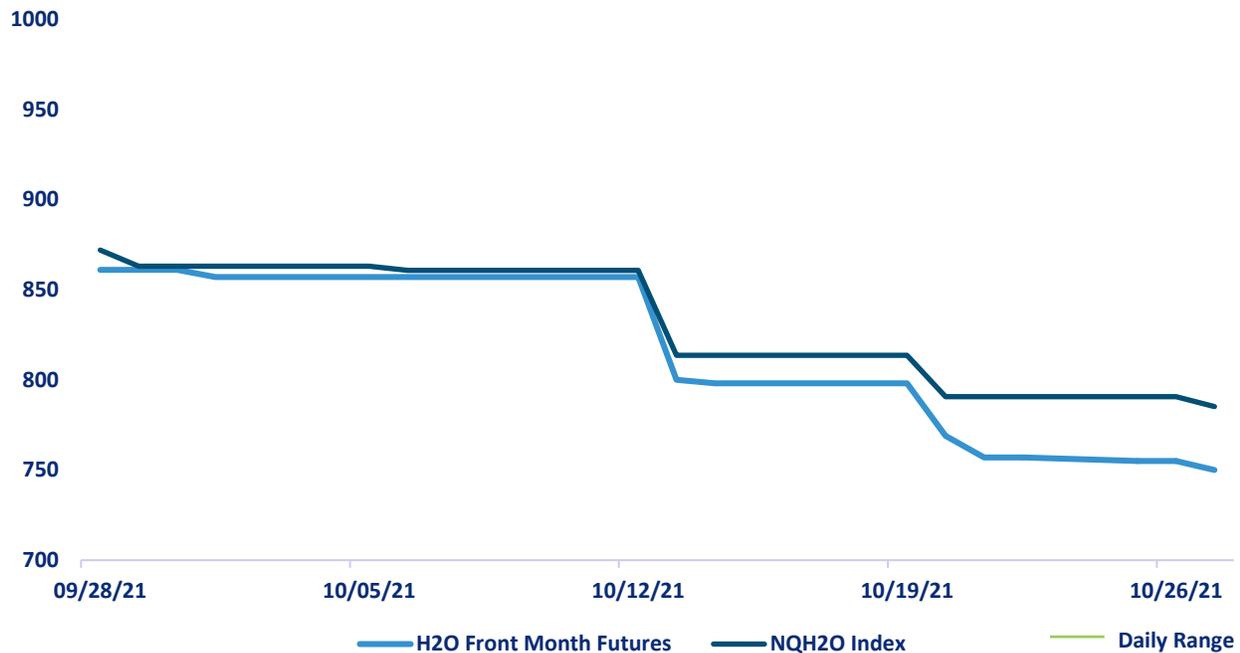
"A 2 minute technical analysis video of H2O futures"

<https://vimeo.com/639875211>



NQH2O INDEX PRICE vs H2O FUTURES PRICE

1 Month Price Performance NQH2O Index vs H2O Futures



Price Chart Based upon Daily Close

Yesterday a new Index was published at \$785.19, down 0.69% or \$5.46. Over the past week the Futures have been closing at a discount to the index of \$30.19 - \$35.65. The Futures have closed at low of \$750 and a high of \$757.

NQH2O is up 57.09% YTD.

Below are the bid offer prices on different expiries being quoted in the market.

November 750@757

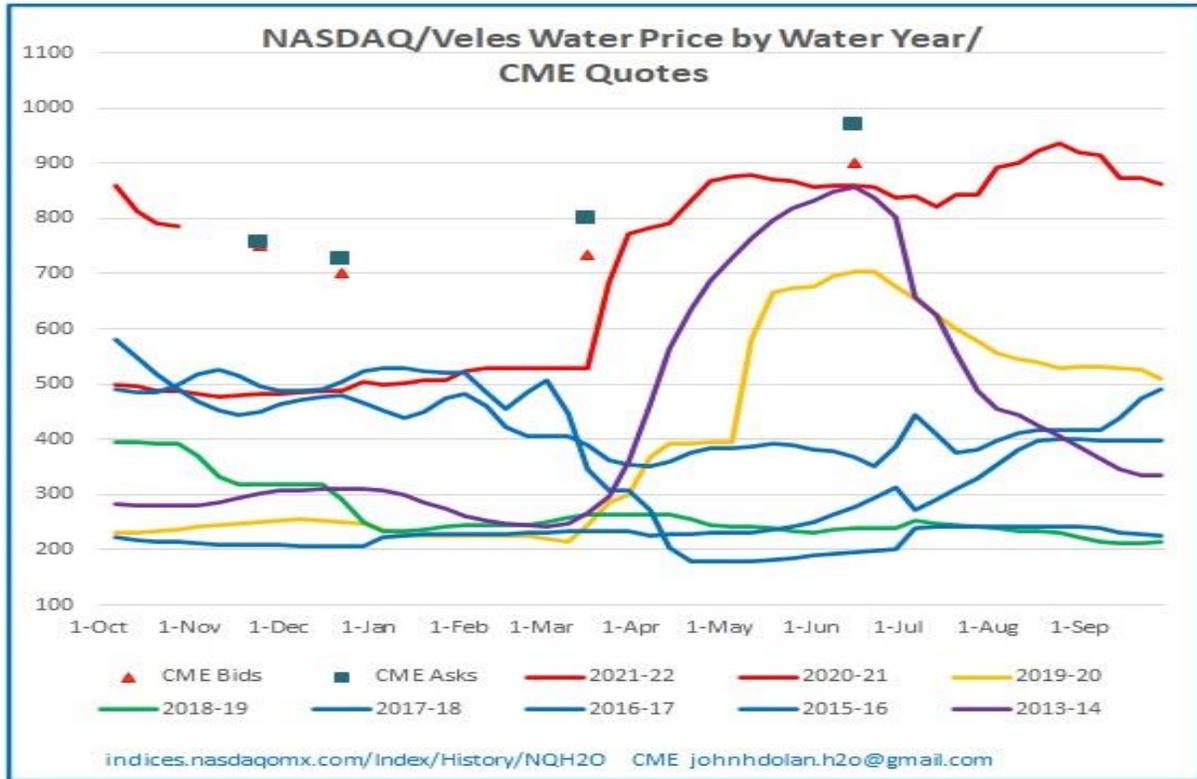
December 700@725

March 22 735@800

June 22 900@970

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NQH2O INDEX HISTORY



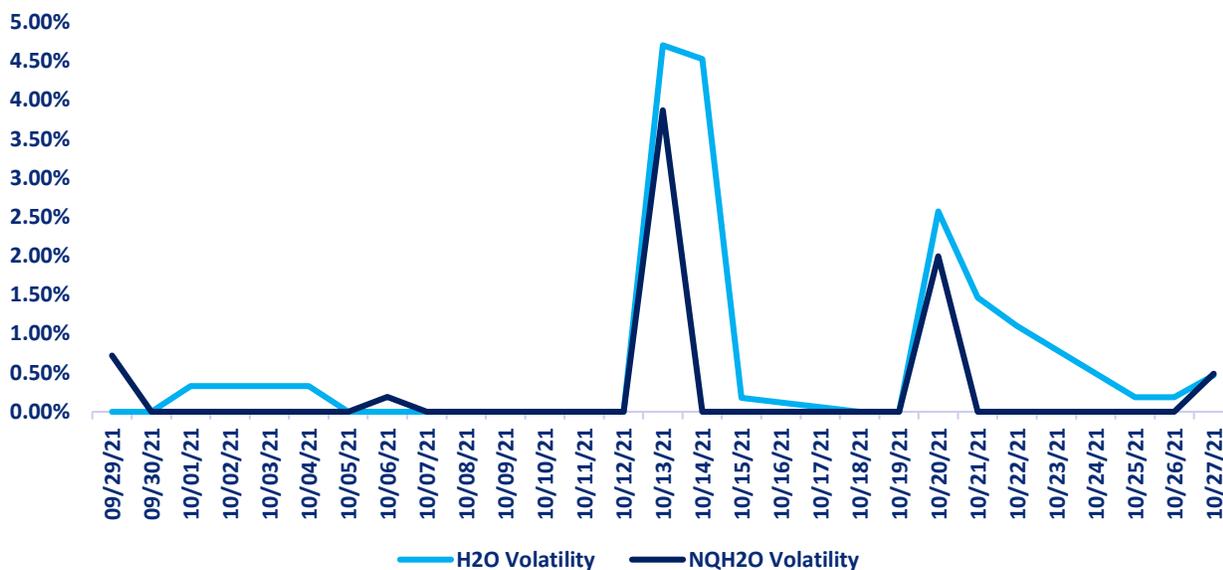
The graph above lays out the Nasdaq Veles water index by year, showing 2013- 2022. In very dry years, prices clearly rise through the spring, peaking in May to July (with the exception of 2015) as demand for water from farmers peaks. Prices then taper off heading into the winter on reduced demand, and the possibility of rain/snow. The restricted ability to “carry” water, much like one can do with financial contracts, gives this index the same type of seasonal pattern that one sees on some other commodities.

The graph for 2021 is highlighted in red. It shows the same seasonal climb, but at record-high values above each of the last eight years since February. Current bids and offers in the market are still higher than historic prices showing that expectations are that this is an exceptionally dry year and prices may not fall seasonally as much as they have in prior dry years.

(Reference: John H Dolan, CME Market Maker)



Daily H2O Futures Volatility vs Daily NQH2O Index Volatility



DAILY VOLATILITY

Over the last week the November future volatility high has been 1.10% on October 22nd with lows of 0.19% on October 25th.

ASSET	1 YEAR (%)	2 MONTH (%)	1 MONTH (%)	1 WEEK (%)
NQH2O INDEX	34.35%	5.97%	4.76%	2.13%
H2O FUTURES	N/A	9.02%	7.40%	3.28%

For the week ending on the 27th October the two-month futures volatility is at a premium of 3.05% to the index, up 1.35% from the previous week. The one-month futures volatility is at a premium of 2.63% to the index, up 0.62% from last week. The one-week futures volatility is at a premium of 3.28% to the index, down 0.10% from the previous week. These volatility moves are reflecting that the futures are anticipating further moves in the underlying index.

