Veles Water Weekly Report

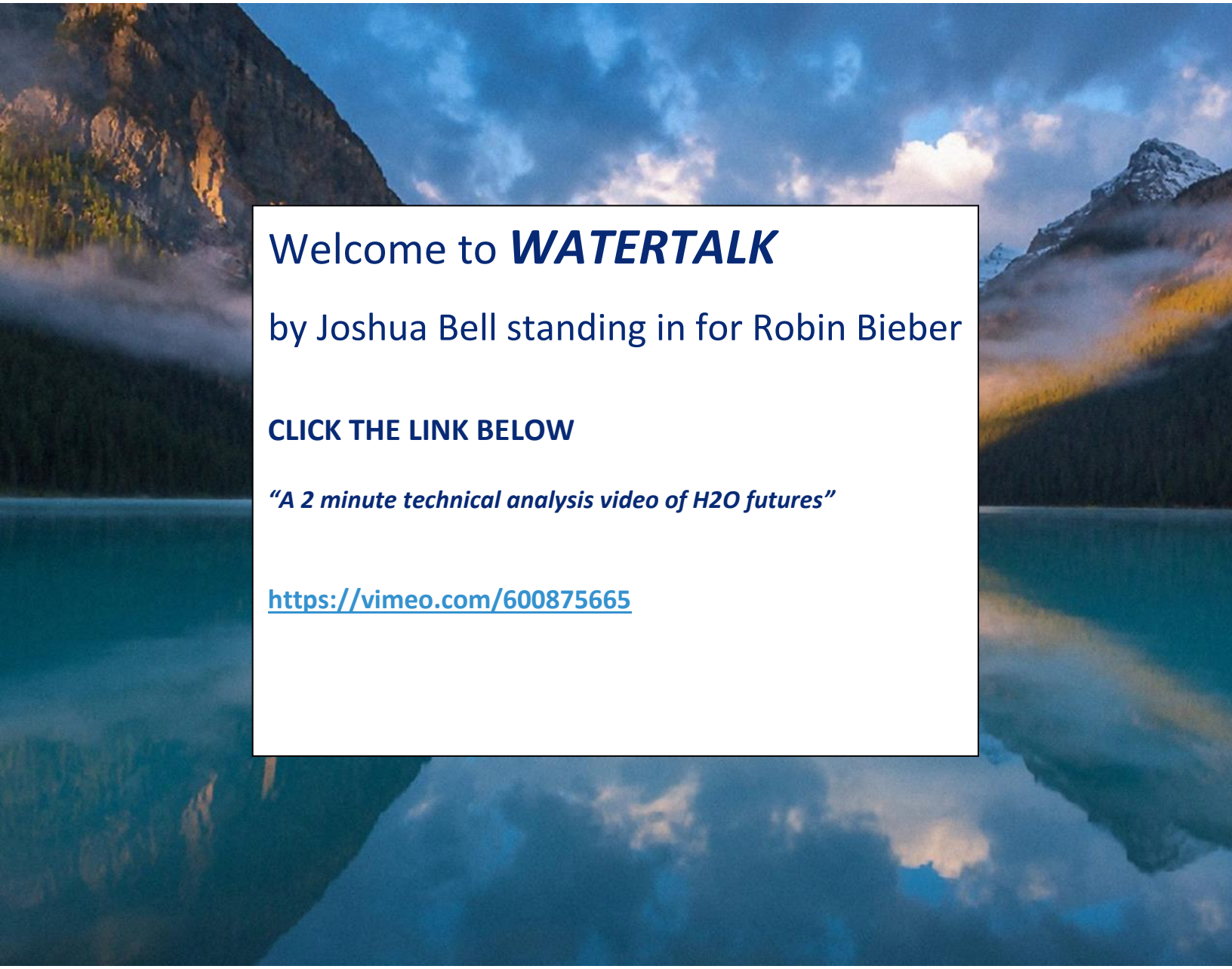
September 9th 2021

Authors:
Lance Coogan - *CEO*
Joshua Bell - *Research Analyst*

research@veleswater.com
+44 20 7754 0342

VelesWater

WATER FUTURES MARKET ANALYSIS



Welcome to ***WATERTALK***

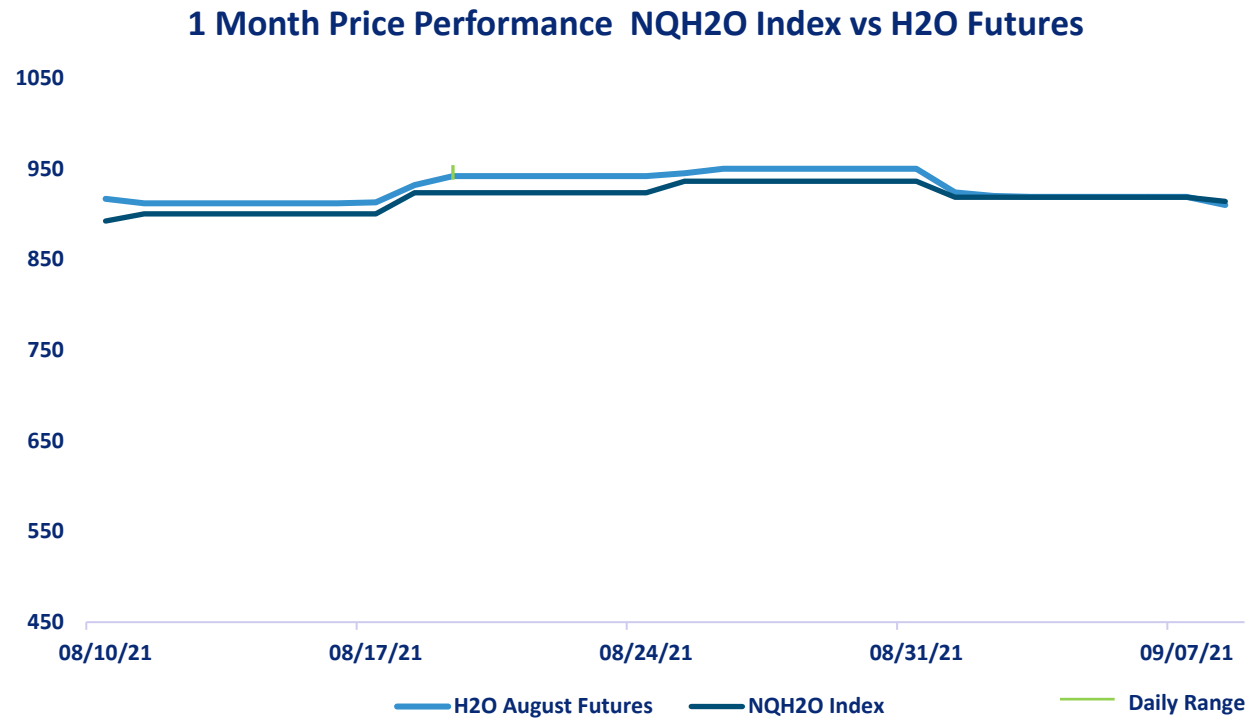
by Joshua Bell standing in for Robin Bieber

CLICK THE LINK BELOW

"A 2 minute technical analysis video of H2O futures"

https://vimeo.com/600875665

NQH2O INDEX PRICE vs H2O FUTURES PRICE



Price Chart Based upon Daily Close

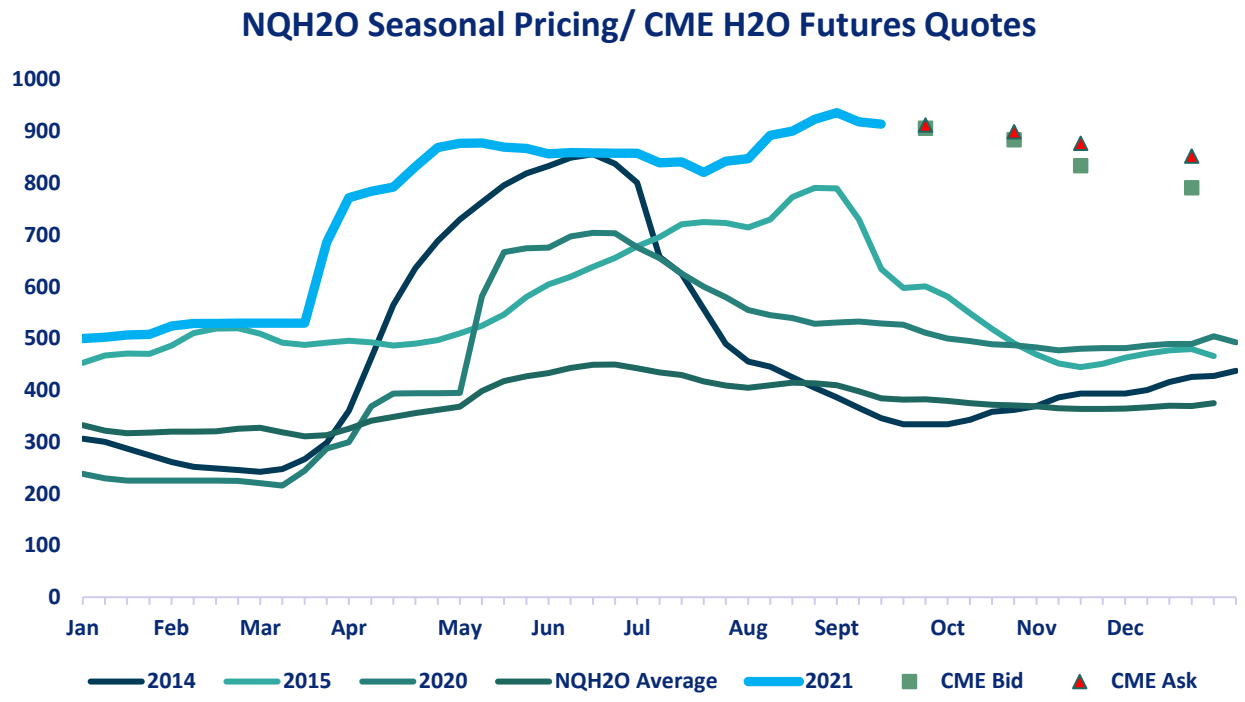
The new NQH2O price published yesterday, September 8th, was down $4.48 to $913.97 or 0.49% from the previous week. Over the summer months the H2O futures contract has been closing at a premium to the index, last weeks' premium being $0.55 -$1.55. For the first time since early March the H2O near month futures are now at a discount to NQH2O of $3.97. The H2O contract low for the week has been $910 on September 8th and the high for the week was $920 on September 2nd. The discount may be signaling the index has peaked and may weaken a bit further.

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

September	906@912
October	884@899
November	834@877
December	791@852
June 22	960@1040

The December offer price is still cheaper than the September bid. The September bid to December offer is minus $54. This is indicating a significant implied seasonality in the trading of water, with prices peaking in summer and tapering off in winter. NQH2O index is up 82.86% up Year to Date.

