

**BAY AREA WATER SUPPLY AND CONSERVATION AGENCY
BOARD POLICY COMMITTEE MEETING**

April 8, 2016

Correspondence and media coverage of interest between March 16, 2016 and April 8, 2016

Correspondence

Date: April 6, 2016
From: Steve Ritchie, SFPUC Asst. General Manager, Water
To: SFPUC Wholesale Customers
Subject: Final Water Availability Estimate

Media Coverage

Drought:

Date: April 8, 2016
Source: San Mateo Daily Journal
Article: San Mateo County conserving more water than state

Date: April 4, 2016
Source: Sacramento Bee
Article: Drought still grips Southern California, keeping pressure on state water supplies

Date: April 4, 2016
Source: San Francisco Chronicle
Article: California statewide water restrictions still needed

Date: April 4, 2016
Source: San Jose Mercury News
Article: California water-saving rules to ease, but nobody's off the hook

Date: April 4, 2016
Source: LA Times
Article: No, California's drought isn't over. Here's why easing the drought rules would be a big mistake

Date: April 4, 2016
Source: Maven
Article: This just in...Californians Save 1.19 Million Acre-Foot of Water, Enough to Supply Nearly 6 Million People for a Year

Date: April 4, 2016
Source: San Francisco Chronicle
Article: Modern rainmakers helping fight drought

Date: April 2, 2016
Source: San Jose Mercury News
Article: California water allocation has winners, losers

Date: April 2, 2016
Source: Modesto Bee
Article: Valley's irrigation supplies range from near-normal to dismal

Date: April 1, 2016
Source: Monterey Herald
Article: Stanford study: California moving toward more extreme weather

Water Management:

Date: March 30, 2016
Source: Daily News
Article: Palo Alto moves ahead with \$25 million water facility

Date: March 29, 2016
Source: Water Deeply
Article: Can Silicon Valley Growth Be Water Smart?

Date: March 24, 2016
Source: Maven
Article: Department of Water Resources awards groundwater management grants

Date: March 23, 2016
Source: Climate Central
Article: California Snowpack Returns, But Fears Held for Future

Date: March 22, 2016
Source: KQED
Article: East Palo Alto's Economic Future Tied to Water

Date: March 21, 2016
Source: SF Gate
Article: Fight over senior water rights splashes into the Capitol

Date: March 16, 2016
Source: Water Deeply
Article: Silicon Valley Seeks Local Water Sources

Water Policy:

Date: April 2, 2016
Source: East Bay Times
Article: Contra Costa Water District's Delta deal raises eyebrows among environmentalists

Date: March 29, 2016
Source: AgNet
Article: DWR Reaches Agreement with Contra Costa Water District to Address Concerns Related to California WaterFix


Date: March 22, 2016
Source: Sacramento Bee
Article: New dispute erupts over Sacramento Delta tunnels project

Date: March 22, 2016
Source: SF Gate
Article: White House summit focuses on aggressive, new ways to save water

Date: March 22, 2016
Source: SF Chronicle
Article: Feds warn of new threats to water supplies with climate change

Date: March 22, 2016
Source: EcoWatch
Article: Big Business Steps Up to Help Solve California's Drought



TO: SFPUC Wholesale Customers 

FROM: Steven R. Ritchie, Assistant General Manager, Water

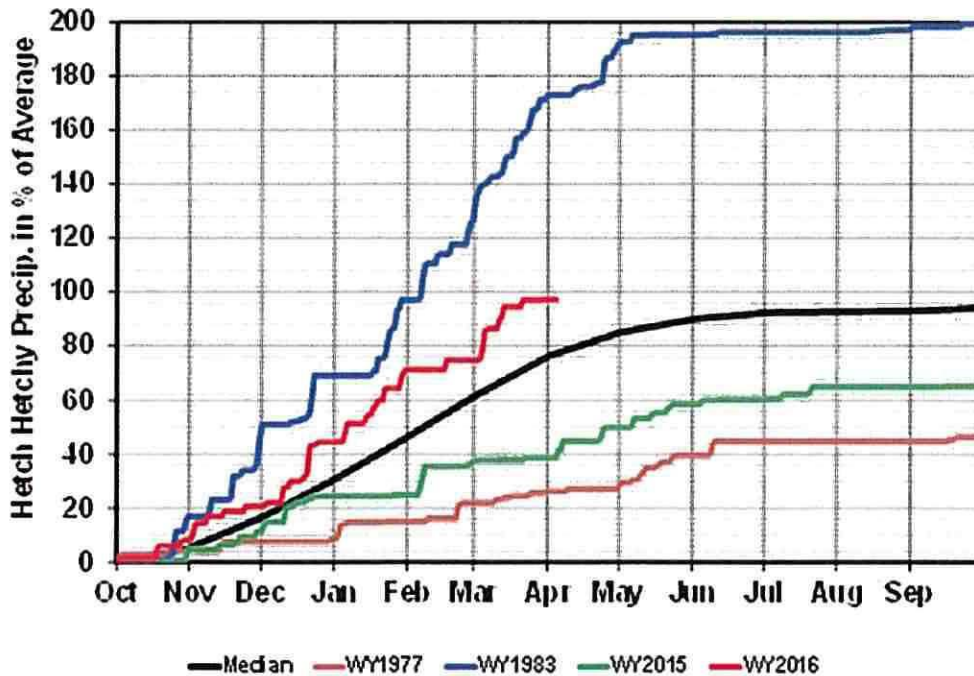
DATE: April 6, 2016

RE: Final Water Supply Availability Estimate

This memo provides an update on the water supply availability estimate provided March 7th, 2016 and the current hydrologic conditions.

March precipitation was well above normal conditions for both the Hetch Hetchy and Bay Area reservoir watersheds. Hetch Hetchy received 8.0 inches in the month of March which brings the annual precipitation at Hetch Hetchy to 115.8% of average annual to date. The plot below shows precipitation at Hetch Hetchy as of April 3rd. The Bay Area reservoir watersheds received well over average precipitation for March resulting in above average annual to date totals as presented in the table below.

Precipitation at Hetch Hetchy - Water Year 2016



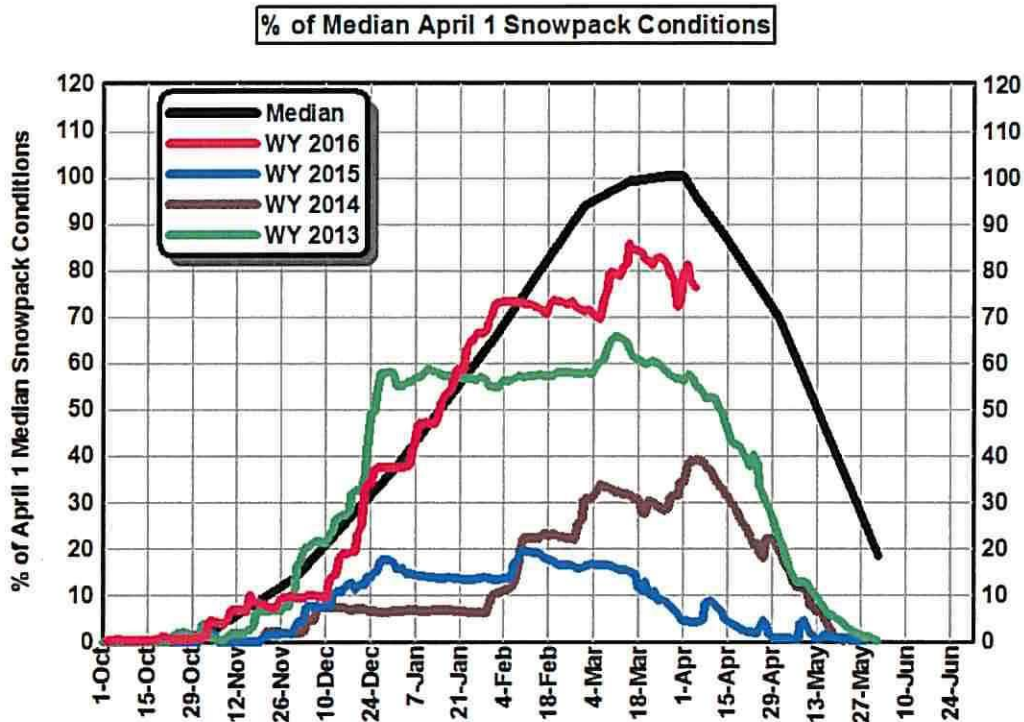
- Edwin M. Lee**
Mayor
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- Anson Moran**
Vice President
- Ann Moller Caen**
Commissioner
- Vince Courtney**
Commissioner
- Ike Kwon**
Commissioner
- Harlan L. Kelly, Jr.**
General Manager



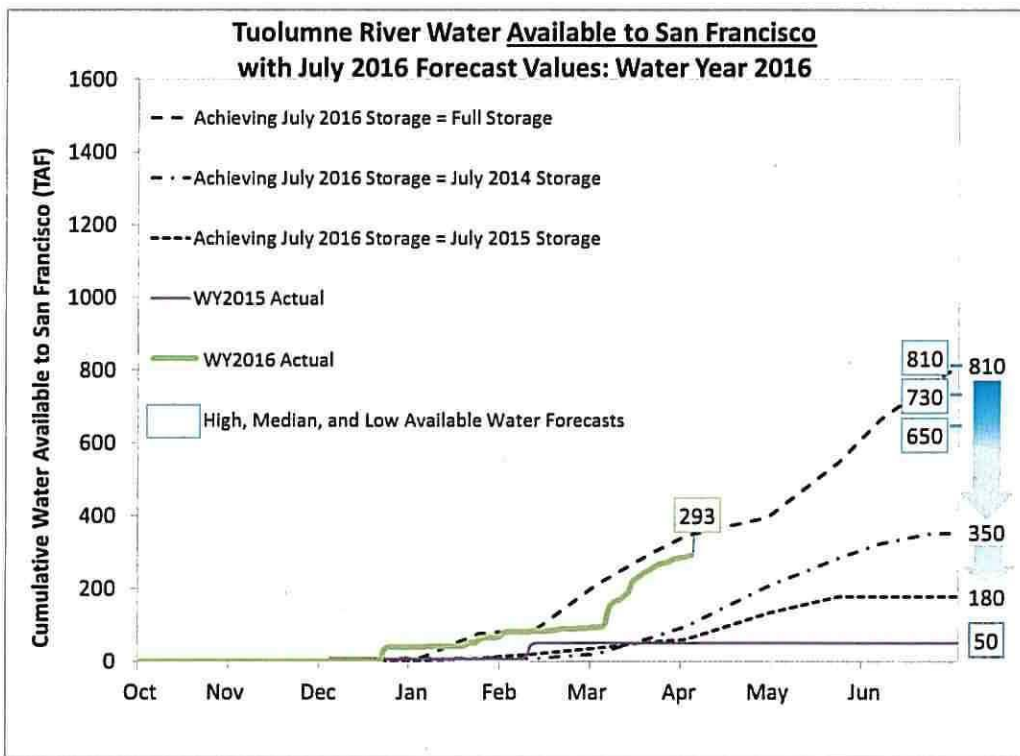
Precipitation Totals at Three Local Reservoirs for March 2016				
Reservoir	Month Total (inches)	Percentage of Average for the Month	Water Year to Date ⁷ (inches)	Percentage of Average for the Year-to-Date ⁷
Pilarcitos	12.65	231%	39.04	114 %
Lower Crystal Springs	8.60	223%	26.12	110 %
Calaveras	5.93	182%	20.08	107 %

⁷ WY 2016: Oct. 2015 through Sep. 2016.

Snowpack conditions in the Tuolumne River watershed ended the month at about 89% of median April 1st conditions as shown in the chart below.



While the storms in March did not result in pushing the snowpack to average April 1st conditions or above, they did result in high flows in the Tuolumne River basin. Inflows to the Tuolumne watershed reservoirs were 179-195% of normal for the month. This was due to warm storm events which melted lower elevation snowpack. As a result, water available to San Francisco was 284.5% of normal for the month of March. This enabled reservoir elevations to increase while also increasing storage in Water Bank. Total Tuolumne system storage is at 62.8% of maximum storage compared to last year's 55.6% of maximum storage at this time of year with water bank being 124,410 AF higher this year. The chart below shows how much water available to San Francisco is necessary to fill the Regional Water System. The chart also provides a forecast of how much water San Francisco estimates will be available under different hydrologic conditions. If wet conditions persist, San Francisco will end up with 810,000 acre-feet which will fill the system. Under median hydrologic conditions, San Francisco will end up with about 730,000 acre-feet or a RWS that is 90% full.



As a result of San Francisco's forecasts of RWS storage, San Francisco will not request further action of its customers beyond the current State Water Resources Control Board mandatory conservation requirements. As of today, it is uncertain if the State Board will relax the mandatory conservation requirements. We may provide additional recommendations after any State Board action. However, conservation savings in the SFPUC service area are paramount to refilling the RWS, thus, maintaining water deliveries at or near Calendar 2015 levels will benefit the RWS as we recover from the drought conditions and put the RWS in a better state to take on additional dry years if they follow.

As always, we encourage you to visit our website at <http://www.sfwater.org/supplyupdate> where you can find information regarding water use reductions, track water consumption, reservoir storage levels, and inflow and precipitation data.

cc.: Nicole Sandkulla, CEO/General Manager, BAWSCA

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San Mateo County conserving more water than state: Water conservation statistics show residents exceed drought mandates

San Mateo Daily Journal | April 08, 2016 | Samantha Weigel

Despite Californians falling just short of the governor's goal to save 1.24 million acre feet of water over nine months, the vast majority of San Mateo County residents overwhelmingly exceeded their conservation mandates in an effort to combat the ongoing drought.

The State Water Resources Control Board released conservation statistics between June 2015 and February 2016 this week, highlighting a statewide cumulative 23.9 percent reduction — a bit shy of Gov. Jerry Brown's 25 percent mandate.

But while some in more southern, rural or dry parts of the state were far from hitting the mark, many in the Bay Area exceeded their tiered targets that range from 8 percent to 36 percent.

Menlo Park residents remain some of the state's most thrifty users having reached a cumulative 41 percent savings — nearly 25 percent more than their mandate, making it the top Bay Area city and second in the state to exceed its requirements by the highest percentage.

Only one service area in San Mateo County missed their target — residents in California Water Service Company's Bear Gulch District, which includes large landscaped properties in Atherton, Portola Valley, Woodside, as well as parts of unincorporated Redwood City and the county. Customers were ordered to cut back 36 percent, but narrowly missed the mark by 1.3 percent. Cal Water spokeswoman Yvonne Kingman said customers are continuing to reduce and is hopeful they'll keep up the trend.

"Our customers did such a fantastic job last summer," Kingman said, noting it is harder to cut back during winter months when outdoor irrigation is already at a low. "We really want to continue to encourage them to use water wisely. ... I think different methods work for different people, certainly nothing is a one size fits all."

Cal Water encouraged Bear Gulch customers to cut back through incentive programs through which 25 rebates were issued for turf replacement projects totaling about \$20,000. Another 346 customers received rebates totaling about \$43,000 for programs such replacing appliances or devices with high-efficiency models, according to Kingman.

The county's other most notorious gulpers, those in the town of Hillsborough, were extremely successful over the last nine months.

Residents exceeded the state's highest 36 percent target by cutting back 42 percent, according to the water board. Residents in Cal Water's South San Francisco district surpassed its mandate by 12.4 percent after squeezing out a 20.4 percent reduction. They also used the least amount of water capping off at an average of just 37.5 gallons per person in February. The city of South San Francisco, along with Menlo Park, were recipients of this year's Silicon Valley Water Conservation Awards.

Nicole Sandkulla, CEO of the Bay Area Water Supply and Conservation Agency, said the entire county has done exceptionally well. BAWSCA represents the interests of 24 cities and two utilities in San Mateo, Santa Clara and Alameda counties that purchase wholesale water from the San Francisco Public Utilities Commission. Across BAWSCA's service area, customers have exceeded the governor's mandates by reducing a cumulative 26.5 percent, according to Sandkulla.

In San Mateo County, residents have saved a cumulative 25.85 percent — well in excess of what's required considering the majority of local cities and utilities fall into tiers mandating lower cutbacks ranging from 8 percent to 16 percent, according to water board data.

Better shape statewide

According to the water board, only 55 percent of suppliers met their February targets and it will host a workshop April 20 as it considers possibly changing drought mandates if snowpack and reservoir levels have significantly increased.

“March brought us much needed rain and snow after a frightening February,” water board Chair Felicia Marcus said in a press release. “We are in better shape than last year, but are still below average in most of California. We need to keep up our efforts to conserve the water we've gotten. We can better tune up and adjust our emergency rules once we see our final rain and snowpack tallies in the next few weeks.”

BAWSCA plans to recommend the board eases mandates for certain communities over the summer. Sandkulla said BAWSCA will highlight the significant water reductions locals have made and support a move away from the current gallons per person per day target toward a system based on an agency's own supply reliability. Meaning, those with reliable access to water should have less stringent mandates.

Conservation still key

But like other conservation gurus, Sandkulla emphasized customers should stick to their thrifty ways.