*Above prices are all **HISTORIC VOLATILITIES** and **IMPLIED VOLATILITIES** will be introduced once an options market has been established. All readings refer to closing prices as quoted by CME.*



Central Valley Precipitation Index



Central Valley average is calculated using data from 19 weather stations in the Central Valley, California.
Data as of 27/10/2021

STATION	MTD (INCHES)	WEEK ON WEEK CHANGE (INCHES)	% OF 20 YEAR AVERAGE MTD	2022 WYTD VS 2021 WYTD %	2022 WY VS 20 YEAR AVERAGE TO DATE %
SAN JOAQUIN 5 STATION (5SI)	6.61	5.97	314.98%	267	267
TULARE 6 STATION (6SI)	2.59	2.27	214.30%	265	265
NORTHERN SIERRA 8 STATION (8SI)	12.4	11.58	424.04%	514	514
CENTRAL VALLEY TOTAL	21.60	19.82	317.77%	349	349

RESERVOIR STORAGE

RESERVOIR	STORAGE (AF)	% CAPACITY	LAST YEAR % CAPACITY	HISTORIC ANNUAL AVERAGE CAPACITY %
TRINITY LAKE	660,540	27	53	46
SHASTA LAKE	1,001,122	22	46	41
LAKE OROVILLE	941,413	27	43	52
SAN LUIS RES	197,527	22	46	22

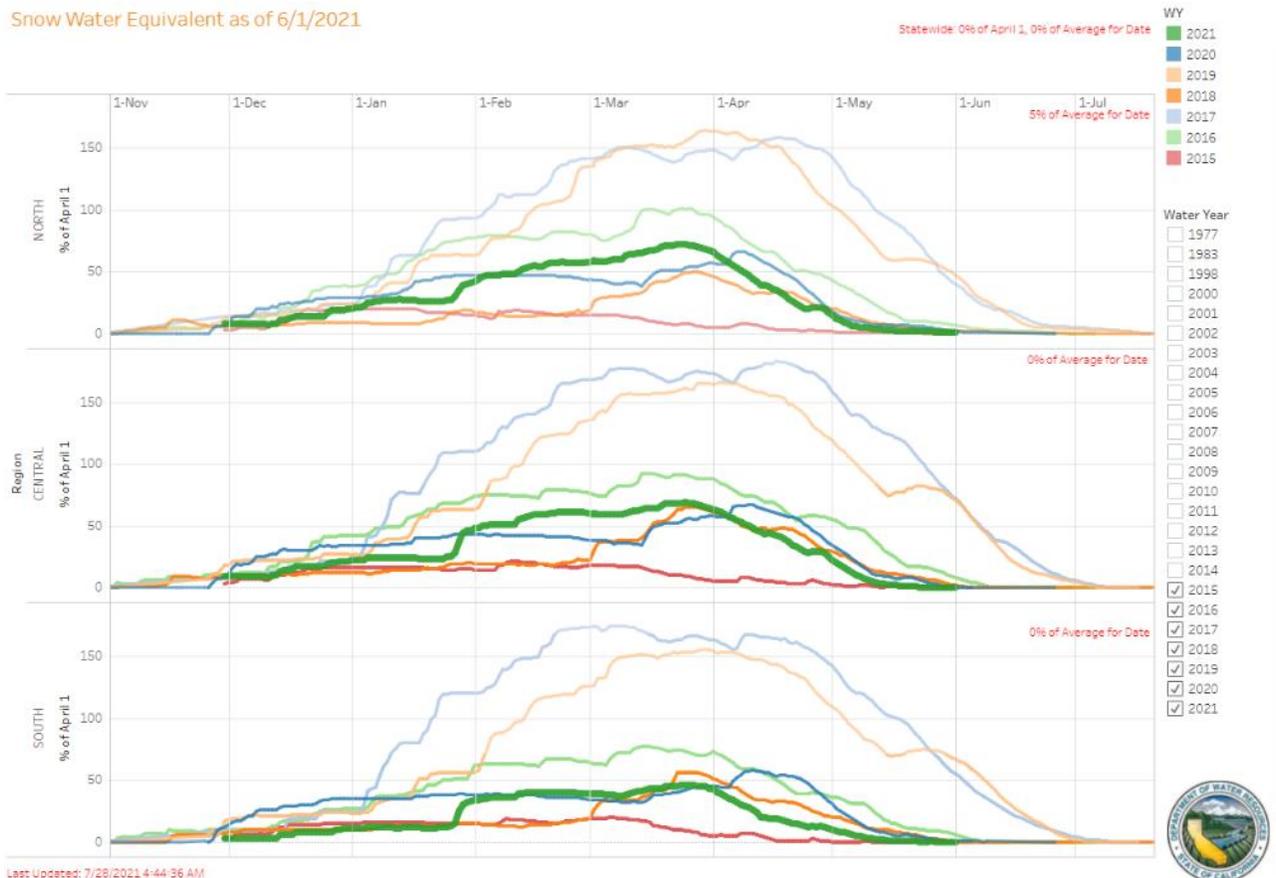
Reference: [California Water Data Exchange](https://www.waterdataexchange.com/)

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SNOWPACK WATER CONTENT



Snow Water Equivalent as of 6/1/2021



Last Updated: 7/28/2021 4:44:36 AM



REGION	*SNOWPACK WATER EQUIVALENT (INCHES)	WEEK ON WEEK CHANGE %	% OF AVERAGE LAST YEAR	% OF 20 YEAR HISTORICAL AVERAGE	% OF HISTORICAL **APRIL 1ST BENCHMARK
NORTHERN SIERRA	0	0.00%	0	0	0
CENTRAL SIERRA	0	0.00%	0	0	0
SOUTHERN SIERRA	0	0.00%	0	0	0
STATEWIDE	0	0.00%	0	0	0

*Snow Water Equivalent, or SWE, is a commonly used measurement used by hydrologists and water managers to gauge the amount of liquid water contained within the snowpack. In other words, it is the amount of water that will be released from the snowpack when it melts. SWE has regional variance.

** April 1st is used as the benchmark as it when the snowpack in California is generally deepest. It has been used the benchmark date since 1941 by DWR and can be used to predict spring river flow.



**U.S. Drought Monitor
California**

October 19, 2021
(Released Thursday, Oct. 21, 2021)
Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	100.00	93.81	87.18	45.66
Last Week 10-12-2021	0.00	100.00	100.00	93.93	87.18	45.66
3 Months Ago 07-20-2021	0.00	100.00	100.00	94.75	85.75	33.42
Start of Calendar Year 12-28-2020	0.00	100.00	95.17	74.34	33.75	1.19
Start of Water Year 09-28-2021	0.00	100.00	100.00	93.93	87.88	45.66
One Year Ago 10-20-2020	15.40	84.60	67.54	35.61	12.74	0.00

Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

Author:
Brad Pugh
CPC/NOAA



droughtmonitor.unl.edu

U.S. Drought Monitor Class Change - California
1 Week



October 19, 2021
compared to
October 12, 2021

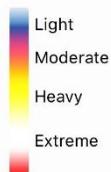


- 5 Class Degradation
- 4 Class Degradation
- 3 Class Degradation
- 2 Class Degradation
- 1 Class Degradation
- No Change
- 1 Class Improvement
- 2 Class Improvement
- 3 Class Improvement
- 4 Class Improvement
- 5 Class Improvement

droughtmonitor.unl.edu

The US Drought Monitor release their statistics with a 1-week lag to this report. Over the past week there has been 0% change in drought conditions in California.

The U.S. Drought Monitor is jointly produced by the National Drought Mitigation Center at the University of Nebraska-Lincoln, the United States Department of Agriculture, and the National Oceanic and Atmospheric Administration. Map courtesy of NDMC.



CURRENT SATELLITE IMAGERY

The current satellite picture shows a frontal system off the Northwestern region of the US just making landfall in the Seattle region.

It is expected this front will bring further precipitation to the Northwestern US and into Northern California with potential to reach the San Francisco area.

Further Northwest over the Pacific on route via Southern Alaska is another frontal system developing and we expect this to bring another round of precipitation later in the week.

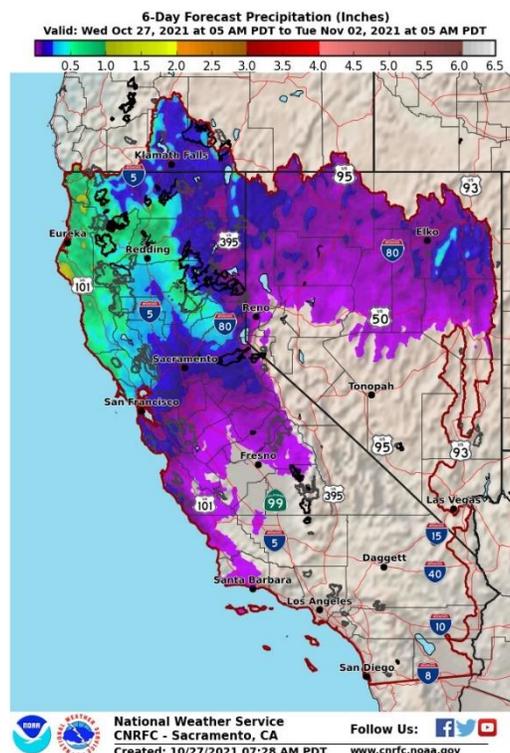
Once again Monsoonal effects are not prevalent on this satellite picture at present as

it appears this moisture inflow from the South may have ceased for the year. Our long-term models are still showing the potential for greater precipitation to reach the SW and Western US this winter.

Ref. Dark Sky

10 Day Outlook

A weak front is bringing light precip to portions of far northern CA, especially the far north coast, this morning and should wind down through the day. Freezing levels above 10,000 ft are expected. The next front should bring additional light precipitation to mainly far northern CA/NV Fri-Sat with freezing levels around 9000 ft. A wetter system is expected to bring more widespread light precipitation across northern/central CA/NV early next week, with freezing levels 8000-10000 ft. Overall totals for the next 6 days are for 0.5-1" in the far northern Sierra, north coast, and Shasta drainage, with lighter amounts further south into central CA/NV.



Reference: National Weather Service / California Nevada RFC / Sacramento CA



Severe (D2) to exceptional (D4) drought continues throughout much of the Pacific Northwest, California, and the Great Basin. Nearly all of this region remained status-quo in terms of drought changes as the Monsoon season ended and the wet season just began. A robust Monsoon brought an end to short-term drought impacts across Arizona and southern Utah, but long-term drought impacts persist. Along and west of the Cascades, above normal precipitation was observed across western Oregon and Washington since mid-September. This favorable start to the wet season along with improving streamflows and SPI values support the removal of small D4 in Douglas and Linn counties of Oregon. Periods of beneficial precipitation and cooler temperatures led to an improvement from D4 to D3 along the mountain range front in Utah. However, D4 persists across the Sevier River Basin of southern Utah. The increase in precipitation, related to the onset of the wet season, along with much cooler temperatures resulted in a large decrease in the number of large wildfires throughout the West during mid-October. Extreme drought (D3) was expanded across northwest Montana based on 28-day streamflows near the 5th percentile along with 30 to 60-day SPIs. Conversely, last week's major storm prompted slight reduction in drought intensity across parts of eastern Montana.