NQH2O INDEX HISTORY



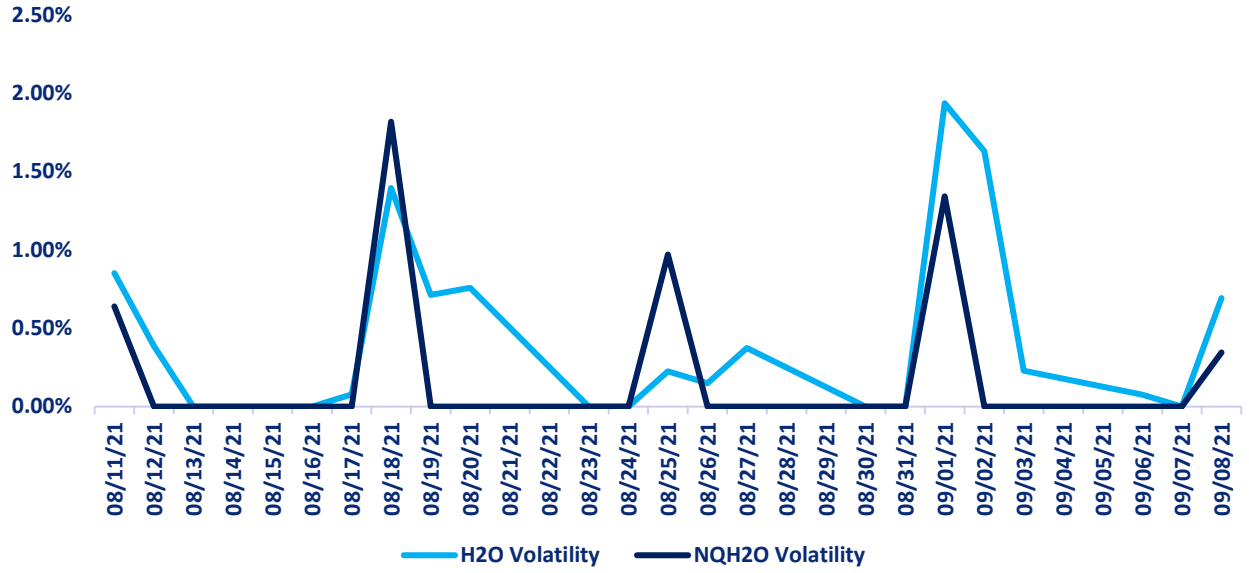
The graph above lays out the Nasdaq Veles water index by year, showing 2014, 2015 2020, 2021 plus an average price of the last eight years. In very dry years, prices clearly rise through the spring, peaking in May to July (with the exception of 2015) as demand for water from farmers peaks. Prices then 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 light blue. 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**)

H2O FUTURES AND NQH2O INDEX VOLATILITY ANALYSIS

Daily H2O Futures Volatility vs Daily NQH2O Index Volatility



DAILY VOLATILITY

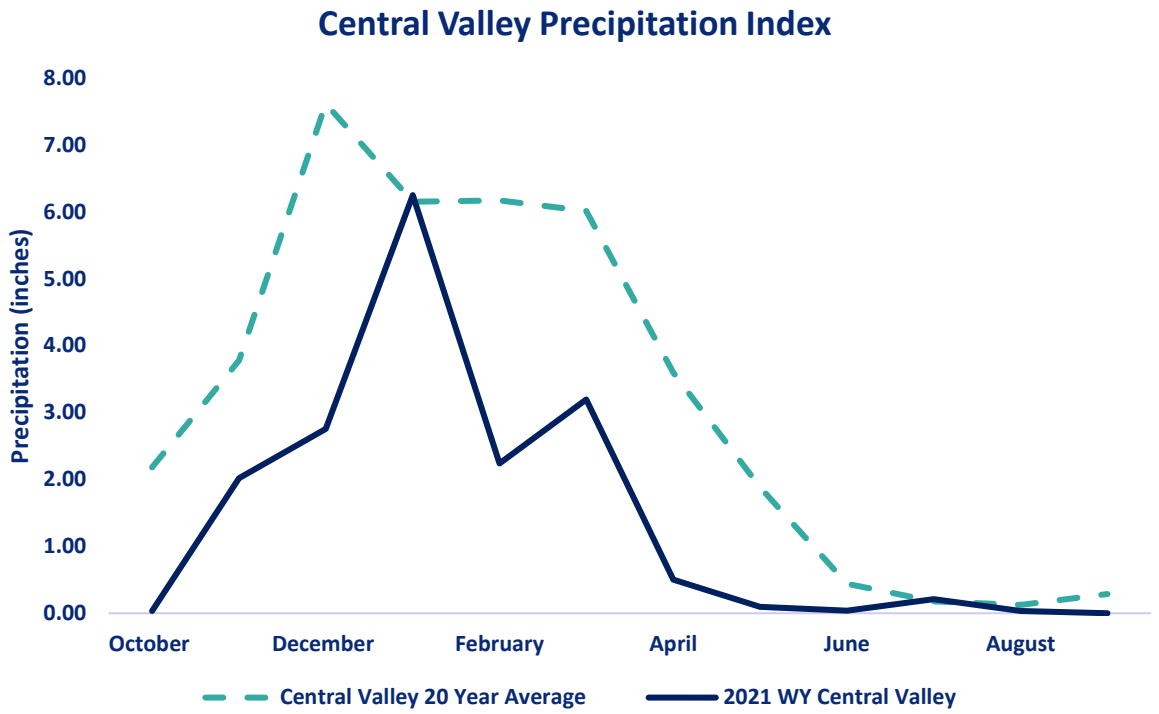
Over the last week the September future volatility high has been 1.63% on September 2nd and the low has been 0% on August 7th.

ASSET	1 YEAR (%)	2 MONTH (%)	1 MONTH (%)	1 WEEK (%)
NQH2O INDEX	33.53%	6.45%	3.95%	1.41%
H2O FUTURES	N/A	7.28%	3.91%	2.37%

For the week ending on the 8th September the two-month futures volatility is at a premium of 0.83% to the index down 0.60% from the previous week. The one-month futures volatility is at a discount of 0.04% to the index, a reversal of 1.07% from last week. The one-week futures volatility is at a premium of 0.96% to the index, a reversal of 0.39%.

*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 REPORT



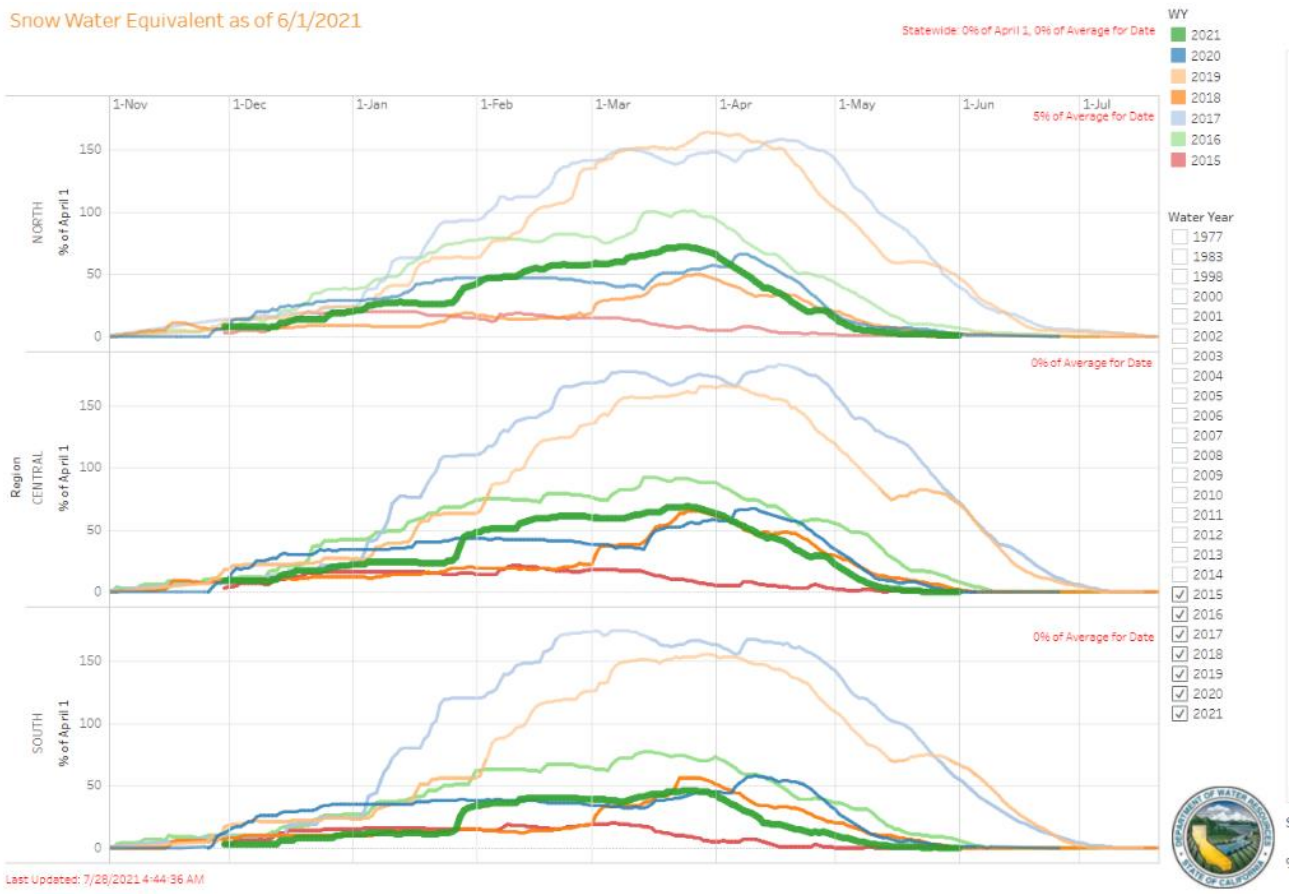
Central Valley average is calculated using data from 19 weather stations in the Central Valley, California.
Data as of 09/09/2021

STATION	MTD (INCHES)	WEEK ON WEEK CHANGE (INCHES)	% OF 20 YEAR AVERAGE MTD	2021 WYTD VS 2020 WYTD %	2021 WY VS 20 YEAR AVERAGE TO DATE %
SAN JOAQUIN 5 STATION (5SI)	0	0.00	0.00%	62	47
TULARE 6 STATION (6SI)	0	0.00	0.00%	65	35
NORTHERN SIERRA 8 STATION (8SI)	0	0.00	0.00%	62	45
CENTRAL VALLEY TOTAL	0.00	0.00	0.00%	63	42.33

RESERVOIR STORAGE

RESERVOIR	STORAGE (AF)	% CAPACITY	LAST YEAR % CAPACITY	HISTORIC ANNUAL AVERAGE CAPACITY %
TRINITY LAKE	818,531	33	60	46
SHASTA LAKE	1,179,772	26	51	42
LAKE OROVILLE	794,176	22	48	35
SAN LUIS RES	261,119	13	47	30

SNOWPACK WATER CONTENT

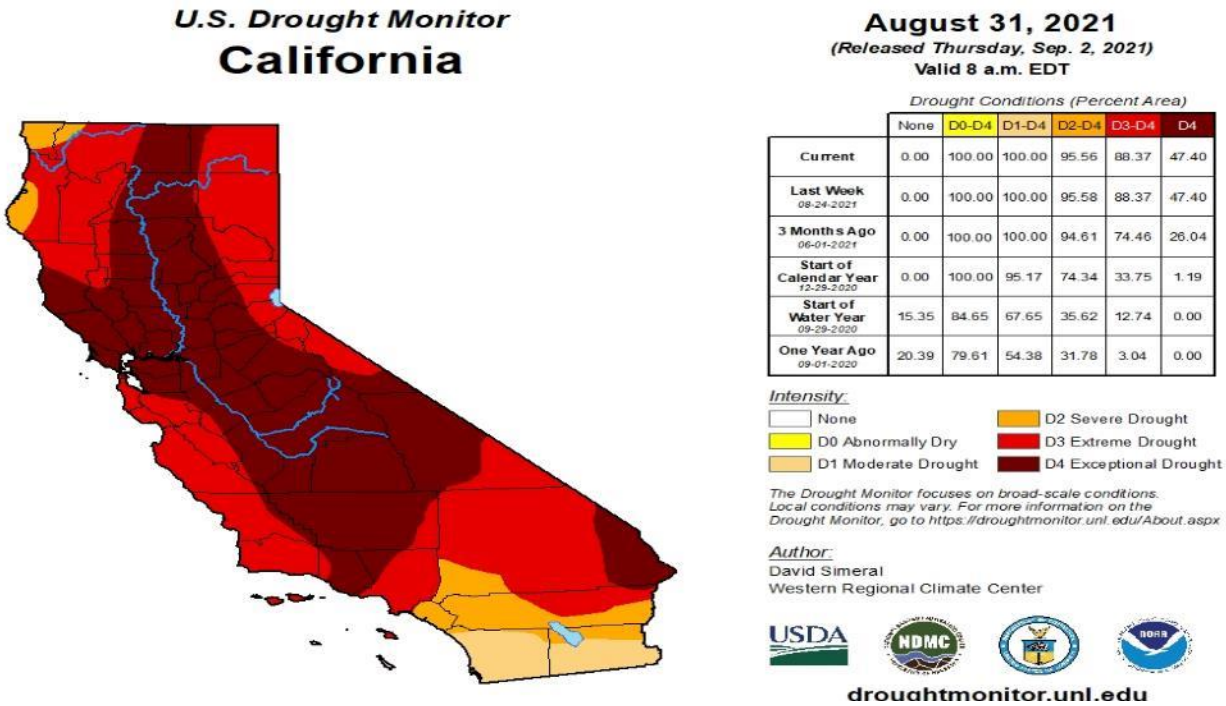


REGION	*SNOWPACK WATER EQUIVALENT (INCHES)	WEEK ON WEEK CHANGE %	% OF AVERAGE LAST YEAR	% OF 20 YEAR HISTORICAL AVERAGE	% OF HISTORICAL **APRIL 1ST BENCHMARK
NORTHERN SIERRA	0	0.00%	0	0	0
CENTRAL SIERRA	0	0.00%	0	0	0
SOUTHERN SIERRA	0	0.00%	0	0	0
STATEWIDE	0	0.00%	0	0	0