“Despite the recent precipitation, which has resulted in increased water storage in the reservoirs and snow in the mountains, we encourage every customer to continue their efforts to reduce water use,” Sandkulla said in an email. “Drought is a natural occurrence in California and while this year may truly be the end of this drought, it could also just be a wet year in the middle of many dry years.”

But utilities and suppliers must still make ends meet, particularly as consumption has gone down. Many San Mateo County residents could face double-digit increases in the price of water as the SFPUC has proposed raising wholesale rates by about 8 percent. The increase to those sipping from the Hetch Hetchy Reservoir will help the SFPUC pay for a \$4.8 billion systemwide upgrade and individual suppliers typically increase rates to cover maintenance costs.

Kingman said Cal Water is trying to show its customers some appreciation by easing up on penalties for those who go only slightly above their water budgets. With two tiers, those who exceed their budgets by 500 cubic feet, or approximately 3,740 gallons, will not receive any penalties. Those who use more than that will have a \$10 penalty per hundred cubic feet above their allocation, Kingman said.

Agreeing there's no firm end to the drought in sight, Kingman said water providers should do their best to instill lasting behaviors.

"We've had the drought for four years, so the one wet winter isn't going to get us out of it," Kingman said, adding the behavioral shift is needed in the state. "These droughts come around and just because we've received more rain, we don't want to stop using water wisely."

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Drought still grips Southern California, keeping pressure on state water supplies

Sacramento Bee | April 4, 2016 | Dale Kasler and Ryan Sabalow

Los Angeles — El Niño has been little more than a cruel joke in Southern California this winter.

The torrential rains haven't materialized. Groundwater aquifers have been pumped to near-historic lows. A sizable reservoir two hours east of Los Angeles, built for \$2 billion as drought insurance, is two-thirds empty, its boat launch closed.

"It's actually been a shockingly bad year," said Jeff Kightlinger, general manager of the Metropolitan Water District of Southern California, the umbrella agency that delivers water to much of the region.

Northern Californians who believe the drought is over should think again. While north state reservoirs are brimming, the meager rainfall in cities such as Los Angeles and San Diego means continued strain on California's man-made water system. Southern California, short of water but with economic and political clout to spare, will press the state to deliver plentiful water from Northern California for the near future.

That shouldn't come as a surprise. Sacramento water expert Lester Snow, former secretary of the California Natural Resources Agency, said much of the state's water infrastructure — including Sacramento Valley's second-largest reservoir — was paid for by Southern California agencies to store north state water and ship it south.

In addition, many Southern Californians resent the north for treating their water needs as somehow inferior, given the south state's enormous economic contributions.

"It's not as if you (in Northern California) have a claim on that water that is morally superior to Southern California," said Thad Kousser, a professor of political science at UC San Diego. "So let's all share."

Sharing doesn't come naturally in the contentious world of California water, and the mandatory water cuts that have hit communities such as Sacramento particularly hard have sharpened the traditional geographical schisms. The north-south tensions have put state water officials on the spot, as they wrestle with the consequences of a glass-half-empty winter that did little to alleviate drought conditions south of the Sacramento-San Joaquin Delta.

Some Northern California water agencies, which enjoy among the strongest legal water rights in the state, are calling for an end to the drought emergency and the stringent conservation orders that remain in place despite healthy precipitation in the Sacramento Valley and northern Sierra Nevada.

Meanwhile, some Southern California agencies, along with farm organizations in the San Joaquin Valley, complain that a portion of El Niño's bounty is flowing to the ocean instead of being pumped south, the result of environmental concerns over endangered fish species in the Delta. U.S. Sen. Dianne Feinstein has taken up the cry of the south-of-Delta water users, urging President Barack Obama to ramp up the pumps.

Metropolitan officials couldn't agree more. With so much water cascading through Northern California's rivers, "you should have been able to move another half-million acre-feet of water (south) in the last 60 days alone," Kightlinger said last week.

In an hourlong interview in his 12th-floor office at Metropolitan's headquarters, with its panoramic view of downtown Los Angeles, Kightlinger argued that it's in Northern California's "enlightened self-interest" to keep his region, its massive population and its powerful economic engine well-hydrated.

"If Southern California starts to falter economically, it has a ripple effect throughout the entire state," said Kightlinger, a genial lawyer who is also one of the most powerful figures in California water.

Metropolitan is a \$1.8 billion-a-year behemoth. It supplies water wholesale to 19 million residents and consumes about half of the water delivered by the State Water Project, the giant delivery system built in the early 1960s by Gov. Pat Brown, father of current Gov. Jerry Brown. Kightlinger is one of the leading proponents of Jerry Brown's controversial plan to re-engineer the system by building a pair of tunnels beneath the Delta. The idea is to improve the reliability of a delivery network that has become increasingly fragile as fish numbers in the estuary continue to plummet.

"What we don't want to do is bring more water south," Kightlinger said. "What we want to do is stabilize the system."

A land with comparatively little rainfall even in the best of times, Southern California has dealt with water shortages for much of its history – sometimes making enemies along the way. It was more than a century ago that the city of Los Angeles bought up much of the land and water rights in the Owens Valley, about 200 miles north, effectively drying up a once-prosperous farming community. The episode still reverberates in rural communities, where suspicions persist about Southern California's seemingly insatiable demands.

In the 1930s, Metropolitan built the 300-mile aqueduct to import water from the Colorado River, and Metropolitan's somewhat grudging financial support was crucial to getting the State Water Project off the ground.

In recent years, Metropolitan has taken a more diversified approach, stepping up imports when possible but also working to curb consumption. After the U.S. government took almost half of Metropolitan's Colorado River water away in 2003, giving it to Nevada and Arizona to resolve years of squabbling, Kightlinger's agency reached out to farmers of the Palo Verde Valley for help. The result was a multiyear deal in which Metropolitan pays farmers to fallow some of their land and part with their Colorado River water.

At the same time, Metropolitan has invested heavily in recycling, low-flow toilets, cash-for-grass and other measures to tamp down demand, while one of its member agencies, in San Diego, built a \$1 billion ocean-desalination plant.

And Southern California does not live on imported water alone. Roughly 35 percent to 40 percent of the region's supply typically comes from local rainfall, much of it stored in vast underground basins regulated by obscure government agencies such as the Water Replenishment District of Southern California.

Founded in 1959, the district monitors groundwater levels to ensure they are not overpumped. It also finds sources of water to replenish what's taken out by the 4 million people living in the district's 420-square-mile service area. That puts Southern California decades ahead of much of the Central Valley, where unregulated groundwater extraction has depleted aquifers to the point where portions of the valley floor are sinking.

The drought, not surprisingly, has put the Southern California groundwater agency in a bind. A rainy winter generates about 54,000 acre-feet of new water for the Water Replenishment District. Not so this year.

"We had two years in a row where we got negligible, almost zero," said district general manager Robb Whitaker. "This year ... we're at 10,000 acre-feet, and we're a month away from the end of the rainy season or less."

Since the drought started in 2011, water levels in the district's basin have dropped nearly 50 feet, a loss of 70 billion gallons. Normally the district would buy water from Metropolitan to replenish its underground reserves, but for four years Metropolitan has had little to spare. The agency is spending \$100 million on a water-recycling plant to try to ween itself from Metropolitan.

"There was so much hype about El Niño, and there was so much hope, but we didn't really see it," Whitaker said. "It makes these efforts (to recycle water) all the more relevant."

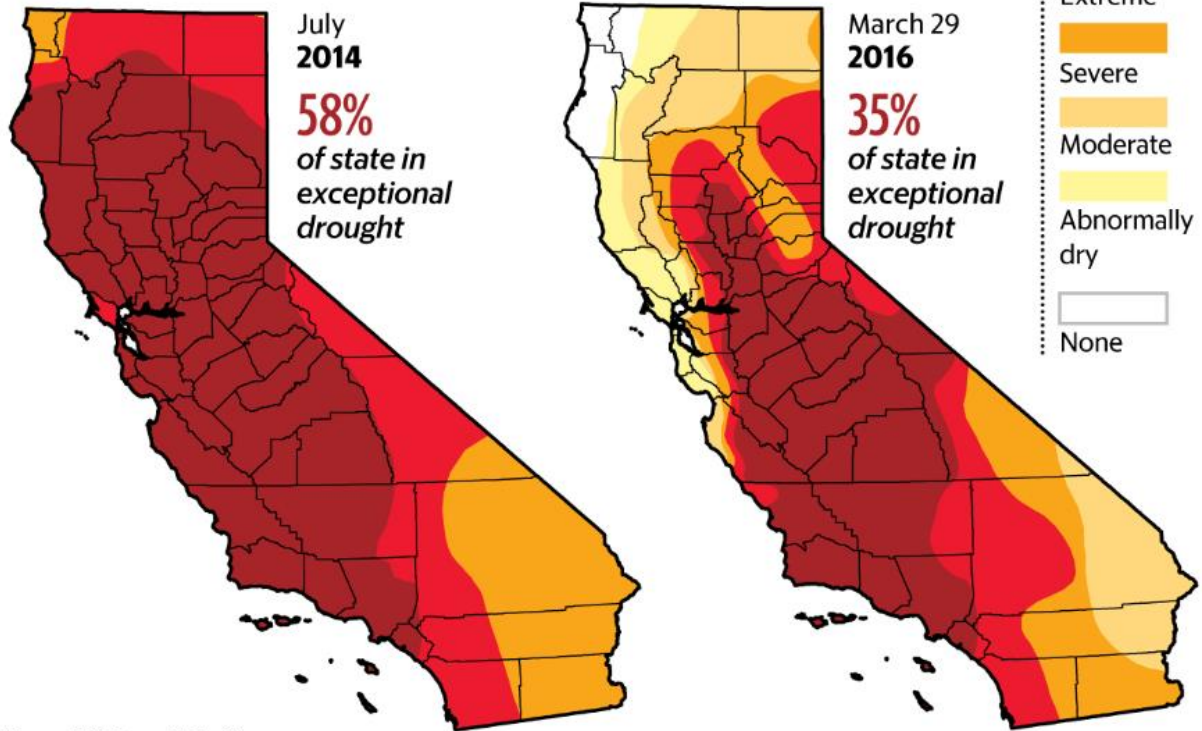
El Niño's uneven performance is one of the great ironies of the drought. Original forecasts called for heavy downpours in Southern California and so-so precipitation north of the Delta.

Instead, the reverse happened, leaving Southern California gasping.

Downtown Los Angeles has received 6.59 inches since the "water year" began in October, according to the National Weather Service. While that's almost an inch more than last year, it's less than half the historical average. Sacramento has received twice as much rain as Los Angeles.

California's drought

The effects of the drought were severe across the state in July 2014, when 58 percent of California was under exceptional drought conditions – the highest level recorded for the current drought. Since that time, conditions have eased somewhat for parts of the north state.



Source: U.S. Drought Monitor
(NOAA/U.S. Dept. of Agriculture)

NATHANIEL LEVINE nlevine@sacbee.com

But if it had to be one end of California or the other, it's been better for the state as a whole that the heavy precipitation has fallen on the north. Even as 75 percent of the demand for drinking water and irrigation lie in the south state, three-quarters of the state's reservoir capacity sits north of Fresno. The state relies on those reserves and Sierra snowmelt to buoy it through summer and fall.

The heavy rains that have fallen on Northern California have resulted in increased deliveries to Southern California through the State Water Project, which accounts for 30 percent of Metropolitan's supply. The state project is expected to deliver 45 percent of what Metropolitan and other customers have requested this year.

While that's twice as much as last year, it's well short of a full allocation.

"Like it or not, the entire state is plumbed together," said Shane Chapman, general manager of the Upper San Gabriel Valley Municipal Water District in eastern Los Angeles County. "To a degree we don't get precipitation locally, we're more dependent on imported water."

The drought's continuing impact is perhaps best viewed at one of the gems of the Metropolitan system: Diamond Valley Lake, a man-made reservoir built on a cluster of former chicken and onion farms in the Riverside County community of Hemet.

Spanning 4 1/2 miles from west to east, capable of storing 810,000 acre-feet of water, Diamond Valley doubled the region's reservoir capacity when it opened in 2000. In the past year it's become a vivid symbol of the drought.

Diamond Valley is fed entirely by the State Water Project, and multiple years of meager deliveries reduced lake levels to their lowest point ever over the winter. The reservoir's public boat launch, a massive ramp longer than two football fields, has been closed since April 2015.

Even with the recent uptick in state water deliveries, Diamond Valley has a desolate look. The water level sits 20 yards below the bottom edge of the concrete ramp.

Touring the lake on an agency pontoon boat last week, Metropolitan regional manager Glen Boyd pointed to water marks on the reservoir's inner stone walls, showing lake levels roughly 100 feet below where they'd been a few years ago.

Boyd said there's a chance the boat launch could reopen later this spring. But Metropolitan's press officer, Bob Muir, who regularly gets phone calls from fishermen eager to bring their boats to the lake, said he's unable to provide a firm answer.

"Diamond Valley Lake shows the drought is alive and well," Muir said as the boat skipped along the choppy waters. "At least in Southern California."

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California's statewide water restrictions still needed

SF Chronicle | April 4, 2016 |Melissa M. Rohde

This month marks one year since Gov. Jerry Brown sounded the alarm about the need for water restrictions. Now public officials are deciding whether to extend statewide and regional conservation measures. Ending such measures would be a poor decision for all Californians.

Northern California had above-average rainfall and snowpack this winter. Some of our state reservoirs are overflowing. But this does not mean our drought is at an end.

Groundwater has played an important role in safeguarding Californians in times of drought. The reality is that without implementing proven and practical measures to restore our groundwater reservoirs, these reserves will disappear over time.

The situation is particularly dire in Central and Southern California, which rely heavily on groundwater during dry years to meet deficits in rainfall, or surface water. Replenishing aquifers by conserving water in wet years is just as important as conserving water in drought years.

As Brown said a year ago, "The reality is the climate is getting warmer, the weather is getting more extreme and unpredictable, and we have to become more resilient, more efficient and more innovative."

Conserving water

A high efficiency sprinkler waters a drought resistant sustainable garden, including red-hot poker plants (center), in Concord, Calif. on Friday, Oct. 30, 2015. The Cowell Homeowners Association has been able to dramatically reduce its water use while maintaining its landscaping using an effective water management program.

California barely misses 25% water-savings drought goal

What we are experiencing in California and throughout the West is not only a drought in the traditional sense of the word, but a new normal. We cannot make good public policy by reading this month's weather report in isolation. Every year, California pumps out about 650 billion more gallons of water from our groundwater storage reserves than can be naturally replenished, according to the California Department of Water Resources. This is analogous to a household or business spending more than its income and savings year after year. We quickly will go bankrupt.

The good news is that the restrictions Brown ordered are starting to work. Californians conserved 388 billion gallons of water between June and February, just missing Brown's goal of 25 percent. As a result, California water agencies already are taking steps to reuse water and set regional conservation goals.

The second half of the water equation in California is replenishing aquifers so that nature and people have the water we need. Surface water and groundwater must be considered in tandem. The Sustainable Groundwater Management Act of 2014 provides an historic opportunity for local water agencies to recharge groundwater basins and restore basins to a healthy water level

by 2040 in order to prepare local communities for future water shortages. Through planning, local agencies can implement a blend of cost-effective recharge and injection projects to take advantage of the more than 500 groundwater basins in California. But there is simply not enough surface water to restore the vast amount of groundwater that has been pumped out for decades. The solution lies in sustainable management of groundwater along with efforts to recharge aquifers.

Many businesses and households have invested in conservation measures that will pay off for years to come. We should not disrupt these efforts by removing restrictions based on one wet El Niño year. It is clear that implementing water conservation and groundwater replenishment measures in one plan now will save us money and disruption later, as the longer we fail to act on the coming shortages, the more drastic the measures we will have to take in the future.

One year after Brown's announcement, Californians have made some progress toward addressing the water challenges that will continue to confront us in the years ahead. We should mark the anniversary by expanding our strategy to include groundwater to cope with this new reality.

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California water-saving rules to ease, but nobody's off the hook

San Jose Mercury | April 4, 2016 | Paul Rogers

Poised to ease California's mandatory drought rules after rebounding rain and snow levels this winter, state water officials on Monday made it clear that -- even where reservoirs are 100 percent full -- no community is likely to get an entirely free pass from conservation targets this summer.

"One average year does not mean that we can forget about saving water," said Felicia Marcus, chairwoman of the State Water Resources Control Board. "We don't want to let our guard down."

California's urban residents cut water use 23.9 percent from June through February, compared with the same period in 2013, the state board announced Monday. That's just shy of Gov. Jerry Brown's request for 25 percent savings last April when he ordered the water board to impose California's first-ever mandatory statewide drought rules, with fines for cities failing to meet assigned water-saving targets.

California might have hit Brown's 25 percent goal, if not for low levels of water savings in Los Angeles and San Diego in February. The South Coast region of the state, as the water board defines it, cut water use only 6.9 percent in February, compared with the same month in 2013. By comparison, the Bay Area cut use by 18.3 percent and the Sacramento region by 20.7 percent. Statewide, all Californians averaged 12 percent savings in February -- the lowest savings since Brown imposed mandatory restrictions.

