Veles Water Weekly Report

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May 26th 2022

Authors:
Lance Coogan - CEO  
Joshua Bell - Research Analyst

research@veleswater.com
+44 20 7754 0342
Welcome to **WATERTALK**

by Joshua Bell

CLICK THE LINK BELOW

“A 2 minute technical analysis video of H2O futures”

https://vimeo.com/713980440
The new NQH2O index level of $935.45 was published on the 25th of May, up $0.07 or 0.01%. Over the past week the June contract had been trading at a premium of +$45.62-$51.62.

NQH2O is up 32.43% Year to Date.

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

June 22 982@990
July 22 1051@1064
Sept 22 932@989
Dec 22 857@940
Jun 23 1020@1070
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.

(John H Dolan, CME Market Maker)
VELES WATER WEEKLY REPORT

H2O FUTURES AND NQH2O INDEX VOLATILITY ANALYSIS

**Daily H2O Futures Volatility vs Daily NQH2O Index Volatility**

**DAILY VOLATILITY**

Over the last week the April daily future volatility high has been 0.43% on May 23rd and a low of 0% on May 24th.

<table>
<thead>
<tr>
<th>ASSET</th>
<th>1 YEAR (%)</th>
<th>2 MONTH (%)</th>
<th>1 MONTH (%)</th>
<th>1 WEEK (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NQH2O INDEX</td>
<td>21.60%</td>
<td>12.31%</td>
<td>0.33%</td>
<td>0.044%</td>
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<tr>
<td>H2O FUTURES</td>
<td>N/A</td>
<td>12.06%</td>
<td>2.92%</td>
<td>0.61%</td>
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</table>

Mixed signals for the week ending on the May 25th the two-month futures volatility is at a discount of 0.25% to the index, down 1.20% from the previous week. The one-month futures volatility is at a premium of 2.59% to the index, down 2.77% from last week. The one-week futures volatility is at a premium of 0.57% to the index, up 0.40% from the previous week.

*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 16/05/2022

<table>
<thead>
<tr>
<th>STATION</th>
<th>MTD WEEK ON WEEK CHANGE</th>
<th>% OF 20 YEAR AVERAGE MTD</th>
<th>2022 WYTD VS 2021 WYTD %</th>
<th>2022 WY VS 20 YEAR AVERAGE TO DATE %</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAN JOAQUIN 5 STATION (5SI)</td>
<td>0.05</td>
<td>2.72</td>
<td>48</td>
<td>64</td>
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<tr>
<td>TULARE 6 STATION (6SI)</td>
<td>0</td>
<td>0.00</td>
<td>36</td>
<td>59</td>
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<tr>
<td>NORTHERN SIERRA 8 STATION (8SI)</td>
<td>0.5</td>
<td>20.67</td>
<td>46</td>
<td>79</td>
</tr>
<tr>
<td>CENTRAL VALLEY AVERAGE</td>
<td>0.18</td>
<td>7.79</td>
<td>43</td>
<td>67</td>
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RESERVOIR STORAGE

<table>
<thead>
<tr>
<th>RESERVOIR</th>
<th>STORAGE (AF)</th>
<th>% CAPACITY</th>
<th>LAST YEAR % CAPACITY</th>
<th>HISTORIC ANNUAL AVERAGE CAPACITY %</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRINITY LAKE</td>
<td>744,158</td>
<td>30</td>
<td>52</td>
<td>39</td>
</tr>
<tr>
<td>SHASTA LAKE</td>
<td>1,822,707</td>
<td>40</td>
<td>45</td>
<td>48</td>
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<tr>
<td>LAKE OROVILLE</td>
<td>1,936,486</td>
<td>55</td>
<td>39</td>
<td>69</td>
</tr>
<tr>
<td>SAN LUIS RES</td>
<td>934,053</td>
<td>46</td>
<td>45</td>
<td>63</td>
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</tbody>
</table>

Reference: California Water Data Exchange
Snow Water Equivalent Dashboard

<table>
<thead>
<tr>
<th>REGION</th>
<th>*SNOWPACK WATER EQUIVALENT (INCHES)</th>
<th>WEEK ON WEEK CHANGE (INCHES)</th>
<th>% OF AVERAGE LAST YEAR</th>
<th>% OF 20 YEAR HISTORICAL AVERAGE</th>
<th>% OF HISTORICAL **APRIL 1ST BENCHMARK</th>
</tr>
</thead>
<tbody>
<tr>
<td>NORTHERN SIERRA</td>
<td>2</td>
<td>-0.90</td>
<td>6</td>
<td>21</td>
<td>7</td>
</tr>
<tr>
<td>CENTRAL SIERRA</td>
<td>1.4</td>
<td>-1.60</td>
<td>0</td>
<td>11</td>
<td>5</td>
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<tr>
<td>SOUTHERN SIERRA</td>
<td>0.3</td>
<td>-0.80</td>
<td>0</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>STATEWIDE</td>
<td>1.3</td>
<td>-1.20</td>
<td>2</td>
<td>12</td>
<td>5</td>
</tr>
</tbody>
</table>

*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.
The US Drought Monitor release their statistics with a 1-week lag to this report. Over the past week there has been 0.18% Class 1 Degradation in D4 Exceptional 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.
The satellite picture shows a frontal system hitting the Canadian Coastline around Vancouver and possibly some precipitation in the Seattle region.

But the West and Southwest are dry as it appears the weather systems coming off the Northwestern Pacific have moved in a band Northward for the summer.

There is a large weather system stretching from Houston through New York up into Eastern Canada dry Southwestern and Southerly US.

The LA area and the Southern Central Valley region will be relatively dry throughout.

There is no Monsoon activity at present and can only be expected in the next few months.

10 Day Outlook

The ridge bringing the mid-week heat looks to be out of the area on Friday allowing temperatures to drop back to near normal. The upper low over the Gulf of Alaska will strengthen Friday evening while a surface low moves towards the PacNW. This system will take a more southerly trajectory compared to Thursday/Friday's allowing for better precipitation chances for northern areas. The GFS/ECMWF both show showers arriving along the north coast sometime Friday night. The ECMWF is just slightly to the south of the GFS with the surface low, spreading precipitation a bit further across the region than the GFS. Both do agree on the surface low making landfall somewhere in the PacNW later Saturday continuing precipitation across the northern portion of the region for the rest of the weekend. Highest precipitation totals for Saturday/Sunday will be over the Smith Basin (0.25-0.60") and the crest of the Cascades (0.40-0.70") with amounts tapering off to the south. Some light precipitation may fall as far south as the central...
WESTERN WEATHER DISCUSSION

Pacific weather systems brought 2 or more inches of precipitation to the coastal ranges and windward portions of the Cascades in Oregon and Washington, with half an inch or more from northeast Oregon to northern Idaho and in eastern Montana. Less than half an inch fell in other parts of the Pacific Northwest and northern Rockies. Little to no precipitation occurred across the southern states in the West region, from California to New Mexico. Weekly temperatures averaged cooler than normal except in the Four Corners states. The hot temperatures in New Mexico continued to increase evapotranspiration and dry soils. The Calf Canyon/Hermits Peak fire exceeded 298,000 acres burned, becoming the largest wildfire in modern New Mexico history. Moderate to exceptional drought expanded in New Mexico; extreme drought expanded in Utah; moderate to extreme drought expanded in Arizona; and exceptional drought from Nevada crept southward into northwest Arizona. Further north, extreme drought was removed from Washington, while abnormal dryness and moderate to exceptional drought contracted in Oregon. The precipitation of recent months in the Pacific Northwest has helped refill some reservoirs, especially the smaller ones. But larger ones remain depleted, including Oregon’s Crescent Lake reservoir, which is 12% full, Prineville (32%), Phillips (13%), Warm Springs (18%), Owyhee (46%), Howard Prairie (16%), Emigrant (26%), and Hyatt (20%). According to USDA statistics, 89% of the topsoil moisture was short or very short in New Mexico, 47% in Utah, and 40% in Nevada, and 51% of the pasture and rangeland was in poor or very poor condition in New Mexico.