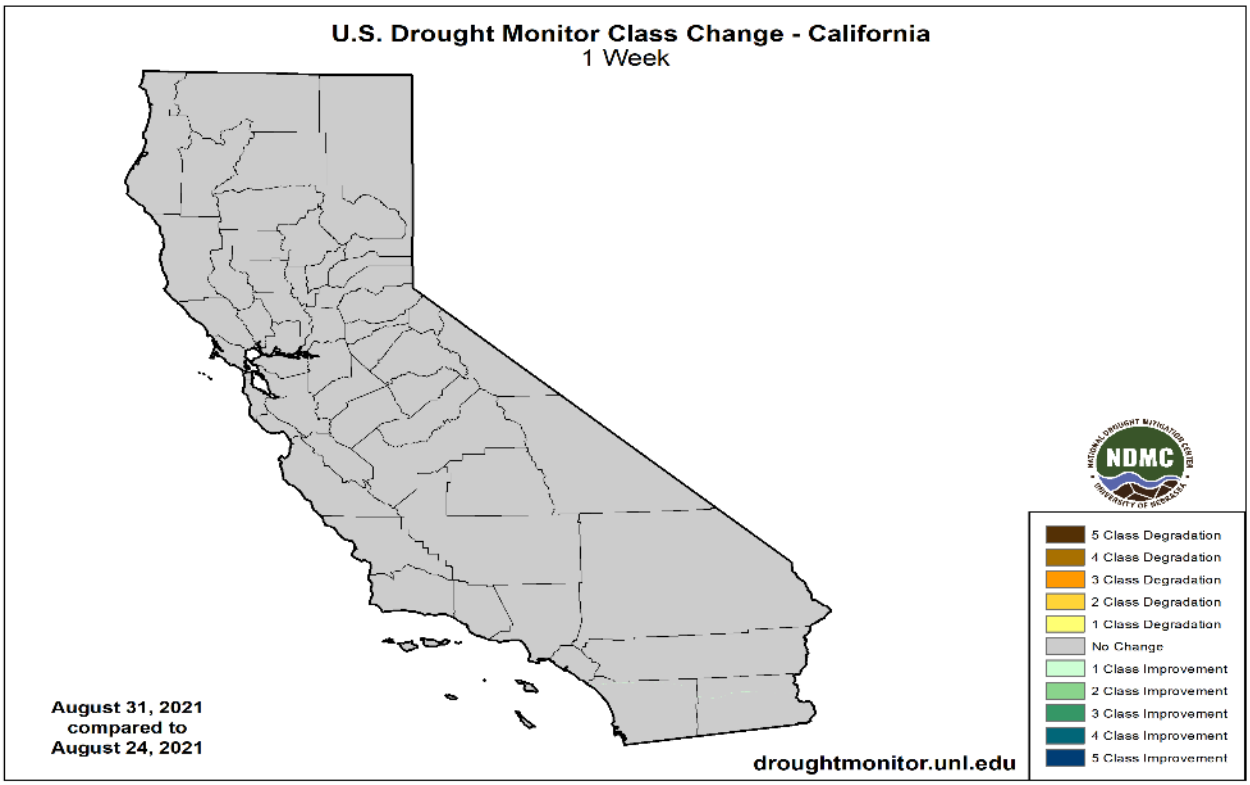
****Snow Water Equivalent*, **or** SWE**, is a commonly used measurement used by hydrologists and water managers to guage the amount of liquid water contained within the snowpack. In other words, it is the amount of water that will be released from the snowpack when it melts. SWE has regional variance.**

**** 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.**

DROUGHT MONITOR



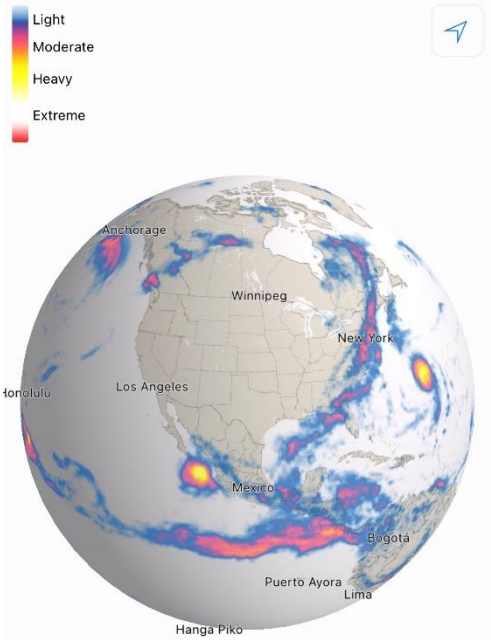
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.00	100.00	100.00	95.56	88.37	47.40
Last Week 08-24-2021	0.00	100.00	100.00	95.58	88.37	47.40
3 Months Ago 06-01-2021	0.00	100.00	100.00	94.61	74.46	26.04
Start of Calendar Year 12-29-2020	0.00	100.00	95.17	74.34	33.75	1.19
Start of Water Year 09-29-2020	15.35	84.65	67.65	35.62	12.74	0.00
One Year Ago 09-01-2020	20.39	79.61	54.38	31.78	3.04	0.00



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

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 the unusual situation of two cyclones, one off the west coast of Mexico and one off the east coast of the US. While most of continental US is dry except for the East Coast these cyclones have the potential for significant weather conditions and associated precipitation.

While the trajectory of the cyclone off the west coast of Mexico is uncertain, we do expect monsoonal moisture to flow into the SW US over the next week.

Our models show there is a 10% chance of the cyclone off Mexico affecting weather conditions as far north as Los Angeles and would bring welcome relief to that area.

It is more likely to provide more moisture inflow into the Southern AZ region in a Monsoonal effect.

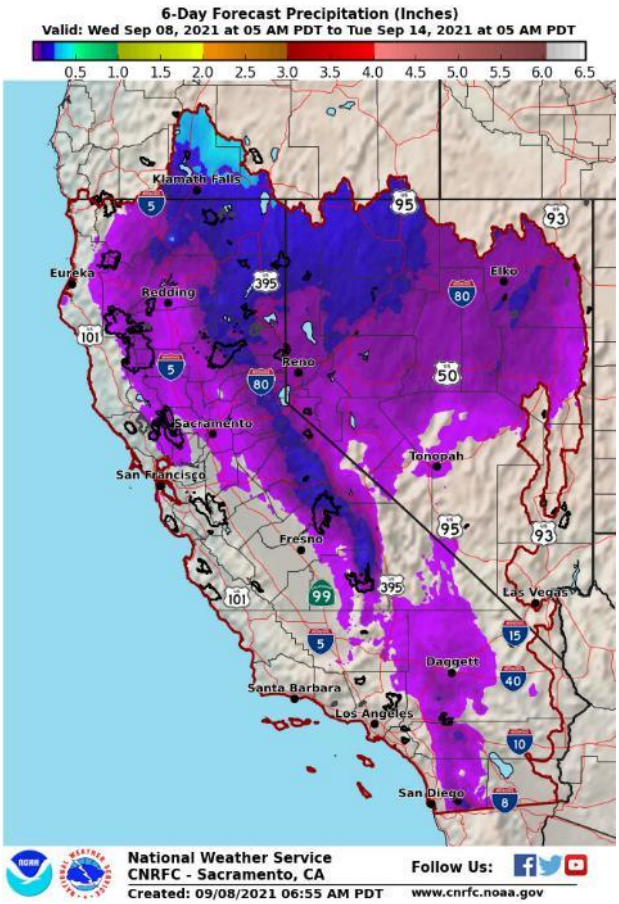
Ref. Dark Sky

There is an equal probability that it may move slightly northwards along the Baja peninsula and then move westwards and dissipate over the Pacific.

10 Day Outlook

High pressure over the Great Basin shifts to the east to the four corners region as a trough approaches the west coast into Thursday. Moisture increases and spreads north Wednesday into Thursday for possible showers and thunderstorms to the Southern Sierra and south, mainly over the Southern CA mtns. An upper level trough along the west coast Thursday evening and moving through Pacific NW and Northern CA into Friday. This may bring precipitation to Northern CA and down the Sierra and over Northern and Central Nevada Thursday night into Friday. Precipitation forecast generally around three tenths of an inch for the Upper Klamath basin and less than a quarter for the Sierra. Generally dry for the weekend and Monday. There is a weak shortwave trough through north Sunday into Monday.

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



WESTERN WEATHER DISCUSSION

Currently, ~90% of the West region (including Colorado and Wyoming) is categorized as “in drought” on the map with 54% in Extreme Drought (D3) or Exceptional Drought (D4). On this week’s map, some improvements were made in New Mexico and Utah in response to the cumulative impact of this summer’s active monsoon and its associated short-term improvements to vegetative health, soil moisture, and streamflow activity. Elsewhere, degradations were made on the map in the eastern plains of Montana, southeastern Wyoming, southern Idaho, and central Oregon. In Northern California, dry and windy conditions led to further expansion and intensification of the Dixie and Caldor fires during the past week. According to CalFire, the Dixie Fire is now the second largest wildfire in California history, while Caldor Fire is now the 15th largest. According to the National Interagency Coordination Center’s Incident Management Situation Report (Sept 1), the Dixie Fire had burned 819,956 acres (49% contained) and the Caldor Fire totals 199,632 acres (18% contained). During the past week, the Caldor Fire spread rapidly eastward up the Highway 50 corridor and into the Lake Tahoe Basin, leading to evacuation of the largest town in the basin—South Lake Tahoe. Looking at reservoir conditions across the region, statewide reservoir storage levels (August 1) were below normal across all the western states with the exception of Montana and Washington. In California, the state’s two largest reservoirs, Lake Shasta and Lake Oroville, were at 43% and 34% of historical averages on August 31, respectively. At the time of writing this report Lake Shasta and Lake Oroville sit at 26% and 22% capacity.

In the Colorado River Basin, Lake Mead is currently 35% full and Lake Powell is at 31% full (August 31). On a positive note, this summer’s monsoonal rains have led to some modest reservoir inflows in the Salt and Verde River system reservoirs in Arizona where the total reservoir system was at 71% full (85% full one year ago) as of August 31. For the week, rainfall activity (accumulations generally <2 inches) across the region was restricted to isolated areas of Arizona and New Mexico as well as central and eastern Montana. Average temperatures during the past week were slightly above normal (1 to 8 deg F degrees) across the southern half of the region, while cooler-than-normal temperatures were observed in northern portions ranging from 1 to 8 deg F below normal. According to NOAA NCEI, Arizona experienced its 2nd wettest July on record as well as its 3rd wettest May-July period on record.