Weather is to blame, experts said. It was hotter and drier in Southern California all winter than in the north, as El Niño storms mostly hit the northern part of the state and left the Southland with sunshine, low reservoirs and rainfall at barely half its historic average.

"There was a miserable February," Marcus said. "It was hot, and folks couldn't bear to see everything die so they turned the sprinklers on.

"I definitely would have liked more" savings, she added. "Southern California, because of its sheer size, can drive the percentages."

Nevertheless, California residents saved 1.2 million acre-feet of water during the nine-month period from June to February. That's enough for 6 million people's needs for a year, and it helped reduce the impact of the historic drought as it entered its fourth year.

Most Northern California cities, however, received 90 to 100 percent of their historic average rainfall this past winter. The state's two largest reservoirs, Shasta, near Redding, and Oroville, in Butte County, were 89 percent and 87 percent full on Monday. And the Sierra Nevada snowpack was at 81 percent of its historic average, the best in five years.

Marcus said the state water board will relax mandatory conservation targets on cities, water districts and water companies, with the biggest reductions coming in the north, where it rained and snowed most.

The board's original rules gave water providers targets, ranging from 8 percent to 36 percent, depending on how much water they were using per capita. Places like Santa Cruz and Hayward, which has among the lowest per-capita use in California, were given 8 percent targets, while communities like Bakersfield and Beverly Hills, with high per-capita use, were given 36 percent.

Those numbers were eased slightly last month, when the board allowed water providers to reduce targets by up to 8 percent if they had unusually hot weather, high rates of population growth or robust supplies of water from desalination and recycling.

Following a public hearing April 20, the water board will impose softer rules in May, Marcus said.

"Our emergency authority is something we should use judiciously," she said. "We certainly are open to adjusting those tiers for people."

But even areas that have received deluges of water this winter won't get their targets reduced to zero, she said, hinting that 4 percent might be the lowest level of conservation required. An example is the Marin Municipal Water District, where all seven reservoirs are 100 percent full.

"We may have a baseline conservation number that we ask everybody to do to keep the 'We're all in this together' attitude," Marcus said.

That was fine with many Bay Area agencies Monday.

"Our groundwater levels haven't recovered significantly for us to call it all off," said Colleen Valles, a spokeswoman for the Santa Clara Valley Water District in San Jose. The district asked every city and water company in Santa Clara County to cut water use 30 percent last year. That target will be reduced -- although how much is not yet known, Valles said -- when the agency's board makes a final call in late April or early May. It might also allow lawn watering to increase from two days a week to three, she added.

At the East Bay Municipal Utility District, where the largest reservoir, Pardee, is 99 percent full, officials are on a similar schedule and expect to relax the rules, said spokeswoman Andrea Pook. That could include boosting watering days and easing or eliminating drought surcharges and excessive use fines. The district's state target is 16 percent, and from June to February, it achieved 23.6 percent.

"You can't just let go of all this conservation at the drop of a hat," Pook said. "We do need to continue to be mindful of the situation in the context of what happens next year. We need to be prudent."

Even in Marin, where customers were asked to cut 20 percent and met that goal -- an achievement that cost the Marin Municipal Water District \$4.4 million in lost water sales last year -- some conservation is expected for this summer, said Libby Pischel, a spokeswoman for the district.

"We have a two-year supply, even when our reservoirs are full," she said. "So we always promote conservation."

At Bay Area garden centers, some people are behaving differently.

"People are talking about the drought less, for sure," said Marlon Nehls, manager of Encinal Nursery in Alameda. "They are buying a little more grass now. But people are still buying a lot of cactus and succulents."

He laughed and added, "A couple more shots of April rain would be nice."

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No, California's drought isn't over. Here's why easing the drought rules would be a big mistake

LA Times | April 4, 2016 | Michael Hiltzik

On March 23, the San Juan Water District, which serves upper-crust residential estates in the Sacramento area, declared that the drought is over.

After months of El Niño rainfall, Folsom Lake, the district's chief water source, had become so full that excess water was being released over Folsom Dam. "That was a very visible signal," says Lisa Brown, customer service manager for the district. Customers, some of whom own spreads as large as 10 acres, "wanted to know why they were still being held to drought restrictions." So the district board lifted them, replacing a 33% mandatory conservation cutback with a 10% voluntary cut and eliminating a 10% drought surcharge on water rates, effective April 1.

The abundance of water, says Assistant General Manager Keith Durkin, made it "very difficult to defend a continued 33% reduction in use."

Across Northern and Central California, brimming reservoirs and a recovering mountain snowpack are prompting water users to pressure Gov. Jerry Brown and the State Water Resources Control Board to ratchet back restrictions that have made California a national leader in conservation.

The Placer County Water Agency on March 18 asked state authorities to rescind emergency drought regulations on the grounds that its supply is "robust enough to meet demand" from its customers through 2017. The Nevada Irrigation District, east of Marysville, cited "well above average precipitation, full reservoirs and a mountain snowpack" in rescinding its own drought declaration and calling on the state to ease its restrictions.

Districts such as San Juan have taken matters into their own hands by unilaterally removing the most stringent regulations on their own customers. San Juan says its customers met their conservation obligation by reducing usage by 34% from June through February. Not all the protesting districts managed that; the Georgetown Divide Public Utility District in El Dorado County, which last month lifted a drought-inspired moratorium on new water connections, acknowledges that it was upbraided by the state board in January for failing to meet its goal.

Some Northern California reservoirs have risen above historical levels, but drought effects are still evident in Southern California

Some Northern California reservoirs have risen above historical levels, but drought effects are still evident in Southern California (DWR)

The Water Resources Board is looking for ways to ease pressure on water-rich districts without giving them a free hand. It has scheduled to consider relaxing some restrictions at a meeting in May, following a workshop at which those districts will be asked to make the case for more flexibility. "In the eyes of Placer County and San Juan the job is over," says George Kostyrko, a

spokesman for the board. But water conservation "isn't a regional or a siloed issue," he says. "It's a statewide issue."

Policymakers are getting the uneasy feeling that public impressions of newfound abundance could undo much of the progress of the last few years. "Droughts are really a matter of signals," Jeanine Jones, deputy drought manager for the California Department of Water Resources, told me. "When it has rained a lot, people get comfortable."

That would be a mistake. Experts reckon that even if 2016 represents a break from the record dry conditions of the last four years, the damage done by the drought to the state's water supply will be lasting. Long-term reserves in groundwater have been drained to the point that years, even decades, of wet weather would be required to replenish them. "We've depleted our savings account in reserves and groundwater storage," Jones says.

A more likely scenario for the future is a change in climatic conditions requiring a permanent change in water usage habits. "In the water community, people talk about a new normal, with dry conditions becoming more frequent and more lasting," says Matt Heberger, senior research associate at the Pacific Institute, an environmental think tank in Oakland.

These conditions create a quandary for policymakers, who must tread a fine line between enforcing restrictions that people may feel are no longer necessary while guiding residents, growers and businesses toward enduring changes in usage patterns. "Messaging is important," says Ellen Hanak, a water expert at the Public Policy Institute of California. "It doesn't make sense to tell people conditions are terrible when they're not, but it makes sense to tell them that the precipitation we've gotten hasn't put us in a safe spot."

The habits born in the last few years, if they take root, could produce lasting gains in water sufficiency for the future. The emergency atmosphere of the last couple of years has a lot to do with that: In the same sense that \$3-a-gallon gas starts turning people off gas-guzzling SUVs, the best weapon against water shortages in the future is a sensation of crisis today.

Since January 2014, when Gov. Brown declared a drought emergency, Californians have met the challenge. They've replaced tens of millions of square feet of turf with drought-tolerant landscaping (coaxed by hundreds of millions of dollars in utility rebates) and installed water-thrifty indoor fixtures. The results are remarkable: Statewide average residential consumption of 61 gallons a day in January was nearly 15% below the same month a year earlier. Last summer's usage was more than 23% lower than a year earlier.

Indications abound that the regional drought is far from over. The water level of Lake Mead, the reservoir behind Hoover Dam that stores Southern California's Colorado River supply, stood last week at 1,081.32 feet above sea level — a recovery of about 6 feet since it reached a recent low point in June. But that's still the lake's lowest level in any March since 1937, when it was still filling for the first time. Mead is currently at about 39% of capacity.

Although three major Northern California reservoirs — Shasta, Lake Oroville and Folsom Lake — are currently above their average historical levels, they're the exceptions, according to the Department of Water Resources.

Reservoirs in Central and Southern California remain well below their averages, with Don Pedro Reservoir in the Sierra foothills at 82% of its average and 60% of capacity, and Perris Lake in Riverside County at 43% of its average and 36% of capacity. While the snowpack is calculated at 87% of normal overall, its depth varies widely across the state — rising over recent months to roughly 100% of the average in the far north of the state, but reaching only about 75% of the average toward the south. The U.S. Drought Monitor still shows much of Southern and Central California to be facing long-term "exceptional drought."

The problem with giving some parts of the state a pass on water rules while maintaining them elsewhere is that California's water supply system binds north and south together. The long-term water crisis can only be solved as a statewide effort.

The state has begun to make changes that may well be lasting. "There will be a different-looking outdoor space 10 or 20 years from now than there was 10 or 20 years ago," Hanak says. But the mind-set producing those changes could be fragile. The message needs to be that "the fact that we're easing up doesn't mean we're out of drought mode."

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This just in ... Californians Save 1.19 Million Acre-Feet of Water, Enough to Supply Nearly 6 Million People for a Year

California Achieves 96 Percent of Statewide Conservation Goal, Narrowly Missing Governor's Nine Month Mandate

Maven | April 4, 2016 | DWR

Californians came just shy of meeting Governor Edmund G. Brown Jr.'s 25 percent water conservation mandate for the nine months since mandatory urban conservation began. Statewide cumulative savings from June 2015 to February 2016 totaled 23.9 percent compared with the same months in 2013.

"Twenty-four percent savings shows enormous effort and a recognition that everyone's effort matters," said State Water Resources Control Board Chair Felicia Marcus. "Californians rose to the occasion, reducing irrigation, fixing leaks, taking shorter showers, and saving our precious water resources in all sorts of ways."

With nearly 1.19 million acre-feet of water conserved from June 2015 through February 2016, the state achieved 96 percent of the savings goal of 1.24 million acre-feet of water. Water saved during the nine month period is enough to supply more than 5.9 million Californians for one year; this is approximately the combined population of San Diego, Riverside, and Tulare counties, or 15 percent of the state's population.

Statewide, the conservation rate dropped from 17.1 percent in January to 12 percent in February, likely because February 2016 was one of the warmest and driest Februaries since the drought began. In addition, residents generally use much less water for outdoor irrigation in the winter months, so there is less opportunity for high volume, and percentage, savings.

As the wet season draws to a close in April – and with water suppliers, residents, and businesses posing important questions about the future of water conservation in California – the State Water Board will hold a public workshop on April 20 to receive input on conservation needs through the summer. The workshop will consider adjustments to the current emergency regulations given available water supply, storage, and snowpack.

In the meantime, Californians are urged to continue applying their water conservation skills and habits through the spring months. These efforts should include complying with urban water supplier directives on when outdoor irrigation is permitted, not irrigating outdoors during and within 48 hours following a rain event, and fixing leaks that are discovered during individual water user audits.

"March brought us much needed rain and snow after a frightening February," Chair Marcus said. "It was more of a moderate March than the miracle March we hoped for, but we're grateful for every raindrop and every snowflake, and we are still hoping for more April showers. We are in better shape than last year, but are still below average in most of California. We need to keep up our efforts to conserve the water we've gotten. We can better tune up and adjust our emergency rules once we see our final rain and snowpack tallies in the next few weeks."

An updated and extended emergency regulation was adopted by the Board on Feb. 2 and took effect Feb. 11. The regulation extends restrictions on urban water use through October while providing urban water suppliers some latitude in the conservation requirements they must meet. The action follows Governor Edmund G. Brown Jr.'s Nov. 13, 2015, Executive Order directing the State Water Board to extend the emergency water conservation regulation through Oct. 31, 2016 should drought conditions persist.

February Conservation Data

- For June through February, the cumulative statewide reduction was 23.9 percent, compared to the same months in 2013. That equates to nearly 1.19 million acre-feet of water saved, putting the state 96 percent of the way to meeting the 1.24 million acre-feet savings goal set for the end of February.
- Statewide water savings for February 2016 was 12 percent (41,591 acre feet or 13.6 billion gallons), a decrease from January 2016's 17.1 percent savings. See fact sheet [here](#).
- February 2016 compliance indicates that 55 percent of suppliers met their conservation standards.
- Statewide average water use for February was 67 residential gallons per capita per day (R-GPCD), closely matching the December 2015 average but higher than January's all-time low of 61 gallons per person per day.

Enforcement

The State Water Board's Office of Enforcement continues to work with water suppliers that are not meeting their conservation standards, and with small water suppliers that have not filed their December 2015 report.

Since June 2015 the State Water Board has issued:

- 98 warning letters;
- 118 notices of violation;
- 12 conservation orders (one was rescinded due to compliance);
- Four Administrative Civil Liability Complaints (one ACL paid; three in negotiations); and
- Seven alternative compliance orders.

Background

In his April 1, 2015 Executive Order, Gov. Brown mandated a 25 percent water use reduction by users of urban water supplies across California. In May 2015, the State Water Board adopted an emergency regulation requiring an immediate 25 percent reduction in overall potable urban water use. The regulation uses a sliding scale for setting conservation standards, so that communities that have already reduced their R-GPCD through past conservation will have lower mandates than those that have not made such gains since the last major drought.

On Feb. 2, 2016, based on Gov. Brown's November 2015 Executive Order, the State Water Board approved an updated and extended emergency regulation that will continue mandatory reductions through October, unless revised before then. The extended regulation responds to calls for continuing the conservation structure that has spurred such dramatic savings so far while providing greater consideration of some factors that influence water use: climate, population growth and significant investments in new local, drought-resilient water supplies such as wastewater reuse and desalination. Under the extended regulation, statewide water conservation is expected to continue at the high levels Californians have been achieving since June 2015.

The State Water Board tracks water conservation for each of the state's larger urban water suppliers (those with more than 3,000 connections) on a monthly basis, but compliance with individual water supplier conservation requirements and the statewide 25 percent mandate is based on cumulative savings. Cumulative tracking means that conservation savings will be added together from one month to the next and compared to the amount of water used during the same months in 2013.

California has been dealing with the effects of an unprecedented drought. To learn about all the actions the state has taken to manage our water system and cope with the impacts of the drought, visit Drought.CA.Gov. Every Californian should take steps to conserve water. Find out how at SaveOurWater.com. While saving water, it is important to properly water trees. Find out how at www.saveourwater.com/trees. In addition to many effective local programs, state-funded turf removal and toilet replacement rebates are also available. Information and rebate applications can be found at: www.saveourwaterrebates.com/.

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Modern rainmakers helping fight drought

Cloud-seeding increases as districts hire pilots to wring as much water as possible from skies
San Francisco Chronicle | April 4, 2016 | By Kurtis Alexander

MODESTO — Pilots Brandon Thurston and Artie Cifarelli can see their destination even before their twin-engine Cessna leaves its Central Valley hangar: the foothills of the white-topped Sierra Nevada.

Thurston jokes that he's responsible for all the snow clinging thick to the distant peaks. But as an employee of Weather Modification Inc., which is based in North Dakota, what he says is not entirely untrue.

The two airmen have made about three dozen flights from the Modesto City-County Airport to the high country in recent months, "seeding" clouds so they'll produce more snow. The end goal is more water for drought-stricken reservoirs that provide not only for the communities of the valley, but also for the Bay Area.

"For a while, we were flying much of the night," said Thurston, 27, who left his home in Trinidad, Texas, late last year for the busy winter cloud-seeding season in the Sierra. "We were going to bed at 6 in the morning and waking up at 2 in the afternoon."

Efforts to make snow and rain virtually out of thin air were once the realm of science fiction. Even today, they're dismissed by some as fanciful and hardly worth the time. But after four historically dry years in California, the practice has been on the uptick.

The stormy skies that came with this year's El Niño provided ideal conditions for cloud seeding, which requires enough water vapor in the air so that the introduction of chemicals like silver iodide can coax the clouds to crystallize and send droplets to the ground.

From San Francisco's Hetch Hetchy watershed to the East Bay Municipal Utility District's Mokelumne River to the coastal mountains in Southern California, water managers say cloud seeding is boosting precipitation — sometimes by 10 percent or more. Many say that alongside this year's slightly wetter winter it's been essential to riding out the drought.

"Some people used to think of it as smoke and mirrors," said Jason Carkeet, a utility analyst for the Turlock Irrigation District who hired the cloud-seeding company at the Modesto airport. "But it seems to have gained more acceptance. There are fewer and fewer districts that don't have a program."

The Turlock district has partnered with the neighboring Modesto Irrigation District to seed the Sierra's Tuolumne River watershed off and on for the past 25 years. This year has been one of the most extensive efforts, Carkeet said, with the pilots on contract through April, a month longer than usual.

Benefits to users, supplier

The work benefits not only the two districts' mostly agricultural customers, officials say, but also the San Francisco Public Utilities Commission, which counts on the Tuolumne River to send water to 2.6 million people in the Bay Area.