Reference: Brad Rippey, U.S. Department of Agriculture
Richard Heim, NOAA/NCEI

WATER NEWS

CALIFORNIA WATER NEWS

'Not a drought buster.' Northern California rainstorm will help but not end water woes

The rainstorm pelting Sacramento and Northern California will help remedy the state's woeful water situation. But it won't be nearly enough to end the epic California drought. Even with 5 inches of rain in Sacramento, our deficits are immense," said Jeffrey Mount, a geologist and water expert at the Public Policy Institute of California. "We're basically missing two years of 'precip' in this basin. "It's not a drought buster."

The main problem is that the drought, coupled with climate change, has dried out the soils of Northern California — meaning that much of the rain and snow will simply disappear into the ground. "The soil moisture throughout Northern California has been depleted the last couple of years," said Jay Lund, co-director of the Center for Watershed Sciences at UC Davis. "You need to soak the soil first." That issue became obvious last spring. A second straight dry winter left the state in bad but not terrible shape, with the



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Sierra Nevada snowpack at about 40% below average. Then most of that snowpack vanished, with some evaporating and much of it seeping into the dry soil instead of flowing into the reservoirs. Roughly 800,000 acre-feet of water — nearly enough to fill Folsom Lake, one of the state’s most important reservoirs — was gone. In a matter of weeks, the drought had become disastrous. But if the current storm won’t fix everything, it will set the stage for later storms, which will generate the runoff California desperately needs.

Original Article: [Modesto Bee by Dale Kasler](#)

California spending billions on water projects — without borrowing

State politicians have done something laudable, and it has gone unheralded. They haven’t even bragged about it themselves. So, here’s some heralding.

They’ve authorized spending about \$5 billion on drought-related water projects without charging it on the credit card.

They’re going to pay cash. That will save taxpayers roughly twice the projects’ cost for tacked-on interest.

Normally, the politicians pay for water endeavors with borrowed money. It’s exceedingly rare when projects are funded with cash from the general fund, the state’s main banking account. A bond proposal is placed on the ballot and voters approve it. Investors purchase the bonds, and the state repays the buyers with interest for 20 or 30 years.

And the state goes deeper into debt.

As of last November’s election, the state was making \$7 billion in annual payments on \$80 billion in bonds. In addition, voters had approved \$38 billion in bonds that were not yet sold.

Then, in that election, Californians authorized \$5.5 billion more in bonds for stem cell research, costing a projected \$260 million annually for 30 years.

Like a family, it’s wise for governments to avoid borrowing whenever possible.

Actually, Gov. Gavin Newsom and the Democrat-controlled Legislature don’t deserve loud heralding for their pay-as-you-go decision. Keep it at low volume.

Cash financing not only was possible, it was prudent. The governor and lawmakers would have been unforgivably wasteful if they’d done the normal borrowing.

Tax revenue was pouring into state coffers like never before. There was an estimated \$38 billion in discretionary surplus money. And the state has stashed an extra \$14 billion in unexpected revenue since the current \$263-billion state budget took effect July 1.

Sen. Anthony Portantino (D-La Cañada Flintridge) had introduced a \$5.6-billion bond proposal for water supply, drought preparation, flood protection and wildfire prevention. He pushed it through three committees in the spring against weak Republican opposition, then shelved the legislation when it reached the Senate floor.

“I decided to take advantage of the [revenue] windfall and not put a bond on the ballot,” Portantino says. “It was the fiscally responsible thing to do.”



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Portantino's policy proposals plus much more — 25 bills in all — were wrapped into what Newsom predictably crowed was “the largest climate action package in state history.” The total cost: \$15 billion — basically paid in surplus cash.

Original Article: [The Mercury News by George Skelton](#)

Record rains transform a parched California, but ending drought remains elusive

The drought-dried shores of Folsom Lake were damp this week after what officials called the first big storm of the season.

The water level at Lake Oroville, which receded so much this summer that officials had to close its hydroelectric power plant for the first time, rose by more than 16 feet.

And the Russian River — recently reduced to something more like a trickle — flowed with more ease after the atmospheric river dumped record-breaking amounts of rain across California, replenishing dwindled reservoirs and rehydrating cracked terrain.

Despite the mayhem the atmospheric river caused for some residents, the historic storm marked a welcome change for a parched California after a year of heat and drought with so little rain.

“If we could have designed a storm it would have been this one,” said Emma Detwiler, a spokeswoman for the Marin Municipal Water District, which saw its depleted reservoirs grow from 32% capacity to 43% during the storm. “It’s a great step in the right direction.” But while the massive plume of moisture helped, experts said it will take much more than one storm to make a dent in the drought. The 2021 Winter Outlook recently released by the National Oceanic and Atmospheric Administration found that dry conditions are likely to persist across much of the West through at least the start of next year.

“It’s been very, very dry for two years,” said Jay R. Lund, director of the UC Davis Center for Watershed Science. “One storm does not end that kind of a drought.”

The fast-moving storm shattered several records as it moved through the state Sunday and Monday. Downtown Sacramento saw a record 24-hour rainfall total of 5.44 inches, surpassing a mark set in 1880, the National Weather Service said.

City officials said the precipitation totals represented even more than a “200-year storm level,” which occurs at 4.6 inches and has only a 0.5% chance of occurring in any given year.

Placer County's Blue Canyon received 10.4 inches of rain — breaking its previous record from 1964.

And in the San Francisco Bay Area, the 4.02 inches of rain that fell Sunday marked the wettest October day in downtown San Francisco, and the city's fourth-wettest day in recorded history.

The storm was “unusual for this time of year in terms of its strength,” David Sweet, a meteorologist with the National Weather Service, said Monday. “It’s a very, very powerful storm.”

Original Article: [The LA Times by Hayley Smith, Luke Money, Lila Seidman](#)

**Groundwater is not free**

Following a welcome rainstorm and on the eve of COP26, now is a good time to embrace yet another axiom for a sustainable future: Groundwater is not free.

A recent letter in The St. Helena Star addressed concerns of new wells in the Sulphur Creek corridor, which are permitted under the city's agricultural exemption. Science tells us that there is relationship between a depleted aquifer and dry streambeds, due to the lack of groundwater discharge. A recent article in the Napa Valley Register described the concept as "controversial." Regardless of how you may "feel" on this matter, we all have to agree to one principal: Groundwater is not free.

The forthcoming Groundwater Sustainability Plan (GSP) from the County must address thresholds for well water extraction. The city of St. Helena should do the same. If this does not happen, the state will have the authority to limit extraction. Monitoring groundwater use, either with direct water metering or well pump metering courtesy of PG&E, provides the information that we all need. There are easily implemented models for this in other agricultural counties in Northern California, where farmers pay for groundwater.

With all that is at stake, the grape growers must ensure a sustainable future. This is not unlike the implementation of the county's Conservation Ordinance in 1991. The growers bought in and Napa County became the gold standard for erosion control measures. The aquifer is arguably our most valuable resource. The first step is buying in: Groundwater is not free.

Original Article: [St Helen Star by Christopher Cole](#)

Construction on Castaic Dam moving forward

Construction is underway at Castaic Lake, as officials from the California Department of Water Resources work to make seismic improvements on Castaic Dam's tower access bridge.

Castaic Lake is one of many State Water Project facilities that supply water to the state, specifically providing water for the greater Los Angeles area and more than 5.2 million Californians in 2019, according to DWR.

DWR is modernizing its SWP facilities as it works to identify and proactively address any issues that could impact water supplies across the state.

We're moving forward on some of these projects to increase the resiliency of the facilities, and this was one of the projects that we're doing to increase the seismic capacity of this bridge so that it doesn't fail in a very large earthquake," added Jason Brabec, DWR supervising engineer for the Castaic Dam Modernization Program.

As part of the Castaic project, the tower access bridge's piers are being strengthened with a reinforced fiber wrap, among other improvements being completed on the superstructure, Brabec said.



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However, before work could begin on the bridge, DWR worked to lower the water level of Castaic Lake to access the submerged bridge piers.

“This has been a project we’ve been working on with our stakeholders for at least two and a half years, because drawing down the lake is a big endeavor,” Brabec said, adding that the temporary drawdown began in May.

Original Article: [The Signal Santa Clarita Valley by Emily Alvarenga](#)

Black & Veatch to Help Northern California Water District Replenish Stressed Groundwater Basin with Purified Recycled Water

Facing a dwindling water supply due to historic overdraft and climate change-fueled drought, Northern California’s Soquel Creek Water District is turning to an advanced recycled water purification system, delivered in part by engineering leader Black & Veatch, to help drive sustainable groundwater supply management and meet the state’s sustainability mandate.

The Soquel Creek Water District Board of Directors recently approved the next phases of its progressive design-build agreement with Black & Veatch to build treatment facilities and associated infrastructure to help replenish groundwater supplies – the sole source of water for the District’s more than 40,400 residents – impacted by over-drafting and seawater intrusion.

The project, Pure Water Soquel, will recycle up to 490 million gallons of water per year from the Santa Cruz Wastewater Treatment Facility (SCWWTF) by processing it through an advanced water purification center before pumping it back into the groundwater basin.

Black & Veatch completed Phase 1, which included design of the treatment facilities and preconstruction activities, and now has the green light to move on to Phases 2 and 3, which will involve construction, startup and commissioning services, and warranty for the treatment facilities. The treatment facilities include a source-water pump station and tertiary treatment facility at the SCWWTF, as well as the advanced water purification facility (AWPF) located at a second site.

“This is a unique project in that it’s split into treatment facilities at two sites,” said Dave Carlson, Black & Veatch Vice President and Client Director. “What makes it even more unique is the community aspect of the project, including inter-agency collaboration. The ability to collaborate and work together is immensely valuable when it comes to ensuring the resilience of regional water supplies in an area that is completely reliant on local water supplies.”

Pure Water Soquel is a key component of the region’s Groundwater Sustainability Plan. The Santa Cruz Mid-County Groundwater Basin is classified by the California Department of Water Resources as one of 21 “critically over-drafted” basins in the state and must meet the state sustainability mandate by 2040. Seawater intrusion occurs when the groundwater levels become too low to prevent seawater from creeping inland and



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ruining aquifers. Even with significant water conservation measures in place, the current drought is intensifying the challenge.