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

WATER NEWS

CALIFORNIA WATER NEWS

A Test for California's Groundwater Regulations in the Megadrought

Record dry conditions once again in the West have led the federal and state governments to declare water supply shortages. California's governor has declared that 50 counties, in which approximately 41% of the state's population exists, are now under a drought state of emergency. This prompted the adoption of emergency regulations ordering water rights holders to curtail their water diversions on numerous northern California rivers.

The state and federal water projects, which together deliver water to approximately 30 million Californians and more than one-third of the state's agricultural farmland, have reduced deliveries to 5% or less. As a result, agricultural, urban, and environmental water users are being forced to cut back with "devastating impacts on our communities, businesses and ecosystems."

Drought may connote for some an anomalous occurrence. To be clear, paleoclimate records show that California's water regime is in part defined by its droughts and sustained dry periods. What's relatively new is the added layers of complexity hastened by climate change and increased demand.

Historically, droughts have agitated underlying disputes over the allocation of shared water resources. This drought, following so quickly on the heels of the last drought—hydrologists believe we're in the midst of a megadrought—is likely no different.

While much is made of the propensity of water users to engage in "water wars," litigation is the last resort. In the case of California, with its complex and nuanced water regulatory system overlaid by a climate that simultaneously makes it a highly desirable place to grow crops, work and live— but also a highly volatile place to do so—this drought presents the opportunity to finally implement management solutions that ensure sustainability of our water supplies.

Drought impacts in California are well documented. In dry years, snow pack is diminished and surface water sources run dry. Water users then increase their reliance on groundwater supplies, from one-third to more than one-half of total water used.

This increased competition may cause water levels to fall and groundwater wells to go dry in the short-term, or if sustained, result in long-term adverse impacts on the resource.

In 2014, after three consecutive dry years, then the worst in California history, the California legislature enacted the Sustainable Groundwater Management Act (SGMA), the state's historic, first comprehensive regulation of groundwater, to address this problem. Until then, groundwater basins were unregulated and in many cases unmanaged, resulting in adverse or "undesirable results," such as subsidence, seawater intrusion, and long-term supply depletion.

SGMA requires that local agencies—called "groundwater sustainability agencies"—manage the groundwater supplies within their jurisdictions sustainably. They must adopt "groundwater sustainability plans" that implement measures and actions to achieve sustainability within 20 years of the plan's adoption.
To that end, SGMA empowers these agencies to limit or suspend well construction and even groundwater pumping, and to impose fees on groundwater producers to fund management actions. These include construction of supplemental water projects to replenish the basin and fallowing of agricultural lands to reduce demand, to mitigate for groundwater overdraft.
Original Article: Bloomberg Law by Stephanie Osler Hastings

Drought threatens access to clean water in California farming communities, study finds

Researchers have suspected for years that drought conditions worsen groundwater quality, but a study published this week provides strong evidence proving the long-held assumption.
While previous studies have focused on the risk of wells being overdrawn and run dry during drought, the study from the United States Geological Survey and the California State Water Resources Control Board is the first to directly link drought to deteriorating water quality on a regional scale.
The study looked at 30 years of data from California's Central Valley.
"This has been a real big missing link in understanding how drought and groundwater use during drought actually affects the quality of the resource," said Zeno Levy, a research geologist for USGS and lead author on the paper released Wednesday.
Based on their analysis, researchers found higher levels of nitrate at public drinking water wells in the Central Valley in areas where groundwater levels dropped rapidly during drought.
The study's findings are troubling for California, a state currently ravaged by drought. Nearly 40% of California's water is pumped from aquifers and about 85% of residents are reliant on groundwater for a portion of their water supply.
Original Article: The Sacramento Bee by Margo Rosenbaum

As surplus water sales evaporate, Mendocino Coast scrambles to keep from going dry

With private wells running dry on the Mendocino Coast and neighboring communities too tapped out to share, Mendocino County officials are racing to organize a giant bucket brigade over the hills from Ukiah.
The tiny unincorporated community of Westport, the last community that was still selling water, quit this week, leaving the town of Mendocino and neighboring coastal villages — along with families, restaurants, inns and other users — at risk of running out.
Mendocino City Community Services District General Manager Ryan Rhoades recently characterized the coast's water status as "a dire situation … teetering on catastrophe."

"Right now, there is virtually no bulk water for sale available on the coast," Rhoades told county supervisors. "Residents and businesses are scared."

The county board has approved using up to $1.5 million in PG&E settlement funds from the 2017 fires to help transport water from Ukiah to Fort Bragg over the next four months. The water would be transported by private haulers and sold to individuals along the coastline. The board is also applying for $3.84 million through a new Department of Water Resource "Small Communities" drought resiliency grant fund.

The cost to buy and ship up to 118,500 gallons a day would be an estimated $959,850 a month, though actual demand might be two-thirds of that, county officials said.

There are other obstacles. Chief among them is the need to find enough tanker trucks certified to transport potable water as required by state drinking water officials. Ten to 12 trucks are needed, each making two to three trips each day, officials said.

There's also the cost to business users, whose long-haul transport costs — an estimated 24 cents per gallon — would not be subsidized through the state grant. That puts the overall cost at 27 cents a gallon or about $945 a truckload retail — likely beyond the "breaking point" for many businesses, county Supervisor Ted Williams, who represents the south Mendocino Coast, noted during a board meeting last week.

Another complication is that Ukiah water officials have indicated they intend to resort to pumping small amounts of Russian River water for delivery to coastal users without obtaining an exemption from the California State Water Supply Board, which has curtailed the city's surface water diversions.

Original Article: Press Democrat by Mary Callahan

San Jose submits plans for mandatory household water rationing

In theme with the extreme weather being experienced nationwide, California is once again facing a familiar environmental obstacle: severe drought.

As the low rainfall continues to dry out much of California, Santa Clara County is in worse shape than many other parts of the state. The Anderson reservoir, the county's largest, was drained last year in order to rebuild the dam for improved earthquake safety. At the end of August, the 10 reservoirs in the county were collectively just 13% full.

Earlier this summer, the Santa Clara Valley Water District declared a water shortage emergency and told its 13 retailers, including their largest retailer the San Jose Water Company, to cut water use 15% from 2019 levels, the most recent non-drought year. The average monthly water usage in 2019 was 10.75 units.

The San Jose Water Company , which provides water to 1 million people in and around San Jose, asked residents to voluntarily reduce water consumption by 15 percent from 2019 levels. The company has since submitted a plan to the California Public Utilities Commission that would require each of its residential customers to officially cut monthly water use by 15% from their 2019 levels, or face fines of $7.13 in surcharges for every additional unit of water used.

The move could make San Jose the first major California city with water allotments and drought penalties.

According to experts, this plan is a possible indication that similar limits are soon to follow in other communities across the state. Reps from Marin Municipal Water District and the City of Santa Cruz have both said they are likely to impose similar monthly water budgets and surcharges to help curb the droughts impacts in their respective areas as well.

Original Article: Cupertino Today

South Coast Water District digs into desalination costs

Households within the South Coast Water District could expect their monthly water bills to increase between $2.38 and $7.20 if the agency builds the Doheny Ocean Desalination Project, according to a cost analysis released this week.

South Coast Water's Board of Directors reviewed their consultants' findings on the project's cost during a special meeting on Thursday night.

The water district serving South Laguna, Dana Point, Capistrano Beach, and portions of San Clemente and San Juan Capistrano continues to wade into the details of constructing a plant capable of turning saltwater siphoned from under the ocean floor into at least two million gallons of fresh drinking water per day. An alternative design would create up to five million gallons of potable water per day but would require agreements with neighboring agencies to be financially feasible.

Some local advocates are concerned whether the estimated operating cost shouldered by individual households could increase if district officials fail to secure deals selling millions of gallons per day to other communities in South Orange County.

"The District has thoughtfully and diligently evaluated the Doheny Desalination Project cost of water and rate impacts," District General Manager Rick Shintaku said in a statement. "The Doheny Desalination Project could serve as an affordable insurance policy for our community and our region."

South Coast imports about 90% of its potable water from the Metropolitan Water District via the Colorado River and State Water Project. District officials have pitched desalination as a solution amid persistent droughts spurred by climate change, increasing cost of imported water, and a major earthquake knocking out connections to the state's water transportation system. The water agency's emergency storage can provide roughly 11 days of drinking water; far below the 60-day industry standard.

At the earliest, the desalination plant would see its first full-year of operation in Fiscal Year 2026-27, according to a staff report. The district consultants estimate construction could cost more than $126 million for the full-scale project or about $71 million for a scaled-down version.

Although South Coast Water, has floated selling desalinated water to neighboring water agencies, including the Santa Margarita and Laguna Beach County water districts, none

have committed to such a deal. These agencies have previously shared that they're open to buying locally-sourced water if the price is right.

A Santa Margarita water spokesperson said the agency looks forward to reviewing the information after the board meeting on Thursday.

Original Article: Laguna Beach Independent by Daniel Langhorne

Legislation seeks $308 million for key valley canal

Farmers and ranchers are working with key lawmakers in a push to fund repairs and upgrades to California's existing water conveyance system.

State legislation, Senate Bill 559, would pay for more than $300 million in repairs on the critical Friant-Kern Canal, California Aqueduct and the Delta-Mendota Canal in the San Joaquin Valley.

The projects are included in water system upgrades being proposed after two consecutive years of severe drought—with a third dry year likely.

With surface water reservoirs depleted and groundwater aquifers drained, the State Water Resources Control Board recently adopted emergency curtailment orders for the Sacramento-San Joaquin Delta, Russian River and Klamath River watersheds.

The severe water cuts are inspiring urgent calls for investments in water infrastructure improvements.

"If California is serious about water resilience and addressing the changing climatic conditions, we must invest in our water infrastructure. We must increase our water-storage capacity to capture water when it comes," said Danny Merkley, California Farm Bureau director of water resources. "The repairs and maintenance and the upgrades are long overdue."

Authored by Sen. Melissa Hurtado, D-Sanger, SB 559 would establish the Canal Conveyance Capacity Restoration Fund to pay for subsidence repair costs for the San Joaquin Valley canals.

Potential local and federal funding has been identified to help pay for those projects. The state money provided in the measure would be contingent on receiving local and federal funding.

"This is a much-needed measure to fund the repairs and maintenance for California, fish, the environment, the production of healthful food and farm products, and for drinking water for all Californians," Merkley said, as he joined Hurtado and other bill proponents at the state Capitol last Thursday.

He called the bill "a substantial down payment in repairing our aging water conveyance infrastructure."

SB 559, which now moves to the Assembly floor, passed out of the Assembly Appropriations committee with amendments. Hurtado's team, the Farm Bureau and other bill proponents are reviewing amendments, including one that ties funding to improving public benefits.

The bill would allocate $308 million for repairs spanning a 33-mile stretch of the Friant-Kern Canal, which has experienced subsidence linked to groundwater pumping. The canal is operated by the Friant Division of the federal Central Valley Project. In more plentiful water years, the canal loses the opportunity to capture water—up to 300,000 acre-feet in 2019—which is lost to the ocean.

Original Article: Our Valley Voice by Christine Souza

How California's drought is stressing a water system that delivers water to millions of residents

California's worsening drought is putting a strain on the web of rivers and canals that course through the nation's most populous state and provide drinking water for millions of residents.

As the state's major reservoirs hit historic lows, regulators are taking steps to protect the water flow of one of the most crucial water resources: the Sacramento-San Joaquin Delta.

Why is it so important? The Sacramento-San Joaquin Delta water system, also known simply as the Delta watershed, helps provide water to two-thirds of the state's population, irrigation for millions of acres of the state's agricultural industry and is an ecological habitat for bird and fish species. It spans from the state's northern border with Oregon, down to a major river interchange located east of the Bay Area in Northern California, where it ultimately pushes water in different directions, including southward through the Central Valley, which produces a quarter of the nation's food.