While Turlock officials estimate conservatively that cloud seeding boosts runoff in the mountains between 2 and 3 percent, San Francisco officials say it's too difficult to pinpoint their gain.

The pilots' work is more precise. At the Modesto airport, their flights begin only after the forecast shows a cold, east-moving front approaching the Sierra.

Thurston and Cifarelli, who is 26, keep their plane loaded with flares that disperse silver iodide from the craft's wings and belly during seeding — so they're ready to fly at a moment's notice.

"We have to time it so we don't reach the area too early or too late," Thurston said.

Naturally, taking off during a storm doesn't make for the smoothest ride, but the pilots insist they've adapted to the modest amount of turbulence.

About 20 minutes into the flight, as the plane hovers above Highway 49 west of Yosemite National Park, they light one flare at a time, from switches inside the cockpit, and the real work begins, Thurston explains.

Wind does the work

For up to four hours, the flares emit a visibly orange flame as well as the crucial silver iodide mist, which serves as nuclei around which the water vapor in the clouds bonds and, hopefully, coalesces into precipitation.

"We're trying to put the snow right on the front slopes of the mountains," Thurston said. "The wind is going to do the work and carry the silver iodide in."

Clouds aren't seeded only from airplanes.

Less than 100 miles to the north, Pacific Gas and Electric Co. is running several ground-based generators to boost snowfall in the Mokelumne River watershed. The cloud-seeding machines, strategically placed on 10-foot stands, essentially burn silver iodide, similar to the airplane flares, so that it vaporizes into chilly winds during storms and helps make snow.

The effort, one of a pair of cloud-seeding programs run by the utility company, seeks to increase runoff into the river for hydropower plants downstream. Local reservoirs, like the East Bay Municipal Utility District's Pardee Reservoir, also benefit.

For the bump, the East Bay water district is paying 25 percent of PG&E's operating costs.

"We've had quite a few seeding opportunities up here this year," said Ken Ericsson, senior meteorologist for PG&E, noting that storms during this year's El Niño enabled them to seed, increasing snowpack an estimated 6 percent.

PG&E's program costs a couple of hundred thousand dollars annually — the company declined to provide a specific amount — not much different than the \$165,000 tab of the Turlock and Modesto irrigation districts. The sums are relatively small for the big agencies, and well worth the price, they say.

While the science of cloud seeding is real — silver iodide, in the lab, prompts water vapor to crystallize — critics of the practice say it's tough to know exactly how effective it is in the field. Measuring how much more rain and snow a cloud produces when chemicals are introduced is virtually impossible.

“Cloud seeding is not going to solve the drought, I don't think ... (but) it can augment cold-water supplies,” said Maury Roos, chief hydrologist at the California Department of Water Resources. “It's a matter of how much you're paying for what you get out of it.”

About a dozen cloud-seeding programs are operating in the state, Roos said, with many in high gear this year to capitalize on the wet El Niño weather.

Another concern about the practice is the chemicals it uses. Silver iodide can be toxic to fish and even humans, though experts say not at the relatively small levels used for cloud seeding.

Overcoming suspicions

While the technology hasn't changed much since its advent in the 1940s — when author Kurt Vonnegut's brother, Bernard Vonnegut, reportedly helped discover silver iodide's potential — its safety has been tested more in recent decades.

Several surveys in the Sierra found no trace metals above background levels in watersheds where cloud seeding had occurred.

Fray Crease, water agency manager for Santa Barbara County, said the criticism she hears most about her county's cloud-seeding program is that it's part of the purported “chem-trail” agenda.

The conspiratorial fear is that the planes used to enhance precipitation are actually among a larger government fleet of aircraft that disperse subversive chemicals for dark purposes onto an unsuspecting population.

“Cloud seeding has proven to be safe and effective. ... It's one of our more effective water supplies,” Crease said, citing studies that suggest the practice has increased rainfall in the mountains above Santa Barbara between 9 and 21 percent.

“Still,” she said, “that doesn't always allay people's perceptions.”

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California water allocation has winners, losers

San Jose Mercury News | April 2, 2016 | Paul Rogers

In the latest sign of California's improving drought picture, federal officials announced Friday that South Bay cities will receive 55 percent of their contracted water amounts this summer -- up from 25 percent last year -- from the Central Valley Project, California's largest water delivery system.

Heavy rains in March boosted the amount of water in Northern California's large reservoirs such as Shasta and Folsom, allowing farmers in the Sacramento Valley and wildlife refuges to receive 100 percent of their contracted amounts, while the Contra Costa Water District also will receive 100 percent, up from 25 percent a year ago.

Friday's allocations were the highest since 2013 overall across the state. But some San Joaquin Valley farmers will receive only 5 percent of contracted amounts -- barely up from zero last year.

Officials at the U.S. Bureau of Reclamation, which oversees the Central Valley Project, say that's because the rain and snow this winter fell mostly in Northern California. Also, they noted, because it came in March, when endangered salmon and smelt were near massive pumps at Tracy, that limited the amount under federal law that they could pump south into San Luis Reservoir near Los Banos.

"The news today is primarily good news for many of our water users. But the ones who are still impacted are being hit hard," said Shane Hunt, a bureau spokesman.

Some agricultural leaders lashed out at the way the bureau has interpreted the federal Endangered Species Act.

"We prayed for rain and Mother Nature blessed us. We begged for a water supply and instead are handed a pittance that is destroying farms, jobs and communities," said Jason Peltier, executive director of the San Luis & Delta-Mendota Water Authority, whose members irrigate 1.2 million acres of farmland in the San Joaquin Valley.

"The faith we once had in the government to intelligently manage our public water resources has also, sadly, been destroyed," Peltier added.

The low delivery amounts did not affect all farmers in the San Joaquin Valley. Some with more senior water rights will receive 100 percent of their contracted amounts.

The federal Central Valley Project -- which was constructed starting in the 1930s and moves water from Shasta Lake to Bakersfield through a vast array of dams, canals and pumps -- provides about 80 percent of its water to farms. In dry years, however, cities receive priority over farms.

Friday's news brought smiles to the faces of Bay Area water leaders who have contracts for the federal water.

"This is good news," said Colleen Valles, a spokeswoman for the Santa Clara Valley Water District, which serves 1.9 million people. "It's more than we got last year, and that will definitely help us recharge our aquifers and manage supply."

Since last year, the water district has asked all cities and private water companies in Santa Clara County to reduce demand by 30 percent from 2013 levels. A key reason is that Central Valley Project water makes up about 25 percent of the district's supply, but last year, the district received only a quarter of its contracted amount.

In May, water district officials are expected to relax their conservation targets, though some may remain.

Similarly pleased Friday were officials at the Contra Costa Water District, which receives 85 percent of its water via the Sacramento-San Joaquin River Delta from Central Valley Project contracts. The district serves 550,000 people in central and eastern Contra Costa County.

"A 100 percent allocation means that we will certainly be able to meet customer demands," said district spokeswoman Jennifer Allen.

Other urban areas that will receive 100 percent allocations are north of the Delta, including Sacramento, Roseville and Redding.

She noted that full deliveries this summer will allow the agency to raise Los Vaqueros Reservoir, its largest, which now sits at 51 percent full, to at least 70 percent full. It also means that the district will ease water restrictions on residents in the coming months, she said, after state water board officials change mandatory conservation targets across the state on May 3.

Other major water agencies around the Bay Area receive no Central Valley Project water. Customers in San Francisco and parts of the Peninsula and South Bay, for example, get water from the Hetch Hetchy system.

For the 1.4 million people served by the East Bay Municipal Utility District, the federal water represents a small percentage of overall supply.

#

Valley's irrigation supplies range from near-normal to dismal

Modesto Bee | April 2, 2016 | John Holland

The 2016 irrigation season is rolling out on these warm April days with close-to-normal supplies in parts of the Northern San Joaquin Valley.

In other parts, the drought of the past few years has not eased much, and farmers face another year of scraping by.

El Niño, an ocean-warming phenomenon that sometimes brings heavy storms to California, did just that on several occasions over the winter. It just didn't happen often enough, or in all of the places needing relief.

"El Niño has really not pulled us out of the drought by any means," said Walt Ward, water resources manager for Stanislaus County, at a meeting Wednesday. "It's better than where we were, but we still have a long way to go."

Here's a rundown for the main irrigation districts in the region:

- The Oakdale and South San Joaquin irrigation districts, which share reservoirs on the Stanislaus River, are in relatively good shape. SSJID farmers can use up to 40 vertical inches of water over a season that will run through September, up from 36 inches last year and an ample amount for most crops. OID delivered up to 44 inches last year and will let growers use whatever is reasonable for their crop needs in 2016.
- The Modesto and Turlock irrigation districts each set a 36-inch allotment from the Tuolumne River. That is doubled from last year but still short of the 48 inches in years of ample rain and snow.
- The Merced Irrigation District delivered virtually zero water in 2015. This year, it will provide up to 48 inches for most farmers and 24 inches for those in a newer service area south of Merced.
- On the West Side, there is pain and plenty for districts getting water from the federal Central Valley Project. It announced Friday that it will provide just 5 percent of the contracted amount to some customers while allotting 100 percent to four districts with senior water rights.

Daniel Bays, part of the third generation of a farming family near Westley, is among those with low surface water supplies. Some comes from the Del Puerto Water District, which is getting 5 percent of its federal contract. The rest is from the Patterson and West Stanislaus irrigation districts, which are doing better but still short of what it takes to grow crops.

Bays said he will have to rely once again on groundwater to sustain the 2,000 or so acres of apricots, almonds, walnuts, tomatoes, lima beans and cantaloupes.

"A lot of our wells go down 400 or 500 feet, so that's a long way to lift that water up," he said. Bays, like many farmers, uses drip lines and microsprinklers in place of the less-efficient flood and furrow irrigation of old.

Bays serves on the Stanislaus County Water Advisory Committee, which held the meeting where Ward spoke about the irrigation season outlook.

Ward said overall precipitation was 111 percent of average this winter in the central Sierra Nevada, the main watershed for the north Valley, but the snowpack fell a little short. Reservoirs have risen but are still low for this time of year.

The upshot, Ward said: "Groundwater is going to remain a very important supply source to everybody."

The committee's main task is a 2014 state law that requires local entities to draft plans for making groundwater use sustainable over the next quarter-century. That could happen through a combination of reduced water use and recharge of aquifers with stormwater, well-timed flood irrigation and other efforts.

The allotments announced Friday by the U.S. Bureau of Reclamation were based in part on end-of-winter storage in federal reservoirs and measurements of snowpacks that will melt mainly through July.

The numbers are stronger for the Sacramento Valley than for the southern part of the system, including New Melones Reservoir. It will provide water to OID and SSJID, which have senior rights, but not much to federal contractors. San Luis Reservoir, shared by the federal system and State Water Project, also is at less than average.

"While we are on track for a near-average precipitation season this year, the ongoing and residual impacts of the multiyear drought continue," said David Murillo, director of the bureau's Mid-Pacific Region, in a news release.

The districts getting just 5 percent allotments suffer not just from drought, but from pumping limits aimed at protecting fish in the Sacramento-San Joaquin Delta.

Despite this, four districts are getting 100 percent of their contracted water because of rights to the San Joaquin River that predate the federal system. The largest is the Central California Irrigation District, which serves about 143,000 acres between Crows Landing and Mendota.

Del Puerto, which covers about 45,000 acres from Vernalis to Santa Nella, has a long-term plan for meeting a third of its demand with non-federal water. It is arranging to take the highly treated effluent from sewage treatment plants in Modesto and Turlock, perhaps by 2018.

Bays said irrigation districts have helped also by allowing farmers to use canals to transfer groundwater among themselves, as long as it is not too tainted by boron, selenium and other naturally occurring substances. His family also has fallowed about 200 acres with annual crops or with trees near the end of their productive life.

"We're farmers," Bays said. "That's what we do – survive and keep going."

###

Stanford study: California moving toward more extreme weather

Monterey Herald | April 1, 2016 | Laurel Hamers

STANFORD >> Stanford researchers who studied trends in the atmospheric circulation patterns that affect California's rainfall have found that conditions linked to the hot, dry weather during our latest drought have become more frequent in recent years, according to research published Friday.

That means that while this year's El Niño-driven storms may have brought temporary relief to the Golden State's parched soil and depleted reservoirs, Californians can expect more frequent droughts in the decades to come, said the study published by Science Advances.

It's a finding obscured by focusing solely on the state's precipitation, which has remained mostly steady over time. California is trending toward more extreme weather, bringing new challenges for managing our water supply. Even with an increased chance of drought, the weather patterns that trigger exceptionally wet weather also are persisting.

The researchers examined the "Ridiculously Resilient Ridge" — a persistent area of high atmospheric pressure sitting over the north Pacific Ocean. The ridge can divert the path of storms destined for the west coast, like a boulder in a stream forces water to move around it.

"We have a pretty narrow rainy season — really only a handful of months to see all of our annual precipitation," says Daniel Swain, a Stanford University researcher on the study. This ridge can seriously throw off the year's rainfall total if it sits off the coast at the wrong time of year, Swain said, which has been the case during the past few drought-stricken years.

Swain's analysis found that the atmospheric conditions that lead to ridging have become more common since 1949 — and that those triggering wet weather might also be increasing.

But California's reservoir system, which relies heavily on the Sierra Nevada snowpack to gradually replenish, wasn't set up to handle such careening conditions.

"While we can certainly fill up reservoirs with rain, that isn't going to last California in the long run," says Swain. "There's a lot of water stored in California reservoirs, but there's a lot more stored in the Sierra Nevada snowpack."

Even if enough rain and snow fall over a period of several years, year-to-year inconsistency makes it challenging to manage. Steady precipitation year to year means the Sierra Nevada snowpack remains relatively constant. The melting snow provides a consistent trickle of water over the dry summer months, and wet winters build it back up again.

Prolonged drought wears that snowpack down, leaving less to melt each year. And with the warmer temperatures that often accompany severe drought, the snow melts away earlier in the spring.

Then when a deluge does come, says Swain, much of it runs into the ocean instead of the reservoirs.

The new study is part of a larger body of recent evidence predicting a shift toward extremes for California, according to Noah Diffenbaugh, a Stanford University climatologist who headed the study.

“It’s clear that California is now in a different climate than the climate we had a century ago when water rights were designed, and a different climate than we had half a century ago when California’s water reservoirs were built,” says Diffenbaugh.

As the climate continues to change, Californians will have no choice but to adapt, said Jay Lund, a water expert at UC Davis.

“I think this is just another demonstration that California is a dry place and we have to learn to live with it for the most part,” Lund said. But that can be done, he added.

“All the studies seem to indicate that if we manage the water we have well,” Lund said, “California will still be a prosperous place in the future, even with more severe drought.”

#

Palo Alto moves ahead with \$25 million water facility

Daily News | March 30, 2016 | Jacqueline Lee

PALO ALTO -- The Palo Alto City Council voted Monday to solidify plans for a new sludge dewatering facility at the Regional Water Quality Control Plant.

Sewage will be dried in the new two-story building and hauled to other facilities where it'll be harnessed for energy and used to create compost -- a first step in phasing out the city's two polluting incinerators that do the job now, said Assistant Public Works Director Phil Bobel.

The city eventually wants a cleaner system to convert biosolids into gas, but has not decided on an anaerobic digester as the final choice, Bobel said.

The 50-foot-tall, 7,500-square-foot dewatering building will be near existing incinerators at 2501 Embarcadero Road.

The plant treats wastewater from Palo Alto, Stanford University, Los Altos, Los Altos Hills, Mountain View and the East Palo Alto Sanitary District.

The cost of the project, estimated at \$25 million, will be divided among those jurisdictions, with Palo Alto paying 35 percent, according to a staff report.

The city plans to apply for a loan from the state's revolving fund for water quality improvement projects.

Construction is expected to take two years. The council has yet to approve the construction contract.

On Monday, the council voted to adopt a mitigated negative declaration for the project and approve the site and design review.

Councilman Greg Schmid asked city staff to make sure the landscaping on the south side of the facility is consistent with the master plan for the Baylands Nature Preserve, a mere 500 feet from the plant.

"Because the project would be located on an existing (water plant), would be similar in scale to existing features ... the visual character and quality of views from the Palo Alto Baylands would not be substantially degraded," according to the declaration.

Vice Mayor Greg Scharff and Councilwoman Karen Holman were absent.

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Can Silicon Valley Growth Be Water Smart?

Water Deeply | March 29, 2016 | Tara Lohan

Silicon Valley's population has skyrocketed in the last several decades and, to keep up, development is booming. Some residents are worried this will put a strain on water resources, which are especially tight during California's drought. But experts say that smart development can also be water wise

MOUNTAIN VIEW, California – The 12-acre (4.85-hectare) lot at the intersection of Delaware Drive and Concar Street in San Mateo has been reduced to dirt, with the rubble of its previous incarnation (a Kmart) hauled away. Behind the chain link fence cloaked in green cloth are cement mixers and bulldozers preparing for what comes next.

