BAY AREA WATER SUPPLY AND CONSERVATION AGENCY

BOARD POLICY COMMITTEE MEETING

November 10, 2016

Correspondence and media coverage of interest between October 15, 2016 and November 10, 2016

Media Coverage

Conservation:

Date: November 8, 2016
Source: Water Deeply
Article: How Water Use Has Declined With Population Growth

Date: November 3, 2016
Source: Water Deeply
Article: Social Norms Messaging: How Water Agencies Can Change Our Habits

Date: November 2, 2016
Source: Sacramento Bee
Article: Californians move beyond emergency water conservation to more sustainable practices

Date: November 2, 2016
Source: Maven's Notebook
Article: Californians' Water Use Reflects Shift to Permanent Changes

Date: November 2, 2016
Source: Maven's Notebook
Article: Environmental Community Calls for Reinstatement of Emergency Water Use Standards in Light of Declining Conservation

Date: November 2, 2016
Source: Maven's Notebook
Article: State Water Board temporarily suspends monthly reporting requirement

Date: November 1, 2016
Source: Recordnet.com
Article: A 'welcome number' on savings

Date: November 1, 2016
Source: Reuters
Article California relaxes conservation rules as rain eases drought

Date: November 1, 2016
Source: Los Angeles Times
Article: Water conservation improved in September but is still worse than in 2015

Drought:

Date: November 1, 2016
Source: Comstock's
Article: California Keeps On Farming, With or Without Water

Date: October 31, 2016
Source: Inland News Today
Article: Figures confirm drought's impact

Date: October 31, 2016
Source: The Daily Progress
Article: Wet start of rainy season respite in California drought

Date: October 31, 2016
Source: Sacramento Bee
Article: Study blames low 2015 Western snowpack on high temperatures

Date: October 25, 2016
Source: Recordnet.com
Article: Six takes on six years of drought

Date: October 24, 2016
Source: Capital Press
Article: Weak La Nina may help ease drought

Date: October 24, 2016
Source: Golden Gate Xpress
Article: Drought not nixed despite bouts of heavy rainfall

Date: October 24, 2016
Source: Motherboard
Article: The California Drought is Still Happening, and This Winter Won't End It

Water Management:

Date: November 3, 2016
Source: Pacific Standard
Article: As Californians Fight Over Fresh Water, the San Francisco Bay Barely Survives

Date: October 28, 2016
Source: San Diego Union-Tribune
Article: Unity needed for statewide water solutions

Date: October 25, 2016
Source: San Francisco Chronicle
Article: How to revive a dying delta

Date: October 25, 2016
Source: Central Valley
Article: Delta Tunnels: Fitch Ratings Downgrades Westland's Next Bond Sale

Date: October 24, 2016
Source: Water Deeply
Article: Delta Tunnel Alternative: Embracing Flooding for Water Supply

Water Management, cont'd:

Date: October 23, 2016
Source: San Francisco Chronicle
Article: Regulators propose leaving more water in California's rivers

Date: October 22, 2016
Source: Los Angeles Times
Article: Even with drought, a California river will begin flowing year-round for the first time in 60-years

Date: October 15, 2016
Source: Farm Press Blog
Article: Are farmers, San Francisco up the same river?

Water Supply:

Date: November 2, 2016
Source: Water Deeply
Article: Meet the Minds: Newsha Ajami on Innovation in the Water Sector

Date: October 25, 2016
Source: YubaNet.com
Article: Conservation Groups Protest Water Rights for Centennial Dam

How Water Use Has Declined With Population Growth

Water use has not gone up as population increased in the last few years, contrary to popular opinion and expectations. How does this impact how urban water managers are planning?

Water Deeply | November 8, 2016 |Padma Nagappan

Rebates for low-flow toilets are on display at Lowes in San Bruno, California. Increases in conservation and efficiency have helped decouple population growth from water consumption.Tara Lohan

Until 1980, water use went up steadily as population increased, necessitating investments in infrastructure and boosts to capacity. But since then, there has been a dramatic decoupling across the United States, with water use declining even as the population and the economy continued to grow.

The U.S. Geological Survey found that water consumption peaked at 440 billion gallons (1,665 billion liters) per day before dropping in 1980 and then remained steady through the 1980s and 1990s. It rose slightly in 2000, but significantly declined between 2005 and 2010, when it fell to 350 billion gallons (1,325 billion liters) per day. The USGS attributes this decline to better cooling methods that cut water use for thermoelectric power, and water use efficiencies in irrigation for farming, improved standards for many appliances and fixtures and laws requiring low-flow fixtures.

“Back in 1980 toilets used 6 gallons [23 liters] per flush, but now it’s 1.2 gallons [4.5 liters] in California. These standards have allowed our economies to grow while our communities grew too,” says Heather Cooley, director of the Water Program at the Pacific Institute. “Another reason is the passage of the Clean Water Act, which tried to reduce impacts of waste discharge, that drove efficiency improvements in industry.”

But despite the public and industry adopting efficiency practices, most of us continue to think water use will keep increasing as population grows, so water agencies have planned for it.

“Emphasis has been on building more supply to meet increasing demand. But if water use remains stagnant, that might mean we invest in facilities we ultimately don’t need, or pay for supplies we don’t need,” Cooley points out.

Improve Demand Forecasting

These developments, and the USGS data that showed declines across the board, prompted Cooley and her colleagues to study these trends and put together a community guide for evaluating future urban water demand.

After examining water use data and water agencies’ urban water plans, Cooley and her colleagues found that while water use stayed stagnant or declined in some areas, many utilities were projecting increased water use in the future, which shows they’re not allowing for efficiency improvements and so they could be overestimating demand, which could increase costs for rate payers for water they may not use.

“So we need to improve demand forecasting approaches,” Cooley says. “None of us has a crystal ball, but we can look at trends for the last 20 to 30 years, and use that to calculate water needs, which will help us to develop a much more sustainable water future for California.”

Part of that forecasting is planning for climate change and its impact on demand, something that she says many water agencies have yet to incorporate successfully.

For each area, water forecasting can look very different depending on local variables.

Water Use Stays Steady in L.A.

A Lowes in San Bruno, California, sells “waterwise” plants to help residents use less water in their gardens. Mandates and incentives to conserve have helped keep water use steady or declining even as population has increased. (Tara Lohan)

The Los Angeles Department of Water and Power (LADWP) has seen the city keep its water demand at about the same level for the last 45 years, despite population going up by 1 million people, thanks to conservation measures, incentives and mandates to cut down on use and rebates to switch to more efficient appliances.

“When actual water demands are lower than our projections, the reasons are not necessarily a reflection of overplanning,” says Martin Adams, interim COO of LADWP. “It has more to do with responses coming from the rapidly changing state and local conservation mandates, constantly evolving state legislation on water-efficiency requirements for indoor appliances and outdoor landscape, and impacts and responses to prolonged drought, which we may not be able to forecast.”

Like most water agencies, LADWP has an urban water management plan that it updates every five years, and adapts as conditions change. Asked if it will change how it plans for the future given the downward trend in water use, Adams said it will take into consideration all factors that affect demand forecasting, including population growth, economy, price of water, climate change impacts and operational flexibility.

“We believe our planning methodology has and will continue to serve the city well, and we will continue to update our plans regularly to adapt to evolving conditions,” Adams says.

Progressive Measures Lead to Big Drop in San Francisco

Up north in San Francisco, the city’s Public Utilities Commission (SFPUC), home to its water, sewer and power departments, has seen water use drop 17 percent for its retail customers between 2005 and 2015, with per capita use falling from 61 gallons per day to 44 gallons per day (230 to 167 liters per day) – at the same time that its population increased by 10 percent.

“These numbers are not an accident,” says Paula Kehoe, director of water resources with SFPUC. “We attribute it to decades of efforts in water conservation and education programs.”

San Francisco also has in place its own ordinances, such as a requirement that if a home is resold, it has to have low-flow fixtures in place before the sale goes through – a rule that ensures older homes (with water guzzling fixtures that might otherwise not get upgraded) also toe the line.

The utility recently completed its 2015 urban water management plan that forecasts for the next 25 years, and it’s projecting a slight increase in water demand as a result of increased jobs and population.

“Part of the reason is that we’ve been doing conservation for over two decades here, so we don’t have as much of an ability to conserve as we look to the future,” Kehoe explains. “What’s important to note is that our per capita will remain the same from now through 2040.”

But does this increased demand call for increasing capacity?

“No, it calls for continuing conservation, converting the remaining older fixtures, recycling water and diversifying supplies,” she says. “We’ve also taken other steps to use water as efficiently as possible. We collect and treat all black water in our SFPUC buildings, and use it for toilets, so we’ve been able to establish a program to get other buildings to do this.”

A 2015 ordinance requires new developments with more than 250,000 square ft (23,000 square meters) to assess gray water that would be produced on site and offset that supply for toilet flushing and irrigation.

Engaging the Public

Kehoe says the agency has had a progressive outlook, and always engages the public in its long-term planning, since part of the plans involve asking the public to take action and reduce water use – outreach that the Pacific Institute’s Cooley says other water agencies need to do.

It has to be a way of life, so public outreach is key to making it happen, says Suzanne Gautier, communications and public outreach manager with SFPUC.

“We have campaigns on newspapers, TV, radio, the Muni and public transit,” Gautier says. “Some of those partnerships have included many of our hotel customers. Water use here is not just a San Francisco conversation, but elsewhere too, so our model can be used by other communities.”

Despite gains made by cities like San Francisco, we still have a long way to go, given the ongoing drought and uncertainties with climate change.

Cooley says that while lower water use shows we’ve made huge strides in efficiencies, there’s always room for improvement and opportunities to look at recycled water, stormwater capture and better management of groundwater, which is severely overdrawn in California.

“If you look at our water use compared to Australia or Israel, we are still using a lot more than what they are. We’ve come a long way, so we should celebrate the success we have had, but we need to keep doing more,” Cooley concludes. “The good news is there is a lot of opportunity to improve.”

# # #

Social Norms Messaging: How Water Agencies Can Change Our Habits

Exploiting our desire to conform – through reports comparing our water usage to the norm – is one tactic increasingly used by water agencies and utility companies to push the conservation message.

Water Deeply | November 3, 2016 | Tara Lohan

For years companies have targeted consumers with advertising that leverages social pressure – like saying seven out of 10 people prefer a certain brand of toothpaste or laundry detergent. More recently, that kind of thinking has been used not just to sell products, but also to change behavior.

“Behavioral economists assert that in the absence of price signals, policymakers can change people’s behaviors by harnessing their natural inclination to conform to social norms,” wrote Nola Hastings and Galib Rustamov in a 2015 report on customer water use messaging for the California Urban Water Conservation Council. “For example, customers make decisions based on social cues, self-image, local values and identities.”

Basically, most of us just want to fit in with our social groups. And if given a little direction on how to do so, we’ll respond.