Reference:

Richard Heim, NOAA/NCEI
Tsegaye Tadesse, National Drought Mitigation Center
CALIFORNIA WATER NEWS

California bans watering ‘non-functional’ grass in some areas, strengthening drought rules

California water regulators adopted emergency drought rules Tuesday that increase conservation requirements for water suppliers throughout the state and prohibit the watering of grass that is purely decorative at businesses and in common areas of subdivisions and homeowners associations.

The regulations outlaw the use of drinking water for irrigating “non-functional” grass at commercial, industrial and institutional properties.

The ban doesn’t apply to yards at individual homes. There are also exemptions for sports fields, grassy areas where people gather, and for watering to keep trees healthy.

The State Water Resources Control Board voted to adopt the emergency drought regulations following an executive order by Gov. Gavin Newsom. The measures also require local water suppliers statewide to activate “Level 2” of their local contingency plans to prepare for a shortage of up to 20%.

“We need to activate Californians and really lean into the conservation that we’re needing to see,” said Joaquin Esquivel, chair of the state water board.

The regulations require each urban water supplier to submit an annual water supply and demand assessment. Each agency that has filed a shortage contingency plan should take steps to reduce water use to prepare for a shortage of between 10% and 20%.

Water agencies that haven’t yet turned in a contingency plan are required to take similar steps, including having a public information campaign focused on conservation and enforcing a rule limiting outdoor watering to two days a week, with limited hours before 10 a.m. or after 6 p.m. The water agencies that haven’t yet submitted a plan supply about 8% of the state’s population.

The regulations define “non-functional” turf as grass that is “solely ornamental” and not regularly used for recreational purposes or community events.

Original Article: The LA Times by Ian James

Heat wave this week will intensify fire danger for Bay Area, Northern California

A pre-Memorial Day heat wave will prime the Bay Area for another dry fire season, roasting the region’s landscape with some of the hottest weather so far in 2022 and pushing temperatures in some cities close to 100 degrees.

A month ahead of the official start of summer, high temperatures could climb 5 to 20 degrees above normal on Tuesday and Wednesday for much of the Bay Area — a pre-
VELES WATER WEEKLY REPORT

Memorial Day blast of hot weather that prompted a heat advisory for the entire Central Valley and a red flag warning for a broad swath of Northern California stretching from Vallejo to Redding.

The surge of hot air came as an ominous sign for a state entering its third summer of severe drought. A rash of fires last week across Northern California briefly forced evacuations in Solano and Mendocino counties, and a new blaze popped up Monday afternoon in Contra Costa County.

At least one local Cal Fire unit moved up its summer hiring cycle by about a month out of concern for the growing wildfire threat.

“It’s looking dire,” said Craig Clements, director of the Wildfire Interdisciplinary Research Center at San Jose State University. “But we are in a major drought, a significant drought. So that’s why the fire danger is high.”

Inland portions of the East Bay, including Discovery Bay and Livermore, could see temperatures reach into the high 90s and low 100s on Tuesday and Wednesday, said Matt Mehl, a National Weather Service meteorologist. Highs in the Santa Clara Valley are expected to top out in the high 90s, including in San Jose and Gilroy.

Temperatures should climb only into the low 80s in Oakland — still 10-12 degrees above normal — while reaching the mid-70s in San Francisco.

Parts of the Bay Area were already looking parched, even before the latest hot weather. Shrubs in the Santa Cruz mountains are the driest they’ve been in May during the nine years that researchers with the Wildfire Interdisciplinary Research Center have measured them, Clements said. The moisture content of shrubs on Blackberry Hill just above Los Gatos recently measured 80% — about 20% lower than normal for this time of year, he said.

Original Article: Mercury News by Jakob Rodgers

California threatens ‘mandatory water restrictions’ if people don’t cut back

California could face mandatory water restrictions if residents don’t use less on their own as the drought drags on and the hotter summer months approach, the state’s governor has said.

Gavin Newsom threatened the possibly of statewide mandates in a meeting with representatives from major water agencies, including those that supply Los Angeles, San Diego and the San Francisco Bay Area, according to his office. The Democratic governor has avoided issuing sweeping mandatory cuts in water use and instead favored an approach that gives local water agencies power to set rules for water use in the cities and towns they supply.

January through March is typically when most of California’s annual rain and snow falls, but this year those months were the driest in at least a century. Despite calls for...
conservation, the state’s water use went up dramatically in March – 19% compared to the same month in 2020 – and now Newsom is considering changing his approach.

“Every water agency across the state needs to take more aggressive actions to communicate about the drought emergency and implement conservation measures,” Newsom said in a statement.

Some parts of California have already imposed local water restrictions on residents. This month, the mayor of Los Angeles ordered households and businesses to restrict outdoor watering to just two days a week in an effort to conserve.

California is in its third year of drought and virtually all areas of the state are classified as either in severe or extreme drought.

Newsom last summer called on Californians to voluntarily reduce their water use by 15% by doing things like taking five-minute showers and avoiding baths, only running the washing machine and dishwasher with full loads and limiting water use for cleaning outdoor areas. But residents have fallen far short of the goal.

How soon Newsom could impose mandatory restrictions if conservation doesn’t improve wasn’t clear. He plans to meet with the water agencies again in two months, his office said. A spokesperson, Erin Mellon, said the administration would reassess conservation progress in just “a few weeks”. She didn’t offer a metric the administration would use to measure.

Original Article: The Guardian

Gov. Newsom Still Agitating for Urban Water Restrictions While Ignoring 50% State’s Water Sent to the Pacific

One year ago, May 21, 2021, the Globe reported “Facing Dry Year, CA State Water Board is Draining California Reservoirs.” And that was before the disastrous fires last year.

It is 2022 and California’s reservoirs are still being drained by state officials, and we are still facing a tough fire season.

California reservoirs were designed to provide a steady five year supply for all users, and were filled to the top in June 2019. We had 5-7 years of water in those reservoirs had the state not drained them, even in the face of a drought.

Putting a relatable number on the crisis, Central Valley farmer Kristi Diener said: “In the last 14 days, 90% of Delta inflow went to sea. It’s equal to a year’s supply of water for 1 million people. #ManMadeDrought.”

Monday, Gov. Gavin Newsom announced that unless California residents didn’t cut 15% of home/business water use, the state “could be forced to enact mandatory restrictions.”

As we Tweeted, “Says the governor who knows but ignores that urban water use in CA is less than 10%. We can’t conserve our way out of a drought until the 50% of CA water released to the ocean for environmental use is cut.”
And that is one of the biggest problems in the State of California. We can’t get elected officials to acknowledge honestly how much of and where the water is going. Instead, with the help of the media, they call for restrictions on urban water users and forced conservation. But that is about as effective as squeezing blood from a turnip.

In the Globe interview with President Trump, I told him that the first 50% of California’s water already goes out to the Pacific Ocean for fish and environmental purposes – something the Public Policy Institute of California verified in 2019: “Water in California is shared across three main sectors. Statewide, average water use is roughly 50% environmental, 40% agricultural, and 10% urban, although the percentage of water use by sector varies dramatically across regions and between wet and dry years.”

Indeed. With the building boom in California and the push for more apartments and affordable housing, where will the water come from?

As we asked in April, “How can California have a water crisis when the state borders the Pacific Ocean, and the Sierra Nevada mountain range, 400 miles north-south and 50 miles to 80 miles east–west, drains into more than 15 rivers, 6 lakes, and numerous creeks? The Sierra Nevada snowpack is the major source of water and a significant source of electric power generation in California.”