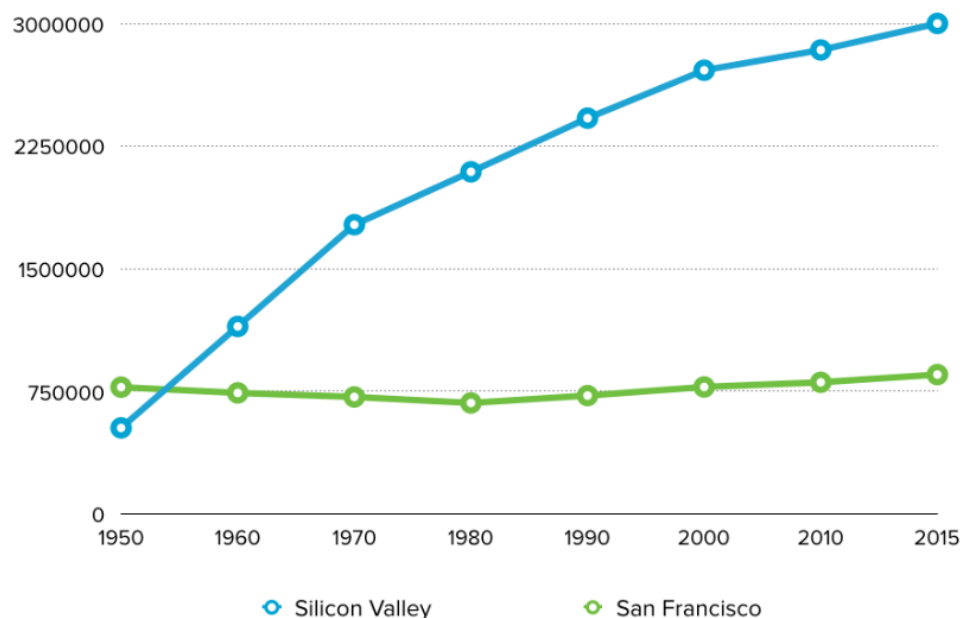
Near the confluence of Highways 92 and 101, and next door to the Hayward Park Caltrain station, this is prime real estate in coveted Silicon Valley where development is trying to keep pace with expanding tech companies and increasing population. Soon this will be Station Park Green, a mixed-use development with 599 residential units, 10,000 square feet (930 square meters) of office space and 60,000 square feet of retail space.

It's just one of many developments planned throughout the region. In many places, Silicon Valley is bursting at the seams, with growth rates between two and four times higher than the state as a whole in the last two years. The fastest-growing cities are Milpitas, Half Moon Bay, San Bruno and Brisbane.

In May 2015, Silicon Valley's population hit 3 million for the first time. Compared to neighboring San Francisco, Silicon Valley's population has skyrocketed. Between 1950 and 2015, population grew 10 percent in San Francisco. In Silicon Valley, it grew 470 percent.

Population from 1950 to 2015

Data from Silicon Valley Institute for Regional Studies and US Census



Rachel Massara, a senior research associate for the Silicon Valley Institute for Regional Studies, said that Silicon Valley has been adding almost 90 people a day. Between 2015 and 2025, San Mateo and Santa Clara counties are expected to add another 217,539 people – a growth rate of 8.2 percent.

For some, it's too much. There are complaints of traffic, long lines and high rents. Some cities, like Palo Alto, are trying to set development limits in certain areas.

California's more than four-year (so far) drought has added another concern: Will there be enough water now and in future decades to support this growth? It turns out, the answer may have more to do with not how much growth, but what kind.

Planning for Water

In the last year Santa Clara County residents have stepped up and exceeded conservation mandates, cutting water use by 27 percent. Some tore out their lawns, replacing the thirsty turf with drought-tolerant plants, others let the green go brown. For the most part, there was a shared sense of purpose in the face of adversity.

But that only extends so far.

Jerry De La Piedra, a water quality and conservation manager at Santa Clara Valley Water District, the wholesale water provider for Santa Clara County, has heard rumblings.

"We hear people saying, 'We are in the middle of a drought, there is a water shortage, why is growth still being allowed to happen?'" said De La Piedra.

For some it can be hard to reconcile the juxtaposition of brown lawns against a backdrop of new subdivisions.

To that end, De La Piedra's agency has been trying to work more closely with the planning departments of area cities to set the bar higher on building standards that can save water. While there are national and state standards for efficiency and conservation, De La Piedra says they hope to up the ante.

"Locally we are working with land-use agencies in Santa Clara County to develop a model ordinance that goes further than California standards," he said. "Land-use agencies realize they need to make it as efficient as possible and we are working with them in the next three or four months. We're looking at gray water, rainwater capture, onsite reuse and hot water recirculation pumps."

California now has among the toughest efficiency standards in the country for plumbing and appliances, which means new houses use way less water than most older homes. That is part of the reason that total water use in urban areas has remained relatively constant in the last 20 years even as cities have increased in population – we continue to get more efficient.

Randy Tsuda is the director of community development for the city of Mountain View, where he says there is currently significant growth, but water is not a concern. “As we have more and more stringent building standards and restrictions on water usage, Mountain View’s water usage has been falling for the last 15 years,” he said. “We’re using less water now, even after growth, than we were 15 years ago.”

Homes now use low-flow fixtures and the city has implemented restrictions on watering landscapes and developed a water recycling program. And he says, attitudes are changing. “We are far below our water allocation,” said Tsuda. “It’s a combo of a number of things. The building codes and recycled water and the general consciousness about the need to be water efficient is all contributing to where we are today, which is using less water.”

Some of these benefits are a ripple effect from the 2009 Water Conservation Act to reduce per capita water use in cities 20 percent by 2020 and last year’s water conservation mandate from Gov. Jerry Brown that sought to cut water use statewide by 25 percent.

“The targets had the effect of curtailing inefficient and discretionary water uses, like lawns, preserving our drought-limited resources for essential needs for all,” said Laura Tam, the sustainable development policy director of SPUR, an urban planning and research organization. “State leadership to advance conservation and water reuse takes some of the local politics out of it. That allows city leaders and water suppliers to work together toward a common goal.”

And on that front, there is still more than can be done. It’s not just about rules from the state or local level – agencies and officials working on land and water issues need better collaboration.

“I think it’s less the water utilities’ role to become involved in land-use decisions, and more the job of planners, elected and other community leaders and project sponsors to ask questions about the impact of land-use decisions on water supply, demand and reuse,” she said. “Generally, those involved in land-use planning and regulation should think and act more progressively about all water as a valuable, limited resource. Water supply availability can be directly addressed in development agreements, specific plans, general plans, precise plans and more.”

A 2013 report from SPUR called “Future-Proof Water” explains that two state laws (SB 610 and SB 221) require that all developments have an assurance from a water agency that there is enough water to meet future demand for the building project.

“But the responsibility for minimizing future water demand through better land-use planning and compact development lies with planning agencies and regional growth management agencies,” the report states. “These agencies and elected officials, who approve new large projects, could do more to consider water issues and to require that new developments meet or exceed efficiency standards.”

Planners and community officials can also ask utilities to study options and help them understand local water resources, and local potential for reuse, stormwater and gray water

capture and treatment, says Tam. “They can also remove barriers for – even incentivize – private sector innovation in these areas,” she said.

Growing Smarter

A sunny March afternoon in Mountain View sounds like a percussive of nail guns and hammers as workers climb the wood skeleton of a new luxury apartment complex near downtown, which spans a block and hovers over the neighborhood’s existing single-story homes.

Not all nearby residents may love the neighborhood’s addition. “There is always that concern that is expressed in Mountain View when folks see new development. And in particular now there is just a lot of new development going on,” said Tsuda. “The construction market, the development market, is probably more active than I’ve ever seen it. On the other hand, a lot of it is housing, which is something that many people here know we need and Silicon Valley as a whole needs.”

There is no doubt a housing crunch. A research paper from the Silicon Valley Institute of Regional Studies found that in some Silicon Valley cities, housing prices are increasing 20–30 percent year-over-year and 40 percent of residents are spending more than one-third of their income on housing. “These issues will intensify with population growth,” the report states.

More development could help ease the strain on the housing market, but at what cost to resources like water?

Experts say more growth can be water wise depending on how it’s done.

“Most people right now think of water conservation as don’t water your lawn as much, take shorter showers, etc.” said Jeremy Madsen, CEO of the Greenbelt Alliance, which focuses on smart growth and conservation in the Bay Area. “But a new home built in the right place uses 35 percent less water than a home built in the wrong place. What you build and where has a big implication for our water sustainability and water security.”

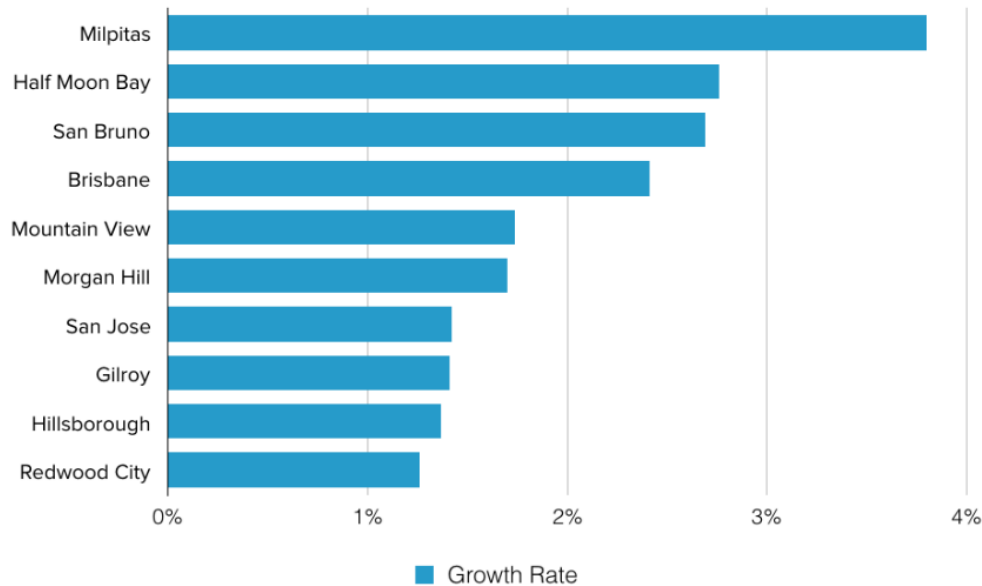
The difference between the “right place” and the “wrong place” boils down to infill, density and proximity to transit. “It doesn’t really require a special type of water-friendly development, it’s just simply building the right kind of development in the right place,” said Madsen whose organization endorsed Station Park Green because it included affordable homes, was near a Caltrain station, had two acres of open public space and promoted car-sharing or biking, which is a bonus for the climate.

“With a changing climate, we are in all likelihood in a new reality where water availability is going to be lower than it was in eras past,” said Madsen. Indeed, local water agencies are conscious of the ways in which climate change may complicate long-term water supply scenarios, which is why many are trying to develop more local water sources and increase water recycling to meet future demand even if prolonged droughts or climate change impact water sources.

Smarter, infill growth can help with that, too. “Less landscaping inherently uses less water and then also gives us a chance to improve upon our aging infrastructure within our cities and towns,” said Madsen. “We can spend our money replacing existing water pipes and fixing leaks that are already there instead of extending the infrastructure out into green spaces where you’ve got miles and miles of more pipes to maintain and have a chance to leak.”

Fastest Growing Cities in Silicon Valley

Data from Silicon Valley Institute for Regional Studies



From the 1960s until the market crashed in 2009, the predominant building trend across California was sprawl development, said Madsen. New construction cooled during the recession and now that it’s rebounding in Silicon Valley, Madsen says he sees more infill development and less sprawl cutting up open spaces and farmland. Although sprawl hasn’t been eliminated entirely. “You’re seeing in the hills around San Jose and in southern Santa Clara County that developers coming back now with these types of [sprawl] proposals,” said Madsen.

Two recent proposals – one that would have developed 700 acres (285 hectares) in Gilroy and another around 400 acres in Morgan Hill – were both turned back by the Local Agency Formation Commission, which is a countywide agency that oversees boundary changes. “They recognized that both of those ran counter to the agency’s own policies around farmland preservation,” he said.

Living closer to town is better, but so is simply living closer together. SPUR’s research found that if more people chose to live in multiunit buildings instead of single-family homes, it would save water. In 2010 the percentage of multi-family housing built was 44 percent. But if that was upped to 64 percent, it would save 2 percent more water. Maybe that doesn’t

sound like much but in the Bay Area that translates to 27 million gallons a day. The SPUR reports calls that savings a “free benefit of urbanization.”

Local officials “need to recognize that permitting smarter, more compact growth will stretch their highest-quality water resources longer into the future,” said Tam. “I think we are probably not doing enough to make extreme water efficiency a condition of new development, or to require efficiency retrofits of existing development, and that is the way the region needs to grow.”

Madsen sees it as an opportunity. “If we do development right, we can save water, we can protect the climate, we address affordable housing, we can make our communities better places,” he said. “These agencies that operate on the water side and local governments that have the land-use authority need to start understanding this connection because we need to do everything we possibly can, especially with a growing population, to conserve as much as we can.”

Water Deeply thanks the Silicon Valley Community Foundation for their support in making this reporting series possible.

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Department of Water Resources awards groundwater management grants

Maven | March 24, 2016 | Department of Water Resources

The Department of Water Resources (DWR) today announced it is awarding 21 counties a total of \$6.7 million in grants to help with sustainable groundwater planning. The Proposition 1 Sustainable Groundwater Planning Grant Program provides funding for county projects that will develop groundwater plans consistent with the Sustainable Groundwater Management Act (SGMA) enacted by Governor Edmund G. Brown, Jr. in 2014. The awards were made to counties with high and medium priority groundwater basins, some of which are in critical overdraft.

DWR received 23 grant applications requesting a total of approximately \$7 million. Adding the matching funds provided by the grant award recipients, approximately \$13 million will be dedicated to projects in counties that need to begin long-term planning for sustainable groundwater management. According to Laura McLean, Senior Engineering Geologist with the Sustainable Groundwater Planning Grant Program, DWR gave priority to proposals that will benefit disadvantaged communities, address critically over-drafted basins, address basins exhibiting stressed conditions, and proposals to enact ordinances to address groundwater sustainability.

“This funding will help counties address long-term planning goals, better understand what’s coming in and going out of their aquifers, and get the much-needed jumpstart on addressing the new regulations,” says McLean. “More funding will certainly become available to help groundwater sustainability agencies moving forward. We aim to complement the timeline requirements of the law as we continue to streamline our grant processes to get the money out as quickly as possible.”

Colusa County is among the 21 counties across California receiving funding and plans to use the funding to advance groundwater sustainability through policy and technical refinement. Mendocino County plans to use the funds for the initial groundwater sustainability plan development, and Kings County’s proposal will include developing a groundwater model for its critically over-drafted groundwater basin.

The funding provides the means for local communities to create long-term sustainable groundwater management plans for California’s groundwater basins. On average, groundwater makes up over one-third of California’s water supply and over one-half of the supply during drought years. When groundwater basins are critically over-drafted, chronically lowered groundwater levels, seawater intrusion, and land subsidence can result. The SGMA requires basins in conditions of critical overdraft to be managed under a groundwater sustainability plan two years prior to other high- and medium-priority basins, stressing the need for funding to implement sustainability plans and take steps to rehabilitate basins as soon as possible.

DWR announced draft funding recommendations in January and considered public comments on the proposals. DWR staff is working with grantees on detailed work plans for their respective projects including efforts to develop groundwater ordinances and develop plans that protect basins, their beneficial uses, and facilitate basin-wide sustainability. Over next several months

DWR will continue to work with counties regarding budgets and schedules for the funds, which counties can expect to receive as soon as June 2016.

For more detailed information from the Sustainable Groundwater Planning Grant Program and a map identifying the allocated awards please visit www.water.ca.gov/irwm/grants/sgwp/solicitation.cfm.

For more information regarding California's groundwater please visit <http://www.water.ca.gov/groundwater/index.cfm>.

Discover more about the DWR Sustainable Groundwater Management Program at <http://www.water.ca.gov/groundwater/sgm/index.cfm>.

To be added to the SGW Program contact list, please email your contact information to SGWP@water.ca.gov.

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California Snowpack Returns, But Fears Held For Future

Climate Central | March 23, 2016 | John Upton

California's main water reservoir — its mountain snowpack — has made a triumphant return to the Sierra Nevada following severe shortfalls in recent years.

A string of winter storms boosted by El Niño has restored much of the mountain snow that melts through summer to help top up the state's reservoirs, but the prognosis for the decades ahead remains grim.

Climate change is projected to corrode California's snowpack, forcing water officials to rethink how they store and distribute water in a state that's prone to prolonged droughts. Work is underway to improve the management of water stored in the state's underground aquifers, which could help compensate for its loss of snowpack storage.

Despite this month's storms, which mostly drenched the state's northern regions, the Sierra Nevada snowpack contains 10 percent less water than average for this time of year. That's a stark improvement from the same time last year, when it was worse than 90 percent below average.

The low snowpack experienced last year is expected to become more common during the decades ahead — even though storminess in the region is projected to increase. Last year's was the smallest snowpack on record, caused primarily by a shortfall in large winter storms, fueling a withering drought exacerbated by high temperatures.

Within 50 years, snowpacks as diminutive as last year's could occur on average more than once every decade, said Michael Dettinger, a U.S. Geological Survey hydrologist.