Generally, a watershed system is "anywhere where water flows from and to," said Laura Ramos, programs manager at the California Water Institute at California State University, Fresno. There are many small- to medium-sized river systems in California, but the Sacramento-San Joaquin Delta is the state's largest, connecting the Sacramento River, which flows southward, with the San Joaquin River, which flows northwest.

Both rivers take in millions of acre-feet per year of fresh water from the Sierra Nevada mountains. (For scale, a single acre-foot is equivalent to about half an Olympic-size swimming pool.) Where the rivers merge, along with many other channels arriving at the ecological interchange, powerful, human-engineered pumps help move water into different areas.

"We are amazing at moving water around in California," Ramos said.

The Delta watershed is a critical link in the state's complex water-distribution system, according to the Water Education Foundation, a nonprofit that educates about the state's water resources. This water infrastructure has provided a lifeline to farmers, cities and regions that otherwise would not have reliable water dating back to the 1930s.

The Sacramento-San Joaquin Delta also aids two other important water channels. The California Aqueduct, also known as the State Water Project, transports water on the western edge of the San Joaquin Valley toward Southern California. The Central Valley Project, which includes canals like the Friant-Kern canal flowing from the Fresno area to

Bakersfield, conveys water along the eastern edge of the Valley. The two arteries are helped by the Delta's forces, and in turn have turned the Central Valley into a top-producing agricultural region.
Original Article: PBS News by Cresencio Rodriguez Delgado

The Heavy Cost Of Heavy Rain In California

With California's seemingly endless drought it may be years before the spillway at Oroville Dam — which created Lake Oroville, the largest state-owned reservoir — sees another drop of water.

That wasn't the case in February 2017, when runoff from torrential rains filled Lake Oroville to its 1.1-trillion-gallon capacity, forcing dam operators to begin releasing torrents of water and damaging both the main and emergency spillways. Short-lived evacuation orders were initially issued as a precaution for more than 180,000 people living downstream.

Within eight months the main spillway was repaired and during 2018 the spillway was completely reconstructed and a new emergency spillway was completed.

The price tag: At least $1.2 billion.

Part of that cost will be paid with property taxes or increased water rates by millions of customers served by 29 water districts who have long-term supply contracts with the State Water Project, operated by the California Department of Water Resources.

A department spokesperson told Patch the Federal Emergency Management Agency is expected to reimburse $630 million of the cost with about $479 million paid over the next 16 years by water agencies, an amount that will be increased by interest. Until then the water resources department has been paying the bills from its short-term financing program and proceeds from bond sales.

The state began collecting the water districts' proportionate share of the costs during the 2019-2020 fiscal year and payments will continue through 2035.
Original Article: Patch by Kristina Houck

Antioch launches the region's first water desalination project

The city of Antioch's water supply has been challenged in recent years by a variety of factors. But the Brackish Water Desalination Project, the first desalination project of its kind in the five-county Sacramento-San Joaquin Delta region, is intended to improve the reliability of the city's water.

The city filed its notice of preparation for the project just over four years ago and then broke ground on the plant in February of this year.

"I believe that we're about a quarter of the way complete with the work," said John Samuelson, public works director/city engineer for the city of Antioch. "It's expected to be completed in the middle of 2023."

When complete, the plant, using a reverse osmosis process, will produce about 6 million gallons of drinking water per day from the 8 million gallons of water drawn from San Joaquin River.

"Currently, desalination only provides 1% of the state's water supply needs," said Sean Sou, program manager for the Department of Water Resources (DWR) desalination grant program. "It's relatively small because of the high cost. The National Alliance for Water Innovation is embarking on an effort to research technologies that can lower the cost and energy (use) related to desalination. If that effort succeeds in the future, I think that there will be more desalination plants constructed in the state."

Antioch's drinking water comes from two sources. The city has pre-1914 water rights to pump from the Delta when there is sufficient water flowing to allow pumping. Its supply is augmented by the purchase of untreated water from the Contra Costa Water District (CCWD), which is more expensive than simply pumping water from the river. In recent years, saltwater intrusion from the San Francisco Bay has complicated water operations for the city.

The line indicating where freshwater ends and brackish water starts is referred to as X2. X2 is not fixed. Rather, it moves based upon a number of factors like the season, drought conditions and the volume of water being diverted from the Delta by the State Water Project, the Central Valley Project and other water rights holders in the region. In a normal or wet year, freshwater flowing down through the Delta can push X2 west beyond Pittsburg. In a dry year without a significant freshwater flow, X2 can shift as far east as the Antioch Bridge, or even farther. Once brackish water reaches the Antioch pumps at Fulton Shipyard, they have to be shut down, and the city is forced to purchase its water from the CCWD.

Conditions this year have been particularly difficult.

"We have not been able to use our intakes at any point this year due to the severity of the drought," Samuelson explained.

The expected cost of the desalination project is $110 million. The city received a $10 million grant from the DWR through funding made available by Proposition 1. Proposition 1 made $7.55 billion available to fund ecosystems and watershed protection and restoration; storage and water supply infrastructure projects; and drinking water protection.

Original Article: The Press Net by Tony Kukulich

SSJID suing state after Sacramento goes after its water

South San Joaquin Irrigation District is suing the state in a bid to avoid a curtailment order from creating severe water shortages in 2022 for 200,000 Manteca, Lathrop, and Tracy residents and growers farming nearly 55,000 acres

SSJID, along with Oakdale Irrigation District, over a century ago secured first-in-line rights under state law for the initial 600,000 acre feet of annual water runoff in the Stanislaus River Basin.

VELES WATER WEEKLY REPORT

A curtailment order issued Aug. 20 by the State Water Resources Control Board is essentially seizing the water the SSJID and OID legally own and prevents the agencies from diverting and storing Stanislaus River runoff in Donnells, Beardsley, New Melones and Tulloch Reservoirs.

The pre-1914 adjudicated water rights the two districts purchased, developed, and hold under California law means they legally have first right to the water.

"Concerns about next year's water are developing now; we want to make sure we're in a good position," said Peter Rietkerk, SSJID's general manager. "No one knows – and the state won't say – how and when the decision will be made to lift the order."

California is suffering from a second straight year of drought, which is affecting water supplies across the state. OID and SSJID customers fared better than most this year because of the Districts' investments in efficient water management practices; farmers received full allocations, unlike those in other areas. But because of the state's curtailment order, there is no telling what may happen next year if rain and snowfall are well below average for a third year in a row.

The SSID and OID have joined in a lawsuit challenging the State Water Resources Control Board's authority to prevent the two water agencies from diverting and storing Stanislaus River runoff.

The state water board, in an emergency drought order issued Aug. 20, declared that OID, SSJID and 4,500 other water rights holders in California must immediately stop diverting water due to unprecedented drought conditions.

Both the SSJID and OID have the ability to use water previously stored behind those reservoirs and anticipate no immediate impacts to its agricultural and municipal customers.

The order also affects the Turlock and Modesto Irrigation Districts and the City and County of San Francisco, which have historic water rights to the Tuolumne River and store water behind Don Pedro Dam. Together, the four water agencies and San Francisco form what is known as the San Joaquin Tributaries Association.

The SJTA filed the lawsuit against the water board Thursday morning in Fresno Superior Court.

The state's curtailment order is open-ended – meaning there is no specific date indicated when the irrigation districts may again begin storing water in reservoirs. The water board said the curtailments are necessary to keep salt water from building up in the Delta, to protect fish and to maintain drinking water supplies for cities.

The lawsuit contends the state violated the Districts' due process rights and could impact the historic water rights held by SJTA members by not specifying when the curtailment order ends.

Runoff in the Stanislaus River watershed this year was about 350,000 acre-feet – well below the historic average of about 1 million acre-feet into New Melones Reservoir, making 2021 the third-driest year on record going back nearly 100 years ago. The problem is compounded by the fact that 2020 was the ninth-driest year ever recorded.

No two back-to-back years in any previous drought have been drier.
Original Article: Manteca/ Ripon Bulletin

Years later, state's voters still wait on water projects

In 2014, in the middle of a severe drought that would test California's complex water storage system like never before, voters told the state to borrow $7.5 billion and use part of it to build projects to stockpile more water.

Seven years later, that drought has come and gone, replaced by an even hotter and drier one that is draining the state's reservoirs at an alarming rate. But none of the more than half-dozen water storage projects scheduled to receive that money have been built.

The largest project by far is a proposed lake in Northern California, which would be the state's first new reservoir of significant size in more than 40 years. People have talked about building the Sites Reservoir since the 1950s. But the cost, plus shifting political priorities, stopped it from happening.

Now, a major drought gripping the western United States has put the project back in the spotlight. It's slated to get $836 million in taxpayer money to help cover it's $3.9 billion price tag if project officials can meet a deadline by year's end. The Biden administration recently committed $80 million to the reservoir, the largest appropriation of any water storage scheduled to receive funding next year.

And the project could get some of the $1.15 billion included in an infrastructure bill that has passed the US Senate.

Still, the delay has frustrated some lawmakers, who view it as a wasted opportunity now that the state is preparing to cut of water to thousands of farmers in the Central Valley because of a shortage.

"The longer you don't build, the more expensive it gets," said Republican state Sen. Brian Dahle, whose rural Northern California district includes farmers.

Storage was once the centerpiece of California's water management strategy, highlighted by a building bonanza in the mid-20th century of a number of dams and reservoirs. But in the more than 40 years since California last opened a major new reservoir, the politics and policy have shifted toward a more environmental focus that has caused tension between urban and rural legislators and the communities they represent.

The voter-approved bond in 2014 was supposed to jump-start a number of long-delayed storage projects. But some experts say the delays aren't surprising, given the complexities and environmental hazards that come with building new water projects.

"We have about 1,500 reservoirs in California. If you assume people are smart — which they kind of are most of the time — they will have built reservoirs at the 1,500 best reservoir sites already," said Jay Lund, co-director of the Center for Watershed Sciences at the University of California-Davis. "What you have left over is more expensive sites that give you less water."

Original Article: Antelope Valley Press by Adam Beam, Associated Press

California Drought: Groups sue Bureau of Reclamation against extra groundwater pumping plans In North Valley

On August 26, three environmental groups filed a lawsuit in federal District Court challenging the U.S. Bureau of Reclamation over extra groundwater pumping plans by Sacramento River water districts. The filing of the suit by AquAlliance, the California Sportfishing Protection Alliance, and the California Water Impact Network was followed on Wednesday, September 1, by a motion for a Temporary Restraining Order (TRO). At stake is an estimated 60,000 acre feet of groundwater, according to AquAlliance Executive Director Barbara Vlamis.

Reclamation seeks to pay the extra groundwater pumpers for their energy costs based on the analysis found in the Environmental Assessment for Groundwater Actions to Offset Surface Water Diversions from the Sacramento River in Response to Drought in 2021.

The named participants in the Extra Groundwater Pumping Program include Anderson Cottonwood WD, Glenn-Colusa ID, Princeton-Codora-Glenn ID, Provident ID, Reclamation District No. 108, Reclamation District No. 1004, River Garden Farms and Sycamore Mutual WC.

Reclamation concluded that the proposed action in the EA would have no significant impact on the human environment.

"In assessing the appropriate level of NEPA (National Environmental Policy Act) review, Reclamation determined the Proposed Action is not likely to have significant effects," the Assessment found. "In considering whether the effects of the Proposed Action are significant, Reclamation analyzed the affected environment and degree of the effects of the action."

"The Proposed Action will occur within existing facilities and there would be no effects to the following resources: aesthetics; geology, soils, & mineral Resources; land use; population & housing; transportation & traffic; recreation; hazards & hazardous materials; cultural resources; public services & utilities," Reclamation claimed.