And as Ed Ring explained in his recent water Abundance article, in 2014 a supermajority of California voters, 67%, approved Proposition 1 to fund water storage projects. As of the spring of 2022 not one project has begun construction, eight years later. Meanwhile, in Southern California, a proposed desalination plant in Huntington Beach that could produce 60,000 acre feet per year of fresh water from the ocean has been held up by a mostly hostile bureaucracy and endless litigation for over twenty years.” And just last week, the California Coastal Commission voted unanimously to reject the Poseidon Water desalination plant from being built in Huntington Beach, the Globe reported.

It’s really challenging not to see some conspiracy in California’s perpetual water shortages. Why won’t the governor get involved and weigh in on the 50% of water flowing to the Pacific when the people of the state he was elected to represent are being forced to do without, and California’s farms and ranches, which feed the country, are being starved of water and dying off?

As Diener said last May, “Before our magnificent reservoir projects were built, California never had a steady and reliable supply of water. Now water is being managed as if those reserves don’t exist, by emptying the collected water from storage to the sea, rather than saving it for our routinely dry years,” Diener says. “Our water projects were designed to be managed for the long term providing a minimum five year supply, but California has now put us on track to have a man made drought crisis every time we don’t have a wet season.”

And the governor only issues edicts and ridiculous helpful home water conservation tips while ignoring the obvious issue requiring his attention: “Today, Governor Gavin
Newsom convened leaders from the state’s largest urban water suppliers, which cover two thirds of Californians, and water associations imploring them to take more aggressive actions to combat drought and better engage their customers to ensure all Californians are doing their part to save water.”

As Ed Ring asks, “why is the only significant statewide policy priority been conservation? Without Colorado River water, or unimpeded access to groundwater, or a viable snowpack, the ‘conservation’ solution is disastrous: Every household will be limited to 40 gallons per person per day, outdoor watering will be prohibited, and a million acres of farmland will be taken out of production. Is that the future Californians are prepared to accept? Because that is the course Californians are on today.”

And, as the Globe has asked many times, why isn’t urban water recycling mandatory in every urban city and county in California?

Original Article: California Globe by Katy Grimes

Has California’s Fire Season Begun?

More than half a dozen wildfires broke out across California in a 48-hour span late last week, an unsettling picture of what’s to come as temperatures warm and drought conditions worsen this summer.

On Thursday afternoon, a blaze erupted in Kern County and grew to nearly 700 acres. Another in Tahoe National Forest forced the closure of a nearby highway. A brush fire north of Vacaville prompted evacuation orders Saturday in Solano County.

As you probably know, California’s fire season traditionally peaks between July and October — and it’s only May. Yet weather officials are warning there could be even more dangerous fires before spring is over.

Today and tomorrow, gusty winds, low humidity and unseasonably hot temperatures are creating high fire risk across an inland swath of California between Redding and Sacramento. “Any fires that develop will likely spread rapidly,” said the National Weather Service office in Sacramento.

The transformation of California’s summer and autumn fire season into a year-round phenomenon is a story that’s probably become familiar. Typically, it took months of dry, warm weather after the state’s winter rains for vegetation to become parched enough to fuel massive fires. But increasingly warm temperatures and a shorter wet season are leaving the land primed for destructive fires earlier in the year.

In January, typically one of California’s wettest months, a wildfire swept through Big Sur — an event the National Weather Service called “surreal.”

This month, a blaze erupted in Laguna Niguel and destroyed 20 homes, another surprise given that humid and coastal conditions typically don’t allow fires to explode so quickly. Though California saw record rainfall in the final three months of 2021, that was followed by an unusually dry January through March. California went from 88 percent of its land being considered in extreme or exceptional drought down to 1 percent
California is about to begin the nation’s largest dam removal project. Here’s what it means for wildlife

After decades of negotiation, the largest dam-removal project in U.S. history is expected to begin in California’s far north next year. The first of four aging dams on the Klamath River, the 250-mile waterway that originates in southern Oregon’s towering Cascades and empties along the rugged Northern California coast, is on track to come down in fall 2023. Two others nearby and one across the state line will follow.

The nearly half-billion dollars needed for the joint state, tribal and corporate undertaking has been secured. The demolition plans are drafted. The contractor is in place. Final approval could come by December.

Now, among the last acts of preparation, scientists are trying to make sure the fish and wildlife that are intended to benefit from the emergence of a newly wild river will thrive. While the decision to remove the hydroelectric dams was financial, it was urged — and enabled — by those hoping to see a revival of plants and animals in the Klamath Basin. The native flora and fauna in the region are bound to prosper as algae-infested reservoirs at the dams are emptied, the flow of the river quickens and cools, and river passage swings wide open.

“At its heart, this is really a fish-restoration project,” said Mike Belchik, senior fisheries biologist for the Yurok Tribe, which has long lamented the decline of salmon on its ancestral territory in the basin. “That’s why we’re doing this.”

In one of the latest and most significant tests of how fish may fare, a team of scientists recently released thousands of juvenile salmon into the rivers and creeks upstream of the dams, areas where fish migrating up the Klamath haven’t been able to go since the dams blocked access more than a century ago.

The researchers are tracking these “experimental” salmon with the goal of learning whether more than 300 miles of waterways in the upper Klamath Basin are still navigable and fit for fish. As it stands now, fish swim upriver but are stopped at the dams, an impasse considered detrimental to their numbers.

“The landscape is a lot different now than it was,” said Mark Hereford, fish biologist at the Oregon Department of Fish and Wildlife, who is leading the study on fish passage in the Klamath Falls area of Oregon. “There are uncertainties we have about how the fish will do as they migrate through the system.”

The concerns run the gamut. Urban development has crowded out wetlands. Recently established invasive fish could prey on natives. Communities may be drawing too much water from rivers and creeks.
At stake is nothing less than the future of the cherished chinook salmon run. The fish once numbered in the hundreds of thousands in the Klamath River, making its migration the third largest salmon run on the West Coast. Only populations in the Columbia and Sacramento rivers were bigger.

Original Article: San Francisco Chronicle by Kurtis Alexander

‘Everyone loses’: Sacramento Valley struggles to survive unprecedented water cuts
Standing on the grassy plateau where water is piped onto his property, Josh Davy wished his feet were wet and his irrigation ditch full.
Three years ago, when he sank everything he had into 66 acres of irrigated pasture in Shasta County, Davy thought he’d drought-proofed his cattle operation.
He’d been banking on the Sacramento Valley’s water supply, which was guaranteed even during the deepest of droughts almost 60 years ago, when irrigation districts up and down the valley cut a deal with the federal government. Buying this land was his insurance against droughts expected to intensify with climate change.
But this spring, for the first time ever, no water is flowing through his pipes and canals or those of his neighbors: The district won’t be delivering any water to Davy or any of its roughly 800 other customers.
Without rain for rangeland grass where his cows forage in the winter, or water to irrigate his pasture, he will probably have to sell at least half the cows he’s raised for breeding and sell all of his calves a season early. Davy expects to lose money this year — more than $120,000, he guesses, and if it happens again next year, he won’t be able to pay his bills.
“I would never have bought (this land) if I had known it wasn’t going to get water. Not when you pay the price you pay for it,” he said. “If this is a one-time fluke, I’ll suck it up and be fine. But I don’t have another year in me.”
Since 1964, the water supply of the Western Sacramento Valley has been virtually guaranteed, even during critically dry years, the result of an arcane water rights system and legal agreements underlying operations of the Central Valley Project, the federal government’s massive water management system.
But as California weathers a third year of drought, conditions have grown so dry and reservoirs so low that the valley’s landowners and irrigation districts are being forced to give up more water than ever before. Now, this region, which has relied on the largest portion of federally-managed water flowing from Lake Shasta, is wrestling with what to do as its deal with the federal government no longer protects them.
All relying on the lake’s supplies will make sacrifices: Many are struggling to keep their cattle and crops. Refuges for wildlife also will have to cope with less water from Lake Shasta, endangering migratory birds. And the eggs of endangered salmon that depend on cold water released from Shasta Dam are expected to die by the millions.
For decades, water wars have pitted growers and ranchers against nature, north against south. But in this new California, where everyone is suffering, no one is guaranteed anything.