“This is a historic project grounded in environmental stewardship that will also ensure economic vitality and support a thriving community for residents, businesses and tourists – for current and future generations,” said Ron Duncan, General Manager of the Soquel Creek Water District. “Pure Water Soquel will not only reduce the overdraft conditions in the basin but will protect against further seawater intrusion and promote beneficial reuse by reducing discharge of treated wastewater into the Monterey Bay National Marine Sanctuary.”

When completed in 2023, the project will produce up to 1,500 acre-feet per year of purified water from the AWP and additional 300 acre-feet per year of Title 22 unrestricted, non-potable recycled water from tertiary treatment.

Original Article: [Business Wire](#)

First two projects meet continuing eligibility requirements, move forward in Water Storage Investment Program

Two projects in the Water Storage Investment Program (WSIP), the Los Vaqueros Reservoir Expansion Project and the Harvest Water Program, met the statutory deadline to ensure progress and remain eligible for WSIP funding. Proposition 1, the Water Quality, Supply, and Infrastructure Improvement Act of 2014, requires all WSIP applicants to complete their feasibility studies, release a draft version of their environmental documents for public review, provide the DWR director documentation of commitments for at least 75 percent of the non-program funding, and have the California Water Commission find their project feasible no later than January 1, 2022. At the October 20 meeting, the Commission found that the Los Vaqueros Reservoir Expansion Project and the Harvest Water Program are both feasible. The Los Vaqueros Reservoir Expansion Project would add 115,000 acre-feet of storage by enlarging the existing off-stream reservoir located in southeastern Contra Costa County from 160,000 to 275,000 acre-feet. The project would deliver water to agencies within Contra Costa Water District’s service area, the Bay Area, the Delta, neighboring regions, and south-of-Delta wildlife refuges. Construction is expected to begin in mid-2023. The Harvest Water Program is a conjunctive use project that would supply 320,000 acre-feet of tertiary treated wastewater to irrigate up to 16,000 acres of agriculture and habitat lands in Sacramento County near the lower Cosumnes River and Stone Lakes National Wildlife Refuge. The Harvest Water Program is scheduled to begin operation in mid-2024. “This is an important step in the progress of these projects and the Water Storage Investment Program as whole,” said Commission Chair Teresa Alvarado. “The applicants have worked hard to get to this point and we are hopeful that they will build upon this success and see these projects through to completion.” Two more projects – the Chino Basin Program and Kern Fan Groundwater Storage Project – are expected to come before the Commission for feasibility determinations in November, with the remaining three



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projects – Pacheco Reservoir Expansion Project, Sites Project, and Willow Springs Water Bank Conjunctive Use Project – scheduled for December. Beyond January 1, 2022, Proposition 1 requires each of the seven projects to meet four requirements before they can appear before the Commission for a final funding decision: final environmental documents, non-public benefit cost share contracts, contracts for the administration of public benefits, and all permits required to begin construction. Combined, the projects, if completed, would add 2.77 million acre-feet to California's water storage capacity. The nine-member California Water Commission uses its public forum to explore water management issues from multiple perspectives and to formulate recommendations to advise the director of the California Department of Water Resources, and as appropriate, the California Natural Resources Agency, the Governor and Legislature on ways to improve water planning and management in response to California's changing hydrology.

Original Article: [California Water Commission](#)

Clean Water In California Is Overdue

Forty-nine years ago this week, Congress passed the federal Clean Water Act, with the goal of restoring America's waters. Yet today, 95% of California's rivers, lakes, bays and wetlands are plagued by pesticides, metals, pathogens, trash and sediment, making it unsafe to swim, fish or drink. As we approach the 50th anniversary of this landmark environmental legislation, it is time for the state to get on track toward ensuring swimmable, fishable and drinkable waters for all Californians.

Underserved communities of color shoulder far too much of the cost of unsafe water. But the state has increasingly treated these communities as water quality "sacrifice zones." For example, communities along the Los Angeles River face the highest pollution levels statewide. But rather than adopt enforceable numeric water quality standards, the Newsom administration is pressuring the State Water Board to relax stormwater pollution standards in underserved communities of color.

The Newsom administration must instead hold polluters accountable. One solution is to ensure that low-income communities suffering poor health because of overexposure to environmental hazards are better represented in water quality regulatory decision-making. The Legislature should pass legislation requiring state and regional water boards to include at least one tribal or environmental justice representative. The state also should dedicate funding to aid participation by these environmental justice communities in the regulatory process.

The Clean Water Act has successfully reduced pollution from traditional industrial outfalls. Today, most pollution in California waters is caused by runoff from farms and cities, causing toxicity, respiratory diseases and gastrointestinal illness. For example, Stockton suffers from a growing number of harmful algal blooms. A 2020 outbreak measured up to 49 times the "danger" level. The state must set freshwater flow standards and nutrient water quality standards to prevent toxic algae blooms.



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Across the state, subsistence fishers — low-income anglers often from immigrant communities — fish to feed their families. Yet a state study determined that fish in 99% of coastal waters and 49% of freshwaters exceed safe levels established for eating.

Mercury and polychlorinated-biphenyl (PCB) contamination is particularly alarming in the San Francisco Bay and the Sacramento-San Joaquin Delta. In 2001, a Contra Costa County study determined that 70% of local anglers surveyed were Asian, African American or Latino, and 73% regularly ate fish that can be unsafe to consume.

Inadequate river flows have decimated California's native fish populations, including salmon runs that are essential for tribes. A growing list of fish species teeter on the brink of extinction.

The state has promised for decades to create a set of rules known as a biological policy to protect the biological health of our waterways. It is time California met that promise.

Original Article: [Patch By Sean Bothwell, Special to CalMatters](#)

Southern California, Arizona water suppliers collaborate on water recycling concept

The Metropolitan Water District, which supplies water to six counties in Southern California, announced a partnership with the Arizona Water Department on Wednesday, October 13. To 150 million gallons daily to serve more than 500,000 homes.

The Central Arizona Project will provide \$ 5 million and the Arizona Department of Water Resources will provide \$ 1 million for the environmental planning of the Regional Recycled Water Program. The program purifies treated wastewater and provides Southern California with water that is resistant to new droughts. If the entire project were developed, it would cost \$ 3.4 billion and improve the sustainability of the Colorado River's water supply.

The project's environmental planning started last year and will cost about \$ 30 million over three years. Officials said Arizona's institutional investment could lead to a long-term agreement to fund the construction and operation of the project. Arizona agencies offset the cost of the Metropolitan project and receive water from the Colorado River in return.

"This project can help the entire Southwest. Resolving the supply-demand imbalance that threatens the Colorado River will require both a reduction in demand through conservation and the addition of new supplies such as reclaimed water. We know," said Adel Hagekaril, General Manager of the Metropolitan Water District, in a statement. "That's why Lower Basin partners are interested in helping us develop projects."

The feasibility of project development is determined according to the environmental planning process.

Ted Cook, General Manager of the Central Arizona Project, said:

The Metropolitan Aqueduct has signed a similar agreement with the South Nevada Aqueduct. Authorities said the agreement was important as the current guidelines will



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expire in 2025 and states in the Colorado River basin are working to develop operational guidelines for water.

“Increasing the reuse of reclaimed water is important for increasing water supply and creating a more resilient Colorado River,” said Tom Bushtake, director of the Arizona Department of Water Resources.

Metropolitan, along with 26 cities and retailers, is a state-owned co-operative that provides water to 19 million people in six counties in Southern California. It imports water from the Colorado River and Northern California to supplement local supplies and help members strengthen water conservation, recycling, storage and other resource management programs.

Original Article: [California News Times](#)

One of California’s Wealthiest Counties Could Run Out of Water Next Summer

Welcome to the future in Marin County, one where a \$2 million house with an ocean view doesn’t necessarily come with a reliable water supply.

Water managers are taking extraordinary measures to keep faucets flowing should the state enter a third year of a punishing drought this winter. That this affluent redwood-studded ecotopia faces such a possibility, though, is a harbinger of a climate-constrained destiny that is fast arriving.

“These droughts are now on a new timeline,” says Newsha Ajami, a hydrologist and director of urban water policy at Stanford University’s Water in the West program. “There used to be at least 10 years in between droughts in California, which was time enough for water ecosystems to recover.”

No longer. The last California drought, which persisted six years, ended in 2017. The current one began three years later and poses an existential threat to places like Marin County, which rely on local water sources for most or all of their supply. The past year has been the second driest on record in California.

That’s forcing a reckoning with a century of water management that has largely focused on expanding supply rather than on conservation and managing demand.

“We need a new relationship with water, and must realize that we are in this moment of climate change, and we cannot continue to use water, particularly outside, in the way that we have in the past,” says Cynthia Koehler, president of the board of directors at the Marin Municipal Water District, which serves two-thirds of the Bay Area county’s 252,000 residents.

It’s a cloudless September morning and as temperatures climb toward 75 degrees, the bone-dry bed of Alpine Lake stretches toward the horizon. Surrounded by redwood- and Douglas fir-covered hills, the century-old reservoir is one of seven that supply 75% of the district’s water. They are down to less than a third of capacity and if sufficient rains don’t arrive this winter, the district projects they could be empty by July 2022.



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Marin Water obtains the other quarter of its water from the Russian River in neighboring Sonoma County. That allocation, however, has so far been cut 20% and further reductions are likely if the drought intensifies.

The crisis has compelled the district to embark on a crash project to spend up to \$90 million to build a pipeline across San Francisco Bay to import enough water to meet indoor consumption. Although Marin Water hasn't made a final decision on the pipeline, on Tuesday the board approved \$23.2 million for the project and it is negotiating to buy water from agricultural irrigation districts in the Sacramento Valley.

Also on the table is spending at least \$35 million to rent or buy portable desalination plants from Australian company Osmoflo Holdings Pty. Ltd. that would supply about half of indoor demand. The plants would be set up on the shoreline to draw water from San Francisco Bay.

The board has called on residents to voluntarily slash water use by 40% and has restricted outdoor irrigation. The district has yet to hit that target — it achieved a 24% savings the second week of October — and will impose modest fines on customers who exceed certain thresholds of use.

The district is also pursuing longer-term solutions, such as a possible groundwater storage program with Sonoma County to capture runoff from California's increasingly intense, if infrequent, deluges.

Ajami says water utilities' traditional centralized infrastructure is ill-suited to the climate challenge. Rather, they need to treat individual homes as sources of supply, by promoting systems to recycle and reuse water, such as capturing runoff from showers to flush toilets. That alone would cut household use 30%, she notes.

Original Article: [BNN Bloomberg by Todd Woody](#)

Will the drought lead to an overhaul of California's water rights system?

Interest may be rising in the Legislature for modernizing California's water rights system, according to Ana Jovel Melendez, who directs legislative affairs at the State Water Resources Control Board. She was responding to concerns over water rights at a joint meeting of state and regional water boards on Thursday.