Opower, a customer engagement platform for utilities, took this philosophy and tested it in the electric utility sector. In 2008, it began sending Home Energy Reports to its utility partners’ customers, which showed people their energy consumption and how it compared to other similar households. The company now works with over 100 global utilities and its use of “social norms messaging” has begun to gain traction with water utilities.

The first substantial research that emerged from the water world on this front resulted from a June 2012 to June 2013 pilot project between 10,000 customers of East Bay Municipal Utilities District in the San Francisco Bay Area and WaterSmart Software. Much like Opower’s model, WaterSmart Software sends Home Water Reports, which tell customers how much water they’re using, how it compares to their own past use, as well as how much water similar households and similar efficient households are using. The reports also provide information on how to increase water efficiency, available rebates or other messaging from utilities.

The project compared two groups to controls – the first being a random sample of customers and the other (referred to as the Castro Valley group) were those thought to be “good candidates” for the messaging (mostly higher income and higher water use households).

Researchers found that the random group on average increased conservation by 4.6 percent and the Castro Valley group by 6.6 percent compared to the control groups. The effects went beyond just conservation, though. They also found that households from both groups were 6.7 times more likely to participate in a water audit program and 1.7 times more likely to participate in a rebate program than those not receiving Home Water Reports.

Another study is under way by Steven Buck, assistant professor at University of Kentucky. Buck is examining how customers may be changing water use behavior in the city of Folsom, California, near Sacramento.

Folsom’s water agency signed up to work with Dropcountr, mobile and online application that tracks and shares water-use information. Customers in Folsom can voluntarily sign up for Dropcountr and create a customized household water budget. They’ll also receive information

about water usage, how that usage compares to neighbors, specific tips for reducing water use and notifications about abnormal water usage.

“We are comparing households that enrolled versus households that didn’t enroll in the program and looking at what happened to consumption two months, three months, six months and 18 months after enrollment,” said Buck. Because the people who enroll may be more likely to conserve already, he said they are not simply comparing the difference between the two groups but, “we are taking into account the fact that there were baseline differences between the group that enrolled and the group that didn’t.”

Buck’s research has yet to be peer-reviewed, but his preliminary findings show that on average, those who enrolled in Dropcountr in Folsom had a 6 percent drop in their consumption since enrollment. And that number jumps to a 12 percent drop for the very highest water users.

The city has roughly 24,000 accounts, and 3,300 have enrolled in Dropcountr.

Folsom customers also have the added bonus of having water meters that relay data every day, instead of monthly or bimonthly. “There is more to learn about the usefulness of having daily water readings,” said Buck. Without them “it’s harder to detect a leak and hard to see a response in consumption.”

And Buck stressed that his research with the city of Folsom and Dropcountr is just beginning. He wants to look at how the results persists, if they would find the same results if it were not during a drought and which attributes of Dropcountr drove the effects.

One thing is pretty certain in the industry – the typical format for water bills from many agencies aren’t very good at conveying important information.

“Even though you’ve received a water bill in the past, the info may not be so salient or transparent to the user,” said Buck. Many people receive water bills that measure use in units or cubic feet, which aren’t easily understood by most customers.

“Dropcountr provides a simple visual on how much water was used and when it was used,” said Don Smith, Water Management Coordinator with the city of Folsom. “The daily use graph provides 24 hourly data points that show the customer how much they use. Dropcountr provides current information on how their conservation efforts are working.”

And, many people simply disengage from their bills altogether, said Jeff Lipton, director of marketing at WaterSmart Software. That’s why WaterSmart sends water reports separately from bills because they are more likely to be read.

Increasing conservation and efficiency, however, isn’t the only helpful result from companies that increase customer engagement with their water utilities.

“The reduction numbers of 6 percent to 12 percent are great, but are only part of the story,” said Smith. “Dropcountr provides a platform for customer engagement. We can communicate through email and mobile devices with customers who use Dropcountr and we can monitor usage of all our customers.”

Utilities can use these tools to communicate important information with customers – something that is especially useful during droughts, but not just limited to times of water shortage.

Portland, Oregon, for example, is using WaterSmart's Home Water Reports to try and reach low-income customers to help promote customer assistance programs and increase efficiency to reduce bills, said Lipton.

"What we see the need for in the water space is better customer education and engagement around a variety of topics and the ability to build political support for infrastructure investments so we don't have Flint, Michigan, happening all over the country," said Lipton. "In some cases the need to improve efficiency is important but there are lots of other things utilities need to address with customers."

Utilities may want to communicate about how they are spending money on new infrastructure or the costs of maintaining quality service that may help customers better understand how their rates are set and the money spent.

"Social norms messaging can be used to drive behavior in different directions," said Lipton. "It's really important the way we're able to leverage behavioral science insight to achieve measurable outcomes that utilities care about it."

# # #

Californians move beyond emergency water conservation to more sustainable practices
Sacramento Bee | November 2, 2016 | Timothy Quinn Special to The Bee

After five years of historic drought, Californians will never again look at water in the same way. Wasting water is now as socially unacceptable as littering became in the 1970s after a massive public education campaign.

This permanent shift in the way Californians use and think about water is apparent in communities up and down the state where lawns are being replaced with water-wise landscapes thanks in part to the hundreds of millions of dollars in rebates offered by state and local agencies. Water customers also are changing out toilets and appliances indoors, making meaningful water-use reductions that can be sustained into the future.

Last winter's modest storms and smart planning and investments by local water agencies allowed Californians to move beyond drastic emergency measures required in 2015 to more sustainable practices. Yet this shift to permanent change seems to be getting lost in the focus on monthly water-use data reported by the State Water Resources Control Board.

Despite the appropriate move to a "stress test" that emphasizes drought preparedness, some continue to judge success by how Californians are performing each month compared to 2015, when state-mandated targets were in effect due to an unprecedented emergency.

The latest data show Californians continue to achieve significant water savings in the absence of state mandates. Yet some are raising concern that residents are taking their eyes off the ball because their monthly water use was slightly higher than last year's.

Not so. A modest uptick in water use was predicted as local agencies adjusted their local requirements to emphasize ongoing water supply reliability and efficiency as a way of life. This is completely appropriate as we move beyond the extreme actions required last year – such as letting lawns go completely brown, putting buckets in showers, refraining from flushing, and basically not using water.

We knew those drastic actions weren't sustainable, and we shouldn't push the panic button because Californians are doing less of them.

Local water agencies and their ratepayers have been investing heavily in water-use efficiency and drought-resilient supplies for the past two decades. The fact that the majority passed their "stress tests" with flying colors and don't require extreme actions from their customers this year is a good thing. It speaks volumes about local drought preparedness.

Yet some headlines suggest we are backsliding from last year's "success" under state-mandated conservation. That is unfortunate. It would be a mistake to go back to the emergency approach of 2015 and re-impose extreme actions that are neither sustainable nor necessary at this time.

Even more concerning is the mixed message we would send to water customers who are doing exactly what we have asked: embracing conservation as a long-term way of life as Gov. Jerry Brown has requested. Onerous and extreme actions must be reserved for when we actually need them.

So what's to be done? Let's start by changing the conversation. Being prepared for drought and achieving high levels of ongoing efficiency are far more meaningful goals than imposing monthly targets on Californians.

We need to continue investing in drought resilience while raising the bar on long-term efficiency so we can prepare our communities for the inevitable droughts to come.

Californians get it. They know water is precious, and they are making changes for the long haul.

# # #

Timothy Quinn is executive director of the Association of California Water Agencies, which represents 430 public water agencies. Contact him at timq@acwa.com.

Californians' Water Use Reflects Shift to Permanent Changes
Maven's Notebook | November 2, 2016 | Association of California Water Agencies:

Association of California Water Agencies (ACWA) Executive Director Timothy Quinn issued the following statement today on Californians' ongoing water conservation efforts under the state's modified emergency conservation regulation.

"Wherever you go in this state, there are signs that Californians are making permanent changes to the way they use water indoors and outdoors. Lawns are being replaced with water-wise landscapes, and toilets and fixtures are being changed out for more efficient models. These changes – aided in part by hundreds of millions of dollars in rebates and incentives from local water agencies – are translating into permanent, sustainable water savings.

"The latest data from the State Water Resources Control Board shows that Californians continue to step up and use water wisely. We are glad the State Water Board is recognizing this commitment to ongoing efficiency, and we hope the policy discussion can now move beyond comparing how Californians are performing each month compared to 2015, when state-mandated targets were in effect due to an unprecedented emergency. Those comparisons are much less meaningful than the actual shift we are seeing to permanent, efficient practices that can be sustained over time.

"Californians are not taking their eyes off the ball. They are doing less of the onerous and drastic measures required last year – such as letting lawns go completely brown, putting buckets in the shower, refraining from flushing and basically not using water. Those actions are not sustainable, and they are not warranted now.

"We applaud Californians for doing what we've asked: making changes for the long haul. That's exactly what we need to raise the bar on long-term efficiency and prepare our communities for the inevitable droughts to come. We need to move forward with long-term water-use efficiency that makes sense for Californians."

# # #

Environmental Community Calls for Reinstatement of Emergency Water Use Standards in Light of Declining Conservation

September Water Usage Show Californians Continue to Backslide on Conservation

Maven's Notebook | November 2, 2016 | National Resources Defense Council:

For the third month in a row – since the State Water Resources Control Board abandoned its hugely successful mandatory urban water conservation program in favor of a 'self-certification' scheme – California residents have conserved less water. According to a report just released by the State Water Resources Control Board, Californians conserved only 18.3 percent in September compared with the same month in 2013, falling significantly from the 26.2 percent savings we achieved in September 2015 under mandatory conservation.

Emergency and long-term water conservation standards are being developed pursuant to a series of Executive Orders issued by Gov. Jerry Brown, who has identified "mak[ing] conservation a way of life for every Californian" as the top priority of his California's Water Action Plan .

With the State Water Board, California Department of Water Resources and several other state agencies poised to release a draft long-term conservation plan on November 14, environmental groups are calling for the reinstatement of emergency drought regulations that proved so successful until long-term standards are adopted.

Following is a statement from Tracy Quinn , senior water policy analyst at the Natural Resources Defense Council:

"The State Board has failed the people of California by letting water agencies off the hook for mandatory conservation. That sent a very confusing message to residents, who are wrongly being told it's OK to water their lawns or roll back the conservation efforts they'd implemented over the past few years.

"As we face a potential sixth year of unprecedented drought, it's critical that we reverse this backsliding trend by returning to mandatory conservation targets and adopting a suite of strong permanent conservation measures. We need meaningful regulations that are going to make a real difference in our homes, businesses, and farms across the state."

Following is a statement from Sara Aminzadeh, Executive Director of California Coastkeeper Alliance:

"Governor Brown has a real opportunity to cement his legacy as an environmental champion by leading the charge on aggressive water conservation standards to ensure our state's water security. We can't continue to lurch from drought emergency to drought emergency. We need to recognize the reality of less predictable water supplies due to climate change, and adopt permanent conservation standards that will allow California's environment, communities and economy to thrive."