"Last year was the real story, as its 5 percent of normal snowpack was like something right out of the far future," Dettinger said. "Looking to the future, we expect long-term declines compared to this year."

Much of central and southern California remains in severe drought, but U.S. Department of Agriculture meteorologist Brad Rippey said there has been substantial improvement in northern California.

Reservoir operators in the state are "encouraged" by the sudden deepening of the snowpack this March, said Lisa Lien-Mager, a spokeswoman for the Association of California Water Agencies. But she said changes caused by climate change are a major concern for the group's hundreds of members.

The kinds of storms that boosted the state's snowpack this year are expected to become less effective as the impacts of climate change continue to worsen. Global warming is projected to reduce California's snowpack by causing it to melt earlier in the year, and by causing more rain to fall instead of snow.

"We're already seeing some of the expected changes to our rain and snowfall patterns; we're already seeing that we're getting earlier runoff," Lien-Mager said.

“That flips our system on its end,” she said. “It was all designed to capture gradual runoff from snowmelt. If we’re moving away from that kind of pattern, then we may be getting too much runoff at a certain time, and we won’t necessarily be able to capture it all.”

California’s natural aquifers offer cavernous potential spaces where that water runoff could be stashed until it’s needed. Aquifers can be recharged by pumping water into them, or by allowing water to seep into them.

Park Williams, a bioclimatologist at Columbia University who is about to begin a three-year project aimed at better understanding Californian snowpack trends, likened the state’s aquifers to an “extremely large” reservoir — one that has long been mismanaged.

“In an ideal world, that large reservoir of water would be available during bad times,” Williams said. “You could draw down on that when times are really bad, and then when times are really good you can replace it again.”

Researchers at Stanford have shown that California’s natural aquifers offer cheaper options for boosting water storage capacity than expanding or building above-ground reservoirs. Storing water in aquifers was also shown to be cheaper than desalting and filtering sea water.

Building and expanding above-ground reservoirs also comes with heavy environmental impacts, drowning landscapes and releasing climate-changing methane as submerged vegetation rots.

Groundwater recharge efforts received a boost from a 2014 state law that requires more careful management of California’s groundwater supplies.

Under the Sustainable Groundwater Management Act, state officials could take over management from local water agencies and districts that fail to take mandated steps to ensure that groundwater is being managed sustainably.

The law wasn’t designed to boost groundwater storage to offset the effects of climate change, per se, but Jeanine Jones, a California water official who has been working on drought-related issues, said it could help “facilitate” such improvements.

“Even long before we had this new legislation, going back several decades, water agencies in California have embarked on programs to develop large managed groundwater storage projects,” Jones said.

Decades of work lie ahead as water officials strive to make sweeping improvements required under the new rules. Stanford water researcher Tara Moran praised the work that’s already underway to create new systems for managing groundwater.

“I do think the state is doing a great job — they’ve been very engaged and working incredibly hard,” Moran said. “But it’s a huge undertaking.”

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East Palo Alto's Economic Future Tied to Water

KQED | March 22, 2016 | Tara Lohan, Water Deeply

Many cities in Silicon Valley are working to develop new sources of water to avoid shortfalls in future decades, but East Palo Alto is already at a critical point. The city needs more water in order to spur much-needed economic development and new housing. Here's how it hopes to get there.

Carlos Martinez has big dreams for East Palo Alto. It will continue to be multi-ethnic, there will be residents of all economic classes, affordable housing, schools with 100 percent graduation rates and community programs for youth and seniors.

It's a lot to ask from any town and East Palo Alto has an additional hurdle right now. The city doesn't have enough water to drive economic growth, which would help provide the tax dollars to fund housing, schools, city services and new development.

"It is true when you look at other planets, when you look for life, you look for water and it is equally true here," said Martinez, who is East Palo Alto's city manager. "If you don't have water, you don't have affordable housing. If you don't have water, you can't grow, and if we can't grow we can't generate jobs, which our citizens need."

Development on Hold

One key to East Palo Alto's future is a small triangle of land in the back corner of a Home Depot parking lot. A sunken indent in the lawn is the only indication of the good fortune below. This is the location known as Pad D, where the city has already dug a test well in search of drinkable groundwater. The results were very promising – a good quantity of water and good quality. In less than two years, it's possible this could be a producing well.

A sign warns not to drink the water at the Gloria Way well in East Palo Alto. The city hopes in 2017 to begin construction on a new well here to use groundwater to augment water supply. (Tara Lohan/Water Deeply)

And that's good news because East Palo Alto's water supply today comes from the San Francisco Public Utilities Commission's Hetch Hetchy water system. The water itself is not problematic, but the amount is. East Palo Alto currently uses all of its allocation. By 2035, with the city's projected growth, it will be short 1,200 acre-feet a year (an average household uses between one half and one acre-foot a year and East Palo Alto residents have some of the lowest water use in the state).

The situation is not as dire as some Central Valley towns where wells ran dry last year and residents had to haul water for showering and drinking. East Palo Alto residents currently have enough water to meet their basic needs, but without an additional supply the city's economic growth is hamstrung because new developments are not able to be approved by the city.

And this isn't a function of California's four-year drought, either. "I don't want to give the impression that because of the drought there is no water," said Martinez. "There is water – there is plenty of water."

In fact, he says, other nearby cities have allocations that currently exceed their needs, but East Palo Alto officials haven't yet managed to find cities that are willing to sell or trade their unused water. "There is plenty of water in the system, it's just not ours," he said.

And without well water or supplies from other cities to increase their allocation, East Palo Alto is out of other options. Even increasing conservation would be hard at this point. Residents have a reported per capita daily water use of 52 gallons – one of the lowest in the area (and the state). When Gov. Jerry Brown ordered statewide conservations mandates of up to 36 percent last year, East Palo Alto was tasked with trimming its water use only 8 percent because it was already low.

But residents didn't just hit the target, they nearly tripled it. By February they had saved enough water to meet an October target.

"We have very few parks and open spaces so we are not irrigating huge lawns. Our lots are small also, we don't have three or four acre lots with landscaping," said Martinez. "There is little we can do to gather more water. We are already doing what we can. We can't tell our residents to use less water because it would be dangerous to their health and safety."

So East Palo Alto is looking to add two new wells to augment Hetch Hetchy water with local groundwater. The first is Pad D and the second well will be located 1.5 miles (2.4km) away on Gloria Way, a residential road. The Gloria Way well was in use decades ago, but residents disliked the color and odor of the water because of high levels of manganese and iron, so a filtration system will be needed before a well here can be used again.

Martinez estimates that construction could start on the Gloria Way well at the beginning of 2017. And it won't be soon enough for some developers hoping to begin construction on projects in East Palo Alto.

"We have developers lining up," said Michelle Daher, the city's environmental coordinator. "We're telling them we'll process your applications, but without having the water to promise to your project we are not going to move forward beyond just an initial preview of the application. We can't take it to the planning commission and get it fully vetted or get the entitlements because there isn't water to meet the requirements."

Martinez says there are three main projects in limbo while the city works on securing new water sources. Two are "Class A" office spaces (the most premiere) – one at 200,000 square feet (19,000 square meters) and the other a whopping 1.4 million square feet (130,000 square meters). The third project is the Primary School, a new school combining education and health services for 500 kids led by Priscilla Chan, the pediatrician and philanthropist wife of Facebook CEO Mark Zuckerberg. The school plans to open in a temporary location this fall until it can complete construction on its permanent East Palo Alto site.

All three projects would bring in needed revenue for the city, but East Palo Alto also has other priorities as well. "The city has a site they would like to develop as affordable housing, but of course we can't develop affordable housing without water," said Martinez.

Planning for the Future

With more water, East Palo Alto, which is squeezed between the shoulders of Palo Alto (home to Stanford University) and Menlo Park (headquarters of Facebook), may be poised for big changes.

And it's not the first time.

In the last decade Martinez says he's already seen substantial changes. Back in 1992 East Palo Alto held the unenviable title of having the highest homicide rate per capita in the country.

These days, though, thanks to the proliferation of the tech boom, it finally has the attention of moneyed interests and large developers.

But that hasn't always been the case.

"When the city of East Palo Alto incorporated, many people in San Mateo County thought that the city could not survive because it has a very tiny tax base," said Martinez. For example, in 1977 total sales tax revenue per capita in East Palo Alto was \$8.33. Next door in Palo Alto, it was \$64.35 per capita.

Up until 1983, East Palo Alto was an unincorporated part of San Mateo County. In the years preceding, neighboring towns and highway construction had chipped away parts of East Palo Alto's neighborhoods, shrinking the city's borders down to an irregularly shaped 2.5 square miles (6.5 square km).

"The largest tax generator was a McDonald's," said Martinez. "You can't run a city with that."

A vacant lot in East Palo Alto may be the future site of a new downtown development when the city secures additional water resources to approve new building projects.

A vacant lot in East Palo Alto may be the future site of a new downtown development when the city secures additional water resources to approve new building projects. (Tara Lohan)

Community leaders were determined to make East Palo Alto economically sound and do so with a commitment to fair housing. The first step after incorporation, said Martinez, was enacting rent control ordinances.

Housing has been a defining factor in the area's history, long before it was officially incorporated. In the post World War II boom that drove population growth in the peninsula, East Palo Alto became a refuge for African Americans at a time when housing discrimination and "redlining" were common in other nearby cities.

For decades East Palo Alto was predominantly African American, but the demographics have shifted in recent years, though it still remains more racially diverse than neighboring towns or the county as a whole. Census numbers from 2010 show the city is 65 percent Hispanic or Latino, 17 percent Black and 7.5 percent Pacific Islander or Hawaiian. The majority of people in the city speak a language other than English at home and 40 percent were born in another country.

And as the tech boom has fueled a drastic rise in rents and home prices throughout the area, East Palo Alto remains more affordable, relatively speaking. Neighborhoods tend to have more modest homes and multiunit buildings. Median home prices have risen in East Palo Alto to \$650,000, but it's still a bargain compared to \$2 million in neighboring Palo Alto or \$1.5 million in Menlo Park.

Residents of East Palo Alto, though, have smaller paychecks than their neighbors. Median household income is 43 percent less than the rest of San Mateo County, which makes the need for economic development even greater.

But Martinez knows that it will come with trade-offs. It already has. Back in the 1990s, when others counted East Palo Alto as down and out, the city's leaders made strategic decisions to boost its economy. The downtown area known as Whiskey Gulch "suffered from physically dilapidated buildings, high crime and drug activity, and the proliferation of liquor stores and

bars,” the city’s website explains. But it was razed and replaced in 1999 with “University Circle,” which now includes a Four Seasons hotel and office towers.

“And that began to bring property tax revenue and stabilize the city,” said Martinez. “People didn’t think retail users would relocate to East Palo Alto.” But they were wrong. Next came another development with Ikea, Home Depot, Nordstrom Rack, Sports Authority, Starbucks and other big chain businesses.

“There is no longer a doubt that East Palo Alto can sustain itself as a city but I think in that process to get to that point, many people were displaced, multi-family homes were demolished and families were relocated,” said Martinez. “The city council had to make very hard choices in order to survive as a city. Development generates revenues for financial services but also creates other impacts – it’s a balancing act.”

That balancing act is something that the city takes seriously as it develops a new general plan for how to grow East Palo Alto as more water becomes available.

“The city is actively seeking input to make sure we get it right for future generations and have a vision that is long-term,” said Daher. “The residents have made it clear they are interested in seeing development happen, but in certain areas they want to focus on retaining their low-income housing portfolio.”

On the horizon is a new city center that would bring more pedestrian-friendly streets, retail and higher-density housing. The area that Martinez calls the “linchpin” for this new downtown is an empty 6-acre (2.4-hectare) lot surrounded by a chain-link fence. It’s across from the McDonald’s that used to be the city’s biggest tax generator. A sign lists a phone number for the vacant parcel’s developer, Barry Swenson.

Right now, it is another dream deferred for East Palo Alto. Like other developments, it will have to wait for more water.

Martinez hopes the wait is not too long.

“We should have more and better city facilities and better recreational opportunities,” said Martinez. “There are many things that we should be doing but we don’t have the resources at this point. Additional development would enable us to provide that for our citizens. But that cannot happen if we don’t have water.”

This article originally appeared on Water Deeply, and you can find the original [here](#). For important news about the California drought, you can sign up to the Water Deeply email list.

###

Fight over senior water rights splashes into the Capitol

SF Gate | March 21, 2016 | Kurtis Alexander

Late last spring, amid the depths of California's punishing drought, state officials made a historic determination that rivers and creeks were too low for many farms and cities to draw from.

Not everyone agreed, however. And now nearly a year later, even as waterways have partially recovered, the fate of two delta water agencies accused of illegally pumping is expected to be decided at a hearing in Sacramento.

More importantly, the case may have consequences for the state's fundamental ability to crack down on longtime water-rights holders — some of whom say their access to water predates regulation by the State Water Resources Control Board.

The board on Monday — in a hearing scheduled to last up to two weeks — took up the matter of whether to reverse its decision to proceed with penalties against the two delta agencies. The state's regulations are also the subject of several lawsuits.

"The issue under debate is what the board's authority is to curtail them," said Ellen Hanak, director of the Public Policy Institute of California's Water Policy Center. "This oversight is a piece we have to fix. In a modern water system, where we know that curtailments are something that we're going to have to be ready for with future droughts and climate change, having a unified oversight system just makes a lot of sense."

In a sign of the case's potential reach, an attorney for San Francisco participated in Monday's opening arguments. He said that the state water board has no authority to limit those with water rights before 1914, when regulation was introduced.

San Francisco has several pre-1914 water rights in the Sierra, which allow it to send supplies to millions in the Bay Area, and city water officials have been adamant that they don't want to be curtailed.

At issue this week specifically is whether the State Water Resources Control Board properly restricted pumping by the Byron-Bethany Irrigation District and the West Side Irrigation District, both agricultural suppliers in the Tracy area.

The districts allegedly diverted water from the delta in June in spite of notice that their water rights were too junior to continue their draws. Byron-Bethany was hit with a tentative \$1.4 million fine, while the West Side district was issued a cease-and-desist order and tentative \$10,000-a-day fines. The fines will be finalized at the hearing.

Representatives for the two agencies argued Monday that the state didn't properly calculate how much water was in the delta last year. Had that been done, they said, it would have been obvious there was enough water to avoid restrictions.

Additionally, the districts maintained that the water they pumped after the restrictions were enacted came from supplies not tied to the disputed water rights. They came from such sources as irrigation runoff and wastewater, they said.

In both cases, the districts have made clear that they believe they were targeted because the state wanted to signal its authority over water-rights holders.

“The farmers in this room are being punished because that district stood up for itself,” said Daniel Kelly, attorney for Byron-Bethany, amid a standing-room-only crowd in the Sacramento boardroom.

State officials countered that their decisions to penalize the districts were simply a matter of enforcing the rules.

Water board attorney Andrew Tauriainen explained that the state’s best measuring tools showed that California’s drought-stricken rivers and creeks contained only enough water for those with the most senior water rights.

“The methodology is simple math, like what you’d use to set a budget,” he said. Neither the West Side district, which has water rights dating to just after 1914, nor Byron-Bethany, with rights dating before 1914, was senior enough to continue pumping, according to the state’s calculations.

The restrictions enacted by the state last year were the most sweeping since the 1970s. It’s one of few times it has cut off the disputed right of pre-1914 water-rights holders.

#

Silicon Valley Seeks Local Water Sources

Water Deeply | March 16, 2016 | Tara Lohan

Most of the water supplied to residents of Silicon Valley come from imported sources through either state and federal canals, or the Hetch Hetchy system. But now, water agencies are looking to develop new, local water sources thanks to the pressure from drought, climate change and population growth.

On August 1, 2015, a massive 8ft (2.4m)-tall pipeline suffered a rupture, sending a gusher of 15 million gallons (57 million liters) of water into a farmer's field. The spill was not only a "loss" of precious water at the height of the drought but also signaled problems with a key piece of infrastructure for Silicon Valley – a pipeline that supplies drinking water for 1.8 million people in Santa Clara County and imports 40 percent of the area's water via the Sacramento-San Joaquin Delta.

The pipeline is owned by the U.S. Bureau of Reclamation, but Santa Clara Valley Water District (known locally as Valley Water District), the county's wholesale water provider and manager, is responsible for maintenance and has been left holding the bill, which could top \$20 million.

It was another reminder for Valley Water District of the need to develop more local sources of water. Currently, 55 percent of Santa Clara County's water is imported, most through federal and state canals associated with the Delta system, and the rest from San Francisco's Hetch Hetchy system.

If water travels hundreds of miles to get to customers, there is ample room for problems, especially in an area known for seismic activity. But imported water comes with other potential headaches as well, as the ongoing drought has shown – supplies can be limited in times of shortage.

Add in the pressure of population growth and climate change, and it's easy to see why water managers in Silicon Valley are hoping to develop new, local sources of water to supplement imported supplies. But these new schemes do not come without great cost and effort.

"We are really trying to provide a larger in-county, year-in year-out reliable source of water," said Garth Hall, deputy operating officer of Santa Clara Valley Water District. "And that new local source of water comes from purifying wastewater."