"A huge amount of money from the private sector is buying up water rights, particularly in the San Joaquin Valley," said Los Angeles regional board member Jim Stahl, who felt the Sustainable Groundwater Management Act (SGMA) is pitting ag against urban areas. Melendez pointed out that lawmakers drafted SGMA in response to the last drought.

"The new conversation here does seem to be about water rights," she said, noting that the Legislature allocated \$30 million for upgrading the water rights data system. "What that says to me is that we do see an interest in the Legislature in wanting to discuss and figure out how we modernize these systems."



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Members of the state water board earlier this year raised the notion of updating in the system to streamline curtailments for senior water rights, avoiding the current process of emergency orders that can take months to process.

Original Article: [Agri Pulse by Brad Hooker](#)

Judge Blocks Trump-Era Rule That Limits States' Ability To Review Federally-Approved Water Projects

A judge has vacated a Trump-era rule that limited states' ability to review federally-permitted water projects.

When the federal government OKs a permit for a project that will discharge into navigable waters, state governments have the right to review the project to make sure it complies with state laws. States can approve, modify or deny the permit.

Former Republican President Donald Trump's administration issued new rules that limited states' ability to review these permits. Attorneys general in California, Washington and New York led a coalition of 21 states to sue to block this rule.

Now that Democrat Joe Biden is president, the U.S. Environmental Protection Agency wants to reconsider the rule. Thursday, a U.S. District Judge William Alsup ordered the rule sent back to the EPA for further proceedings. But he also vacated the rule, meaning it won't stay in effect while the EPA makes changes.

California Attorney General Rob Bonta, a Democrat, praised the judge's ruling. He said states rely on their reviewing power to "safeguard our precious resources by ensuring that federal projects meet the state's robust water quality requirements."

Original Article: [CBS Local Sacramento](#)

La Niña: NOAA winter forecast predicts drought will continue or worsen in parts of CA

The southwestern US will continue to struggle through drought conditions this winter, the National Oceanic and Atmospheric Administration predicted Thursday in its outlook for the coming winter.

Meanwhile, a warmer and drier-than-normal winter is forecast for the nation's southern region, along with a wetter-than-normal winter for the Pacific Northwest and northern Rockies, the agency said.

In all, cooler and wetter conditions are forecast across portions of the northern tier of the country, with warmer and drier conditions for much of the southern tier -- in line with a typical La Niña weather pattern.

The Southwest may suffer the most from this forecast. The area is drought-stricken and most likely won't get relief through the winter.



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More than 90% of the West is in drought conditions, and more than half of the region is in extreme or exceptional drought. California has just faced its driest year in nearly a century as the state continues a statewide drought emergency.

The Southwest will not only be dry, it will also continue to be warmer. In fact, the entire southern half of the country -- Midwest, Ohio Valley and Eastern Seaboard -- is forecast to have a warmer-than-average winter.

The only place that is forecast to have a cooler-than-normal winter is the Pacific Northwest and northern Rockies -- pretty much the same area that is expected to have a wetter-than-normal winter.

"In the Pacific Northwest, Northern California, the Upper Midwest and Hawaii should likely see drought improvement," said Jon Gottschalck with NOAA's Climate Prediction Center.

A wetter-than-normal season is forecast for portions of the Midwest, Ohio Valley and New England, as well, NOAA said.

La Niña could impact the drought "significantly," NOAA said.

Original Article: [ABC 7 News by Jennifer Gray and Taylor Ward, CNN Meteorologists](#)

US WATER NEWS

The Southwest must fight for its water and its future

For over 30 years, I've been a climate scientist who has focused intensely on the causes and consequences of drought and climate change. I've done my research all over the planet, but my No. 1 focus has been on interactions of drought and climate change in the Southwest United States and on how drought and climate change are impacting the Colorado River. Seven states in the U.S. and Mexico depend on the Colorado River for water, yet I worry most about one state: Arizona.

Why do I worry so much about Arizona?

Without a sustainable water supply, life in the desert is all but impossible. Fortunately, when people first came to Arizona millennia ago, there were many flowing rivers, allowing complex communities, large and small to thrive. Europeans arrived, and the thirst for water grew steadily. With that growth, increasing numbers of rivers started to



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dry up from over-allocation and groundwater pumping. Fortunately, groundwater was still abundant, and starting in the 1930's, the engineering of big dams and reservoirs on the Colorado River connected Arizona farms, Phoenix, Tucson and more to the flows of the Colorado River.

But now, the flows of the Colorado have shrunk by almost 20 percent, and we know why. Flows of the Colorado are steadily shrinking because it's snowing and raining less in the headwaters. Even bigger reductions in river flow have occurred due to the impact of relentless global warming. Warming means more moisture ends up in the atmosphere, to be carried away by the winds, and the river flow shrinks. There is almost no scientific doubt that climate change makes the growing water crisis worse. Climate change, along with over-allocation of river water, forced the federal government to recently declare the first-ever Colorado River water shortage this year and cut the amount of water available to Arizona.

Original Article: [The Hill by Jonathan Overpeck, Ph.D., Opinion Contributor](#)

Lowered Lake Freeman water levels caused economic decline in 2020

The regional economies of White and Carroll counties experienced an overall decline of more than \$600,000 in 2020 affecting more than 25 industries, according to a recently released Lake Freeman Economic Impact study.

The study, commissioned by the economic development organizations in White and Carroll counties, gives a macro-level picture of the effect that the reduced water levels of Lake Freeman had on each county from 2018-2020.

Water levels dropped about 13 feet below normal levels for several months (July-December) in 2020 due to a moderate drought that triggered a US Fish & Wildlife Service mandate to hydrate an endangered species of mussels downriver of the Oakdale Dam on the Tippecanoe River. In some parts of the lake, levels dropped so much that it exposed a lakebed not seen by human eyes since the 1920s.

The study was performed by the Purdue Center for Regional Development (PCRD).

"This study produced great insight on the immediate effect," said Jake Adams, executive director of the Carroll County Economic Development Corporation. "This new information allows us to examine and provide possible projections to what a long-term reduction would do to our communities. This data clearly shows a significant impact."

The three main areas of study were local visitor data, consumer spending, and household gross assessed value (AV) leading up to and throughout the lowered water level period of 2020. Comparative data from 2018 and 2019 was also used since 2020 – when Lake Freeman's water levels were the lowest – coincided with a pandemic year.

Key findings include:

- Average days spent by visitors and property owners (secondary residences) at the lake decreased between 2018-2019 and 2020
- Lake property owner expenditures declined between 2018-2019 and 2020

Original Article: [Herald Journal by Michael Johnson](#)

**Even with rain, 2022 water outlook is grim**

Many local people check weather forecasts for Tehachapi as they prepare for their day. But Tom Neisler looks northward, checking to see what Mother Nature might be bringing to Oregon.

As general manager of the Tehachapi-Cummings County Water District, Neisler knows that local water fortunes depend in large part on weather systems moving out of the Pacific Northwest toward Northern California and specifically the Feather River Basin. That's because the water that is eventually delivered to the district and other water agencies from the Bay Area to San Diego by the State Water Project begins with precipitation — rain and snow — in the Feather River watershed. The four forks of the river flow into Lake Oroville, the second-largest reservoir in the state. From there, the water flows through rivers and the California Aqueduct to San Luis Reservoir west of Los Banos. Eventually, also via the aqueduct, the water reaches a spot near the base of the Grapevine where the district's pumps begin to lift it 3,425 vertical feet toward Stallion Springs. Water is then piped across the Cummings Valley to Jacobsen Reservoir, also known as Brite Lake. The local pipeline carries the water further, across the Tehachapi Valley to Willow Springs Road.

Neisler knows this story by heart and can tell it in much greater detail. And lately, he's hopeful that predictions of a major weather system bringing significant rain and snow out of Oregon this week will come to pass.

On Oct. 21, the water district hosted a tour of its pumping facilities and Neisler shared the story of Tehachapi's water with several dozen people. Typically, the tour has been held in the spring when it would be hard to hear his voice above the roar of the gigantic pumps moving water up the hill. But two spring tours were canceled because of COVID-19 concerns, so the recent tour was the first since 2019. And the pumps were silent last week because the pumping season is over. When they will be used again — and how much water they will bring to Tehachapi — remains to be seen.

Although the first official announcement of how much water the SWP will allocate to each district next year isn't expected until December, the continuing drought has raised alarms. It's possible no water will be delivered next year.

California's water year runs from Oct. 1 through Sept. 30. The most recent water year was the second driest on record, leaving reservoirs astoundingly low.

"Nothing in our historic record suggested the possibility of essentially that snow disappearing into the soils and up into the atmosphere at the level that it did," California Natural Resources Secretary Wade Crowfoot said in a recent call to reporters. "These climate changes are coming fast and furious."

And Department of Water Resources Director Karla Nemeth issued a dire warning to water managers throughout the state — the extraordinarily dry conditions may result in the project's first-ever 0 percent allocation.

Locally, Neisler has been sounding the alarm for months.



Entire city of Jacksonville under boil water notice

The entire city of Jacksonville is under a boil water notice due to a main water line break in the distribution system.

From the City of Jacksonville:

Due to a main water line break in the distribution system resulting in lowered distribution system pressure, the Texas Commission on Environmental Quality has required the City of Jacksonville Public Water System TX0370002 to notify all customers within the City of Jacksonville to boil their water prior to consumption (e.g., washing hands/face, brushing teeth, drinking, etc).

Children, seniors, and persons with weakened immune systems are particularly vulnerable to harmful bacteria, and all customers should follow these directions.

To ensure destruction of all harmful bacteria and other microbes, water for drinking, cooking, and ice making should be boiled and cooled prior to use for drinking water or human consumption purposes. The water should be brought to a vigorous rolling boil and then boiled for two minutes. In lieu of boiling, individuals may purchase bottled water or obtain water from some other suitable source for drinking water or human consumption purposes.

When it is no longer necessary to boil the water, the public water system officials will notify customers that the water is safe for drinking water or human consumption purposes. Once the boil water notice is no longer in effect, the public water system will issue a notice to customers that rescinds the boil water notice in a manner similar to this notice.

Original Article: [KLTV by Stephanie Frazier](#)

Arizona is spending \$30 million to keep more water in Lake Mead

Arizona water officials have invested \$30 million in efforts to help keep Lake Mead from reaching critical levels.

The state Department of Water Resources will work with communities that hold rights to the Colorado River to keep more water in the reservoir. The program is similar to measures contained in the 2019 Drought Contingency Plan signed by Arizona and six other western states.