Following is a statement from Jonathan Nelson, policy director of Community Water Center:

“At a time when so many of our communities still lack access to safe, reliable drinking water, we should not have abandoned successful emergency mandatory water conservation targets. The drought still continues in significant portions of the state, so we must continue to promote the Human Right to Water by implementing water conservation response measures that take the unique needs of our most vulnerable communities into account.”

# # #

State Water Board temporarily suspends monthly reporting requirement
Maven's Notebook | November 2, 2016 | State Water Resources Control Board

On February 4, 2015, the Deputy Director for Water Rights issued Order WR 2015-0002-DWR (Informational Order) to 1,061 Statement holders in the Sacramento and San Joaquin watersheds and Delta. This Informational Order, adopted as part of the integrated emergency drought response and extended in force through September 13, 2016, requires among other things affected diverters to report their water diversions for each month by the fifth day of the succeeding month.

Even though the Informational Order remains in force, the Division of Water Rights recognizes that early cumulative precipitation for the current water year and coincident seasonal reduction in diversions have reduced pressure on the Sacramento-San Joaquin watershed.

In light of the current conditions, but mindful of the potential for on-going drought, the Division hereby exercises its discretion and temporarily suspends, beginning with the October 2016 reporting period, the requirement for monthly reporting of water diversions under Order WR 2015-0002-DWR.

The Division will continue to monitor conditions and will make future decisions with respect to monthly reporting as conditions develop. This temporary suspension does not affect the enforceability of the order, as to responses previously required, or for the other annual reporting responsibilities of all water users under their water rights.

# # #

A 'welcome number' on water savings
Recordnet.com | November 1, 2016 | Alex Breitler

A drop-off in Californians' water conservation efforts seems to have leveled off, state officials said Tuesday, though residents still used more water during the month of September than they did the same month in 2015.

The news comes one month after the State Water Resources Control Board expressed concern that savings were slipping.

Earlier, the board had decided to relax the rules and allow cities to set their own numeric targets; most decided that none were needed. So when conservation starting slumping, critics said the board wasn't taking aggressive enough action.

But savings actually increased a tad in September, according to data released Tuesday. Californians saved 18.3 percent, up from 17.5 percent in August.
"It shows continued commitment to conservation across the state overall," said Max Gomberg, a water board staffer. "It's a welcome number after slightly concerning numbers over the summer."

In San Joaquin County, every city except Ripon saved less water this September than the previous year. And even if Ripon stepped up its efforts, it has by far the most room for improvement, with residents there using 196 gallons per person per day, highest in the county.

California Water Service Co. customers in Stockton were the thriftiest in the county in September, using just 80 gallons per day.

Most cities saw their rate of water conservation fall by at least a few percentage points, sometimes more. Tracy's savings fell from 24 percent last September to 12 percent this September while the city of Stockton slid from 25 percent to 15 percent.

Bottom line: We're not saving as much as we did last summer, when the drought was at its worst, but we're still saving more than we did before the drought began.

The water board has warned that if conservation efforts lag, mandatory targets might be imposed once again next year. But it's too soon to tell what will happen, with the winter season still to come.

David Bolland, with the Association of California Water Agencies, told water board officials on Tuesday to "stay the course."

"I think it's a good news story," he said. "Californians really are seeming to dig in here and change behaviors in a lot of ways."

Not as enthusiastic was an environmental group, the Natural Resources Defense Council, that later issued a statement calling for a return to the mandatory targets.

“The state board has failed the people of California by letting water agencies off the hook for mandatory conservation,” said Tracy Quinn, the council’s senior water policy analyst. “That sent a very confusing message to residents, who are wrongly being told it’s OK to water their lawns or roll back the conservation efforts they’d implemented over the past few years.”

Overall, residents have saved nearly 2.2 million acre-feet of water since June of 2015, nearly enough to fill New Melones Lake from bottom to top.

# # #

California relaxes conservation rules as rain eases drought
Reuters | November 1, 2016 | Sharon Bernstein

SACRAMENTO, Calif. - California on Tuesday moved to ease water conservation rules for farmers in the northern and central parts of the state, a sign that a wet fall may portend an easing of the state's five-year drought.

The decision to temporarily stop requiring mostly agricultural users from detailing how much they take from key watersheds comes as new data show that conservation among urban Californians was up slightly in September over August.

Felicia Marcus, chair of the California State Water Resources Control Board, said she welcomed rain that drenched cities throughout the state in October, but warned that the state's crushing drought was not yet over.

"We'll take every drop we can safely handle," Marcus said. "But just because we're ahead in the early innings doesn't mean that we've won the game."

Storms last month dumped 12 inches (30 cm) of rain on the northern part of the state, making it the second wettest October on record for the northern Sierra Nevada mountains, according to weather data firm Atmospherics Group International. The storms did not bring as much relief to the drier south.

On Tuesday, the state announced that farmers and others who hold rights to water in the massive but fragile San Joaquin-Sacramento River Delta and its watersheds will not be required to submit drought-related reports on how much they used in October.

In recent weeks the state has lifted similar orders in other areas, easing a requirement that many farmers felt was burdensome and intrusive.

Water board spokesman Timothy Moran said Tuesday's move affects about 1,000 users, mostly farmers.

Amid a wet winter earlier in 2016, the state had already loosened some conservation requirements for urban communities.

Data released Tuesday showed that residents and businesses conserved a bit more water in September than they had in August, but far less than they had the prior year.

Californians used 18.3 percent less water in September 2016 than the 2013 benchmark, more than the 17.5 percent they saved in August but less than the 26.2 percent conserved in September of 2015.

Most of California has experienced drought conditions since 2012, according to the U.S. Drought Monitor, a cooperative service involving the federal government and the University of Nebraska.

The water shortage has cost the state's economy billions and led farmers to fallow about a half-million acres in 2014 and 2015, the worst years.

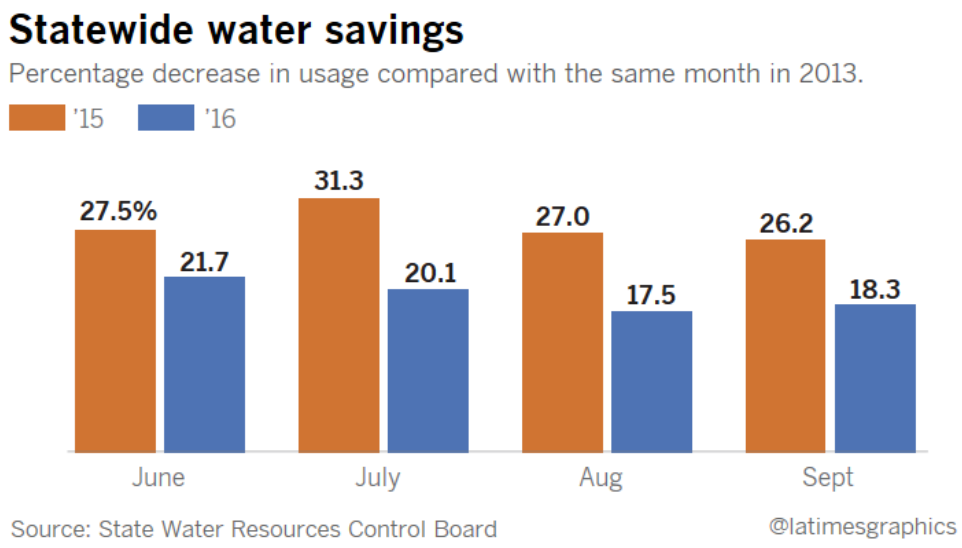
The drought monitor's Oct. 27 report showed a slight easing, with 81 percent of the state in drought last week, compared with 97 percent a year earlier.

# # #

Water conservation improved in September but is still worse than in 2015
Los Angeles Times | November 1, 2016 | Matt Stevens

Californians halted a three-month slide in water conservation in September, saving enough to hearten state regulators who previously had expressed alarm about possible drought fatigue.

Residents and businesses cut their water consumption by 18.3% in September compared with the same month in 2013. The savings represented a slight uptick from the 17.5% reduction urban Californians managed in August.



“I am glad to see the slide stop, and even reverse a bit overall, especially as we move into traditionally lower water-use months when we would expect [savings] percentages to drop significantly,” State Water Resources Control Board Chairwoman Felicia Marcus said in a statement.

“Overall, we’re happy to see millions of Californians and many water agencies continue significant conservation,” she added. “Conversely, we’re concerned to see some agencies return to using hundreds of gallons per person per day while saving little. … We need to keep conserving.”

A statewide analysis by The Times found that water conservation slid about 9 percentage points in June, July and August of this year compared with the same period in 2015, at the height of the drought.

About 93% of local suppliers saved less this summer than they did during the summer of 2015, according to the analysis.

In its statement Tuesday, the board praised many water suppliers for maintaining high levels of conservation — including some that saved more this September than in September 2015.

However, regulators also singled out a few suppliers that they said were not “sustaining significant conservation.” They listed the San Juan Water District, the supplier The Times focused on in its report, as one they were “particularly concerned about.”

At their Tuesday meeting, regulators and representatives of water agencies said it was important to look at cumulative savings numbers rather than concentrating solely on monthly savings percentages.

During the 16-month period that ended in September, Californians used 23% less water compared with 2013 benchmarks, water board staff members said.

Some agency representatives took umbrage at the notion that they are abandoning conservation.

“It’s a good news story,” said Dave Bolland of the Assn. of California Water Agencies.

He added that some media organizations are attempting to “make a story about all of California out of a few specific agency situations.”

Inland Northern California was home to some of the state’s biggest backsliders during June, July and August, according to The Times’ analysis.

On Tuesday, Amy Talbot, a representative of the Regional Water Authority for the greater Sacramento area, framed the upticks in usage as a natural consequence of moving from mandatory conservation to voluntary conservation. “We see it not as backsliding, as some articles have mentioned,” she said.

Environmental advocates, however, saw September’s 18.3% savings as a significant slip from the 26.2% savings achieved in September 2015 under mandatory conservation.

The board lifted mandatory conservation for the vast majority of California suppliers earlier this year.

“The state board has failed the people of California by letting water agencies off the hook for mandatory conservation,” said Tracy Quinn, senior water policy analyst at the Natural Resources Defense Council. “That sent a very confusing message to residents, who are wrongly being told it’s OK to water their lawns or roll back the conservation efforts they’d implemented over the past few years.”

In her statement, Quinn called for a return to mandatory conservation targets and “a suite of strong permanent conservation measures.”

The executive order that governs the current drought rules will expire in February. So water board members will need to decide whether the emergency regulations should be extended; if so, officials may choose to modify them further.

A series of storms in Northern California has gotten the state off to a good start, officials said. As of Tuesday, an eight-station index that measures rain in the northern Sierra Nevada had recorded 12.6 inches of precipitation — almost 400% of the average for Nov. 1.