The groups strongly disagree with Reclamation's Finding of No Significant Impact. (FNSOO). The lawsuit asks the court to declare Reclamation's Environmental Assessment invalid and issue a temporary restraining order and a preliminary injunction to stop the project that the plaintiffs say will harm local domestic and agricultural users, the Sacramento River, streams, and ecosystems.

The motion for a TRO and/or preliminary injunction notes that "groundwater and groundwater dependent people and resources are already severely impacted" in the Sacramento Valley.

"BOR grossly failed its statutory mandates under the National Environmental Policy Act ("NEPA") to disclose and consider the Project's effects prior to approval, and prior to irreversible effects occurring," the groups allege.

"To have the federal government enable the abuse of groundwater by river water-rich Settlement Contractors, particularly in a critically dry year, is heinous," said Vlamis. "The Extra Groundwater Pumping Plan pits Sacramento River water right users against groundwater-reliant neighbors and habitats that are already struggling. To represent the people and environment, we had to pursue our legal options."

The groups said that with the knowledge of California's climate and history, "Reclamation failed to prepare for the dry year before us."

"The districts are hammering already taxed local groundwater basins during the serious 2021 drought, because they don't want to accept cuts in river water deliveries even though their 25% cut is much less than those other users have experienced," according to the groups. "However, the same districts have enough river water to sell to south-of-Delta interests." (see table below)

"If Reclamation hadn't released so much water from Shasta Reservoir in April and May this year, there would have been more in storage for critical flows for salmon and Delta farmers," said Bill Jennings, Executive Director/Chairman of the California Sportfishing Protection Alliance (CSPA).

Total Keswick Dam water releases in April were 352,673 acre-feet of water and 509,160 acre feet in May, a total of 861,833 acre-feet during the two months according to the Bureau of Reclamation's Northern CVP Water Temperature Plan.

Original Article: Red, Green and Blue by Dan Bacher

US WATER NEWS

As aquifers drain, El Paso County is hoping a nearly endless loop of water can fight future shortages

Water drawn from deep wells in the southern Denver Basin has a wild ride ahead, if a $134 million proposal to build a pipeline and reusable water "loop" through much of El Paso County moves forward.

With drought and climate change piling on top of population growth, getting creative to the point of crazy is the new water reality. The federal government underlined just how precious water is last month when it shut down 2022 deliveries to Arizona from Lake Mead's Colorado River water.

Every drop of water inside the boundaries of Colorado must be counted, coddled, diverted, bought, rented and, if necessary, looped.

For the H20 molecules lying thousands of feet underground in the Denver Basin aquifer, trapped by millions of years of geologic shifts, there would be a long journey ahead.

Should they get sucked up a well owned by a northern El Paso County water agency, the water drops may first be sprinkled on a lawn in, say, the Woodmoor district east of

Monument. From there, the water would sink back underground and flow downhill toward Monument Creek. On into Fountain Creek, and south toward the Arkansas River.

Then the drops would ripple past Colorado Springs, which is desperate to entrap more water of its own for future growth, and is pushing for unloved dams 100 miles away to bring more Western Slope water over the Continental Divide.

On the water would glide past Security, Widefield and other communities, which are struggling to secure clean water supplies of their own in the wake of contamination from polyfluoroalkyl substances (PFAS) running off firefighting foam used for decades at a local military base.

Still going, the hardworking aquifer water then would pass farmland that will eventually be dried up by Woodmoor and other northern suburbs buying agriculture water for their own growth. At the town of Fountain, the water would pass a town that has slowed new homebuilding because it doesn't have enough future supply for new water taps.

And then those precious H20 molecules would hit a curve of Fountain Creek where the Chilcott Ditch headgate looms like an ominous fork in the road of life: If Woodmoor and its allies get their way, the molecules they pulled from the timeless aquifer will get diverted here and sent into a $130 million-plus pipeline, to be shipped back north to the top of El Paso County. The journey for those molecules would begin all over again, in a project appropriately dubbed The Loop, until — in the official water rights phrase — the original aquifer water has been "used to extinction."

But that only happens if El Paso County and local water agencies convince the keepers of the federal American Rescue Plan that the stimulus funds can be used for water projects like the Loop, and not just highways.

Can this tortured trip for the ancient, sandstone-filtered water really be the best solution to Colorado's relentlessly expanding water demands?

"There's something in it for everybody," said Jessie Shaffer, Woodmoor Water and Sanitation District manager and a key proponent of the Loop.

"Mother Nature isn't sending more water down into those aquifers naturally. So when the water's gone, it's gone," said Shaffer.

"Water is gold," said El Paso County's northern district commissioner, Holly Williams. The Loop may seem complicated, Williams said, but the problem it would solve is pretty simple: suburbs from El Paso County to north of Palmer Divide and on up to Greeley are relying too much on aquifer water that won't last.

"The more straws you're putting down into that aquifer with wells is just like everybody's drinking out of the same soda," Williams said. "And eventually, that is no longer going to fill up, because let's face it, we may be a drier, arid state for a while."

Backers of the Loop idea say it would solve many problems at once.

Original Article: The Colorado Sun by Michael Booth

Ida left behind a water crisis in the Gulf

VELES WATER WEEKLY REPORT

It has been a week and a half since Hurricane Ida hit the Gulf Coast and the devastating impacts of the Category 4 storm are still being felt throughout the region. Some 418,000 people in Louisiana remain without power, unable to run air conditioning units to deal with scorching late summer temperatures or keep food fresh in homes and grocery stores. The storm has also forced hundreds of municipal water systems offline, creating a drinking water crisis that officials warn could last weeks.

As of Tuesday, 51 water systems across Louisiana, each serving between 25 to 20,000 people, remained shut down due to Ida. Another 242 remained under boil water advisories. Around 642,000 people remain without access to clean water, according to the Louisiana Department of Health. In Mississippi, the state Department of Health has 10 active boiling water notices, affecting 7,142 people.

"There is no particular timeframe for all systems to come back up to 100 percent," Kevin Litter, a spokesperson for Louisiana Department of Health, said in an email. "This will be different for every system and also based on location."

The reasons for the immediate water crisis are two-fold: Across Louisiana and Mississippi, Hurricane Ida ripped down power lines, leaving water systems unable to get the electricity they needed to pump groundwater or to run treatment facilities. Even though Louisiana mandates that all water systems have backup, fuel-powered generators, many don't comply with the rule, Litter explained. Those who do have backup pumps are being affected by the extended blackout still crippling parts of the Gulf a week post-storm — a situation that has created fuel shortages that leave generators useless. Flooding on roads can also leave critical infrastructure, like water wells or pump stations, out of reach, making it impossible to fix storm damage. Lastly, the destruction of roads and bridges has literally ripped apart water pipelines, disrupting the whole system.

Intensified by climate change, Hurricane Ida is one of the strongest storms on record to hit the Gulf Coast. But the 150-mile-per-hour winds that took down electric lines, trees, and homes, as well as the powerful storm surge that briefly reversed the flow of the Mississippi River, can't fully explain the state's water systems failures.

Original Article: Grist by Maria Paula Rubiano A

Phoenix, other Arizona cities to provide water to farmers during drought

Phoenix and other cities in the Valley will provide water to Arizona farmers struggling through the current drought, per a press release. The federal government has classified the state of the Colorado River as a Tier 1 water shortage. Pinal County agricultural water users are most affected.

In preparation for this event, two years ago, several Valley cities and entities came up with the 2019 Drought Contingency Plan.

This involves the implementation of Underground Storage Facilities to Groundwater Savings Facilities Program, which the city of Phoenix describes as a savings account.

Cities make “deposits” by granting water from their Colorado River supplies to irrigation districts in Pinal County in the short term. In exchange, the cities will gain access to ground water later on.

The agriculture irrigation districts will exclusively use the water provided instead of ground water until that supply builds back up.

Phoenix will supply 12,000 acre-feet of water, while 5,000 will each come from Scottsdale, Tucson and Peoria. Avondale, Chandler and Goodyear will also be providing water.

Central Arizona Irrigation and Drainage District will receive the most water, followed by Maricopa Stanfield Irrigation and Drainage District.

Phoenix has spent decades building up a “robust” water supply, so the plan is not expected to impact its ability to provide clean water to its customers.

Original Article: KTAR News by Alex Weiner

Reclamation awards $3.1M in applied science grants

Yesterday, the U.S. Bureau of Reclamation announced that it had selected 20 projects to share $3.1 million in applied science grants.

The awarded grants will help develop tools and information to support water management decisions. These projects in 11 western states include improved water data, modeling and forecasting capabilities.

"Water managers today need more accurate and reliable information to make the best water management decisions in a changing climate," said Chief Engineer David Raff. "Applied Science Grants are an important tool to assist water managers getting the information they need so they can make those informed decisions."

Projects selected range from $48,000, for the Big Bend Conservation Alliance in Texas to develop a common data management platform for shared aquifers, to several receiving the maximum $200,000. Texas A&M University-Kingsville is receiving $107,497 to develop a web-based tool to simulate post-wildfire hydrologic changes in Northwest Montana.

A complete description of all the selected projects can be found here.

Applied Science Grants are for non-federal entities to develop tools and information to support water management for multiple uses. Selected projects must provide at least a 50 percent non-federal cost-share. Project types include:

Enhancing modeling capabilities to improve water supply reliability and increase flexibility in water operations.

Improving or adapting forecasting tools and technologies to enhance management of water supplies and reservoir operations.

Improving access to and use of water resources data or developing new data types to inform water management decisions.

For more than 100 years, Reclamation and its partners have developed sustainable water and power future for the West. This program is part of the Department of the

Interior's WaterSMART Program, which focuses on improving water conservation and reliability while helping water resource managers make sound decisions about water use.

Original Article: Water World/ U.S Bureau of Reclamation

Rainy Season Unleashes With Fury, Beauty in US Southwest

After two bone-dry years that sank the U.S. Southwest deeper into drought, this summer's rainy season unleashed with fury.

Monsoon storms have brought spectacular lightning shows, bounties of wildflowers and mushrooms, and record rainfall to the region's deserts. They've also brought destruction, flooding streets and homes, and leading to some swift water rescues and more than a dozen deaths.

It's a remarkable reversal from 2019 and 2020, when the annual period known simply as “the monsoon” left the region parched. The seasonal weather pattern that runs from mid-June through September brings high hopes for rain, but the moisture isn't guaranteed.

“That traumatized a lot of us here in the Southwest, really worried if the monsoon was broken,” said Mike Crimmins, a climatologist at the University of Arizona. “And then here 2021 monsoon comes along, and it’s almost like we’re trying to make up for the last two seasons.”

Tucson, in southern Arizona, marked its wettest July on record and was sitting at No. 3 on Thursday for record rainfall during a monsoon. The Phoenix airport is above average for the season but far from hitting the city's record, the National Weather Service said. Some higher-elevation cities in metropolitan Phoenix fared better.

Payson has logged nearly 13 inches (33 centimeters) of rain so far — about 6 inches (15 centimeters) above normal. An area south of Flagstaff had hail that measured 2.5 inches (6.4 centimeters) in diameter, according to the weather service.

“That's usually something you see in the news across the Midwest in tornado season," said meteorologist Cindy Kobolb in Flagstaff. “Forecasters that have been here for decades can't even say the last time they've seen hailstones that big in the state.”

Some locations like Window Rock, on the Navajo Nation, and Farmington, New Mexico, were just behind normal so far for the season. The Hopi Tribe recently ordered livestock reductions on the reservation in northeastern Arizona that's in severe to extreme drought.

Hopi Vice Chairman Clark Tenakhongva said it was difficult to sign off on the July 20 executive order because he's also a rancher who has reduced his herd, and hauled water and supplemental feed for his cattle. But, he said, "there's no nutritious foods out there, there's no water.

Roswell, in southeastern New Mexico, has received nearly double its normal rainfall, while Albuquerque to the northwest was lagging. Rainfall can fluctuate wildly even within cities because of the hit-and-miss nature of the monsoon.