On the outskirts of San Jose, between the office parks and the landfill at the bay's edge, is the Silicon Valley Advanced Water Purification Center. From the road you can see massive silver tanks and an assortment of pipes and pumps. But it's inside the warehouse onsite that most of the key processes take place.

The facility is the largest of its kind in Northern California and is modeled on a successful program that has been operating for years in Orange County, in Southern California. The Orange County plant treats wastewater to drinking water standards and then the treated water is injected back into the aquifer, where it is later withdrawn along with other groundwater, for supplying drinking water. It's known as indirect potable reuse.

By injecting the treated water back into the ground instead of sending it straight to homes for consumption (known as direct potable reuse), Orange County has helped to reduce some of the “ick factor” that resulted from early resistance to “toilet to tap,” as detractors dubbed it.

At Santa Clara’s purification center, there are numerous steps in between toilet and tap. Wastewater first goes to the standard wastewater treatment plant, where it is cleaned twice before being piped across the street to the purification center. There are three key steps that take place next.

First the water goes through microfiltration, where it is pumped through tiny membranes to remove solids, some viruses and bacteria. Then it is forced under pressure through microscopic membranes in reverse osmosis getting rid of salts, viruses, most pharmaceuticals and other contaminants. Even though the water looks clean at this step, it is finally subjected to ultraviolet light, which kills any remaining pathogens.

These processes ensure the water ends up “meeting and exceeding California drinking water standards,” as tour guides at the purification center explain. The water may be clean enough to drink, but will people want to drink it? Four years of drought and browned lawns may help convince Santa Clara County residents that recycled wastewater is palatable, but that remains to be seen.

“There will always be those people who are no-ers,” said Amy Fry, a tour guide at the purification center. “But in terms of public support, we have gotten so much.” Fry said that 200 people have signed the center’s “supporter cards,” which means they are publicly affirming their support of the project. News stories have been mostly positive and at an open house in October 900 people attended to tour the facility and hear about the process.

“We have provided taste testings in the past, that does help,” said Fry. “Seeing is believing and I guess, tasting is believing in a way. When people taste it it really does change people’s minds, as well as coming through the facility, it helps.”

Assemblymember Rich Gordon hopes to help raise awareness about purified water from the center. Under current state law, only visitors to the purification center can taste the water for “educational purposes,” but Gordon has written new legislation that would allow the water to be bottled at the center and given away offsite (say at farmer’s markets or conferences). It still would be simply for educational purposes, not mass use or distribution, says Gordon, but it would help Valley Water District to get the word out to more people about the purification process.

“If you think about it, the astronauts at the space station have been drinking recycled water for years and we’ve never had a problem with an astronaut getting sick or having a problem relative to the water they drink,” said Gordon. “If it’s good enough for astronauts, it’s good enough for us.”

Supply Gaps

Gordon’s district, which includes portions of San Mateo and Santa Clara counties, gets most of its water from the Hetch Hetchy system and he says he is concerned about the long-term reliability of the supply. “Obviously there are snowpack issues – a lack of water in the Sierras will be a problem longer term,” he said. “Other than a few options for groundwater there aren’t a lot of other options in my district for new supply, so recycling and conservation are critical.”

But it's not cheap. The facility cost \$72 million to build and currently costs between \$3.6 to \$5.5 million a year to run at its current production level, which is 8 million gallons (30 million liters) of water a day. Most of the money to build the project, \$47.5 million, came from Valley Water District, \$11 million came from the City of San Jose and the rest came from state and federal programs.

And the water that is purified now, even though it meets drinking level standards, is actually mixed with recycled water from the treatment plant across the street and distributed via a recycled water (purple pipe) system that delivers non-potable water for irrigation and industrial uses. The end goal of the facility, though, is a larger build out that by 2022 would be able to augment drinking water supplies – initially by helping to replenish groundwater and maybe one day in the future delivering water directly to customers.

The region has a huge groundwater basin, but it has been overdrafted in the past, most severely in the 1960s when the land subsided 13ft (4m) in some places because of too much groundwater pumping. Even during the last few years the county used an unsustainable amount of groundwater to counter diminished surface water deliveries.

And that makes recycling water one of the most viable options for the area as it is both cheaper and less energy-intensive than desalinating seawater, which is now being done in San Diego.

But that doesn't mean that desalination is totally off the table. Since 2003, five Bay Area water agencies, including Valley Water District, have been studying the potential of building a regional desalination plant in Contra Costa County that could produce about 10–20 million gallons (38–76 million liters) a day of water for Bay Area customers. So far, feasibility studies have been completed, but the project has yet to move further forward. "The next step is to revisit the role of the project within the context of each agency's changing water supply and demand picture through 2030," the project website states.

Several years worth of studies have also been done by the Bay Area Water Supply and Conservation Agency (BAWSCA) to determine the feasibility of desalinating brackish groundwater in San Mateo County from a shallow aquifer under the bay. "The next critical step is a test well," said Michael Hurley, BAWSCA's water resources manager. "We really need to get a handle on how productive that basin is." The hope would be to produce somewhere around 6 million gallons (23 million liters) a day of drinking water to supplement regional supplies.

For both water agencies in San Mateo and Santa Clara counties, new water sources are becoming a key focus of long-term planning. Valley Water District is currently looking at its plan for water reliability decades out. "We're still running the models right now and doing analysis, but in an average dry year we're fine. In a super-dry year we're fine. When we start getting to a three-, four-, five- or six- year drought, like we're in now, is when we start seeing some shortages," said Jerry De La Piedra, water quality and conservation manager at Valley Water District. "Expanding our purified water program, potentially moving toward using that to recharge our groundwater basin, means we can close that gap."

The City of East Palo Alto has a gap they need to close, as well. Most residents of East Palo Alto are served by American Water Services and the water comes from San Francisco's Hetch Hetchy system with its headwaters in Yosemite National Park.

And while the water is good quality, there isn't quite enough of it anymore. East Palo Alto has outgrown its allocation from the San Francisco Public Utilities Commission, which owns the Hetchy system, and without new sources of water the city can't continue to grow. East Palo Alto currently receives 2,199 acre-feet (2,700,000 cubic meters) a year from SFPUC, but needs 2,200 acre-feet currently and is projected to need 3,400 acre-feet by 2035.

Not having enough water is a "severe economic disadvantage and it's been like that here for a number of years," said Michelle Daher, environmental coordinator for the City of East Palo Alto. Economic constraints are a big concern, and so is emergency preparedness. Right now, 100 percent of the supply is Hetch Hetchy, which means that East Palo Alto doesn't have an alternative source of water if something should disrupt the conveyance or quality of the Hetchy water, which happened recently.

"We sat down and looked at strategies for how can we supplement the Hetch Hetchy water," said Daher. "The city of East Palo Alto is at our max water allocation. We have been for a number of years and haven't diversified."

That's now about to change but a high-tech purification center like Valley Water District's is not an option. East Palo Alto is a mere 2.6 square miles (6.7 square kilometers) and has about 30,000 residents. Until 1983 it was an unincorporated part of San Mateo County. Many residents here are already struggling to pay their water bills, says Daher. The city has some of the lowest per capita water use in the state, in part because some residents can't afford to use more water.

So the city is going back to an old technology – groundwater wells. It hopes to drill a new well on a sliver of land behind a Home Depot. Daher estimates that there is probably a year's worth of planning before construction could begin.

And there are plans to bring back into activity a previously shuttered well on Gloria Way that had high levels of manganese. A naturally occurring mineral, manganese can leave water with a brownish color, making it unappealing to drink. Daher said that the city is looking into putting a wellhead on that will pull out and treat any of the water quality problems, but it's a bigger undertaking than the new well.

East Palo Alto is also exploring the possibility of using treated wastewater to help meet the needs for non-potable water such as irrigation and street cleaning. Right now, the wastewater is treated and then gets piped into San Francisco Bay.

But increasingly wastewater is being seen as a resource instead of a liability. Daher says the city has now been invited to join a water recycling committee with Valley Water District to explore the potential of becoming a customer of its recycled water in the future.

But East Palo Alto's plans for tapping groundwater do raise concerns for some in the community, especially the ones who have been around long enough to remember the 1960s, says Daher, when the city used to rely on groundwater but it became so overdrafted that subsidence was common.

"They are very concerned about that and people that study the issue are very concerned about saltwater intrusion, particularly at the Gloria Way Well because it's closer to the bay," said Daher. "If that is being pumped more than it should be it could have a potential of pulling salt water into the aquifer and ruining it for everyone."

That means that monitoring the groundwater program is crucial, but Daher says, the city has the least staff per capita in the area. "So if we are responsible for monitoring, how is it that we have the expertise to do that? Are we hiring the right expertise if we're hiring contracts to do it? It's important to make sure enough eyes are on the situation," she said.

And while plans for desalination and purified wastewater for drinking by other water agencies in the area are still years, if not decades out, for East Palo Alto, time is of the essence in securing new sources of water.

"There is a boom," said Daher. "We are receiving a lot of interest in the community and a lot of very high and low profile projects all over town. Everyone wants in."

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Contra Costa Water District's Delta deal raises eyebrows among environmentalists

East Bay Times | April 2, 2016 | Denis Cuff

CONCORD -- In a deal stirring up new waves about the governor's twin water tunnels plan through the Delta, a water supplier for 500,000 Contra Costa County residents has dropped its protest against the project in exchange for a new source of higher-quality water from the Sacramento River.

Some environmentalist say the legal deal between the state and the Contra Costa Water District helps the district at the expense of water quality for the Delta environment, farms and fish.

"Sadly, CCWD has sacrificed other Delta communities and bay-Delta fisheries by agreeing to this settlement, as everyone else in the Delta would be left with degraded water quality," said Barbara Barrigan-Parrilla, executive director of Restore the Delta.

In defense of the deal, Contra Costa Water officials said they got insurance that the \$15.6 billion tunnel plan won't degrade their Delta drinking water for people and industries in an area stretching from Concord and Walnut Creek to Antioch and Oakley.

"We are not abandoning the Delta," said district spokeswoman Jennifer Allen. "The agreement is only about protecting water quality for our customers from harm if the California WaterFix is built."

The state proposed the tunnels to change how water is moved to south Delta water export pumps, reducing harm to wild fish that has led to restrictions on water pumping to 25 million Californians and nearly a million acres of farmland.

But a team of five hydrology modelers for Contra Costa Water calculated that the governor's plan would lead to higher salinity and more algae and minerals in district water pumped from the western Delta.

Worried about a prolonged lawsuit, the state Department of Water Resources announced earlier this week it had reached an agreement with Contra Costa Water to address the concerns.

Under the 40-page deal, the state pledged to provide CCWD a big slug of higher-quality Sacramento River water to make up for fears about degradation of Delta water.

And CCWD would get this water at no extra cost, with the bills to be paid by state contractors who would benefit from the twin tunnels, otherwise known as the California WaterFix.

The state agreed to provide between 2,000 and 50,000 acre-feet of Sacramento River water each year. The annual amount would be tied to how much water moves through the tunnels.

The amount adds up to about 1 to 25 percent of Contra Costa Water's maximum annual federal supply of 195,000 acre-feet of water, which is taken from four spots in the western Delta.

The water district wouldn't be getting any more water than before but taking some of it through the higher-quality river source before it flows through the Delta and picks up salt, algae and other impurities.

"We take our role to protect our customers seriously and cannot gamble with the future of our water quality," said Jerry Brown, the CCWD general manager. "We are confident this is an ironclad insurance policy for our customers."

For its part, the district agreed to withdraw its protests against the twin tunnels as the state prepares this fall to rule on a project environmental impact report.

The district also pledged to keep a neutral stand on the project itself.

Environmentalists, however, asserted that the water district and the state are selling other Delta water users -- including farmers and fish -- down the river.

Having Contra Costa Water take up to 50,000 acre-feet of water a year from above the Delta will weaken water flows out of the estuary, said Jonas Minton, a water policy adviser for the Planning and Conservation League.

"I understand why (CCWD) wanted insurance," Minton said, "but I think this will leave a stain on Contra Costa Water for years to come."

CCWD officials replied that the deal will not alter existing standards for Delta water flows one bit.

Minton said the compensation agreement changes the scope and cost of the California WaterFix plan enough that the state is required to revamp its upcoming environmental report on the project despite the significant delay that will cause.

It's too early to know which of several options for delivering the Sacramento River water to CCWD would be used, but one of them could cost \$75 million to \$150 million, state water officials said.

Environmentalists also criticized the state and Contra Costa Water for negotiating and signing the deal behind closed doors without consulting the public or other Delta stakeholders.

Contra Costa Water officials said state law allowed the deal to be negotiated behind closed doors because there was a threat that the district could have sued the state.

"Our goal was to get the best deal for our customers," Allen said.

While the deal is already done, the water district will hold a public presentation and discussion on the agreement at the district board's next meeting, at 6:30 p.m. Wednesday. Allen said the public is encouraged to ask questions and make comments about the agreement.

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DWR Reaches Agreement with Contra Costa Water District to Address Concerns Related to California WaterFix

AgNet.com | March 29, 2016 |

The California Department of Water Resources announced today an agreement with the Contra Costa Water District related to potential water quality impacts to its water supply in the event California WaterFix is built.

Under the agreement, when California WaterFix becomes operational, the Department of Water Resources (DWR) would deliver a portion of the district's water supply from a new source on the Sacramento River. In return, the Contra Costa Water District (CCWD) agrees to withdraw a pending protest over California WaterFix and not sue DWR over the project.

Although California WaterFix would be operated to meet all water quality standards established by the State Water Resources Control Board, the agreement compensates CCWD for a potential increase in salinity at its Delta water supply intakes that does not exceed state standards.

"When and where possible," said DWR Director Mark W. Cowin, "we have modified our proposed project to avoid or minimize potential negative effects on local communities, others who depend upon the Delta for water supplies, and fish and wildlife."

"We're pleased to announce this agreement to resolve concerns of the Contra Costa Water District and avoid unnecessary litigation. We'll continue to listen to concerns, adjust the proposed project where possible, and commit to agreements to address concerns."

CCWD General Manager Jerry Brown said, "We appreciate that the state has taken the time to sit down with CCWD to better understand our unique issues and has worked with us to resolve our water quality and supply concerns. We are confident that this is an iron-clad insurance policy to protect our customers. We wouldn't have reached agreement otherwise."

California WaterFix is a major project proposed by DWR and the U.S. Bureau of Reclamation now in the environmental review stage. It involves construction of three new intakes along the Sacramento River in the north Delta near Hood. The purpose of California WaterFix is to reduce the reliance of California's two biggest water projects on two existing pumping plants in the south Delta that were built 49 and 65 years ago.

These pumping plants pull south and central Delta channels in unnatural directions potentially harmful to fish. As a result, the water projects that supply two-thirds of California's population and a third of its farmland are often restricted from operating, even when flows into the Delta run high. With new Sacramento River intakes connected by 40-mile-long tunnels to the existing pumping plants, California WaterFix would protect fish against reverse flows caused by pumping and give operators of the State Water Project (SWP) and Central Valley Project (CVP) more opportunities to capture and store water at times of peak flow.

Modeling shows that the operation of new intakes on the Sacramento River, as proposed by California WaterFix, could at times change water quality in the south Delta near four intakes that

CCWD uses to help supply its 500,000 customers. Those intakes are in the west Delta, at Mallard Slough near Pittsburg, and in the south Delta, at Rock Slough near Oakley and Old River and Victoria Canal near Victoria Island. All of CCWD's intakes are subject to variations in water quality caused by salinity intrusion, Delta hydrodynamics, and discharges into the Delta and its tributary streams.

Under the agreement announced today, DWR would provide from the Sacramento River some of the water allowed for under the CCWD's existing water rights and contracts, including with the U.S. Bureau of Reclamation.

The agreement describes several options for providing CCWD water via the Sacramento River:

- Use the Sacramento River intake operated by the East Bay Municipal Utility District near Freeport, after CCWD reaches agreement with EBMUD;
- Build a connection between the proposed California WaterFix tunnels and a CCWD pipeline where the conveyance systems would cross in the south Delta; or
- Build a short pipeline from Clifton Court Forebay in the south Delta under Victoria Island to connect with a CCWD pipeline.

The costs of moving the water through the EBMUD facility or building an intertie would be borne by the public water districts paying the costs of California WaterFix. These districts in the Santa Clara Valley, East Bay, San Joaquin Valley, and Southern California take delivery of water from the SWP and CVP.

Under the agreement, DWR would provide 30,000 acre-feet of water from the Sacramento River to CCWD the first year that California WaterFix is operational. In each subsequent year, the volume of water to be delivered under the agreement would be determined by a formula tied to the ratio of water diverted from the Sacramento River through the three new intakes of California WaterFix. The annual quantity of water to be conveyed under the agreement is expected to range between 2,000 acre-feet and 50,000 acre-feet. For the sake of comparison, CCWD has a federal contract for 195,000 acre-feet per year.

The purpose of the agreement is to address CCWD concerns that construction of California WaterFix could damage district facilities on and near Victoria Island and that operation of the project could cause salinity, algae and other contaminants to increase at CCWD's intakes.