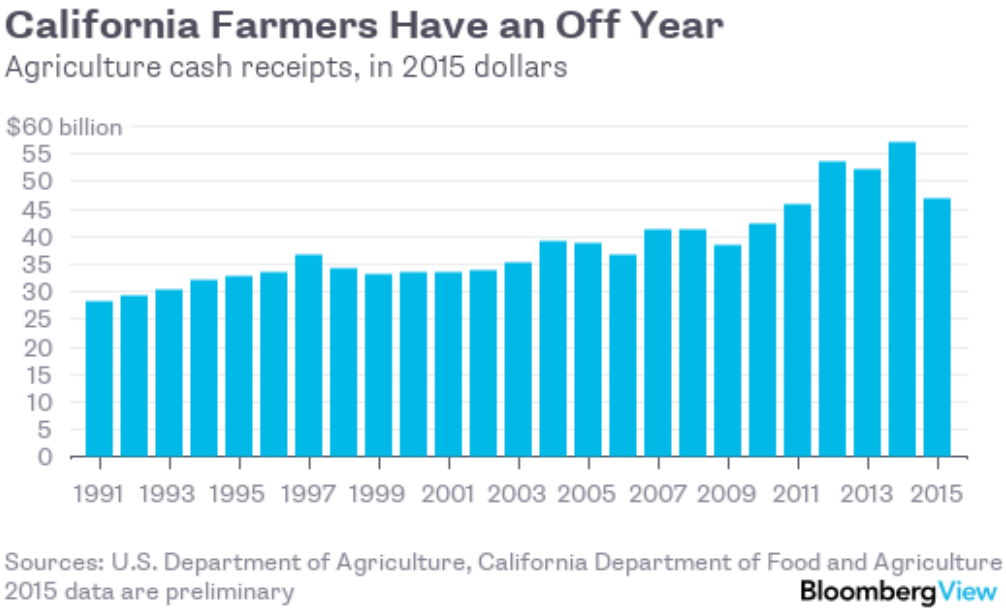
Regulators wondered aloud how the rain would affect conservation during October. More rain, they said, should lead to less outdoor watering — and perhaps greater savings.

“We’re watching the weather like everyone else is,” said Max Gomberg, the water board’s climate and conservation manager. “This is an encouraging start to the water year, but there’s a long way to go.”

# # #

California Keeps On Farming, With or Without Water
Comstock's | November 1, 2016 | Justin Fox

California agriculture, which had been plowing ahead in the face of a major drought, finally had an off year in 2015, according to data released recently by the U.S. Department of Agriculture. The state's farms brought in cash receipts of an estimated $47.1 billion (this will be revised in the months and years to come), down from a record $56.6 billion in 2014. Here's how that looks in historical context, with the numbers adjusted for inflation.

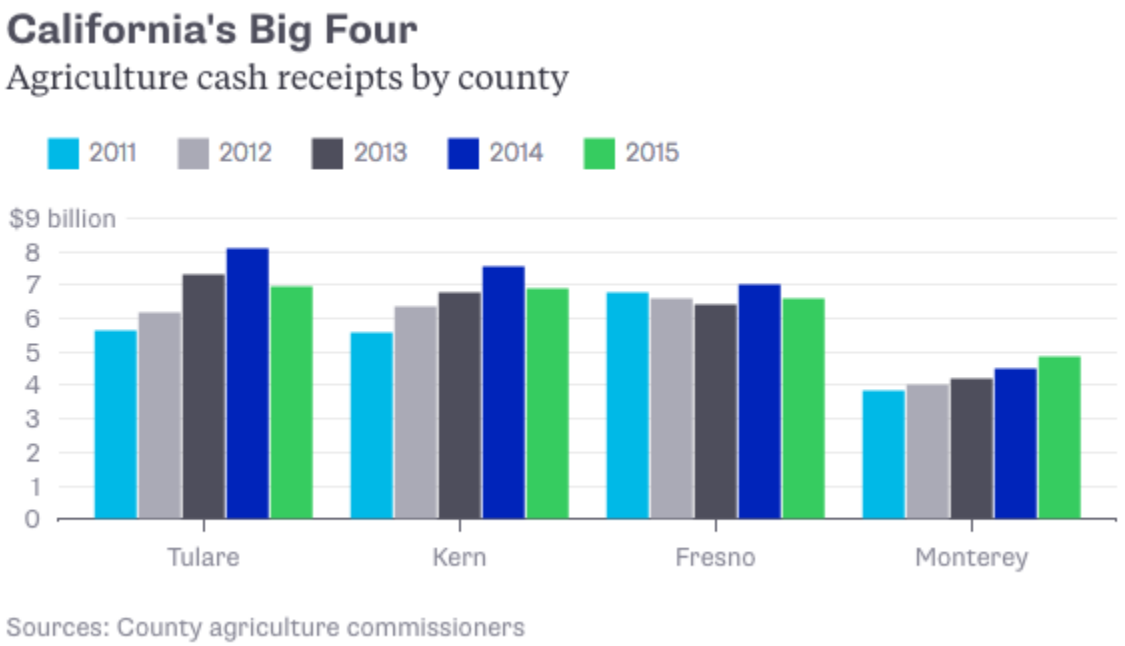


Why should you care about this, if you're not a California farmer? Well, California is the country's leading agricultural producer, by far. (Iowa was No. 2 in 2015, with cash receipts of $27.8 billion.) It is also the most populous state, with an economy that would rank as the world's sixth largest (behind the U.K., ahead of France; although it's lower if you go by purchasing-power parity) if it were an independent nation.

California also has, as you may have heard, some chronic water-supply issues that may be getting worse as climate change affects weather patterns and reduces the Sierra Nevada snowpack that has always acted as the state's biggest reservoir. Agriculture accounts for about 80 percent of the state's water use, and I think it's fair to say that the consensus among those who think hard about these things (including farmers) is that this percentage will have to go down for the state to continue to survive and thrive. Improved efficiency can take care of some of this, but it also seems inevitable that there will have to be a bit less farming done. Low-value crops that could easily be grown in other states — alfalfa, say — are an obvious target for many observers.

So was the 2015 drop in agricultural receipts a sign that California's farmers are actually pulling back? Definitely, somewhat — a federal-state study found that farmers in the state's Central Valley left 522,000 more acres (about 7 percent of the state's irrigated farmland) unplanted in

the drought summer of 2015 than in the last above-average rain year, 2011. But a closer look at the 2015 crop statistics for California's top farm counties still leaves an observer (me) astounded at how little impact the drought had on production.

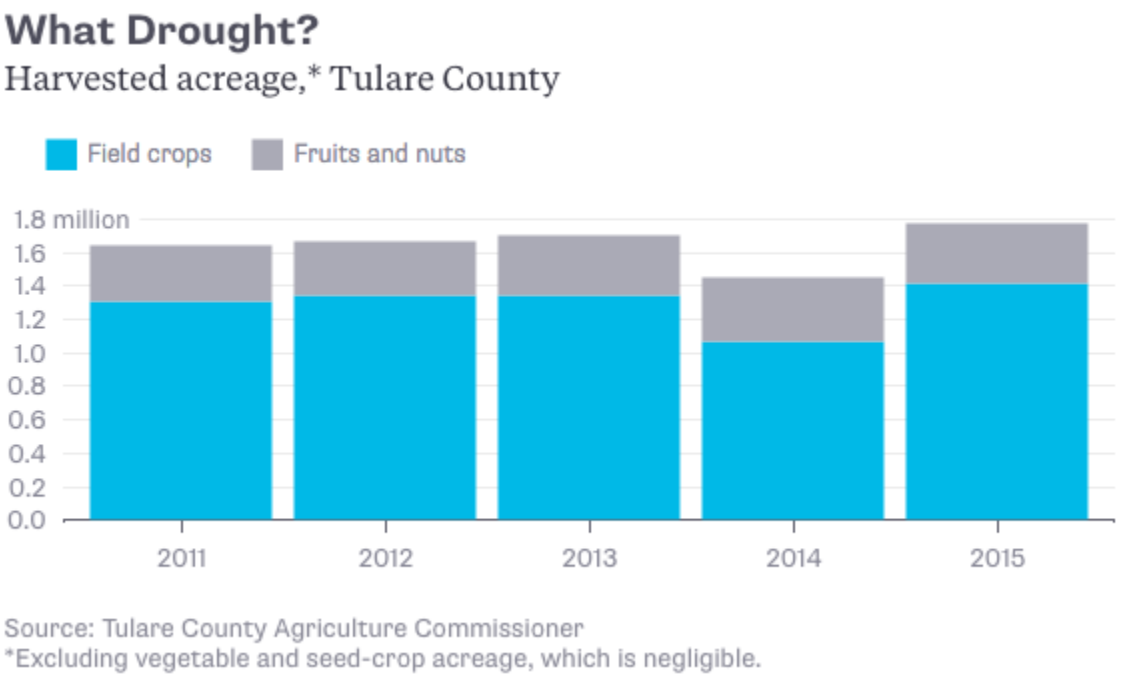


Fresno County is the outlier here, with agricultural receipts that actually fell from $6.8 billion in 2011 to $6.6 billion in 2015. Which makes sense: It is home to the Westlands Water District, a vast, controversial and currently struggling expanse on the west side of the county that is heavily dependent on water from the federal Central Valley Project, which delivered nary a gallon to Westlands farmers in 2014 and 2015. But the other three counties all had substantially higher receipts in dry 2015 than wet 2011 (and while the numbers in the above chart aren't adjusted for inflation, that would still be true if they were).

Tulare and Kern counties did see drop-offs from 2014 to 2015, but this appeared to have at least as much to do with falling prices for milk (Tulare County's No. 1 agricultural product and Kern County's No. 4) as with drought-related cutbacks. And Monterey County, which specializes in a lot of the crops most identified with California agriculture — its top three are lettuce, strawberries and broccoli — has just kept setting new agricultural production records every year.

None of these places had any gushers of water flowing its way. Tulare and Kern counties, both in the Central Valley to the south of Fresno County, were mostly cut off from state and federal water deliveries in 2014 and 2015, and Monterey County never gets them because it's on the other side of a range of mountains from the aqueducts through which the water flows. Farmers in all three counties had to rely on a few not-very-full local reservoirs and groundwater. So they pumped, and pumped. (Something that, because of salinity issues, many Westlands farmers aren't able to do.)

In Tulare County — the state's and nation's No. 1 farming county, and my place of residence for a year in the late 1980s — this groundwater pumping enabled farmers to harvest more acres of crops in bone-dry 2015 than in relatively wet 2011.



There was a big cutback in field crop acreage in 2014, which the county's agricultural commissioner attributed to the drought, but the acreage bounced right back up in 2015. What were these fields planted with? Mainly things to feed the cows, with corn silage, small-grain silage and alfalfa at the top of the list. As already noted, milk is Tulare County's No. 1 agricultural product. Cattle (and calves) is No. 2.