The remnants of Tropical Storm Nora pushed moisture into the region this week, boosting rainfall totals. With each storm, officials warn of potential flooding dangers. At least 10 people have died in Arizona in flooding events since the monsoon started this year, and at least five in New Mexico.

Despite the abundant rainfall, the region is still trending toward hotter, drier weather because of climate change. All of Arizona is in some level of drought and most of New Mexico, according to the U.S. Drought Monitor.

The monsoon is characterized by a shift in wind patterns that pull moisture in from the tropical coast of Mexico. Many cities in Arizona and New Mexico get much of their annual rainfall during the monsoon. In a strong season, the moisture extends into southern Utah, Colorado and California, Crimmins said.

Original Article: US News by Felicia Fonseca

Research aims to make every drop count in Nevada's alfalfa production

As wildfire smoke continues to fill the skies and drought grips the West, farmers are trying to cope with dwindling water supplies and do what they can to sustain profitable operations. Researchers at the University of Nevada, Reno are using new technologies to try to equip growers with "smart" irrigation scheduling, computer-generated models that would tell them how much to water based on certain conditions.

The work is being led by Assistant Professor of Agriculture Alejandro Andrade-Rodriguez in the College of Agriculture, Biotechnology & Natural Resources as part of at the College's Experiment Station research. Andrade-Rodriguez aims to use various new technologies to develop a "smart" deficit irrigation scheduling system capable of identifying irrigation management decisions (when and how much to irrigate) that can help producers achieve the maximum yield that can be obtained with the conditions and water available that season.

He is focusing his research on alfalfa for now, with alfalfa being a widely grown crop in Nevada. He says that although alfalfa uses a relatively large amount of water, because of its deep roots, growth duration and extend of ground cover, it is also a good candidate for the application of deficit irrigation strategies, that is, using less water than what would be considered full irrigation while trying to maintain yield and quality. His research is focused on finding new ways to increase the amount of yield obtained per unit of water used.

Last fall, Andrade-Rodriguez and students in his Water and Irrigation Management Lab planted 18 plots of alfalfa at the University's Experiment Station Valley Road Field Lab in Reno. They planted two alfalfa cultivars, one billed as drought-tolerant, ladak II, and the other billed as high-production, stratica. Nine plots of each variety were planted, three plots of each using three different watering regimes: full irrigation (100%), mild deficit irrigation (80%) and moderate deficit irrigation (60%), where 100% represents full replenishment of soil water depletion to field capacity during each irrigation.

Irrigation amounts required to implement these treatments are calculated using hourly data collected by “internet of things” (IoT)-enabled soil moisture-sensing stations and then applied with precision by a drip irrigation system. The degree of stress caused by the irrigation treatments is being monitored with infrared thermometers measuring plant canopy temperature, which is an indicator of plant stress. In addition, every two weeks, plant height and plant canopy cover (how much of the ground is being covered by the plants) are also measured, and aboveground biomass samples are collected.

Original Article: Nevada Today by Claudene Wharton

Governor Hochul Announces $53 Million for Clean Water Systems and Drinking Water Infrastructure Projects Statewide Statewide

Governor Kathy Hochul today announced that the New York State Environmental Facilities Corporation has approved more than $53 million to help nine municipalities finance their drinking water and wastewater projects. The grants, interest-free financings and low-cost financings approved by the EFC Board of Directors help provide innovative solutions for critical infrastructure projects across the state that protect or improve water quality. Of the project financings announced today, over $20 million will be allocated to plan, design and construct a regional wastewater treatment plant for the villages of Watkins Glen and Montour Falls in Schuyler County.

"By investing in clean water and drinking water infrastructure, New York is helping to protect public health, quality of life and the environment," Governor Hochul said. "We will continue to work hard to help local governments access the resources they need to complete critical water infrastructure improvement projects and lay the groundwork for growth and resiliency for generations to come."

Environmental Facilities Corporation President and CEO Joseph Rabito said, "Water infrastructure investments are tough decisions for our communities. Governor Hochul has a unique understanding of these challenges having led on these issues at every level of government. Governor Hochul's announcement today puts a premium on the partnerships that makes our communities healthier and more vibrant. Through EFC, New York State is partnering with local governments and providing grant funding for effective planning that gets shovels in the ground faster through the Engineering Planning Grant program (EPG), leading to affordable financing and completion of these critical investments."

Department of Environmental Conservation Commissioner and EFC Board Chair Basil Seggos said, "As a leader with experience serving at all levels of government, Governor Hochul understands how sustained investments through New York's robust Clean Water Infrastructure Act and Clean Water State Revolving Fund provide communities across the state with the financial flexibility to fund critical clean

water infrastructure improvements. Clean water projects help safeguard public health and the environment, keep our economy running, and create good paying jobs."

New York State Health Commissioner Dr. Howard Zucker said, "New York's aging infrastructure requires modernization in many municipalities where resources are tight. This latest funding will assist communities that are facing significant costs for addressing drinking water system upgrades and improve wastewater storage through projects that are both cost-effective and environmentally sound."

The Board's approval includes financing through the Clean Water State Revolving Fund ("CWSRF") and Drinking Water State Revolving Fund ("DWSRF") and grants pursuant to the Water Infrastructure Improvement Act (WIIA).

Original Article: New York State Governor Kathy Hochul

Climate change is destabilizing the Colorado River Basin. Where do we go from here?

In June, a portion of my neighborhood in Flagstaff, Arizona, was put on pre-evacuation notice due to a nearby wildfire. A few weeks later, storms dumped heavy rains over a burn scar from a 2019 fire that caused destructive floods through parts of town. So far, this summer has been our third-wettest monsoon season on record, a complete contrast from our two driest monsoon seasons on record in 2019 and 2020.

These extremes are just a few local examples of the havoc that climate change is causing around the world. Here in the West, we are now in uncharted territory with the first-ever shortage declaration on the Colorado River.

The U.S. Bureau of Reclamation recently confirmed the Colorado River will be operated under never-before-used shortage rules, called a “tier 1” shortage, starting in 2022.

Under the rules defined by the 2019 Drought Contingency Plan (DCP), other agreements and the river’s operating guidelines, Arizona will absorb the brunt of this shortage. About one-third less water will flow through the Central Arizona Project canal to the Phoenix and Tucson areas, primarily impacting farmers. Nevada and Mexico will also see mandatory but smaller water cuts.

Even more concerning are water supply projections for 2023 and beyond.

Bureau of Reclamation projections forecast Lake Mead could fall close to a threshold where there are no rules outlining additional water cuts to avoid a crash to dead pool — when no water can flow out of Hoover Dam. This risk of an acceleration in plummeting water levels — which also jeopardizes water levels in Lake Powell — has prompted basin state representatives to initiate meetings to discuss additional actions that might be needed if water levels in Lake Mead fall below 1,020 feet.

This unprecedented situation offers a glimpse into our future. Warming scenarios from the latest IPCC report suggest that we could exceed 2 degrees Celsius of warming around midcentury, with more than 5 degrees by the end of the century, in the absence of action to curb carbon emissions.

Why does this matter for the Colorado River? Colorado River flows are highly sensitive to warming, and aridification caused by climate change is already reducing the water flowing in the river. With each additional 1 degree Celsius (1.8 degrees Fahrenheit) of warming, the Colorado River's average flow drops by 9.3%, according to the U.S. Geological Survey. Colorado River flows could be up to one-third less than the current average within a generation, unless meaningful and immediate reductions in carbon emissions are achieved.

The outlook for the Colorado River is overwhelming. But what our future looks like is still our choice. We can, and should, choose to pursue a just transition to a basin with significantly less water. While in no way comprehensive, below are four ways to get started on that path.

Original Article: Environmental Defence Fund by Christoper Kuzdas

Oregon irrigation project to save farmers 10 billion gallons

Standing in front of pipes taller than any NBA basketball star and against the backdrop of grazing cattle with Smith Rock in the distance, Oregon Sen. Jeff Merkley kicked off the second phase of a project to pipe the canal that delivers water to Central Oregon irrigators.

"Water is really the lifeblood of our ecosystem and our economy both," said Merkley. "It's what matters when it comes down to healthy streams and lakes and drinking water. It certainly matters a hell of a lot when it comes to farming and ranching. You can't grow crops in an arid situation without a good irrigation system."

The pipes for this phase of the project are 8 1/2 feet in diameter. Some pipes in the plan will be even larger, 13 feet in diameter. Crews have already laid four miles of pipe, with three miles to go for a total of seven miles of piping.

Piping irrigation canals has long been in the works, but never so appreciated as this year. After five years of drought Central Oregon, farmers have experienced the worst water shortage on record.

The open-air canals lose 30 to 40% of their water through leakage and evaporation. Piping solves that problem.

"We're looking at 10 billion gallons of water being saved going in stream for the fish and the frog, for recreation, and for our communities," says Julie O'Shea, executive director of the Farmers Conservation Alliance.

O'Shea points out the project not only saves pumping costs for irrigators, it also generates in-conduit hydroelectric power, which districts can sell for additional revenue.

This piping project will save 30 cubic feet per second, or 10,000-acre feet. Craig Horrell, manager of the Central Oregon Irrigation District, puts the saved water in more practical terms. That 10,000-acre feet would have extended the irrigation season two to three weeks for Jefferson County farmers this year.

In fact, the North Unit Irrigation District, which serves Jefferson County, stands to gain the most from this project. With junior water rights, NUID gets last dibs at the water. COID passes the water it saves along to NUID.
Original Article: Portland Tribune by Pat Kruis

Flash floods threaten U.S. Southern states deluged by Hurricane Ida

U.S. Southern states still grappling with widespread power outages and water-logged homes after deadly Hurricane Ida faced new flash flood threats on Monday from slow-moving rain and drenching thunderstorms.
Storms capable of producing two to three inches (5-8 cm) of rain "in a pretty short period of time" were saturating New Orleans and other parts of Louisiana and Mississippi, and were expected to continue into the evening, said National Weather Service meteorologist Lara Pagano.
The states are struggling to recover after more than a week since Ida, one of the most powerful hurricanes ever to strike the U.S. Gulf Coast, tore a devastating path of destruction and crippled the New Orleans power grid.
The storm claimed at least 13 lives in Louisiana. More than 500,000 customers in the state remained without power on Monday, according to the PowerOutage.us website, which tracks power outages.
Some of that (rain) will occur over soil that is saturated by Ida, areas that are already sensitive, with any additional heavy rain problematic and leading to flash flooding," Pagano said.
The U.S. Coast Guard on Monday said it was probing nearly 350 reports of oil spills in and along the Gulf Coast in the wake of Ida.
President Joe Biden has approved disaster declarations for Louisiana, which he visited on Friday, as well as for New York and New Jersey, where he will travel on Tuesday.
The declarations qualify the states for federal assistance for repairs and rebuilding after the intense flooding that also killed dozens in the U.S. Northeast.
Original Article: Reuters by Barbara Goldberg

GLOBAL WATER NEWS

Blue bonds need new standards

For some years now, China has been working on a green finance system to fund the construction of its “ecological civilisation” and industrial restructuring. The country is now one of the world’s largest green bond markets. Blue bonds, designed to support

sustainable development of the ocean economy, are building on that success. But there are differences that need to be taken into account.

Over the past 12 months, Chinese institutions have been arriving on the blue finance scene. Last September, the Bank of China's Paris and Macau branches issued, respectively, US$500 million (3.2 billion yuan) in three-year blue bonds and US$442.5 million (3 billion yuan) in two-year blue bonds. These proceeds will fund current and future ocean-related projects in China, the UK and France, such as wastewater treatment plants, treating effluents before they are discharged into the sea, and offshore wind power. In November, the Qingdao Water Group issued 300 million yuan (US$46.4 million) of blue bond debt. Chinese institutions have now issued more blue bonds than institutions from any other market.