Lake Mead has been declining since it was last full in 2000 as a result of over-allocation and climate-change-induced drought. In August, the federal government declared the first-ever shortage of the Colorado River triggering water cuts to Arizona farmers.

Original Article: [KNAU News Talk](#)



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St. George not the reason for water shortages on Colorado River, Mitt Romney says

Even as California has declared a statewide drought emergency in response to a federal shortage declaration for the Colorado River, Sen. Mitt Romney, R-Utah, says blaming St. George for the strain on the water supply in the western U.S. is misguided.

Romney was responding to a 60 Minutes documentary that aired Sunday night, which featured JB Hamby of the Imperial Irrigation District in California saying building the Lake Powell pipeline to support growth in St. George did not make sense.

“60 Minutes was right to raise the alarm over the shrinking Colorado River. Criticism of St. George, however, with 1/100th the population of Los Angeles was misguided. New strategies, not blame, are needed. Utah will continue to be a good partner in this effort,” Romney wrote on Twitter.

Officials in Utah have argued the state is exercising its share of claims to the Colorado River under the Law of the River by building the pipeline from Lake Powell, which is at its lowest level in history as drought and climate change have dried out the Colorado River basin.

“What we are witnessing in Utah and throughout the West is an historic drought. The changing climate means that we are going to have to rethink how we solve the West’s water challenges, and last month’s float trip down the Colorado River with Senator Bennet was an opportunity to begin to build consensus toward addressing them,” Romney said in an emailed statement to The Tribune. “I look forward to our continued work in the Senate to find solutions to climate-related challenges so that we can do our part to leave the world in a better place for our children and grandchildren.”

The 60 Minutes segment looked at how seven southwestern states, including Utah, and over 30 Native American tribes, have ties to the diminishing river. The Utah Division of Water Resources is proposing the Lake Powell Pipeline, estimated to cost \$1.1 to \$1.8 billion. It would pump about 28 billion gallons out of the river to send it to Washington County, which is experiencing a population boom.

Zach Renstrom, general manager for the Washington County Water Conservancy District, told 60 Minutes that Utah is entitled to its share of water.

“Every state on the Colorado River was allotted so much water and a water budget,” Renstrom said. “And so with their water budget, the state of Utah has decided that it wants to use a portion of its water here in St. George.”

Zachary Frankel, executive director for Utah Rivers Council, disputes that there is water in the system for Utah to claim more. Frankel said that Utah’s claim to the Colorado fails to account for how climate change has dramatically diminished the river’s flows, and he says that the state is already diverting its full share. Anything piped to St. George, he said, would be taken from existing water rights holders, such as tribes and farmers.

“Utah does not have rights to more Colorado River water,” Frankel said. “To claim otherwise is propaganda. To claim otherwise is climate change denial.”

Original Article: [The Salt Lake Tribune by Alastair Lee Bitsóí and Brian Maffly](#)



States and Tribes Contemplate the Colorado River in Serious Decline

States in the Colorado River Basin are adjusting to the reality that their rights outstrip the available water by nearly one-third, state and tribal leaders told a congressional panel Friday.

The situation is likely only to worsen as the climate changes, leaving states and tribes in competition for their most vital resource.

Representatives from the seven Western states — Arizona, Colorado, Nevada, New Mexico, California, Utah and Wyoming — that depend on the river for drinking water and irrigation said at a U.S. House Natural Resources subcommittee hearing that they are preparing for a future where the river and their entitlements do not match.

State officials and lawmakers emphasized how serious the situation was, but offered few solutions during Friday's hearing — the first of two the panel plans to hold on the drought in the Colorado Basin — beyond general appeals to conservation and collaboration. States and tribes in the basin are legally entitled to 15 million acre-feet of water per year, with another 1.5 million going to Mexico, but only about 12.4 million has flowed in an average year over the last two decades. The deficit is the result of a years-long drought that was tied to climate change, U.S. Rep. Jared Huffman, a California Democrat who chairs the House Subcommittee on Water, Oceans and Wildlife, and others said.

"After more than two decades of drought with no end in sight, it's clear — to most of us at least — that climate change is fundamentally altering the Colorado River," Huffman said. "It's decreasing the amount of water available from this key river."

Ranking Republican Cliff Bentz, of Oregon, said the shortage in the Colorado River Basin could soon be the reality elsewhere.

"This situation the Colorado's facing is so reflective of what we're going to be seeing all over the West," Bentz said, adding that whatever solution was reached could be "a template of some sort."

Arizona Democrat Raul Grijalva, chairman of the full Natural Resources Committee, called for "a comprehensive initiative" to plan for lower water levels in the basin.

Original Article: [Pagosa Daily Post by Jacob Fischler](#)

Pima County may sue Tucson over water rates in unincorporated areas

Pima County is preparing to file a lawsuit against the city of Tucson over the differential water rates for those considered unincorporated.

On Tuesday the city voted to charge customers in outer areas 40% more for the same amount of water. Differential water rates are common in most Arizona cities, including Phoenix. Before issuing a change in water rates, a city must provide proof that it costs more to provide services to those living outside city limits.

Tucson has conducted a cost analysis, and it has proved there is a higher cost for unincorporated areas to receive water.



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“There are justifications for it including the higher rate of cost for infrastructure and to drive water use down in those higher water use areas.” James MacAdam is the superintendent for public information and conservation for Tucson Water.

Water conservation is a main concern not only for Tucson but for all of Arizona, and finding a way to best conserve water sources is a common goal both parties share. The changes in water rates are scheduled to take effect Dec. 1 or sometime soon after.

Original Article: [KJZZ by Thalia Lopez](#)

EPA finally has an action plan to improve water infrastructure and sanitation for US tribes

Hoping to step up the federal government’s response to long-standing water issues facing Native American communities, the U.S. Environmental Protection Agency released an “action plan” earlier this month that will seek solutions to the many barriers tribes have to running water and wastewater services.

The plan will guide the EPA Office of Water as it works with federally recognized tribes to implement the plan, which was prepared with input from the National Tribal Water Council, an EPA-funded advisory group. Priorities include the creation of federal baseline water-quality standards under the Clean Water Act.

According to a 2019 report from the U.S. Water Alliance, Native American households are 19 times more likely than white households to lack indoor plumbing. The lack of a clean, reliable water source can make handwashing and hygiene difficult for Native households—inequities that were further exposed by the COVID-19 pandemic.

“The infrastructure for safe drinking water and basic sanitation needs are core concerns for any tribal nation,” said NTWC chairman Ken Norton, who is a member of the Hoopa Valley Tribe, whose lands are in Northern California.

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Norton said the NTWC made a series of recommendations on ways to improve tribal water infrastructure, including a survey of the lead pipes that are still in service on many reservations. Many of the council’s recommendations were incorporated in the action plan, Norton said, adding that the need for infrastructure funding “far outweighs the allocations that come from federal agencies.”

In the coming months, the EPA will distribute \$22.5 million in grant funding for improving tribal drinking water systems, and \$32.8 million for wastewater infrastructure, according to the plan. Another goal is to foster tribal self-governance on certain water issues while maintaining the U.S. government’s federal trust responsibility to protect tribal rights and resources. The EPA is also expected to consider reinstating protections for streams that run intermittently throughout the year, reversing a Trump-era change that removed protections for “ephemeral streams.”

Although it remains to be seen what kind of progress the EPA makes within the plan’s three-year framework, Norton said he is confident the plan will have “immediate



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positive outcomes for tribal drinking water and sanitation,” especially given the Biden administration’s willingness to engage in tribal consultation.

Original Article: [Grist by Mark Armao](#)

Southwest states facing tough choices about water as Colorado River diminishes

This past week, California declared a statewide drought emergency. It follows the first-ever federal shortage declaration on the Colorado River, triggering cuts to water supplies in the Southwest. The Colorado is the lifeblood of the region. It waters some of the country's fastest-growing cities, nourishes some of our most fertile fields and powers \$1.4 trillion in annual economic activity. The river runs more than 1,400 miles, from headwaters in the Rockies to its delta in northern Mexico where it ends in a trickle. Seven states and 30 Native American tribes lie in the Colorado River Basin. Lately, the river has been running dry due to the historically severe drought.

The majestic, meandering Colorado River that cut through these red cliffs, carving the Grand Canyon, is a wonder of nature and human ingenuity. The Glen Canyon Dam created Lake Powell and 300 miles down river Lake Mead sits behind the Hoover Dam. These reservoirs are now being sucked dry by 40 million different straws - that's the number of people in booming western states who depend on the Colorado to quench their thirst, power their homes, water lawns and splash in the sun. Its waters irrigate farms that produce 90% of the country's winter greens. To all these demands add the stress of a 22 year drought - as dry as any period in 1,200 years - and you have a river in crisis.

Original Article: [CBS News by Bill Whitaker](#)

Keeping PACE with water reuse: Underused financing tool can help buildings buy less water

Just north of downtown San Antonio in the Pearl district, the Credit Human building is hard to miss. Its blue and green lettering, solar-paneled roof and sleek exterior are highly visible from U.S. 281 and strike an impressive pose for passersby on Broadway. But what can't be seen from the outside is perhaps more notable.

Behind its energy-efficient windows and walls, the Credit Human building can store nearly 140,000 gallons of rainwater and condensate from its air-conditioning system to be used for irrigation, flushing toilets and cooling the building. The only water it buys from the San Antonio Water System is for consumption, resulting in the building using 97 percent less potable water than a typical building its size.

The building sets a lofty example of what's possible in water efficiency and reduced utility expenses. But the costs of equipping buildings with such infrastructure, particularly for existing buildings, can discourage commercial property owners from doing so — Credit Human designed its headquarters with water reuse from the onset.

**Climate change makes drought recovery tougher in U.S. West**

Californians rejoiced last week when big drops of water started falling from the sky for the first time in any measurable way since the spring, an annual soaking that heralds the start of the rainy season following some of the hottest and driest months on record.

But as the rain was beginning to fall on Tuesday night, Gov. Gavin Newsom did a curious thing: He issued a statewide drought emergency and gave regulators permission to enact mandatory statewide water restrictions if they choose.

Newsom's order might seem jarring, but experts say it makes sense if you think of drought as something caused not by the weather, but by climate change.

For decades, California has relied on rain and snow in the winter to fill the state's major rivers and streams in the spring, which then feed a massive system of lakes that store water for drinking, farming and energy production. But that annual runoff from the mountains is getting smaller, mostly because it's getting hotter and drier, not just because it's raining less.