“In the end, when one person wins, everybody loses,” Davy said. “And we don’t actually solve the problem.”

This parched valley was once a land of floods, regularly inundated when the Sacramento River overflowed to turn grasslands and riverbank forests into a vast, seasonal lake. Settlers that flooded into California on the tide of the Gold Rush of 1849 staked their claims to the river’s flow with notices posted to trees in a system of “first in time, first in right.”

The river was corralled by levees, the region replumbed with drainage ditches and irrigation canals. Grasslands and swamps lush with tules turned to ranches and wheat fields, then to orchards, irrigated pasture and rice.

The federal government took over in the 1930s, when it began building the Central Valley Project’s Shasta Dam, which displaced the Winnemem Wintu people. A 20-year negotiation between water rights holders and the US Bureau of Reclamation culminated in a deal in 1964.

Original Article: Cal Matters by Rachel Becker

California to test solar panels over irrigation canals to save water, boost electricity output

As the most persistent drought conditions on record continue to grip the Southwest, a pilot project in California’s lush Central Valley looks to save water and increase energy efficiency.

The Turlock Irrigation District, the California Department of Water Resources, and university researchers are working together to build solar-panel canopies over existing canals to test and study the benefits of saving energy and water. They’ll break ground this fall on Project Nexus, which focuses on three sections of the district’s 250 miles of canals.

The district says canal water should cool the solar panels, increasing their efficiency, while the canopies will shade the water and protect it from wind, lowering evaporation while reducing aquatic growth that harms water quality.

But what works in the Central Valley is impractical in Arizona, according to water experts in that desert state, who say the costs would be too high and the savings too low.

The Turlock pilot program is expected to be completed in 2024. But a 2021 study by researchers in the University of California system concluded that if all 4,000 miles of California’s irrigation canals had solar canopies, 63 billion gallons of water could be saved from evaporation each year.
VELES WATER WEEKLY REPORT

In addition to water savings, said Brandi McKuin, a postdoctoral scholar with the University of California, Santa Cruz and one of the study authors, the panels also should enhance electricity production, possibly increasing it by 3%.

“There’s a thermal threshold on solar panels — if they become too hot, they have a decline in performance,” she said. “Because water heats up more slowly than land, we estimate there could be an increase in efficiency in solar panel electricity.”

Using the Turlock Irrigation District’s existing canals rather than purchasing land and digging new canals has both financial and ecological benefits.

“By using already disturbed land,” McKuin said, “we can avoid habitat loss, degradation, and fragmentation. So, there are tremendous benefits for biodiversity using this approach, as opposed to taking up large tracts of desert.”

Josh Weimer, the external affairs manager at the irrigation district, said that because the land value in California is high, purchasing new land would have driven up the project’s cost.

Project Nexus is the first solar canal project in the U.S., but India was the first to experiment with such panels. Since 2015, when panels were first used on a large scale in the Vadodara district of Gujarat, India, has expanded its solar canals to include a 100-megawatt project in the Narmada River Basin, which empties into the Arabian Sea on the country’s western coast.

Original Article: Gila Herald by Anna Cambell and Karen Marroquin

North Bay agencies seek $83 million to expand water recycling amid drought

Petaluma, one of the driest corners of Sonoma County during the past two years of drought, is making a multimillion-dollar advance into recycled water.

Operator of a wastewater treatment plant that serves about 65,000 people and treats about 5 million gallons of effluent a day, Petaluma is seeking grants for four projects with a total cost of $42 million.

Six other North Bay agencies — including Sonoma Water and the Sonoma Valley County Sanitation District — are proposing a dozen projects totaling $41.2 million, bringing the total to $83.2 million, as Gov. Gavin Newsom is backing water reuse as an antidote to drought.

The projects are meant to help offset already strained supplies of North Bay drinking water as California braces for longer and more severe periods of water scarcity amid the escalating climate crisis.

Through expanded treatment, new pipelines and storage facilities, the 16 projects are expected to deliver 5,364 acre feet of water per year — enough to offset potable supplies for about 32,000 people. An acre-foot is 326,000 gallons, about half the size of an Olympic swimming pool and enough for more than two households for a year.
“First and foremost is drought resistance,” said Christopher Bolt, Petaluma’s public works and utilities director. “In the face of climate change we want to make sure we can meet the community’s needs.”

Water recycling — transforming sewage through intensive treatment into water safe for irrigation of landscapes, pastures, playgrounds and crops that are eaten raw — is a high priority throughout California in the third year of a drought that experts say could last another decade.

“Recycled water is a sustainable, nearly drought-proof supply when used efficiently, and the total volume of water California recycles today could triple in the next decade,” said the 2020 California Water Resilience Portfolio, a response to Newsom’s order calling for recommendations “to enable water security for all Californians.”

California produced 728,000 acre feet of recycled water in 2020, up about 40% from 20 years ago.

The State Water Resources Control Board is currently funding $970 million in loans and grants for 12 projects that would provide about 62,000 acre feet of recycled water per year for urban and agricultural irrigation and indirect potable use through groundwater recharge.

Wastewater experts like to say all water on, in and above Earth is recycled and humans are using the same water as the dinosaurs.

Petaluma’s Ellis Creek Water Reclamation Facility commits all treated water to irrigation of parks, schools, commercial properties, golf courses and farms during dry summer months, averting it from discharge into the nearby Petaluma River. In wet months, however, a substantial amount goes into the river, which is a tidal slough from San Pablo Bay.

“We’re looking to expand and grow the water recycling system,” Bolt said. “We have a vision of zero discharge into the river year-round.”

Expansion of the distribution system and developing more storage capacity would reduce the wintertime discharge, he said.

Petaluma’s rainfall to date for this year and 2021 is well below or only an inch above the level for the other 18 communities in The Press Democrat’s weather log.

Sonoma County Supervisor David Rabbitt, a Petaluma resident, is an avid booster of recycled water.

“My mantra is you gotta use water twice,” he said. “In an ideal world we would avoid using potable water for irrigation.”

Purple pipes that carry recycled water should go under every street in newly developed areas, along with power, sewer and regular water lines, Rabbitt said.

Rabbitt has served since 2013 as chair of the North Bay Water Reuse Authority, a collaboration of 11 agencies in portions of Sonoma, Napa and Marin counties dedicated to ending discharge of treated wastewater into San Pablo Bay, largely by diverting it to urban and agricultural irrigation.
VELES WATER WEEKLY REPORT
The authority’s 350-square-mile territory faces “long-term challenges in providing reliable water supplies” with limited surface and groundwater sources and some groundwater basins “showing harmful effects on water levels and quality,” its website says.
“A warming climate will likely further stress water supplies, and recycled water is a sustainable resource that can help augment regional water supplies,” it says.
The authority’s first round of projects, started in 2012 and completed in 2020 at a cost of $104 million, is providing 3,800 acre feet per year for urban and agricultural irrigation along with 46 miles of new pipeline.
Original Article: Press Democrat by Guy Kovner

US WATER NEWS

What’s Happening with the Arizona Water Shortage Crisis
The Arizona water shortage 2021 is just the beginning of an ongoing crisis in the region, as climate change-induced droughts and heatwaves have driven water levels at Lake Mead and the Colorado River to plummet. Arizonans are now restricted on how much water they could use and the situation will not likely abate anytime soon. Who are impacted most by the water shortage and what are the policy solutions being implemented and considered?
Due to its dry desert climate, Arizona is home to some of the world’s most stunning and unique landscapes, from the Red Rock State Park and the iconic Grand Canyon. It is also where the all-important Hoover Dam is located – bordering with Nevada – where it helps control floods, provide irrigation water as well as generate hydroelectric power. But as the climate crisis continues to intensify, Arizona has been embattled with a myriad of issues, chief among them being the increasing threat of water shortage and scarcity.
Temperatures in Arizona have been steadily rising with average summer temperatures now 1.8F (1C) higher compared to 1970 levels. Over the same period, the state has recorded 6.2 more days that are above 110F (43C), which translates to significantly more ‘danger days’ where residents are more likely to succumb to heat-related health issues and deaths.
Hotter days and climates increase evaporation rates as a result, leading to water bodies and sources becoming more stressed, and threatening availability. There’s no clearer example of this phenomenon than what is currently happening at the Colorado River and its two reservoirs, Lake Mead and Lake Powell, which are the primary water supply for Arizona’s 7 million residents.
Water levels on Lake Mead, the largest reservoir in the US, is currently experiencing historic low-water levels, caused by the ongoing 20-year-long megadrought in the US West, as well as reduced snowpack in the Rocky Mountains – where it usually provides a steady supply of water as it melts. Lake Powell upstream on the Colorado River is similarly experiencing water dropping to its lowest level since it was filled in the 1960s.