Modeling of the potential water quality impacts of California WaterFix finds that the construction, operation and maintenance of the proposed conveyance facilities would not result in any significant impacts on Delta water quality for any beneficial uses. Mitigation for California WaterFix includes some tidal restoration that could result in minimal increases in methylmercury levels at locations nearest to the restoration areas.

The agreement guarantees CCWD that a certain portion of its supply will come from an upstream intake where water is generally less salty than the district's supply. It also avoids litigation over potential water quality effects based on modeling results and ends a protest filed by the CCWD with the State Water Board. The State Water Board soon will begin hearings on

an application by DWR and Reclamation to add three new California WaterFix points of diversion to the water rights of the SWP and CVP.

In a February ruling on how it would conduct its hearings, the State Water Board encouraged those concerned about the potential effects of California WaterFix to strike settlements outside of the Water Board hearing process to resolve potential issues.

“We’d like to take the same practical, solution-oriented approach with other parties as we’ve taken with CCWD,” said Director Cowin. “We look forward to more such agreements as we work to modernize our water projects in the Delta.”

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New dispute erupts over Sacramento Delta tunnels project

Sacramento Bee | March 22, 2016 | Dale Kasler and Ryan Sabalow

A potentially major new fight has erupted over Gov. Jerry Brown's plan to build two huge tunnels beneath the Sacramento-San Joaquin Delta, and this time the protests are coming from a group of farmers that wants the tunnels built.

The San Luis & Delta-Mendota Water Authority, a powerful San Joaquin Valley farm water agency, demanded Monday that two members of the State Water Resources Control Board be disqualified from a crucial hearing on the tunnels scheduled for early May.

In papers filed Monday, the San Luis agency said board Chair Felicia Marcus and board member Tam Doduc, the presiding officers in the hearing, have already made up their minds about a critical issue that could translate into less water delivered to San Luis and other water agencies south of the Delta. Several other water agencies pushing the tunnels project have voiced similar concerns, but none demanded Marcus' and Doduc's ouster from the tunnels hearing.

The protest raises fresh questions about the viability of the \$15.5 billion project, which is designed to re-engineer the plumbing of the Delta, repair its fragile ecosystem and shore up reliability of deliveries of water pumped to the San Joaquin Valley and Southern California. Those deliveries often are interrupted by the need to keep water in the Delta to preserve fish, as well as other environmental concerns.

California WaterFix, as the project is formally known, is already enormously controversial among environmentalists, Delta landowners and Northern California elected officials, who say the tunnels will harm the estuary and enable south state interests to pump more north state water.

San Luis and other south-of-Delta water customers like the idea of the tunnels, but so far most have voiced only tepid support for the project because the Brown administration can't predict how much water the tunnels would deliver. Those south state interests would be on the hook for the \$15.5 billion cost.

The protest over Marcus and Doduc revolves around a crucial decision that the state water board will have to make sometime this year. Currently, water flows down the Sacramento River to the Tracy area, where it's pumped by the federal and state governments to the San Joaquin Valley and Southern California. In order to build the tunnels, the state Department of Water Resources and U.S. Bureau of Reclamation need permission from the water board to divert water from the river at a point north of Tracy, near Clarksburg, where the tunnels would begin. Without that right, the tunnels project can't move ahead.

In a procedural ruling setting out the schedule for the hearings last month, Marcus and Doduc said the board intends to require that, once the tunnels are built, water flows through the Delta would "be more stringent" than what is currently mandated.

Their comment raised red flags throughout the community of water contractors south of the Delta who would have to agree to pay for the tunnels project. If more water is required to flow naturally through the Delta, that potentially would leave less water available to be sent through the tunnels and on to the San Joaquin Valley and Southern California.

Several agencies protested. Reclamation and the Department of Water Resources asked Marcus and Doduc to rewrite their ruling and strip out the language about Delta water flows. State Water Contractors, a consortium of south-of-Delta agencies that includes the powerful Metropolitan Water District of Southern California, said in a letter to the board that the ruling on Delta water flows “appears to be biased and constitutes an abuse of discretion” and should be rescinded.

Marcus and Doduc, in a follow-up order in early March, insisted that their earlier ruling “should not be considered a final determination. ... We have not prejudged this issue.”

But the south-of-Delta water customers remain concerned about the issue, and the San Luis agency said Marcus and Doduc must be removed from the proceeding altogether. They “have predetermined a critical issue,” the San Luis agency said in the papers filed with the water board Monday.

Jon Rubin, the San Luis water agency’s general counsel, said in an interview Tuesday that the board’s mandates could make “less water available for the Central Valley Project and State Water Project,” the two major projects that pump Sacramento River water to the south state. The San Luis agency delivers Central Valley Project water to a host of agricultural districts in the San Joaquin Valley, including the influential Westlands Water District.

Water board spokesman Tim Moran said Marcus and Doduc would have the responsibility for deciding whether they should be disqualified from the proceeding. “There is also the possibility of the entire (five-person) board considering the issue,” he said in an email.

He declined to comment on the arguments raised by the San Luis agency.

Project opponents seized on the new controversy as fresh evidence that the tunnels would be used to facilitate a water grab from Northern California.

“Clearly, the large agribusiness water districts on the west side of the San Joaquin Valley know that the tunnels do not pencil out unless they grab more water from the Bay-Delta estuary,” said Barbara Barrigan-Parrilla of Restore the Delta in a prepared statement. “They are seeking to manipulate the State Water Resources Control Board permitting process to that end.”

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White House summit focuses on aggressive, new ways to save water

SF Gate | March 22, 2016 | Carolyn Lochhead

WASHINGTON — Occupants of 11,000 new single-family houses under construction near Tracy will be able to recycle their shower, bath, laundry and sink water on site using a system designed by Australian water engineers, one of dozens of new water technologies the White House will showcase at its big “water summit” Tuesday.

Hoping to leapfrog a Congress still trying to wring more water out of California’s over-drafted rivers, the Obama administration wants to replicate for water the push it made on solar power nearly eight years ago to jump start new technologies and coordinate the federal response to droughts.

President Obama views efforts to address climate change as a key piece of his legacy, and White House officials view drought as among the most dire consequences of a warming climate. After last fall’s climate talks in Paris, the administration immediately targeted water as a priority.

The White House issued a governmentwide directive Monday to reduce the nation’s vulnerability to drought, which it said “poses a serious and growing threat to the security and economies of communities nationwide.” Toward that effort, administration officials said 150 businesses and nonprofits will pledge \$4 billion in private capital to improve water resiliency.

White House science adviser John Holdren, who has been helping drive the administration’s water policy, said Tuesday’s summit was planned to coincide with World Water Day, and while it comes at the tail end of the Obama presidency, “we’ll be passing along a lot of good ideas about what works and what doesn’t.”

Technically known as “gray water,” the soapy effluent of showers, sinks and laundry has long been an obvious source of new water supply. Most of the focus, however, has been on building large recycling plants that ferry household sewage to a centralized treatment plant.

‘Like solar panels’

Treating gray water within each home is “conceptually sort of like solar panels,” said Ralph Petroff, co-founder and chairman emeritus of Nexus eWater, an Australian startup that moved to California last year. The company designed the system employed at River Islands, a master-planned development in the town of Lathrop (San Joaquin County), near Tracy. The company calls the project “the first major development in the world” to combine on-site gray water reuse with recycled energy from the home water heater.

“When the energy crisis hit, people said, ‘Let’s build huge power plants,’” Petroff said. But that takes decades and cost tens of billions of dollars, he said, so rooftop solar began catching on.

“There is a similar dynamic now,” he said. “People say, ‘We’ve got a water crisis. We need a lot more water, so we’ll build recycling and desal (desalination) plants,’ and it’ll take 15 years and cost billions. So our solution, similar to solar panels, is to do it on-site and do it during construction.”

The houses will have separate gray-water plumbing, with two underground tanks and a recycling unit about half the size of a refrigerator turned on its side, said Nexus eWater chief executive Tom Wood. The system adds \$8,000 to \$10,000 to the cost of each house, but will be amortized in a monthly bill partially offset by savings in water and sewer charges. The water can be used to flush toilets but mainly will go outdoors for landscaping and car washing. The system does not include toilet or kitchen waste, so-called black water, but still can reduce household use by an estimated 40 to 60 percent.

Cynthia Koehler, who will attend the summit as executive director of WaterNow, a nonprofit that works on reducing urban water use, said reusing gray water is critical because half of all household water is used outside. She called gray water recycling a “two-fer” that reduces a home’s intake of water and helps maintain some level of landscaping, which is environmentally preferable to covering everything with pavement.

Showcased projects will range far beyond gray water. Ceres, a water nonprofit that opened an office in San Francisco last year, will also announce a “water climate bonds standard” to provide scientific guidelines that can help investors evaluate the credibility of “green” water bonds. Kirsten James, Ceres’ senior manager for California policy and partnerships, said the San Francisco Public Utilities Commission will be the first to issue a bond under the new standard for storm-water capture and wastewater treatment.

Groundwater accounting

At the summit Tuesday, Stanford University and Aqua Geo Frameworks will release maps made from sensor-equipped helicopters that collect data on alluvial sands in the San Joaquin Valley to help farmers know when to pump or when to refill aquifers. The UC Water Security and Sustainability Research Initiative will unveil a system that combines conventional groundwater data with modeling tools to create a groundwater accounting system that water managers will be able to use by next year.

And NASA’s Jet Propulsion Laboratory at the California Institute of Technology will commit to elevate its Western States water modeling project to a high priority spaceflight mission, providing detailed information on snow, surface water in rivers and reservoirs, soil moisture and groundwater.

Peter Gleick, co-founder of the Pacific Institute, an Oakland nonprofit that works on water issues, said the efforts to improve water use, including everything from federal data collection to corporate sustainability planning, lag far behind attention to energy use and carbon emissions.

“It’s been a long time since there’s been any executive-level attention to water issues in the U.S.,” said Gleick, who will attend the summit. “We’re incredibly bad at collecting critically important data,” citing the collection of national water data once every five years as just one example.

Corporate stewardship programs to make supply chains more sustainable when it comes to water use are just beginning.

“That’s a critical piece of the puzzle,” Gleick said, “but it’s a very big puzzle.”

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Feds warn of new threats to water supplies with climate change

SF Chronicle | March 22, 2016 | Kurtis Alexander

The Obama administration underscored the threat of climate change to Western water supplies Tuesday, releasing a report that projects less snowpack in the mountains and reduced flows in major rivers — all of which spells a much drier future for places such as California.

The report estimates that diminished runoff from the Sierra Nevada will prompt an average 9 percent drop in state reservoir levels by the end of the century and a 3 percent dip in deliveries to cities and farms from the major water projects.

California can also expect its two longest rivers, the Sacramento and San Joaquin, to become warmer as the globe heats up and saltier as rising ocean waters spill into the delta where the rivers intersect, according to the study. These changes will not only impede fish, notably salmon, but also shake up the timing of water deliveries to communities across the state.

The report, spearheaded by the Department of the Interior and the Bureau of Reclamation, found similar repercussions for water supplies across 17 states as it projects a temperature spike of as much as 7 degrees through the century.

“One of the greatest challenges we face is dealing with the impacts of climate change on our nation’s water, which is really the lifeblood of our economy,” Deputy Interior Secretary Michael Connor said in a prepared statement. “We need to continue to develop collaborative strategies across each river basin to ensure that our nation’s water and power supplies, agricultural activities, ecosystems, and other resources all have sustainable paths forward.”

Tuesday’s report was timed with World Water Day and came alongside a handful of financial commitments by the federal government. Mostly, though, it sought to encourage states to work collaboratively on their own projects, from adding water storage to boosting conservation.

California has already embarked on several efforts to bump up water supplies as it enters a fifth year of drought. A mandatory rationing program over the past nine months has yielded a nearly 25 percent drop in urban water use, and a voter-approved funding initiative, 2014’s Proposition 1, is freeing up hundreds of millions of dollars for new dams and groundwater reserves.

The hurdles the state faces with higher temperatures, as laid out in the report, are expected to vary with geography. The upper Sacramento Valley is forecast to receive the same or slightly more precipitation, the San Joaquin Valley is slated for about the same, and Southern California will probably see less.

Rivers in these regions are projected to surge earlier in the year as winters get warmer, meaning less runoff to fill reservoirs in the drier spring and summer months when it’s most needed.

The state’s reservoirs are also expected to lose more water to evaporation as temperatures climb. Lake Shasta, according to the report, will see between 7.7 percent and 12.3 percent more evaporation through 2080.

Boating and other recreational activities on California’s lakes are also likely to decline, since surface reservoir areas are projected to drop an estimated 17 percent.

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Big Business Steps Up to Help Solve California's Drought

EcoWatch | March 22, 2016 12:44 pm | Kirsten James

Long before the California drought became a national crisis, multinational berry company Driscoll's knew it had to organize a solution to the water problem its grower partners were facing.

Groundwater was being over-pumped in its major California growing region in the Pajaro Valley, and as a result saltwater was seeping into farmers' wells from nearby Monterey Bay, threatening berry growers and other farmers in the valley.

Finding another sourcing region was not an option for Driscoll's, even though the company represents community growers in 21 countries around the world.

"There's a very specific climate for strawberries," said Driscoll's then-CEO Miles Reiter at a drought forum last year. "... and none of the growing environments is quite as perfect as California. That means we need to fix the water situation."

And that's what Driscoll's set out to do. In 2010, it launched the Community Water Dialogue, a bold public/private partnership with local landowners, growers and the Resource Conservation District of Santa Cruz. The dialogue brought disparate and often competing factions together to forge collaborative efforts to solve the valley's water woes.

Driscoll's is one of a growing number of companies with large water footprints that are striving to be part of the solution in solving local and global water scarcity challenges. They're beginning to collaborate at the watershed level in their sourcing regions. They're enlisting their employees, supply chains and consumers in their conservation efforts, and they're even stepping into the policy arena to advocate resilient water solutions, such as through Ceres' Connect the Drops campaign in California.

Today, at a World Water Day Summit, the White House is recognizing Connect the Drops and its five newest members—Anheuser-Bush InBev, Annie's, Eileen Fisher, Kellogg Company and Xylem—for their contributions toward building a sustainable water future in California and beyond.

Like Driscoll's, Anheuser-Bush InBev, whose brands include Budweiser and Stella Artois, is collaborating with stakeholders in the communities where it operates. The beer giant has worked to improve its water efficiency and management, reducing its water usage rate by 23 percent from 2009 through 2015 in the U.S. resulting in water savings of more than 2.5 billion gallons.

Among its many water saving initiatives, it reuses its effluent, reclaimed water, in auxiliary operations to reduce needs from local sources in many breweries such as its Los Angeles brewery, and supplies its effluent to local communities at nearly 40 of its breweries globally for agricultural irrigation, watering public parks and soccer fields, street cleaning, fire-fighting and other community needs replacing the fresh water that would otherwise be used.

Other companies, like Levi Strauss & Co., are engaging their peers in water cutting initiatives. Today the iconic jeans brand is making its innovative Water<Less finishing techniques publicly

available to spur water conservation across the apparel industry. The techniques reduce water use in garment finishing by up to 96 percent and have helped the company save more than one billion liters of water since 2011—or the equivalent to 10.56 million 10-minute showers.

Levi Strauss & Co. also engages its consumers in water conservation because its water footprint analyses show that of the nearly 3,800 liters of water used in the lifecycle of a pair of jeans, consumer care has the second-highest impact on consumption, after cotton. In order to help consumers better understand their environmental impact, LS&Co. created the “Are You Ready to Come Clean” quiz.

But are the collective actions and policy advocacy of these companies making a difference in California?

Steven Moore, a member of the California State Water Resources Control Board, thinks so. “Businesses have a unique bully pulpit to put pressure on policy makers,” he said. “More and more we need that voice at the table as we contemplate sustainable water policy.”

In 2014, for example when Driscoll’s Reiter spoke out in favor of California’s historic Sustainable Groundwater Management Act, it helped to break the logjam in the state to pass the critical bill.

Looking ahead, there are still a number of critical policies that California needs to put in place in order to right many years of unsustainable water use.

One such policy is removing perceived barriers created by Prop 218 to implementing tiered water pricing, a system for charging water guzzlers increasingly higher prices at higher volumes of water use. Tiered pricing can be very effective at incentivizing water conservation.

Another is AB 1755, which proposes to bring California closer to having good water data, and being able to act on it. The proposed legislation would create an online water data information system that could set the stage for a well-functioning water market in California.

And for California’s critical groundwater reform to move forward, sustainability plans must be developed at the sub-basin level. Food companies that source from California’s fertile agricultural lands can and should help to develop and implement those plans, following Driscoll’s lead in the Pajaro Valley.

As increasingly more companies realize the critical role they can and must play in the effort to create a sustainable water future, I believe that we will make great strides. As General Mill’s Ellen Silva put it, “We firmly believe that in order for Californian citizens, businesses, farmers and the ecosystem to thrive, we must all work together to manage the water supply sustainably.”

Kirsten James oversees the California policy program at Ceres, a nonprofit sustainability advocacy organization. She directs Connect the Drops, a network of California businesses seeking smart policies and solutions to ensure a sustainable water future in California and is former science and policy director at the Santa Monica-based environmental group, Heal the Bay.

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