In the spring, California's snowpack in the Sierra Nevada mountains was 60% of its historical average. But the amount of water that made it to the reservoirs was similar to 2015, when the snowpack was just 5% of its historical average. Nearly all of the water state officials had expected to get this year either evaporated into the hotter air or was absorbed into the drier soil.

"You don't get into the type of drought that we're seeing in the American West right now just from ... missing a few storms," said Justin Mankin, a geography professor at Dartmouth College and co-lead of the Drought Task Force at the National Oceanic and Atmospheric Administration. "A warm atmosphere evaporates more water from the land surface (and) reduces (the) amount of water available for other uses, like people and hydropower and growing crops."

California's "water year" runs from Oct. 1 to Sept. 30. The 2021 water year, which just ended, was the second driest on record. The one before that was the fifth driest on record. Some of the state's most important reservoirs are at record low levels. Things are so bad in Lake Mendocino that state officials say it could be dry by next summer.

Even if California were to have above-average rain and snow this winter, warming temperatures mean it still likely won't be enough to make up for all the water California lost. This past year, California had its warmest ever statewide monthly average temperatures in June, July and October 2020.

Jeanine Jones, interstate resources manager for the California Department of Water Resources, said people should not think about drought "as being just this occasional thing that happens sometimes, and then we go back to a wetter system."

"We are really transitioning to a drier system so, you know, dry becomes the new normal," she said. "Drought is not a short-term feature. Droughts take time to develop, and they usually linger for quite some time."



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Water regulators have already ordered some farmers and other big users to stop taking water out of the state's major rivers and streams. Mandatory water restrictions for regular people could be next.

In July, Newsom asked people to voluntarily reduce their water use by 15%. In July and August, people cut back 3.5%. On Tuesday, Newsom issued an executive order giving state regulators permission to impose mandatory restrictions, including banning people from washing their cars, using water to clean sidewalks and driveways and filling decorative fountains.

Original Article: [Northwest Arkansas Democrat Gazette by Adam Beam the Associated Press](#)

NASA launches tool to measure water loss in West

NASA on Thursday launched an online platform with information on how much water evaporates into the atmosphere from plants, soils and other surfaces in the U.S. West, data it says could help water managers, farmers and state officials better manage resources in the parched region.

The platform, OpenET, uses satellite imagery from the Landsat program, a decades-long project of NASA and the U.S. Geological Survey that records human and natural impacts on Earth's surface.

Specifically, it provides data for 17 Western states – down to the quarter-acre – on how much evapotranspiration has taken place. That's the process by which moisture in leaves, soil and other surfaces evaporates into the air.

The West has been mired in drought for more than two decades. Scientists say human-caused climate change has intensified conditions.

Water levels at key reservoirs on the Colorado River have fallen to historic lows alongside growing demand, prompting the federal government to declare water cuts for some states next year. A blazing summer and years of record-breaking wildfires have also zapped moisture from the ground.

Detailed information on soil moisture could help farmers and water managers better plan during dry conditions and reduce how much water is used for irrigation, NASA scientists said on a Thursday call with reporters.

“Farmers and water managers have not had consistent, timely data on one of the most important pieces of information for managing water, which is the amount of water that’s consumed by crops and other plants as they grow,” said Robyn Grimm, a water specialist with the Environmental Defense Fund, which helped NASA develop the tool alongside other environmental groups and Google.

“To date, that data has been expensive and fragmented,” she said.

Many large farms in dry areas, such as California's Central Valley, already have years of experience using advanced data systems to measure evapotranspiration and other water metrics that influence their growing and harvesting seasons and watering schedules.



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Cannon Michael runs an 11,000-acre farm in Merced County, California, that produces tomatoes, melons, cotton and alfalfa. Michael said he looked at NASA's new platform, but didn't think it would provide any additional benefit for his farm.

"We closely monitor and understand our water use," he said. "Our farm is 75% drip irrigation, and we have a very detailed scheduling and forecasting process already in place."

Meanwhile, Colorado rancher Joe Stanko in Steamboat Springs had read about the new tool in a magazine. Her family grows hay for their cattle, and she said the platform could help them determine which fields need more water to replenish soil. It could also help them decide when to harvest hay.

NASA said the platform includes historical data dating back to 1984. In coming months, it will be updated to include information about precipitation rates with the same level of detail. Eventually, the tool will extend to other parts of the U.S., including areas around the Mississippi River and Appalachian region, scientists said.

Original Article: [The Miner by Brittany Peterson And Suman Naishadham, Associated Press](#)

Big tech data centers spark worry over scarce Western water

Conflicts over water are as old as history itself, but the massive Google data centers on the edge of this Oregon town on the Columbia River represent an emerging 21st century concern.

Now a critical part of modern computing, data centers help people stream movies on Netflix, conduct transactions on PayPal, post updates on Facebook, store trillions of photos and more. But a single facility can also churn through millions of gallons of water per day to keep hot-running equipment cool.

Google wants to build at least two more data centers in The Dalles, worrying some residents who fear there eventually won't be enough water for everyone — including for area farms and fruit orchards, which are by far the biggest users.

Across the United States, there has been some mild pushback as tech companies build and expand data centers — conflicts likely to grow as water becomes a more precious resource amid the threat of climate change and as the demand for cloud computing grows. Some tech giants have been using cutting-edge research and development to find less impactful cooling methods, but there are those who say the companies can still do more to be environmentally sustainable.

The concerns are understandable in The Dalles, the seat of Wasco County, which is suffering extreme and exceptional drought, according to the U.S. Drought Monitor. The region last summer endured its hottest days on record, reaching 118 degrees Fahrenheit (48 Celsius) in The Dalles.

The Dalles is adjacent to the the mighty Columbia River, but the new data centers wouldn't be able to use that water and instead would have to take water from rivers and groundwater that has gone through the city's water treatment plant.



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However, the snowpack in the nearby Cascade Range that feeds the aquifers varies wildly year-to-year and glaciers are melting. Most aquifers in north-central Oregon are declining, according to the U.S. Geological Survey Groundwater Resources Program.

Original Article: [KTVN 2 News by Andrew Selsky and Manuel Valdes](#)

Infrastructure Bill Seen as Way to Pay Farmers to Cut Water Use

Four states in the drought-wracked West considering whether to pay farmers to cut their water use see federal infrastructure legislation as a possible revenue source.

The \$550 billion bipartisan legislation approved in the Senate includes \$25 million for the four states—Colorado, New Mexico, Utah, and Wyoming.

“There’s that bucket, and a lot of other buckets, in the federal infrastructure bill that could come into play for drought contingency planning implementation,” said Amy Ostdiek, interstate and federal manager in the Colorado Department of Natural Resources.

The funds would help address a major concern for states in the upper division of the Colorado River Basin that face droughts, wildfires and other climate change effects: Where to get money to pay farmers to voluntarily—and temporarily—cut water use.

The funds would not only pay people for reducing water use but would also help address secondary economic effects that result from the lower usage, Ostdiek said.

The infrastructure bill has been stuck in negotiations by the White House and congressional leaders that also involve a second, larger spending package.

Congressional leaders have set an Oct. 31 deadline for votes on the infrastructure bill and the second package, which expands federal aid for social programs such as education, health care and childcare.

Agriculture uses as much as 90% of water in Western states. But environmentalists aren’t expressing resentment over that reality in the context of paying farmers.

“We need all the tools we can get” to fund climate resilience, said Bart Miller, Healthy Rivers Program director for Western Resource Advocates.

Paying people to cut water use is an option under a 2019 drought contingency plan the four upper division states signed with three states in the Lower Colorado River Basin — Arizona, California and Nevada.

The idea is to pay irrigators to cut back on some water they’re entitled to use. The water instead would flow down the Colorado River and add as many as 500,000 acre feet to the Lake Powell reservoir in northern Arizona and southern Utah. An acre foot of water is roughly what two average households use annually.

Water in Lake Powell eventually flows into Lake Mead in Arizona, the primary Lower Basin storage reservoir.

Because of the severe drought, both lakes are low, imperiling the water source for some 40 million people in the Southwest and the ability of the lake’s dams to generate hydropower.



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Colorado alone would face annual costs of between \$3 million to \$30 million to pay water users to cut back, Ostdiek said.

“It’s very expensive,” said Gene Shawcroft, general manager of the Central Utah Water Conservancy District. “The value of water continues to go up.”

While states generally know how much water is diverted from rivers onto agricultural land, “the challenge is to figure out how much gets used,” he said. States will need to pay for equipment so they can determine that use amount, Shawcroft said.

The Utah Division of Water Resources has engaged the University of Utah to do an assessment of how valuable a demand management program might be, he said.

“If you talk to five different people about what demand management is, you get six different answers,” he said.

Original Article: [Bloomberg Law by Tripp Baltz](#)

Farmer Fined \$304K Over Alleged Water Theft During Drought

A farm in southeastern Washington has been fined \$304,000 by the Washington state Department of Ecology for irrigating 250 acres (101 hectares) without rights to the water.

Frank Tiegs LLC in Franklin County has 30 days to appeal the decision to the Washington state Pollution Control Hearings Board, The Tri-City Herald reported.

Ecology said the illegal water use threatened stream flows on the Columbia and Snake rivers, which are critical rivers for salmon and steelhead.

The farm built pipelines and two 125-acre (51-hectare) irrigation pivot systems to water previously unfarmed land out of the McNary Pool of the Snake River in the irrigation season of 2021, the penalty notice issued this week said.

Ecology asked the landowner in August about the water rights and the farm said it was irrigating the acreage and that it was a mistake. Discussions began to remedy the issue, with reduced irrigation elsewhere on some fields.

Original Article: [US News by Associated Press](#)

GLOBAL WATER NEWS

Iraqi ministry proposes taking Iran to The Hague over water

Iraq’s water ministry has suggested Baghdad file a case against Iran with the International Court of Justice in order to guarantee its right to shared water resources, state media reported Sunday.

“The Ministry of Water Resources submitted a memorandum and an official letter to the higher authorities in the Council of Ministers, the president’s office, the [parliament] speaker’s office, and the Ministry of Foreign Affairs to file a case at the international



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court in The Hague to establish Iraq's water rights with neighbouring Iran," technical advisor to the ministry Aoun Dhiab told state media.

Iraq is heavily dependent on water sources that are shared with neighbouring countries Iran and Turkey, which are both building dams on their rivers.

Baghdad signed an agreement with Ankara that includes "a fair and equitable quota for Iraq across the Tigris and Euphrates Rivers" and came into force earlier this month, said Water Resources Minister Mehdi al-Hamdani.

The ministry had hoped to reach a similar deal with Tehran, but failed to do so this summer, partly because of a new government in Iran and elections in Iraq, according to Dhiab.