These record lows prompted the first-ever Tier 1 Water Shortage declaration for the reservoirs, which has been in effect since early 2022, requiring water users including states like Nevada as well as Mexico to conserve and reduce their water consumption. But Arizona was hit hardest by the declaration with nearly one fifth of the state’s water supply being cut off. According to the Arizona Department of Water Resources (ADWR), 41% of the state’s current water supply comes from groundwater, 36% from Colorado River, 18% from in-state rivers, and 5% from reclaimed water.

But experts predict that water levels in Lake Mead will not likely recover soon amid current global warming projections and aridity. Indeed, if the reservoir drops below 895 feet, it is considered a “dead pool” condition, which will jeopardise the Hoover Dam’s ability to provide electricity – leaving nearly 1.3 million people in Arizona, California, and Nevada without power. As of May 2022, Lake Mead water levels are at 1,049 feet and declining.

So what does this mean for the people of Arizona? Based on 2017 statistics, the total statewide water use was approximately 7 million acre-feet, in which 72% was used for agricultural purposes, 22% for municipal use while the remaining 6% was used for industries. Farmers therefore will be impacted first (and most) by the ongoing water shortage declaration, forcing them to take conservation measures including fallowing land – where a portion of cropland cannot be planted for an entire season. Municipal water users are currently spared from the shortage but this could quickly change as water levels will likely continue to plummet in the next few years.

But water shortage in Arizona is also pitting small towns against fast-growing metropolitan communities. According to Kathleen Ferris, a senior research fellow with the Kyl Center for Water Policy in Arizona, water scarcity in the state has resulted in the “haves” and the “have nots,” and described the coming water competition could potentially be like the Wild West.

It’s clear the state needs to do more beyond the water restriction from the declaration. It is worth noting that despite a population increase of six million residents since 1957, Arizona has been using about the same amount of water now as they did then. While unchanged water usage rates can mostly be attributed to the economy’s transition from one that is based largely on agriculture to urban, decades of conservation efforts including the Arizona Groundwater Management Act of 1980 and year-long mandatory water conservation measures have certainly helped. Apparently, the state has also
**VELES WATER WEEKLY REPORT**

“stored nearly 3 trillion gallons of water for future use or ‘non-rainy days”, which is equivalent to serving the city of Phoenix for 30 years, according to the ADWR.

Original Article: [Earch.org by Olivia Lai](Earch.org by Olivia Lai)

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**Rate Increase Required For TUD Water Rights Acquisition**

The Tuolumne Utilities District Board of Directors will discuss a study looking at how much rates must go up to acquire PG&E infrastructure, like the Tuolumne Main Canal, Lyons Reservoir and Pinecrest Dam.

The study, put together by the outside firm Raftelis, will be reviewed at Tuesday’s TUD meeting which starts at 9am. We reported earlier that District General Manager Don Perkins announced this month that it would initially cost most residential ratepayers, on average, about $200 a year.

It equates to around $16 extra per month.

In total, the district must raise about $4.5-million, annually, in the coming years, to acquire and maintain the infrastructure.

District officials have called the acquisition of the infrastructure and related water rights a “once in a lifetime opportunity.”

Immediately after reviewing the study, the board will vote on issuing a 218 notice to ratepayers, which is a state legal requirement when raising rates.

A public hearing would then be held on July 19 at 9am to formally vote on increasing the rates, as proposed.

If approved, the new rate structure would then take effect this coming September.

Original Article: [My Motherlode by B.J Hansen](My Motherlode by B.J Hansen)

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**Water Bills in Congress, Mega Action Edition**

Congress was busy in the days leading up to the Memorial Day break.

The House Transportation and Infrastructure Committee advanced the Water Resources Development Act, a massive infrastructure and environmental restoration bill for the Army Corps of Engineers that is renewed every other year.

The Senate is working on its version, which also moved out of committee this month.

That’s not all the action in Congress. Several other water-related bills were introduced last week.

- The Water Data Act would force cabinet agencies to align their data collection standards and processes and share data. This National Water Data Framework would be supported by a federal council and an expert advisory committee. A grant program of $25 million annually over five years would bring in the expertise of non-federal groups.
• The Rio Grande Water Security Act would require the Interior secretary to convene a working group to develop a plan for managing the water resources of the Rio Grande basin.
• The Respectful Treatment of Unborn Remains Act would prohibit abortion providers from disposing of fetal remains and medical waste from an abortion in publicly owned sewer systems.
• The STREAM Act would authorize funding for water projects in the western states. The bill offers $300 million in grants for water recycling, $750 million in grants for water storage and conveyance, $150 million for desalination, and $100 million to assist disadvantaged communities with drinking water. The bill also reauthorizes a federal research program to study aquifers shared with Mexico.

Original Article: Circle of Blue by Brett Walton

Iowa's planned $125M water trail project could get a reboot
Organizers of a $125 million Iowa water recreation trail project are seeking formal permission to downsize the scope of work required under a federal grant. Why it matters: The Iowa Confluence Water Trails (ICON) proposal — one of the largest pending public projects in the area — will add amenities like boat launches and whitewater runs throughout central Iowa rivers or creeks. But some of its first pieces are expected to be delayed for years and its price tag keeps growing due in part to inflation and supply chain issues.
State of play: The project was awarded a $25 million federal grant in late 2019, largely for work along a 5-mile stretch of the Des Moines River through downtown. The first phase includes modifying a low-head dam at Scott Avenue to make it safer for recreation and constructing river access points at Prospect Park, Birdland Marina and Harriet Street.
Now organizers tell Axios they plan to ask federal officials Monday for permission to scale down the work.
Details: The revised proposal will still cover the Scott Avenue dam and a revised portion of Harriet Street, Des Moines Area Metropolitan Planning Organization (MPO) spokesperson Gunnar Olson tells Axios. The Birdland and Prospect Park pieces would be completed in 3-5 years, depending on how much money is available then, Olson says.
Catch up quick: The initial two attempts in the last year to contract the first phase failed — one resulted in no bids and another came back with a single $73 million price tag, $34 million above estimates. Des Moines Councilperson Joe Gatto, who's also a member of the MPO's executive committee, had warned earlier this year that the project's finances could unravel if a second attempt to contract out the first phase failed.
What they're saying: Gatto renewed his concern in an MPO meeting last month, telling the board that local governments are in a difficult position and unlikely to allocate more money for the project.

Maggie McClelland, ICON's director, told Axios Friday that they aren't able to estimate how much the project would cost if the revisions are accepted until the first phases are bid out again.

All the pieces are still in the plan, McClelland emphasized.

The bottom line: The water project has hit some snags but organizers assure us they won't sink Iowa's ICON.

Original Article: Axios by Jason Clayworth

Tucson may forgo some water to help keep Lake Mead level up

Arizona's second most populous city has signaled it may forgo part of its allotment of Colorado River water delivered by the Central Arizona Project aqueduct in order to help forestall a shortage declaration for Lake Mead that would trigger mandatory reductions.