Unlike Tulare County's No. 3 crop (oranges), milk and cattle are not agricultural products that California is uniquely suited to produce. But Tulare County's mild winters make it a relatively inexpensive place to keep cows, and it is close to big consumer markets in Southern California and the San Francisco Bay Area. Raising beef cattle was actually the Central Valley's first big agricultural industry. The milk cows came north later, squeezed out of the state's former dairy heartland near Los Angeles by post-World War II suburban sprawl. Tulare County's dairy and cattle farmers have invested a lot in being right where they are, and it's understandable that they haven't wanted to let a few years of drought drive them out of business. The same goes for all the rest of the state's farmers. These are businesspeople with bills to pay, and leaving land fallow doesn't help with that.

That said, they can't just keep pumping and pumping. Last winter and spring were rainy enough to refill California's reservoirs to levels last seen in 2012, but there wasn't a lot of extra water to recharge groundwater basins, and the Sierra snowpack was still below average. Central Valley farmers often argue for the relaxation of environmental rules that keep water behind dams and in streambeds for the benefit of fish, but that's not popular with other Californians and it's hard to see how it would deliver enough water to make a difference anyway. Barring a series of very wet years, the state's farming counties are going to keep getting less surface water than they

want and pumping from the ground to make ends meet. Until, one of these years, the wells run dry (as they already have for some residential water users in Tulare County).

The two main paths to a more sustainable agricultural future for California seem to be groundwater regulation that puts limits on how much farmers can pump and water markets that allow farmers to profit from not using water. (Another storage reservoir or two probably wouldn't hurt, either). The former is on its way, slowly and fitfully, after the state Legislature belatedly approved a set of groundwater-management laws in 2014. The latter exist in California, but still don't trade much water. And so California's farmers just keep on farming, even when there's a drought.

# # #

Figures confirm drought's impact
Inland News Today | October 31, 2016

SACRAMENTO – (INT) – The impact of the ongoing drought is coming into sharp focus for California's vast farming industry.

Last year, California's farms and ranches received approximately $47 billion for their output. This represents a decrease of nearly 17 percent compared to 2014, according to the U.S. Department of Agriculture's National Agricultural Statistics Service. 2014's comparable receipts were $56.6 billion. That's a revenue loss of $9.6 billion in a single year. That equates to erasing the total sales of eBay.

The California Department of Food and Agriculture (CDFA) added these comparisons:

· CDFA reported that California lost 5,300 family farms and ranches between 2010 and 2014. The 2014 Crop Report stated that California had fewer operations in 2014 than at any time since 2007.

· Cultivated and grazed agricultural acreage dropped 700,000 acres since 2007.

· U.C. Davis estimates that 78,800 acres were idled in 2016 due to the California drought.

· A UC Davis' study author, Daniel A. Sumner, confirms an additional 461,000 acres were left unplanted due to federal and state regulatory diversions of water from farms or for other man made reasons unrelated to low natural precipitation or short water supplies. "The rest really are due to long term regulations (or other factors in some cases)," said Sumner.

# # #

Wet start of rainy season respite in California drought
The Daily Progress | October 31, 2016 | Ellen Knickmeyer

SAN FRANCISCO (AP) — Amid a wet start to California's rainy season, and some mending of Californians' backsliding ways on water conservation, the advice of the state's drought czar: Relax and enjoy the rain. For now.

"Celebrate and be happy about it. These last few years...I practically kiss each raindrop," said Felicia Marcus, chairwoman of the state Water Resources Control Board. The board will release Californians' latest monthly water-use figures Tuesday under the state's nearly three-year drought emergency.

Northern Californians have had plenty of opportunity the past month to enjoy the sight and sound of raindrops pelting windows. Northern California, where most of the main reservoirs are, has logged an unusually wet October. San Francisco is ending the month with three times normal rainfall for the period, and Sacramento, five times, the National Weather Service said Monday.

Marcus said the latest water figures, for September, will show conservation by households and other non-agricultural consumers has stabilized. In August, water-use figures showed conservation efforts by Californians had dropped off by a third, alarming water officials.

California by 2015 was marking the driest four-year period in its history. In April 2015, Gov. Jerry Brown ordered mandatory 25 percent conservation by cities and towns. After near-normal precipitation in the north over the 2015-16 winter rainy season, the state lifted the statewide conservation order earlier this year. Currently, just one-fifth of the state remains in the most severe category of drought, in the south. That compares to nearly half the state at this time last year.

In January, the water board is due to take stock of the state of drought and Californians' conservation. Options then include re-imposing some statewide conservation requirement, if needed, Marcus said.

# # #

Study blames low 2015 Western snowpack on high temperatures
Sacramento Bee | October 31, 2016 | Nicholas K. Geranios

SPOKANE, Wash. — The western United States set records for low winter snowpack levels in 2015, and a new report blames high temperatures rather than low precipitation levels, according to a new study.

Greenhouse gases appear to be a major contributor to the high temperatures, according to the study published Monday in the journal Geophysical Research Letters.

Scientists looked at snow-measurement sites in California, Oregon, Washington, western Nevada and western Idaho. They found that in 2015, more than 80 percent of those sites experienced record low snowpack levels as a result of much warmer-than-average temperatures.

Most of the previous records were set in 1977, a drought year, said Philip Mote, lead author of the study and director of the Oregon Climate Change Research Institute at Oregon State University.

"The 2015 snowpack season was an extreme year," Mote said. "But because of the increasing influence of greenhouse gases, years like this may become commonplace over the next few decades."

Winter snowpack in the mountains is important in the arid West because the melting snow provides precious water in dry months. The snow drought last winter led the governors of California, Oregon and Washington to order reductions in water use.

California has been in a drought since 2011. Oregon and Washington experienced much higher-than-average temperatures during the 2014-15 winter, but they were not as dry overall as California, the report said.

"The story of 2015 was really the exceptional warmth," said Dennis Lettenmaier of the University of California at Los Angeles, co-author of the study.

"Historically, droughts in the West have mostly been associated with dry winters, and only secondarily with warmth," Lettenmaier said. But in 2015, "the primary driver of the record low snow packs was the warm winter."

For 111 of the snow-measurement stations in the region, the April 1 reading was zero for the first time ever, essentially indicating that there was no snow left, the study found. The overall snowpack level on April 1 in California and Oregon was 90 percent below average, the report found.

# # #

Six takes on six years of drought
Recordnet.com | October 25, 2016 | Alex Breitler

It might have been sprinkling outside the Stockton Memorial Civic Auditorium on Tuesday, but inside the building some of the state's brightest water experts were taking stock of California's enduring drought.

As we enter into what could be a sixth year of shortage, here are six lessons gleaned from Tuesday's forum sponsored by the nonprofit Water Education Foundation:

1. Yes it rained, but ...

While Northern California enjoyed above-normal rainfall last winter, and some reservoirs rebounded, controversy over who got how much water actually intensified. Fish populations plummeted so much the preceding years that conservative estimates were used to manage water supplies, said Michelle Banonis, manager of the U.S. Bureau of Reclamation's Bay-Delta Office.

Restrictions to protect Delta fish made it hard to pump water south from the estuary.

The lesson: "Even if you have a greater supply of water, it does not mean you have fewer resource conflicts," Banonis said.

2. Warm drought, cold shower

California missed out on a staggering 313 million acre-feet of precipitation from 2012 through 2015, said Michael Dettinger, a research hydrologist with the U.S. Geological Survey. That's a couple of Lake Tahoes worth of water, though much of it would have evaporated and would not have been available for humans or wildlife.

Even more alarming, perhaps, the state also missed out on nearly three years' worth of snow during the drought because temperatures were exceptionally warm.

It's the heat that could make future droughts so difficult, as climate change reduces snowpack and increases evaporation rates, Dettinger said. Even a wetter year like 2016 won't cut much into the state's rainfall deficit because evaporation rates are high.

The lesson: "This was a remarkably warm period," Dettinger said. "It's a snapshot of what we might expect in the future."

3. For fish, the drought never ends

Of all those injured by the drought, the fish are suffering the most.

The Delta's native fish species are biologically adapted to survive severe droughts from time to time. But dams, upstream diversions and Delta exports have left native fish species in a condition of "perpetual drought," said University of California, Davis Professor Peter Moyle.

Now, 80 percent of the state's native fish species require some level of protection.

“That’s not a very good track record,” Moyle said. “California is not a very good place to be a native fish.”

The lesson: “We need to rethink the Delta,” Moyle said, suggesting an increase in freshwater flow coupled with the restoration of wetland habitat in a continuous, sweeping arc from the Yolo Bypass to the Suisun Marsh.

4. Hold the salt

Just because there is always water in the tidal channels that meander through the Delta doesn’t mean farmers there are immune from shortages.

When flows are low, the water in those channels gets saltier. When that water is applied to crops, the salt builds up in the soil and has the potential to reduce yields, said Michelle Leinfelder-Miles, an adviser with the University of California Cooperative Extension in San Joaquin County.

State officials recently proposed allowing more salt in certain south Delta waterways, saying the science suggests farmers won’t be harmed.

The lesson: "We don’t know what will happen if the salinity conditions get worse," Leinfelder-Miles said.

5. Avoid the green cornflakes

With warming temperatures and low flows, blooms of toxic Microcystis bacteria have now been documented in the Delta for up to eight months of the year.

The blooms resemble green cornflakes floating in the water during the daytime hours. Health officials from San Joaquin County and other agencies have repeatedly warned the public to watch for these blooms in Delta waterways and in many lakes across California.

The lesson: “With climate change, in the next 15 or 20 years we might see blooms that last the entire year. That’s what we can look forward to,” said Peggy Lehman, a senior scientist with the state Department of Fish and Wildlife.

6. The silver lining

If nothing else, the drought is a chance to learn how our water system responds when it’s under stress, said Jay Lund, director of the UC Center for Watershed Sciences.

"We could look at the drought as a test. And the reason we give you a test is not to torture you, but to help you to learn,” Lund, a professor, told the experts in the room.

The lesson: "Get as much out of it as you can,” he said.

# # #

Weak La Nina may help ease drought

Capital Press | October 24, 2016 | Don Jenkins

Federal climatologists predict that dry conditions will generally recede over the winter in Oregon, Idaho, Washington and parts of Northern California, providing an early and upbeat outlook on next year's water supply.

The Climate Prediction Center forecast a 70 percent chance of a weak La Nina, a cooling of the ocean around the equator.

La Nina generally tilts the odds in favor of wetter and cooler winters in the northern U.S., according to the center.

It's not a sure bet, though. La Nina's influence will vary by region. The odds it stays through the winter are 55 percent.

Washington State Climatologist Nick Bond said he expects the La Nina to be too feeble to dictate the weather.

Higher ocean temperatures in the northeast Pacific Ocean and a trend toward warmer winters also may influence the weather, he said.

Still, even a normal winter would seem cold after the past several years, Bond said.