This is not the first time Baghdad has made such a threat. In July, Minister Hamdani suggested taking Tehran to the international court after it stopped the flow of water to Diyala completely.

Tehran has accused Baghdad of holding political motives in their dispute over water and says that while Iran has been subjected to years of drought, Iraq's situation is much better as farmers are able to use the flow of water from the Euphrates and Tigris.

Iran says the Iraqi establishment is to blame for their water shortages, pointing to a failure of successive Iraqi governments to implement a water policy or build new infrastructure like dams since the 1960s, while the population has grown from 10 million in the 1970s to 40 million today.

"The area under agricultural cultivation in Iraq in 1970 was 6 million hectares... Data from the Iraqi ministry of agriculture last March said that the total land under cultivation was 3.75 million hectares," state-run IRNA reported on July 27 after Baghdad threatened to take Iran to court.

IRNA went on to blame the US for keeping Iraq "backward" for the last 18 years and noted a lot of water goes to waste in Iraq where the government has not installed water meters in residential houses.

The Iraqi government last week announced it would slash in half the amount of land it will irrigate for winter crops. The province of Diyala is not included in the irrigation scheme and farmers there will have to depend on wells for their fields.

Original Article: [Rudlaw](#)

**Access to climate finance space discussed between Fiji and Cook Islands**

The Attorney-General and the Minister for Economy and Minister responsible for Climate Change, Aiyaz Sayed-Khaiyum virtually held a bilateral meeting with the Prime Minister of Cook Islands, Mark Brown to discuss additional support that is to be provided in the Access to Climate Finance space ahead of the COP26 Summit.

Under the United Nations Framework Convention on Climate Change and its Paris Agreement, the Prime Minister of Cook Islands, Mark Brown has been nominated as the Climate Finance Champion for Pacific Small Island Developing States (PSIDS).

Given Cook Islands' non-participation at the COP26 in person, Fiji has offered to provide additional support during the lead up to COP26 and during the High-Level Events in terms of modalities for interaction on key issues.

During the meeting, Attorney-General Aiyaz Sayed-Khaiyum highlighted the need to drive for additional monetary reserves to meet rising adaptation, mitigation and loss and damage needs for the PSIDS.

The A-G outlined potential areas and activities that can be pursued during the negotiations with various states during COP26, which includes pursuing blue bonds, carbon trading markets and considering 'vulnerability' as a criterion for access to concessional financing.

Prime Minister of Cook Islands, Mark Brown in sharing similar sentiments, outlined the need for new and alternative financial instruments to be sourced as the PSIDS require it now more than ever.

He highlighted that COVID-19 has considerably increased debt levels and it is time that the climate finance grants are increased.

At the end of the virtual meeting, both Fiji and the Cook Islands reaffirmed their support for positive outcomes at the COP26.

Original Article: [Fiji Times](#)

A cost effective and quick way to find groundwater

Water is a scarce commodity and a major environmental, biological and socio-economic issue for many communities across South Australia.

Now, thanks to UniSA researcher Dr. Alaa Ahmed, new cost-effective technology can pinpoint sites in the central Flinders Ranges where precious groundwater is likely to be found, handing a lifeline to residents in that region.

Using satellite imagery, geospatial techniques and adding information on drainage, rock types, fractures, topography and rainfall, Dr. Ahmed has mapped the Hawker region into three distinct classifications for groundwater stored in fractured rock aquifers: good, moderate and low.



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His study indicates that the most effective groundwater recharge zones (where surface water collects as it moves downwards) are located where there are numerous rock fractures, low drainage and a gentle slope.

Conversely, the least effective areas to find groundwater are underlain by shale and siltstone.

"The remote sensing doesn't cost us anything because existing satellites located above Australia are already taking photos of the topography. We also have the software—GIS—to analyze and map all the data," Dr. Ahmed says.

Existing methods to assess groundwater sources involve extensive drilling, which is expensive, time consuming and often inaccurate.

Using a combination of remote sensing, GIS and information and other geological factors, hydrologists should be able to find precise groundwater locations at a fraction of the cost, he says.

"Groundwater makes up approximately 17 percent of Australia's available water resources, 30 percent of its consumption and is found across 60 percent of the continent.

"But prolonged droughts have led to higher salinity and pumping costs and fewer groundwater sites.

"We urgently need to find faster and cheaper ways to locate groundwater because water supplies are limited in so many parts of the country. By creating satellite maps showing where groundwater is more likely to be found, we can go a long way towards improving our water resources," he says.

Groundwater is the main source of fresh water in the Flinders Ranges and is affected by the type, thickness and structural fabric of the underlying rocks, erosion, topography, drainage and the climate.

While the central Flinders Ranges lies north of Goyder's Line, deemed unsuitable for cropping, sheep and cattle farming still needs a reliable source of water, as do the townships of Hawker and Parachilna.

Both towns are reliant on groundwater from fractured rock aquifers for their water supply and are dependent on limited production wells.

While this study was undertaken in South Australia, the same technique could be used to detect groundwater in any arid region across the world, including Egypt, where Dr. Ahmed has carried out similar research.

Original Article: [Phys.org by University of South Australia](#)

Barbados To Benefit From Blue Economy Project

Barbados is one of three Caribbean countries to benefit from the Harnessing Blue Economy Finance for SIDS Recovery and Sustainable Development Project.

It joins Grenada and St. Vincent and the Grenadines in the two-year project, which capitalises on the technical capacities and comparative advantage of the United Nations



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Development Programme (UNDP), the United Nations Environment Programme (UNEP) and the Food and Agriculture Organisation (FAO) to enhance the blue economy in all three territories.

Speaking during a donor meeting earlier this week, Minister of Maritime Affairs and the Blue Economy, Kirk Humphrey, highlighted three pillars in developing a blue economy – findings, financing and friends.

“These are the areas now as we go forward that are going to be very important for us in terms of... small island developing countries,” he said.

The Minister explained that the findings showed that like most small island developing states in the Caribbean, Barbados was grappling with limited fiscal space, “very” high debts, slow implementation capacity, and limited blue economy investment.

“Many of us have started preparing ourselves for this journey recognising that the blue economy presents great opportunities for us going forward. Now is the time to recognise that the opportunities to be found, and that we need, can be located in the ocean,” Mr. Humphrey said.

For Barbados, he outlined that the Blue Economy Scoping Study found that there were opportunities in maritime transport, fisheries, energy, marine biotechnology, marine living and non-living resources.

However, he stressed, there were clear gaps that needed to be filled with assistance in order for the country to maximise the opportunities presented by the blue economy.

During his address, the Minister noted that financing was also very important, but lamented that blue economy investment was difficult.

He pointed out that only two per cent of official development assistance went to the ocean world-wide. “Consider how much is actually coming to the Caribbean,” he stated. Despite this challenge, he said Barbados and its Caribbean counterparts were working on innovative mechanisms, debt swaps, blue bonds and climate resilient bonds, as they moved forward.

Original Article: [Barbados Advocate](#)

Groundwater's value rises as irrigators realise there is more value to be found underground

Groundwater has historically been a highly reliable water source for irrigators, even during the worst droughts.

But its reliability has meant demand for groundwater has risen significantly in the last five years.

In the Lower Murrumbidgee, New South Wales' largest groundwater source, deep aquifer groundwater prices have risen by 84 per cent since the 2017/18 season.

This is despite a drop in prices in the last six months given the wetter conditions.

Waterfind founder Tom Rooney said groundwater was generally increasing in value at about twice the rate of general security surface water.



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"We know that groundwater ... performs very strongly during dry periods, because people utilise groundwater resources when there is no surface water available," Mr Rooney said.

Last year water users in the Lower Murrumbidgee had their groundwater allocations restricted to 60 per cent because they had exceeded the extraction limit.

When the drought broke there was a drop in groundwater use and consequently allocations returned to 100 per cent in the 2021/2022 season.

But with full allocations previously all but guaranteed, last year's restriction has called groundwater's ongoing reliability into question.

Mr Rooney said he expected demand for groundwater to continue to rise in the Murrumbidgee.

"If you look at a trend line over the last 20 years ... the demand for that water has increased dramatically.

"If we continue to see usage of groundwater outstrip the total entitlements on issue ... there might be times in which it sees an allocation reduction."

Groundwater could be labelled the "Goldilocks" of NSW water sources.

It is much cheaper than high security surface water and much more reliable than general security surface water.

There is the added cost of pumping water up from a bore when using groundwater but Mr Rooney said it still represents very good value for irrigators.

Farmers also often ask him if the value of groundwater will keep going up?

"My short answer is yes; I believe it will continue to grow in value and I think it will continue to outstrip the growth we're seeing in surface water just because it's much cheaper."

During the drought permanent surface water entitlements in the Murrumbidgee reached an eye-watering \$7000 a megalitre, compared to groundwater's peak of \$4655 a megalitre.

Original Article: [ABC News by Olivia Calver](#)

Good News! Farmers to Get 90% Subsidy on Drip Irrigation System

80- 90% subsidies on drip irrigation projects are being offered to farmers of Punjab. This is an effort made by the Punjab government to bring Sustainable agricultural practices to the forefront. This is due to the Depleting groundwater levels in the state known as India's Breadbasket.

Punjab produces 17% of India's wheat making it the second-largest producer of wheat in the Indian subcontinent it's also responsible for 12% of Indian rice production and 5% of India's milk.

It's a state that houses around 1.09 million farming households and is based on very fertile plains is touted to also be the Granary of India, however, crops need water and the Groundwater aren't getting recharged fast enough leading to the government's proposal to adopt more sustainable farming practices like Drip irrigation.



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According to S.S. Johl, a prominent agronomic expert and former vice-chancellor of Punjab Agricultural University (PAU), “The water table in Punjab is falling 25-30 cm per year. Drinkable water is now found at a depth of 350 feet. Punjab is heading toward desertification in one or two decades,”

Under the Micro Irrigation scheme, farmers will be eligible to get subsidies on a first-come, first-serve basis. Farmers from Scheduled Castes and marginalised groups, as well as women farmers, would receive up to 90 per cent subsidy, while others will receive up to 80 per cent.

Drip irrigation, according to the Punjab minister for soil conservation and water resources Rana Gurjeet Singh, not only conserved 40 to 60 per cent of water in the agriculture industry but also allowed pesticides to be delivered straight to the root zone of crops.

This not only increases the amount of water absorbed by the roots of the plants but also leads to decreased water precipitation which helps the plants retain more water and keep the plants healthy and decrease the amount of water wasted while irrigating the crops.

Original Article: [Krishi Jagran by Abin Joseph](#)

Note the attachment is not an inducement to trade and Veles Water does not give advice on investments.