The Tucson City Council included its potential willingness to take 20% less CAP water in voting Thursday to direct city officials to discuss with other jurisdictions the possible of coordinated conservation agreements to keep more water in the reservoir, which has seen its water plummet due to drought.

“We have a responsibility to protect our precious water resources and preserve our water supply. With today’s direction we are taking action to safeguard Lake Mead and Lake Powell from the threat of climate change and over-use.”

Lake Mead's surface has dropped more than 170 feet since 1983, and the lake is down to about 30% of capacity.

Tucson receives about 144,000 acre feet of CAP water annually but uses only about 100,000 and has been storing the surplus underground.

Several Indian tribes and local jurisdictions, including Phoenix, have not taken their full allocations of CAP water, and Tucson previously said it would also participate if needed, KOLD-TV reported.

Original Article: KJZZ by Associated Press

Mesa declares 'stage one' water shortage – the next steps include mandates on businesses

The city of Mesa enacted its water shortage management plan this week, citing worsening conditions on the Colorado River.

The city went to “stage one” of its plan, which does not mandate any actions, but is considered a “water watch” stage with the goal of reducing water usage in Mesa by 5%.

The city’s water resources director Chris Hassert said in a statement that Mesa’s water portfolio “remains robust,” and that residents won’t see shortages at the tap, but rather this designation is to raise awareness of the water conditions.
Mesa’s water supply comes from multiple locations including the Colorado, Salt and Verde rivers and groundwater supplies. While stage one does not have any mandatory measures, Mesa has said it will reduce water use at city facilities, limit overseeding on city landscaping, and it will launch a public awareness campaign to alert residents to water shortage conditions. “While Mesa has long prepared for these conditions, it’s imperative that we take any strain on our water sources seriously, as a city, and as responsible residents of our desert environment,” Mesa Mayor John Giles said in a statement. “The city of Mesa has been a leader in prioritizing sustainable practices, and we continue to increase water conservation efforts to reduce overall impact. In stage one, we will work with business and residents to demonstrate ways to adapt and learn to use less water.”

If conditions worsen

If water issues worsen and supplies are reduced or constrained, stage two of Mesa’s plan could impact businesses. According to the city’s plan, which was last updated in 2019, stage two includes several mandatory measures including a ban on lawn and landscape watering between 7 a.m. and 7 p.m., and eliminating the use of water features and outdoor misting systems. If the city gets to stage three, there will be restrictions on when water can be used for construction or other dust control measures, and restaurants will only be allowed to serve water when customers ask for it. Also during stage three, large commercial, industrial and institutional water customers will have to provide the city of Mesa a plan to reduce water and they’ll be required to use the latest commercially available conservation technology. Plans and annual reports will be reviewed by Mesa’s Water Department. If the city gets to a stage four water emergency, even more restrictions will be put into place and certain business users could get charged a 25% surcharge on their monthly water consumption. “While water conservation measures are currently voluntary, practical water-wise changes in lifestyle can significantly impact our community’s water future,” Mesa wrote in press release. “Water conservation and efficiency are vital to a sustainable future in the desert.”

Other municipalities around the state, including Scottsdale, are trying to encourage residents and businesses to reduce water usage during this historic drought. The city of Phoenix recently launched a grant program for businesses to get technology that would reduce water usage in buildings.

Original Article: Phoenix Business Journal by Brandon Brown
Lake Mead levels dip below 1,050 feet

Official Lake Mead water levels dropped to 1,049 feet above sea level Friday. The Southern Nevada Water Authority recently released photos that showed, for the first time, intake pipes visible above the lake’s surface.

The intake pumps provide water for the Las Vegas valley. When levels drop below 1,050 that eliminates intake pump one. The second intake pump works until levels drop to 1,000 feet above sea level. If that were to happen it’s possible there could be new water restrictions. Pump three extends two miles into the lake, which provides much of our drinking water.

Meanwhile, boaters are restricted to Hemenway Harbor’s two launch ramps. The lowering lake levels has closed the five other launch ramps at Lake Mead.

The limited launch ramps will likely lead to longer lines this summer.

“I hope every one gets along,” Boulder City resident John Johnson said. “Doesn’t do any good to get angry especially if there’s newbies go out on the lake and they take a long time. It can be frustrating.”

Memorial Day Weekend is historically an extremely popular boating weekend.

Original Article: Fox 5 Vegas by Drew Andre

2,700-foot Texas tunnel to provide 350 million more gallons of water a day

Many North Texans will soon have access to more water — hundreds of millions more gallons — thanks to a recently finished pipeline.

The Tarrant Regional Water District and the city of Dallas Water Utilities gathered for a ribbon-cutting ceremony Friday after the completion of one of the nation’s largest water supply infrastructure projects finished in Ennis.

Thanks to a 2,700-foot tunnel, the $2.3 billion, 150-mile Integrated Pipeline Project will provide two of the state’s largest water suppliers up to an additional 350 million gallons of water a day for their customers.

The pipeline is located along a separate path than Tarrant Regional Water District's existing pipelines and operates in a different electric grid.

There were a lot of organizations, governments and people that needed to come together to make this project a reality, according to Brooke Paup. She is a board member for the Texas Water Development Board and was heavily involved in the project.

"This project has been a long time coming," Paup said during the ribbon cutting.

From its inception to its completion, this pipeline took 15 years to complete.

By sharing operation and maintenance costs of the completed joint section of the pipeline, the two agencies say they will see more than $1 billion in savings over the life of the pipeline.

Original Article: WFAA by Jay Wallis
State offers $1.3B for water and sewer projects
Massachusetts cities and towns will have access to $1.3 billion in low interest loans and grants to replace aging drinking water and sewer systems. The money, which will be provided through the state’s Clean Water Revolving Trust Fund, will partially fund 183 projects by providing low-interest-rate loans and grants to fund construction, planning and asset management projects designed to improve water quality, upgrade or replace aging drinking water and sewer systems.
Energy and Environmental Affairs Secretary Beth Card said the funding will help communities “by updating their water infrastructure, investing in energy efficiency and renewable energy at treatment facilities, and addressing the problem of emerging contaminants in our drinking water.”
“These efforts make the delivery of local water resources more sustainable, reliable, and affordable,” she said in a statement.
Locally, Haverhill is getting the largest share of funding through the program with more than $84 million in low-interest loans and grants awarded through the program. The funding will be devoted to several projects, some of which are already underway, to repair sewage pumps.
The city will also be getting $7 million through the state program to help cover the cost of closing and capping the 20-acre Northern Mound landfill.
Meanwhile, Lawrence is slated to receive $6.4 million from the latest round of funding for sewer and stormwater projects, according to the state agency.
Gloucester will be getting more than $2.6 million in loans and grants for water and sewer projects at Riggs Point and Riverdale Park, MassDEP said.
The money comes from a $1 trillion infrastructure bill signed into law by President Joe Biden in November, which provides more than $50 billion for states to update drinking water and wastewater systems.
Initially, the U.S. Environmental Protection Agency will be releasing $7.4 billion in clean water funds to states, tribes and territories.
Original Article: The Salem News by Christian M. Wade

EPA, NJ announce $588M in water infrastructure spending
More than half a billion dollars in federal and state funds will go to nearly 30 water systems in New Jersey, serving about 6 million residents, or about two-thirds of the state's population, officials said Friday.
The combined federal and state funding of $588 million in low-interest loans will cover an array of projects: In Newark, the state's biggest city, some $25 million will go toward lead service line replacement; in suburban Philadelphia's Moorestown at the North Church Street Water Treatment Plant, where officials unveiled the funding on Friday,
about $20 million will cover new filters to remove radium and other toxins from water; in rural Clinton, a water system is getting almost $3 million as part of a water main extension project.

The announcement is the latest orchestrated this year by Democratic Gov. Phil Murphy’s and President Joe Biden’s administrations to retool and repair crumbling infrastructure. Vice President Kamala Harris made a stop in Newark in February to highlight the city’s efforts at removing lead pipes.