"There's no indication that we'll have a snowpack like the disaster we had two years ago," he said. "There's no reason to be pessimistic about next summer's water supply."

Idaho State Climatologist Russell Qualls also said La Nina's influence may be blunted by unusually high inland temperatures. Still, most of the state is expected to have above-average precipitation, and snow may accumulate at high elevations, he said.

"The signals are a bit confusing in terms of the water supply outlook," he said. "From what it looks like, the drought at least is likely not going to be getting any worse."

The center issued the forecast for November, December and January.

It also projected that drought conditions likely will be erased by the end of January in Oregon and parts Northern California. About one-third of Oregon is in drought, while 81 percent of California remains in drought.

A year ago, 100 percent of Washington was classified as being in a drought. Now only 8 percent of the state is even "abnormally dry."

In Idaho, 19 percent of the state is abnormally dry and 1 percent is in drought.

Bond, the Washington climatologist, said that even without a strong La Nina or El Nino, the state could have an eventful winter. He said current climatic conditions resemble the months before massive flooding in February 1996. "I'd be surprised if we didn't have some major flooding," he said.

The seasonal outlook rates the chances that an area will have above-average or below-average precipitation and temperatures.

Here's a state-by-state look at the seasonal outlook:

• Washington: The odds favor above-average precipitation in most of the state, though the chances are no better than even in the South Cascades, south Puget Sound, and southwestern and south-central Washington. The chances are even that temperatures will be above or below normal for most of the state. The odds favor above-average temperatures in southeastern Washington.

• Idaho: Southwest Idaho has equal chances for above- or below-average precipitation. The odds favor a wet winter elsewhere. The north end of the panhandle has equal chances of above- or below-normal temperatures. In the rest of the state, the odds favor a warm winter.

• Oregon: Equal chances of above- or below-average precipitation. Odds favor above-average temperatures.

• California: Chances for above- or below-average precipitation are equal in most of the state. Precipitation could change the status of parts of Northern California that are now in moderate drought. Odds favor a dry winter in the southern tip. The odds favor above-average temperatures throughout California. The drought could worsen in Southern California, according to the climate center.

# # #

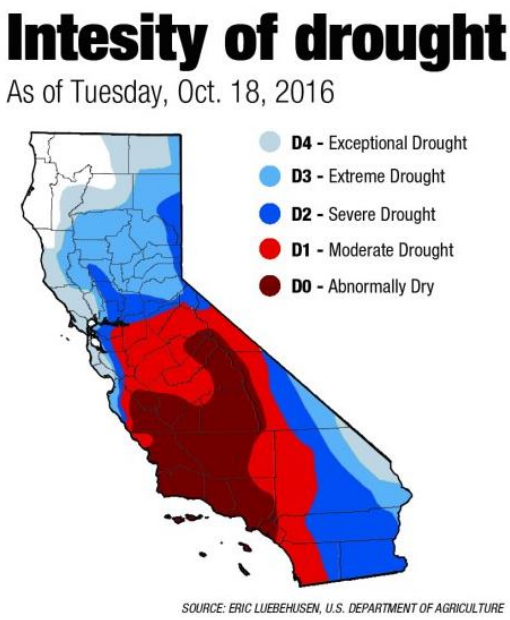
Drought not nixed despite bouts of heavy rainfall
Golden Gate Xpress | October 24, 2016 | Katherine Minkiewicz

Over the weekend, the unfamiliar sound of the pitter patter of rain intensified to a din as people donned their rain boots and lugged around their waterlogged umbrellas in the first rainstorm that San Francisco has seen since March. Despite the early rainfall however, California's drought is far from over.

In the space of three days last week, San Francisco received 1.18 inches of rainfall, according to Meteorology Professor Oswaldo Garcia, which is more than what the city received for the whole month of October last year. At San Francisco International Airport, 175 flights were cancelled and SF State dispatched a weather advisory to students.

However severe the rain may have been for the Bay Area, the severity of the drought is not over according to Jason Gurdak, an associate professor of geology at SF State, with an emphasis in hydrology.

"The drought monitor estimates that 33.7 million Californians are in locations that are experiencing the drought. So the drought is not truly over," Gurdak said.



According to John Monteverdi, a professor in the meteorology department at SF State, even though the five-year drought is still severe in many places throughout California, we don't have to necessarily make up for all the months of rainfall that we haven't received.

"We don't have to make up for it all, but we do need at least a couple normal winters. There is a difference between a meteorological drought and and a water source drought. We are out of the meteorological drought. We got a lot of rain last March and April, but we still have to make up for the water source drought with a few consecutive years of normal rainfall," Monteverdi said.

Despite the fact that we still need a few seasons of normal rainfall to help mitigate the statewide drought, according to Gurdak, the drought is less severe in certain areas of California.

"The drought may be less severe in some regions of California, like Northern California, maybe prompting some managers to lift certain water use restrictions, but much of California is still very much experiencing drought," Gurdak said. "About 83 percent of California is still experiencing at least moderate drought conditions and 42 percent of the state is experiencing extreme drought conditions," Gurdak said, citing statistics from the United States Drought Monitor.

Last year's El Nino2 was expected to dump several inches of rain throughout California, yet the state did not get the amount of rain that was anticipated, according to Monteverdi.

“Typical El Nino ocean temperatures are warmer than normal in the eastern and tropical Pacific, but last year, there were warmer than normal ocean temperatures between Hawaii and San Francisco and forced the jetstream of rain into the Pacific Northwest,” Monteverdi explained. “Northern California and Southern California, especially Los Angeles and Santa Barbara didn’t get much rain. Yet Oregon and Washington got a lot of rain, Portland had record rainfall in December. That should’ve been us,” Monteverdi said.

When asked if last weekend’s rain storm is a good sign for a wet winter, Monteverdi said there is often no correlation with having rain in October to predicting a good season of oncoming rainfall and that rainfall projections for winter are “up in the air.”

However, according to Monteverdi, San Francisco is predicted to receive another couple inches of rain in the next few weeks.

“The next storm is expected for next Monday or Tuesday, it won’t be as wet as the last storm, but we could get two inches of rain in the next few weeks or so,” Monteverdi said.

Even though the outlook for this winter’s rainfall doesn’t look too grim, Monteverdi and Liana Derus, president of the Environmentally Concerned Organization of Students, emphasized that it is still important to be mindful of water usage.

“The drought isn’t a hot topic anymore, but our planet is dying and we should still be scared. Taking 15-minute showers won’t do much (to help conserve water). Eighty percent of water is used in animal agriculture, so we can be mindful of water use at home, but we should be more mindful of what we eat,” said Derus, who is also an environmental studies major. “500 gallons of water go into one serving of beef. We should not be eating meat three times a day. Make a compromise.”

Other ways that students can help cut back on water usage include abstaining from watering lawns and making sure that showers don’t exceed half an hour, according to Monteverdi.

“I don’t think it is too worrisome where people should stop taking showers or flushing the toilet. Just be mindful and keep fingers crossed that these rain predictions for the next few weeks will be true,” Monteverdi said.

# # #

The California Drought Is Still Happening, and This Winter Won't End It
Motherboard | October 24, 2016 | Meredith Rutland Bauer

If you live outside California, you've probably forgotten the state is in a drought.

But it totally is, and state officials announced recently that most of the rain from last winter's El Niño fell as rain rather than snow—bad news for the state's future drought outlook.

Even though state officials reined back mandatory water restrictions this summer, 60 percent of the state is still in a severe or extreme drought, the California Department of Water resources announced at the end of September. Part of that is because most of the state's northern reservoirs and lakes only got half as much rain and snowfall as usual.

"Record warm temperatures created an early and below-average runoff that was in large part absorbed by parched soil before ever reaching the State's reservoirs," the state water department stated in a release. "The water content of the California Sierra snowpack, often referred to as 'the state's largest reservoir,' flows each spring into a series of above ground storage reservoirs that essentially serve as California's water savings accounts in order to meet the growing demands of an uncertain climate future."

The lack of a strong snowpack in the Sierra Nevadas may not seem like a big deal, but it could strangle California's water supplies. Northern California's snowpack provides a slow-release reservoir for nearly all of California during the summer.

Even with the deluge of rain from the recent El Niño, most reservoirs didn't have the storage space to hold all that water. To prevent overfilling their reservoirs or violating rules that require extra room be left in the case of major floods, some of that rain water had to be diverted to the Pacific Ocean. With snow, that water hangs around as pretty powder until residents need it most.

And with this winter expected to be relatively dry due to a predicted La Niña system, that's bad news bears for California.

# # #

As Californians Fight Over Fresh Water, the San Francisco Bay Barely Survives

Drought, industrial-scale agriculture, and an outdated water rights system are killing the largest estuary in the American West, according to a new report. In the coming year, the state's residents have a rare opportunity to turn things around.

Pacific Standard | November 3, 2016 | Jimmy Tobias

The San Francisco Bay is an estuary—an ecological mixing bowl where salty waters from the Pacific Ocean meet the fresh runoff that flows down from the high sierra through the Sacramento and San Joaquin rivers and eventually to the sea. The brackish blending together of these aquatic inputs produces one of the most abundant ecosystems on the planet. Shrimp, crabs, smelt, salmon, and many small but supremely important invertebrates swim (or scuttle) in its mild waters. Cormorants, pelicans, geese, and ducks galore wing overhead or waddle along its shores. Mammals, including whales, seals, and some humans too, depend on its productivity for their very survival. It is the beating heart of its urban namesake, that West Coast capital we call the Bay Area.

But the Bay is in a very bad way. According to a major recent report, thousands of dams and ditches that supply irrigation and drinking water to industrial farms and dense cities throughout California now deprive the estuary of as much as 70 percent of its freshwater inflow during the crucial winter and spring months each year. Even before the present debilitating dry spell, it had experienced its own man-made drought for decades. The largest estuary in the American West is being starved of fresh water, while its life-supporting brackish zone shrinks in the face of increasing salinity. The complex relationships that keep the ecosystem intact are fraying every day.

Jonathan Rosenfield is a conservation biologist with the Bay Institute and the lead author of the report "The San Francisco Bay: The Freshwater-Starved Estuary." Commissioned by the quasi-governmental San Francisco Estuary Partnership, it is a meticulous description of disaster: The report speaks of sharp declines of shrimp and salmon populations. It speaks of dangerous algae blooms and degraded water quality. It speaks of sediment deprivation and beach erosion. It speaks of commercial fishery closures and the loss of thousands of jobs in recent decades. It speaks of a brewing catastrophe for migratory birds and beloved marine mammals.

"Looking at all the signs," Rosenfield says, "it is clear the ecosystem will collapse."

This year, however, Californians have a chance—a rare and controversial opportunity—to clean up their act.

The foremost reason for the San Francisco Bay's woes, according to the report, is large-scale farming that relies on an antiquated and over-allocated water rights system. In fact agricultural irrigation, a traditionally water-intensive form of land use, accounts for approximately 80 percent of the fresh water diverted from the Bay watershed each year. Drinking water provision for cities like Sacramento, San Francisco, Merced, and Modesto makes up much of the rest.