The country is seeing strong growth in offshore wind, marine tourism, shipbuilding, ocean chemicals and biomedicine. Those fields will require financing, and that provides the basis for a market in blue bonds. China's regulators are also involved: the China Banking and Insurance Regulatory Commission has described blue bonds as an "innovative policy tool".

But the success of blue bonds in promoting sustainable ocean economy development requires urgent clarification and improvement of the standards to be applied.

Blue bonds have always been closely associated with green bonds and are sometimes regarded as one of their subsets. The rapid growth of the green bond market and rising investor recognition has laid a good foundation for the new arrival. The blue bonds from the Qingdao Water Group and the Bank of China were issued in line with norms for green bonds.

However, the blue bonds being prepared by the Bank of Qingdao, with assistance from the World Bank's International Finance Corporation (IFC), are somewhat different. The issuer will work to a list of blue bond projects suggested by the IFC to filter and decide on recipients of investment, rather than simply looking for ocean-related projects in lists of approved green bond projects. Key criteria will be how sustainable the economic activity is, and the degree of the project's impact on the ocean environment. While those bonds have not yet been issued, their preparation has become a highlight of innovation in the Chinese sustainable finance sector this year.

Original Article: China Dialogue Ocean by Xu Nan

AP has right to divert water outside basin

Even as Telangana government has continued to find fault with Andhra Pradesh for diverting Krishna water outside the basin claiming that it was against the provisions of the Krishna Water Dispute Tribunal (KWDT) - I, the Andhra Pradesh officials maintained that the state was at liberty and well within the purview of the norms to use the water as per its needs.

Telangana has also alleged that the KRMB has failed to restrain AP from diverting water 'illegally' through 'unauthorised' projects such as Pothireddypadu head regulator, Handri Neeva Sujala Sravanti.

The issue of diversion to outside basin was also a major bone of contention between both the Telugu states at the Krishna River Management Board (KRMB) meeting held on Wednesday with Telangana accusing the board of failing to stop AP from the alleged illegal diversion.

But what do the provisions of KWDT-I say? AP officials argue that clause IV and XV of the KWDT-I final order "categorically permits" all riparian states to transfer Krishna water for its beneficial use outside the basin area, but within the permitted en-block allocations. In volume-II of its final order, KWDT-I says, "...each State shall have the right to make beneficial use of the water allocated to it in any manner it thinks proper." Clause XV says, "Nothing in the order of this Tribunal shall impair the right or power or authority of any state to regulate within its boundaries the use of water, or to enjoy the benefit of waters within that state in a manner not inconsistent with the order of this Tribunal."

"Clause XV of the KWDT-I final order declares that each riparian state to utilise its permitted water allocations in a water year in any manner it likes including outside the Krishna basin area, but without violating the provisions of the. Per clause V(c) of the KWDT-I final order, downstream AP is also given full liberty, till a new tribunal distributes the surplus water in future, to use the surplus water available in a water year in whatever manner it likes," a senior official from the water resources department explained.

The official noted that since AP is the last riparian state, using the water going waste into the sea is not a cause of water dispute between the riparian states per section 2C and 3 of the Inter-State River Water Disputes Act, 1956 (ISRWDA). "AP is at full liberty to divert Krishna River water from any location to outside the basin area provided its water use is not exceeding its permitted water allocations — about 542 TMC including evaporation loss in Srisailam reservoir — by the KWDT-1 in a deficit water year. In addition, the excess water available in a surplus water year can be fully utilised by AP," the official added.

Telengana, on the other hand, has been objecting to the diversion of water claiming that KWDT-I says that priority should be given to basin projects while equitable allocations are made for future projects. It also said that KWDT-I has not made any allocations to any project diverting Krishna water to outside basin from Srisailam.

Original Article: New Indian Express by Jayanth P

Belize Wins First Step Toward an Ocean-Friendly Restructuring

Belize struck an agreement in principle with a group of bondholders to buy back its debt at a discount -- but with an unusual, ocean-friendly twist.

Under the accord announced Friday, the Caribbean nation would purchase, redeem and cancel all of its outstanding dollar bonds, the nation's Ministry of Finance and

bondholder group said in statements. Belize has about $530 million of its so-called superbond outstanding, according to data compiled by Bloomberg.

What is unusual is the financing. The government plans to use money provided by the Nature Conservancy's blue bond financing program, which will use private capital to help refinance nations' public debt. As part of that program, Belize would enact "durable marine conservation efforts and sustainable marine-based economic activity," according the government statement.

Belize will also fund a $23.4 million endowment to support future marine conservation projects.

According to the preliminary pact, creditors who tender their bonds before the deadline will receive a cash amount equal to $550 per $1,000 of the outstanding principal of the bonds as of Sept. 1. The 2034 bonds were little changed on Friday at 39.9 cents on the U.S. dollar.

Original Article: Yahoo Finance by Sydney Maki

Heavy rains recharge groundwater levels in Hyderabad

Blessed with bountiful rains this monsoon, several areas across the city have witnessed a healthy rise in the water table for the second consecutive month in August. "The water table rose by 1.87 meters when compared with the status in July", the latest groundwater table report stated.

The Hyderabad groundwater department measures water levels from 20 locations in the city where piezometers have been places.

With regard to the cumulative rainfall, officials said that between May 1st and August 28th, Hyderabad district received 533.8mm rainfall against the normal of 467.1mm for the period. Bahadurpura, Charminar, Himayatnager, Nampally, Saidabad, Khairatabad and Marredpally have seen a rise of groundwater table etween 0.13m and 0.45m, while Tirumalagiri in Secunderabad witnessed a sharpe rise of 1.87m.

Original Article: The Times of India by Sunil Mungara

$3.7 million investment enhancing water security in WA's southern dryland agricultural areas

A $3.7 million investment by the McGowan Government in its program to expand and enhance off-farm strategic dams now means many areas in regional Western Australia are better placed to respond to the impacts that climate change and reduced rainfall are having on the State's water resources.

Winter rainfall has filled many strategic off-farm community water supply dams in the southern dryland agricultural area, including new water storage assets developed as part of the program.

With predictions of more rainfall this spring, these new water storage assets will provide additional non-potable water supplies for farmers to access as a back-up over summer.

Tommy's Dam, south of Lake Grace, has been totally refurbished and enlarged, and is now at full capacity. This dam will provide a large reliable strategic back-up water supply for local farmers.

The strategic community water supply network is also being boosted through the Community Water Supply Program, with 75 projects already delivered in partnership with 23 local governments across the region including Gnowangerup and Lake Grace.

The program has supported the development of critical additional water storage infrastructure, including a new 32.5-megalitre dam built adjacent to the Gnowangerup airstrip and the refurbishment of the Lake Biddy twin dams in Lake Grace. These twin dams are now full and will significantly boost the emergency water supplies north of Newdegate.

As part of its ongoing commitment to ensure WA farmers have access to reliable agricultural and emergency livestock drinking water sources, especially during dry periods when on-farm supplies are depleted, the McGowan Government has invested $2.2 million since June 2018 in developing and upgrading priority strategic community water supplies and government-owned water sources. A further $1.5 million has been invested in partnering with local government to upgrade and develop local community water supplies.

The Department of Water and Environmental Regulation will continue to work with local government authorities to provide water security and build resilience in farming communities in the State's dryland agricultural region.

This includes through the recently announced National Water Grid Connections projects, which will see the McGowan Government invest a further $5.25 million to refurbish and upgrade 70 agricultural area dams in the Mid-West, Wheatbelt and Great Southern regions, and to continue the development of new community supplies in partnership with local governments.

Original Article: Gov. Western Australia

Young Innovators: U of S researcher explores water economy on the Prairies

University of Saskatchewan PhD candidate Leila Eamen and her research team have developed a hydro-economic model that investigates alternative ways to allocate water resources from the Saskatchewan River Basin among the Prairie provinces to maximize economic benefits, such as a province's gross domestic product.

In Saskatchewan, where precipitation has been low and heat levels high in the summer of 2021, such a model has become extremely relevant as natural water supply dwindles.

"In the case of shared waters, estimating the impacts of water allocation decisions in one part of the region on other parts is crucial to prevent economic losses and build resilience in our communities," Eamen said.

In the Prairie provinces, where agriculture is a fundamental industry, water is an essential ingredient in the recipe for a healthy economy.

Close to 80 per cent of Canada's irrigated agriculture operations take place in Saskatchewan, Alberta and Manitoba. Although Canada is considered a water-rich country, it is important to closely manage the water supply as climate change has already begun to affect the amounts available.

For example, what would happen to the agriculture industry in Saskatchewan should Alberta provide its agricultural lands with more water from the Saskatchewan River? Eamen said her model will be able to aid in determining the answer.

The model will estimate the amount of water available in the river basin and how it should be shared among users to best support the economy. Making these determinations is a critical step to ensuring the security of water resources as supply levels change.

The model will also consider important influences in the environment that will most likely cause water shortages in the future, such as climate change and population growth.

"If water availability decreases by different percentages, for example, 10 per cent and 50 per cent as a result of climate change or socio-economic development, we can reduce the associated economic loss in GDP by up to 28 per cent and 69 per cent, respectively, by allocating water based on economic considerations rather than the existing priority-based allocation strategy in place in most parts of the Saskatchewan River Basin."

The research is unique in that it allows for a number to be calculated for the first time to represent the climate change-induced effects of water shortage on the economy. The work has been published in Ecological Economics and Science of the Total Environment; two more papers are under revision for Water Resources Research and Environmental Modelling and Software.

Developed under the supervision of Dr. Saman Razavi (PhD), associate professor in the U of S School of Environment and Sustainability (SENS), and Dr. Roy Brouwer (PhD) from the University of Waterloo, the research can inform policymakers about the impacts of water allocation on the economy and help them to make decisions that minimize economic losses and navigate trade-offs between economic, environmental and cultural considerations.

"The results of my research show that the economy of Alberta and Saskatchewan is vulnerable to water shortages that are likely (due to) climate change," said Eamen.

"The economic platform developed in this research accounts for the interconnectedness between different industries and various regions."

Although the model was developed based on the shared water resources in the Saskatchewan River Basin, its methodology can also be used in other regions.

Original Article: Saskatoon Star Phoenix by Brooke Kleiboer

Mexican miners warn of 'major delays' from environment, water rules

Mexican mining companies face "major delays" with environmental and water permits, the head of sector chamber Camimex said on Monday, as the metals sector seeks to boost operations in the one of the country's biggest industries.

Camimex President Fernando Alanis told reporters during a webcast presentation touting a new sustainability report that the delays were especially pronounced for getting the country's environment ministry Semarnat to approve environmental impact statements for mining projects.

"This is definitely an issue," said Alanis. "Specifically, with Semarnat we have major delays," he said.

He also noted significant permitting delays with government water agency CONAGUA.

According to Camimex, 18 specific mining project permits are pending before Semarnat, corresponding to projects that represent investment of nearly $2.8 billion.

Alanis said the chamber had held talks with Semarnat's deputy minister, Tonatiuh Herrera, and that more meetings were scheduled.

Mining industry executives in Mexico say Semarnat layoffs over the past couple years, part of government spending cuts under President Andres Manuel Lopez Obrador, have reduced the number of officials who can process permits.

The environment ministry and CONAGUA did not immediately respond to a request for comment.

More than 60% of Mexican mining projects backed by foreign capital, or 757 out of a total of 1,210 projects, were categorized as "delayed" in an economy ministry report from June.

Despite regulatory delays, Mexican mining investment is seen rebounding this year, helped by higher prices for minerals, with expected growth of more than 40% to reach some $5 billion compared with $3.5 billion in 2020.

Mexico is the world's biggest silver producer, accounting for nearly a quarter of global output, as well as a top ten producer of a dozen other minerals, including gold, copper and zinc.

It represents about 2.3% of the country's overall economic activity.

Original Article: Reuters by David Alire Garcia