The funding includes $221 million from the Environmental Protection Agency under a 2014 law known as the Water Infrastructure Finance and Innovation Act. The remainder comes from a mix of state funding and from the sale of bonds from the New Jersey Infrastructure Bank, a state authority that finances road, water and other projects.

Environmental Protection Agency officials said the announcement demonstrated a partnership between the state and federal governments that will shore up water systems. EPA Assistant Administrator Radhika Fox also pointed to the $1 trillion bipartisan infrastructure law that Biden signed in November, though those funds are separate from the loans unveiled Friday.

Local and state officials welcomed the investment, which will be rolled out over three years, with Moorestown's Mayor Nicole Gillespie saying it was one of the largest in the town's history.

It’s not free money. The state water systems — for the most part — are on the hook for investments, but the price they're paying under the low-interest rates as part of the deal announced Friday means they'll be spending less, according to David Zimmer, executive director of the New Jersey Infrastructure Bank.

Zimmer pointed to Moorestown, which he said has a good credit rating and could get a good rate from selling their own bonds on the market. “Instead they come to our program," he said. “It’s 30% cheaper. They'd probably have to pay $23 million through us but on their own 29 million."

Original Article: My Journal Courier by Mike Catalini/Associated Press

Cooperation can mitigate water utilities’ supply risks

A new study of water supply in the North Carolina Research Triangle found that water resource agreements between water utilities can help mitigate their risks. The findings are generalizable to any place where water providers allocate regional water resources among users that face challenges in supply and demand and in affordably financing infrastructure improvements.

“We found that cooperation amongst utilities could be beneficial to both their water supply and financial needs compared to more traditional independent planning and management,” said David Gorelick, a postdoctoral research associate at the University of North Carolina, Chapel Hill, in a press release.
VELES WATER WEEKLY REPORT
The research used supercomputer allocations on the Stampede2 system of the Texas Advanced Computing Center awarded by the Extreme Science and Engineering Discovery Environment (XSEDE), which is funded by the National Science Foundation. The study was published March 2022 in Water Resources Research, a journal of the American Geophysical Union.

Simulating Resource Management
The authors started with a computational model that they developed together with regional utilities in North Carolina.

“Their participation gives us a lot of confidence that our results will be used at least to inform their behavior and to help avoid some more significant pitfalls when it comes to making big, long term, hundred-million-dollar financial decisions concerning water infrastructure, such as new reservoirs or wastewater treatment plants,” Gorelick said.

The model accurately simulates their risk management and long-term infrastructure planning decisions out until 2060.

“This work is not possible without XSEDE supercomputing resources,” said study co-author David Gold, a PhD candidate in the Department of Civil and Environmental Engineering at Cornell University.

Gold and colleagues evaluated the water supply system of the North Carolina Research Triangle of about two million residents, bounded by Chapel Hill, Durham, and Raleigh, over millions of future scenarios out to 2060. This allowed for the discovery of water management strategies that are robust to a broad set of future conditions.

“Without supercomputing capabilities, we’re flying blind in terms of how the water supply system reacts to different types of uncertainties, whether it’s population growth or changing climate,” Gold said.

“It's been expansive for us to be able to use Stampede2,” Gold added. “If we were to try to run these simulations on our desktop, it would take us over 15 years to do all the simulations that we ran using Stampede2 over just the course of a few hours.”

A utility-scale computational model of the region was thus developed using the WaterPaths stochastic simulation software, a utility planning and management tool. The risk-of-failure was evolved based on three factors: reservoir capacity dynamics that change on hydroclimatic conditions, human demands, and management decisions that combine weekly portfolio management with long-term annual infrastructure investments.

Flexible Agreements Can Be Best

“We found that cooperation is a good thing. But the type and the manner in which cooperation occurs can be very important for water utilities, and thus the water rates that all of us pay to get our water bills,” Gorelick said.

Some of the risks of inter-utility agreements include exposure to asymmetric partner growth or the inflexibility of the agreement structure itself to respond to the ups and downs of supply and demand.
VELES WATER WEEKLY REPORT

Interestingly, the authors hypothesized that more flexible agreements might benefit partners more by allowing them to adapt to changing conditions. “In fact, we found that utilities experienced more financial risk in these cases,” Gorelick said.

The study found that, with less flexible agreements, utilities are limited to mitigating their own risks. But when agreements can be updated over time, each utility is more exposed to the risks and the uncertainties of their partners.

A simple example of an agreement studied in the paper was a fixed allocation agreement, such as that for a new reservoir or wastewater treatment plant. Because municipalities and local governments in the U.S. can enact inter-local agreements, utilities can partner together and be allocated fixed allocations of storage or treatment capacity in a shared project at the outset. If one utility, for instance, pays for 20 percent of the development of that plant, they are allowed to use 20 percent of its capacity.

“Why these sorts of agreements matter, and why we wanted to test at least a couple in this study is that the agreements are widespread and very customizable from place to place,” Gorelick said.

Thus far, there have been very few research efforts to assess their performance in terms of utility supply and financial objects.

“Today, our water systems face greater challenges than ever. But we also have tools that we’ve never had before, in terms of supercomputers,” said Gold. “When we think about the challenges and uncertainties coming from population growth and changing climate, these computer resources allow us insight into the potential effects of these changes and the support to develop sustainable management strategies that can keep our water supply reliable for years to come.”

Original Article: Water World
Rethinking Water for Sustainable Development in Africa
On the eve of 22 March, 2022 which is the World Water Day, the United Nations released its first-ever assessment of water security in Africa – the study relied on 10 indicators: access to drinking water, access to sanitation, hygiene and health, water availability, efficiency of water use, water infrastructure, water quality, water governance, water disaster risks and physiography, to quantify water security in 54 African countries. Just as other reports have shown in recent years, this comprehensive assessment also unveils the dire water situation on the continent.

Categorised in five stages of water security: Emerging (a score of 0-45), Slight (45-60), Modest (60-75), Effective (75-90) and Model (90-100) – surprisingly, not a single country or subregion in Africa attained the highest level of ‘Model (90-100)’ or even the reasonably high ‘Effective (75-90)’ stages of national water security. Even though Botswana, Egypt, Gabon, Mauritius and Tunisia are the five most water-secured countries in the region, apart from Egypt, all the other 53 countries obtained scores lower than 70, making the north-African country the most water-secured on the continent.

Furthermore, the intricacies of the assessment reveals that out of the 54 African countries, only 13 achieved ‘Modest (60-75)’ levels of water security while more than a third have the lowest water security – sadly, in the last three to five years, as many as 25 countries in the region have not made any significant progress in water security. With this worrying trend, which is being exacerbated by Africa’s bulging population, economic growth and climate change, one may ask; can Africa achieve sustainable development? Obviously, the simple answer to this important question is no; it will be quite impossible to accomplish sustainable development under this current condition. In fact, water is at the core of sustainable development – As an essential resource, water plays an indispensable role in maintaining healthy ecosystems which support biodiversity. Again, by underpinning human survival, thus mitigating the baleful impact of diseases, improving health and bolstering productivity, water is crucial for advancing social and economic development.

Therefore for Africa to achieve sustainable development, it is imperative for the development community and governments across the continent to provide sustainable solutions to the challenges that impede water security in the region – adopting strategies that leverages technical expertise and technological innovations to improve water resources management – a goal that could be realized by forging cooperation with countries and organizations with proven expertise in tackling a challenge of this magnitude, that have also demonstrated genuine interest to offer immediate assistance to African countries.
VELES WATER WEEKLY REPORT

Evidently, some of these unique arrangements are already yielding desirable outcomes – there are several success stories across the African continent. For example, cooperation with China, Africa’s largest investor to improve water security in the region has been rewarding and commendable. In Southern Africa, the cooperation between Zimbabwe and China has led to the construction of 1,000 boreholes in water-deprived rural communities across the country’s six provinces. Through the China-Zimbabwe cooperation, these 1,000 boreholes which are funded by the Chinese government are improving lives as they have enhanced access to clean water in the Southern African country; local residents including children do not walk long distances to fetch water again, children no longer fetch water from distant locations when they are in school and rural residents are no more using contaminated water.