Agriculture's excessive share of the Bay's fresh water, however, may soon be subject to a shrinking. The California State Water Resources Control Board—a government agency that enforces clean water standards and oversees the allocation of the state's scarce life-giving liquid—is in the midst of revising regulations that control how much water is removed from the

Sacramento and San Joaquin watersheds. These rivers and their tributaries are the principle source of the Bay's fresh water supply. This sort of regulation rewrite is rare—the last meaningful update took place in 1996.

"The water quality control plan update is the biggest thing in California water policy that will happen in our generation," says Rosenfield, whose team published its report in part to inform this bid for regulatory reform.

"To try to return a major portion of these rivers to in-stream uses after developing an economy and a lifestyle and a livelihood for so many people will be bad for just about everybody but the fish."

In September, the State Water Resources Control Board, or the Board, put forward a draft proposal that could keep intact 40 percent of the San Joaquin watershed's natural flow during the crucial winter and spring months. (As it now stands, as much as 90 percent of the water from the San Joaquin and its tributaries is requisitioned by human users during the wet season.) And though it has not yet put out any proposals for the Sacramento River, the Board has released a scientific report that suggests the possibility of leaving as much as 75 percent of that river system's natural flow untouched during the same winter-spring timeframe.

Such reforms are essential if the decrepit estuary and its withering fish populations are to heal. But the response to these ideas has been "polarized," Rosenfield says. Some people, he says, "think the sky is falling."

Agricultural interests, for instance, have already denounced the San Joaquin draft proposal as well as the Sacramento scientific report.

"To try to return a major portion of these rivers to in-stream uses after developing an economy and a lifestyle and a livelihood for so many people will be bad for just about everybody but the fish," says Chris Scheuring, a farmer and lawyer for the California Farm Bureau Federation. The federation's members fear that restrictive flow plans will force the idling of more than 200,000 working acres across the state.

Agriculture is not alone of course. The city of San Francisco also sees the Board's draft policy as a threat. In an October op-ed in the San Francisco Chronicle, Bay Area water officials fretted over the idea of leaving 40 percent of the San Joaquin's winter and spring flow unused. The city, after all, gets its drinking water supply from one of the river's large tributaries.

"With the proposal," they wrote, "we can expect more severe and more frequent water rationing."

Water advocates, conservationists, and commercial fishermen, meanwhile, support the Board's overall goals, though some say its recent proposal doesn't go far enough.

"People would still be able to divert between 50 and 70 percent of [the San Joaquin system's] flow," says Doug Obegi, a senior attorney with the Natural Resources Defense Council. "That is substantially more diversion than what the California Department of Fish and Wildlife and other agencies have recommended as necessary to restore the health of these rivers."

Jonathan Rosenfield agrees. "When we look at the [Board's] proposal, it is very clear that it is not what science from agencies, independent experts, and the board itself has indicated will be necessary to restore populations of salmon as the law requires," he says.

As this once-in-a-generation struggle to change California water allocation continues in the coming years, it's wise to remember the debate's broader context. Like one tale in a larger tome, the San Francisco estuary's unraveling is embedded in more comprehensive crises.

In California, freshwater ecosystems as a whole are in a state of severe distress due to burgeoning human populations as well as carbon pollution. A 2015 study published in PLoS One describes the problem precisely:

Water allocations are currently five times the state's mean annual runoff and, in many of the state's major river basin, rights to divert water lay claim to up to 1,000% of natural surface water supplies. Recent studies have highlighted dramatic declines of California native fishes with 80% either extinct or threatened with extinction within 100 years.

As things stand today, most of the state's fish, including many in its biggest estuary, have no future.

And the Golden State is just one front in the quiet quotidian war on wildlife and wild systems. As the Guardian recently reported, a new study by the Living Planet Index found that the number of wild animals on planet Earth is on track to decline as much as two-thirds by 2020. The major industries driving this ineffable loss include logging and, you guessed it, agriculture.

If you want to catch a first-hand glimpse of this galling global catastrophe, the Bay is Exhibit A.

# # #

Unity needed for statewide water solutions
San Diego Union-Tribune | October 28, 2016 | Mark Cowin

San Diego County's reliance on imported water is among the highest in California. Despite previous and planned local investments in desalination and recycling, most of this region's water will continue to come from distant watersheds for decades to come as far as any water planner today can see. In fact, by 2040 the San Diego County Water Authority (SDCWA) estimates 80 percent of their supply will be imported even with water efficiency savings and increased local supplies. Nearly half of that water will come from Metropolitan Water District which gets its supply from the Colorado River and Sierra Nevada.

Considering this extraordinary reliance on these imported supplies, it is disconcerting to see a deepening undercurrent of skepticism from the SDCWA about maintaining a reliable supply from the North. The U-T's headline for the recent op-ed from County Water Authority Board Chairman Mark Muir — "California's twin tunnels plan should raise concerns for San Diego ratepayers" — captures this sentiment.

Yet water from the Sierra Nevada connects us. Two-thirds of the state draws these Sierra supplies from water projects located in the Sacramento-San Joaquin Delta. As one state, we either find water solutions together or we will collectively suffer the grave consequences.

Fifty-six years ago, California voters made a historic decision to connect our water futures by building the State Water Project. The tallest earthen dam in the world was constructed on the Feather River north of Sacramento. And the world's most powerful pumps began to lift this water from the California Aqueduct in the southern San Joaquin Valley over the Tehachapi Mountains to reach a fast-growing San Diego County that has depended on this water to this day.

In Southern California, San Diego County's votes helped make the State Water Project happen. Local ratepayers began to pay for this vital water supply in their monthly bills. In wetter times, Sierra water can be more than half of what comes out of your tap.

In the months ahead, Metropolitan will come to a decision on whether to modernize the State Water Project. The water intakes for this system in the southern Delta are where conflicts with fish species are at their greatest. This is a chronic problem that is getting worse. After 10 years of study and a quarter-billion dollars of analysis, the only comprehensive solution — California WaterFix — is to construct new intakes in the northern Delta away from endangered species habitats. There, an underground pipeline would transport the supply to the existing aqueduct system to serve 25 million Californians.

If we do nothing, the state and county's initial investment will have been for naught. The State Water Project and south Delta pumps will become a stranded asset. Climate change and sea level rise alone could render the existing infrastructure unusable much of the time.

The public water agencies with a stake in this solution span from Silicon Valley through the fertile farmlands of the San Joaquin Valley to Southern California. Everyone awaits a final plan. Everyone has questions. Nobody has said no. Nobody has said yes. Yet at this pre-decisional stage, the emphasis on “concerns” emanating from San Diego County — as opposed to any balancing mention of potential water benefits — is unique and noteworthy.

For San Diego County and all of Southern California, saying no to WaterFix would risk the region’s largest imported water source. It could strand billions in ratepayer investments. It could reverse the benefits of years of supply diversification. It could increase reliance on the Colorado River that has been in a near ceaseless drought so far this century.

The Brown administration is trying to advance a comprehensive solution, via our Water Action Plan. The goal is to continue to diversify water supplies in San Diego County and elsewhere via conservation and new local supplies. The plan also promotes more efforts to maintain traditional supplies from the Sierra and the Colorado. It employs every water tool at our disposal.

Our collective challenge requires no less. Suggestions to the contrary should merit considerable concern and skepticism.

# # #

How to revive a dying delta
San Francisco Chronicle | October 25, 2016 | Peter Drekmeier

Scientific reports published over the past several years have been unambiguous. The delta, the largest estuary on the West Coast, is on the brink of collapse.

Starved of freshwater inflow due to dams and water diversions, the Sacramento-San Joaquin River Delta's health has faced a precipitous decline over the past few decades. The recently released Bay Delta Water Quality Control Plan offers our last best hope to revive the estuary that defines our region. The new plan calls for requiring more water to be released from dams into rivers, such as the Tuolumne, to help bring the bay-delta ecosystem and rivers that feed it back to life.

Unfortunately, the San Francisco Public Utilities Commission, which owns and operates the Hetch Hetchy Water System, and its wholesale customers appear to want to weaken the plan by scaring the public with inflated economic impacts.

The socioeconomic study was flawed, and recent real-world experience proves its conclusions are baseless. Had the study been accurate, the Bay Area's economy would have lost $7 billion and 24,510 jobs last year. Obviously, that didn't happen.

Flaws in the study included obvious things, such as confusing water demand with supply, treating local water supply as if it would be reduced by a plan to restore the Tuolumne River, and failing to sufficiently analyze the important role storage replenishment plays in our water system. For example, even after five years of drought, with one year of normal precipitation, total SFPUC storage is now close to 80 percent of capacity. We have enough water stored to last more than four years.

Currently, only 20 percent of the Tuolumne River's natural flow reaches its confluence with the San Joaquin River, and salmon populations have suffered as a result. Before the Tuolumne was dammed, an estimated 130,000 salmon spawned in its waters. Last year, fewer than 500 of the iconic fish returned.

And it's not just about salmon. The entire river ecosystem is facing collapse. Healthy salmon populations transport tremendous amounts of nutrients from the ocean to upland habitats where they fuel an entire food web, from hawks and eagles, to aquatic insects that feast on dead carcasses and in turn provide food for the next generation of salmon.

Of the more than 100 species that depend on salmon, humans have historically been at the top of the list. And the beautiful thing is that a healthy salmon population can rebound quickly while supporting a fishery.

In 2010, a report released by the State Water Board determined that 60 percent of natural flow from the San Joaquin River and its tributaries would be necessary to fully protect fish species. The current Bay Delta Plan proposes just 40 percent of unimpaired flow, with the flexibility to increase it up or down by 10 percent, depending on whether fish population and other goals are met.

We have proved we can use water more efficiently. In 2008, the SFPUC estimated it would need an additional 25 million gallons of water per day from the Tuolumne to meet future demand. Conservation groups were staunchly opposed to increasing diversions, arguing the

demand projections were inflated and the potential for water conservation was underestimated. It turned out we were right.

To their credit, the SFPUC agreed to cap water sales until at least 2018. We then all worked together to promote water conservation, and even before the drought kicked in, system demand had dropped significantly. Last year we used 32 percent less water than the sales cap.

The big question with the new Bay Delta Plan is how much of the increased flow will the SFPUC be responsible for providing. If its obligation is proportional to the amount of water it diverts, it would be 20 percent (agriculture uses 80 percent of the water diverted from the Tuolumne). Under such a scenario, the SFPUC would have easily met its obligation over the past seven years due to exceptional water conservation efforts.

We must work together to protect our economy while reviving our rivers and the bay-delta. Accurate information, not scare tactics, will be critical.

# # #

Peter Drekmeier is the policy director for the Tuolumne River Trust.