Original Article: Modern Ghana by Alexander Ayertey Odonkor

Navigating the final months of the Murray-Darling Basin Plan

As the dust settles on the Federal Election, we know we have a new Labor Government, but we don’t know if it will govern as a majority. We knew going into this election that the Murray-Darling Basin Plan would conclude in 2024, but we don’t know whether the new water minister will have the authority and appetite to review the plan.

In short, the legacy of the Murray-Darling Basin Plan is at stake. The incoming government and especially the new water minister, in partnership with the state governments, will define how Australia and the basin communities reflect on this monumental initiative.

The Murray-Darling Basin Plan was an extremely ambitious undertaking. It was designed during the final years of the Millennium Drought and agreed among the states and the commonwealth. The timing, the process to reach agreement and the science of the day greatly influenced its design — from the emphasis on gigalitres recovered, to the mix of water recovery projects and their potential to achieve their water savings targets.

At this stage, the plan’s targets are summarised as 2075GL of water recovery, 605GL from supply offset projects, and a further 450GL of upwater projects.

There is good news. In February this year the MDBA confirmed that 2106GL of water had already been recovered — beating the first of these targets. Around two-thirds of the second target — water recovery from supply offset projects — had also been secured.

As we head into the final stages of the plan, there is an estimated 605GL shortfall that’s made up of the balance of the second target, and almost all of the third target — the 450GL of upwater.

The current plan allows for the shortfall to be recovered through water buybacks, which means regional communities carry all the risk for projects that fail to achieve their targets.

And this is where the plan and its legacy begin to unravel.
VELES WATER WEEKLY REPORT

The Goulburn Murray Irrigation District Water Leadership Forum has outlined what we believe to be the best path forward for all basin interests — communities, environment, industry, and politicians at state and federal level. It’s also the most prudent financial approach given the billions of dollars already invested. The way forward is built on the simple premise that over the past decade water users, managers and regulators have seen and learned. Today we know more about what has worked, what has failed, and the unintended consequences that have emerged along the way for the environment and communities up and down the system.

Our message to an incoming government is simple. It’s time to apply these lessons, to update the tools in the plan’s water recovery toolkit, and to start measuring and evaluating the improved health of our rivers and waterways in terms of outcomes — not just gigalitres.

Original Article: Shepparton News by Linda Nieuwenhuizen

Israel Probes PFAS in Groundwater Supply, Aims to Advance Law to Minimize Exposure

So-called “forever chemicals” were found in groundwater samples taken in Israel in recent months, according to a government report released Thursday, highlighting their continued global ubiquity amid efforts to improve their regulation. Perfluorinated alkylated substances (PFAS), known for their extreme persistence in the environment and ability to accumulate in the human body, have been used widely in consumer goods and industrial applications since the 1950s. They are exceptionally widespread, having been found in the blood of more than 98 percent of Americans, as well as a majority of public wells sampled in 16 eastern states by the US Geological Survey.

Exposure to PFAS may lead to increased risk of cancer, decreased fertility, developmental delays in children, and reduced ability to fight infection, among other health issues.

In Israel, the suspected main source of PFAS pollution in the environment is firefighting foam, and the chemicals have been found in local water sources. Testing carried out by Israel’s Health Ministry between December 2021 to February 2022 found PFAS-class chemicals in 16 out of 100 drinking water drilling operations located near sites with known PFAS contamination. In one instance, an operation was shuttered after the PFAS concentrations measured were higher than the threshold adopted by the Health Ministry.

Samples retrieved over the past few months by Israel’s Environmental Protection Ministry also revealed the presence of PFAS in the industrial waste of nearly half of 13 factories surveyed, as well as nearly a third of 16 industrial wastewater treatment plants. High levels of PFAS were measured by the Water Authority in groundwater samples taken from underneath fuel tank sites, while high concentrations were also detected
VELES WATER WEEKLY REPORT

under large industrial plants, according to the report. Low concentrations were found in the vicinity of airports and landfills.

“In all OECD countries, mechanisms have been established over the past two decades in order to systematically record all chemicals, assess their risks, and manage them,” said Reut Rabi, an official with Israel’s Environmental Protection Ministry. The ministry will soon advance legislation to implement a similar mechanism in Israel, she added, “in order to minimize the danger to the public and the environment from exposure to hazardous chemicals.”

Original Article: The Algemeiner

$156.5m secured to drive a sustainable future for Australia’s irrigation regions

A $50 million Federal Government grant through the Commonwealth Cooperative Research Centres Program, together with $106.5 million from 85 partners, will support a new partnership to achieve a more productive, resilient and sustainable Murray-Darling Basin and beyond through the newly announced One Basin Cooperative Research Centre (CRC).

A collaborative partnership, the One Basin CRC, led by the University of Melbourne and including the Australian National University, Charles Sturt University, the Goyder Institute, Hort Innovation, the Murray-Darling Basin Authority, Sensand Technologies and the University of Sydney, will develop and commercialise opportunities for Australia’s irrigated agriculture and rural water industries.

One Basin CRC will create and assess new sustainable water and agricultural technologies and drive their adoption by water managers and farmers to increase agricultural production while ensuring environmental resilience and sustainability. First Nations inclusion, recognition and respect is a core element of the One Basin CRC.

The initiative aims to secure the future of Australia’s irrigation regions through the successful development, commercialisation and adoption of new business models and technologies that will respond to challenging climate events and foster effective environmental stewardship.

University of Melbourne Professor Mike Stewardson is leading the One Basin CRC as interim CEO, while CEO of the Mallee Regional Innovation Centre, Rebecca Wells, is leading the CRC’s Mallee Regional Hub based in Mildura.

Professor Stewardson said the One Basin CRC is shaped by industry and will pave the way to transform irrigation regions across Australia and internationally.

“By 2037, an estimated $4.3 billion of economic impact will be generated by innovation in water, agriculture and energy technology, enhanced forecasting and decision-making capacity, with a focus on sustainability and resilience in the face of climate change,” Professor Stewardson said.
VELES WATER WEEKLY REPORT

“Australia’s irrigation regions are the powerhouse of Australia’s agricultural sector producing 50 per cent of Australia’s agricultural profits, with the Murray-Darling Basin being the focus of two thirds of that irrigated agriculture.”

Over its ten-year term, One Basin CRC’s activities will be concentrated across four regional Basin hubs located at Loxton, Mildura, Griffith and Goondiwindi, working directly with industry, businesses, First Nations, community and government. Regionally-based research and development will support innovation and adaptation by farmers and communities, resulting in more resilient farms and diversified income streams. Regions will benefit from job growth and socio-economic improvements.

Ms Wells said research in the regions enables meaningful collaboration and engagement with our partners.

“This ensures research is fit for purpose and directly relevant to the region – that will drive greater uptake and adoption, which is essential to achieve the innovation we require for growth in both productivity and sustainability,” Ms Wells said.

Dr Wendy Craik AM, One Basin Chair-Elect said First Nations participation is an important part of the One Basin CRC.

“Involvement, recognition and respect of First Nations peoples is a core element of the One Basin CRC. With First Nations board members, two full-time convenors, and participation through Regional Hubs and research projects, the One Basin CRC partnership will further support First Nations involvement in water management,” Dr Craik said.

University of Melbourne Deputy Vice Chancellor (Research) Professor James McCluskey, welcomed the announcement.

“The University of Melbourne’s work in convening the One Basin CRC with its partners signifies our commitment and dedication to protecting one of Australia’s most important assets. In addressing this challenge through the CRC scheme, we recognise the value of collaborative, community-based research for environmental and economic sustainability in our irrigation regions,” Professor McCluskey said.

Original Article: The University of Melbourne

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