Delta Tunnels: Fitch Ratings Downgrades Westlands' Next Bond Sale
Central Valley | October 25, 2016 | Dan Bacher

It looks like the politically powerful Westlands Water District, one of the main backers of Governor Jerry Brown's Delta Tunnels and Congressional legislation to eviscerate protections for Sacramento River Chinook salmon and Delta smelt, is in more financial trouble.

Fitch Ratings downgraded the scheduled October 26 bond sale by Westlands from 'AA-' to 'A+'.

Among the issues facing Westlands Water District, Fitch cites shrinking irrigated acreage, previous financial obligations, and the potential for increased “leveraging” to pay for the Delta Tunnels," according to Restore the Delta (RTD).

The downgrade reflects Fitch's view that district operations face increased pressure over time," reported Business Wire, a Berkshire Hathaway Company, on October 17. "Despite improvements to the district's debt profile following this transaction and potentially lower leveraging related to a drainage settlement with the U.S. than previous estimates, the prospect of ongoing escalation in district charges coupled with probable declines in irrigated acreage heightens concentration risk and affordability concern."

The statement includes a warning that overcommitting to the California WaterFix could push the rating even lower.

“Public reports now estimate the district's share of future costs of the California Fix at $2.5 billion… Significant further leverage by the district in support of the California Fix could apply downward pressure to the ratings," the Business Wire reported.

Barbara Barrigan-Parrilla, Restore the Delta executive director, quipped, “Bond ratings agencies are like Mom and Dad. Westlands is asking to raise the limit on their credit card again, despite questionable earnings potential. At some point Mom and Dad get out the scissors."

“Tunnel proponents cannot demonstrate how $17 billion, before cost overruns, will be raised to build the Delta Tunnels. The public does not have a completed and vetted finance plan for the project to examine. When asked who commits to paying the bill, all the water districts point to someone else," she said.

"What is clear is that ‘someone else’ includes federal taxpayers, California taxpayers, Southern California and Silicon Valley property taxpayers, and urban water ratepayers. These folks will end up subsidizing large agricultural interests like Westlands growers," Barrigan-Parrilla concluded.

The downgrading follows a huge financial scandal that Westlands has been enmeshed in. The federal Securities and Exchange Commission (SEC) on March 10, 2016 charged Westlands, California’s largest agricultural water district, with “misleading investors about its financial condition as it issued a $77 million bond offering."

In addition to charging the district, the SEC also charged its general manager Thomas Birmingham and former assistant general manager Louie David Ciapponi with misleading investors about its financial condition.

“Birmingham jokingly referred to these transactions as ‘a little Enron accounting’ when describing them to the board of directors, which is comprised of Westlands customers,” the SEC reported.

The SEC said Westlands agreed to pay $125,000 to settle the charges, making it only the second municipal issuer to pay a financial penalty in an SEC enforcement action.

Birmingham agreed to pay a penalty of $50,000 and Ciapponi agreed to pay a penalty of $20,000 to settle the charges against them.

“The undisclosed accounting transactions, which a manager referred to as ‘a little Enron accounting,’ benefited customers but left investors in the dark about Westlands Water District’s true financial condition,” said Andrew J. Ceresney, Director of the SEC Enforcement Division. “Issuers must be truthful with investors and we will seek to deter such misconduct through sanctions, including penalties against municipal issuers in appropriate circumstances.”

# # #

Delta Tunnel Alternative: Embracing Flooding for Water Supply

Some critics of California's Delta water tunnel project say allowing flooding to occur again in the San Joaquin Valley is a better alternative to the costly and controversial water infrastructure plan.

Water Deeply | October 24, 2016 | Matt Weiser

When California officials got serious about building two giant tunnels to divert freshwater out of the Sacramento-San Joaquin Delta, it didn't take critics long to propose alternatives.

One of the first was a grassroots scheme that, at first, seemed radical and counterintuitive: Let winter floods retake vast parts of the San Joaquin Valley – the very farmland that needs those Delta water diversions. The floods would recharge depleted groundwater that could then be used to irrigate the farms, preventing the need for Delta water exports.

The idea came in 2007 from Tom Zuckerman, then an attorney for the Central Delta Water Agency, one of many groups still battling the tunnel project. Zuckerman drafted it in the form of a 26-page "white paper" that he presented to the Delta Vision Blue Ribbon Task Force, a panel appointed by then-Governor Arnold Schwarzenegger.

The proposal was later incorporated by Restore the Delta, another group opposing the tunnels, into its broader "Sustainable Water Plan for California." And then it largely faded from view.

"I have been kind of a voice in the wilderness on this subject," said Zuckerman, who is now retired. "I talk about it constantly. And to this day I haven't had any person or any entity say this is not a feasible approach."

In recent years, other developments have focused fresh attention on California's serious groundwater problems: The state's ongoing drought, passage of the Sustainable Groundwater Management Act in 2014 and new scientific research into floodplain restoration and groundwater recharge.

As a result, Zuckerman's idea no longer seems outlandish.

"That will not solve everything. There will be no silver bullet," said David Gutierrez, executive manager of the Sustainable Groundwater Management Program at the California Department of Water Resources. "But it's a combination of these ideas together that will help us do better than we've been doing in the past."

Zuckerman's proposal centers on reviving the historic Tulare Lake, located in the Southern San Joaquin Valley between Fresno and Bakersfield. Before California was settled, it was the largest natural freshwater lake west of the Mississippi River, fed by snowmelt from numerous streams pouring out of the Southern Sierra Nevada.

The historic Tulare Lake, as shown on a map from 1873, was once the largest natural freshwater lake west of the Mississippi River. Some advocates believe that allowing periodic floods to revive the lake could ease water shortages in the San Joaquin Valley. (David Rumsey Historical Map Collection)

The historic Tulare Lake, as shown on a map from 1873, was once the largest natural freshwater lake west of the Mississippi River. Some advocates believe that allowing periodic

floods to revive the lake could ease water shortages in the San Joaquin Valley. (David Rumsey Historical Map Collection)

He proposes to bring the lake back by strategically breaching levees and directing winter snowmelt back into the Tulare Basin. Other groups have also taken up the call, including Tulare Basin Wildlife Partners, a coalition of nonprofits and government agencies.

The same process could be used further north in the San Joaquin Valley to recharge other aquifers, Zuckerman said. In this way, over time, the region could become self-reliant for its water needs.

“You start adding up these opportunities throughout the state, and you could drive the diversions from the Delta down, probably, to a quarter of what they are now,” he says. “Historically, diversions at that level have not proven injurious to the Delta environment.”

Gutierrez agrees the idea has merit. But he said it will never displace a significant amount of Delta water diversions. That’s because groundwater depletion in the San Joaquin Valley is so severe that it will take a very long time to bring back. And flood-producing storms are actually somewhat rare in the San Joaquin Valley – on the order of once every 20 years.

In other words, he says, the region needs Delta water exports for a long time to come. Which is where the $15 billion tunnel project comes in. Known as California WaterFix, it proposes improved infrastructure to divert Delta water to the San Joaquin Valley and the Los Angeles region.

“We’re not going to recharge the groundwater without some support from northern water,” Gutierrez said. “Both WaterFix and groundwater recharge are two tools that are going to have to be instituted.”

In many areas, the flooding Zuckerman proposes would not require any changes in land use, and would not harm existing crops.

In 2015, a University of California team published a study on groundwater recharge potential throughout the state. It was based on an analysis of soil conditions capable of absorbing large amounts of floodwaters, and crop types that could withstand flooding.

The study found there are 3.6 million acres (1.5 million hectares) of suitable soils with “excellent” or “good” potential for groundwater recharge. Crops identified as being tolerant of flooding include wine grapes, pears, prunes, walnuts and some types of almonds.

In total, the study concluded these lands could absorb as much as 1.2 million acre-feet (1.4 billion cubic meters) of water per day. Five days of recharge at that rate would exceed a year’s worth of Delta water diversions.

The research team subsequently made their findings available in a web-based mapping tool.

“I really think it’s doable – politically and economically – to do this as soon as people catch on that water on the floodplain is not a bad thing for agriculture,” said John Cain, director of conservation for California flood management at the environmental group American Rivers.

“This stuff is not theoretical,” he said. “People are jumping on board, and there are multiple projects to breach levees and create floodplains.”

One such project will reroute levees on Paradise Cut in the south Delta to create a new floodplain for the San Joaquin River near Lathrop. It was recently awarded $2.1 million in grants by the Delta Conservancy.

The state Wildlife Conservation Board also recently funded two other floodplain restoration projects along the San Joaquin River near Firebaugh and at Great Valley Grasslands State Park.

Another motivation for these projects, Cain says, is flood protection. As old levees age, they become increasingly expensive to maintain, and the demand for state and federal funds to help with these projects increases. So local governments and levee agencies are looking for alternatives – including restoring floodplains to absorb the water instead.

The obligation to restore endangered fish species is another motivation. By refilling aquifers, rivers can remain wet longer through the year because their surface flow is naturally connected to groundwater.

Instead, many California rivers today are considered “losing” streams: Groundwater is so depleted that rivers flowing on the surface are constantly losing huge volumes of water to the aquifer. Yet it’s not enough to refill those aquifers, because groundwater is still getting pumped out too fast.

Gutierrez says the Sustainable Groundwater Management Act is poised to change this game. As the law takes effect over the next two decades, many water agencies will be required to find ways to recharge groundwater, especially in the San Joaquin Valley, where most aquifers are known to be in critical condition. He’s certain the solution in many cases will be floodplain restoration.

But it won’t work for all aquifers, because a century of land development has cut off their connection to floodwaters. For aquifers near levees, the solution is simple: Open the levee where water can spill onto the most porous soil. In other cases, new water diversion channels may have to be built. These costs will be passed on to water users, which could make the recharged groundwater very expensive.

Although Cain is a leading advocate for such projects, he said there probably aren’t enough groundwater recharge opportunities to offset a significant share of Delta water exports.

“It’s hard to believe you’re going to meet large fractions of their demand,” he said. “I think it could be really quite good for some basins.”

# # #

Regulators propose leaving more water in California's rivers
San Francisco Chronicle | October 23, 2016 | Carolyn Lochhead |

WASHINGTON — Water users in San Francisco and its suburbs face a day of reckoning as state regulators move to leave more water in California's two biggest rivers in an effort to halt a collapse in the native ecosystem of the San Francisco Bay and its estuary, the Sacramento-San Joaquin River Delta.

Even as water allocations to California farmers have been severely reduced, San Francisco water authorities have freely tapped the Tuolumne River, which the city dammed early in the last century at its headwaters in Yosemite National Park.

Now the State Water Resources Control Board wants the city to help save the estuary by leaving 40 percent of the Tuolumne's water in the river, a level that the board's own scientists have said may not be enough to rescue the freshwater-starved bay and delta.

The Tuolumne is one of the most over-drafted rivers in the state, running on average at just 20 percent of its natural flow. The river provides 85 percent of the water used by 2.6 million Bay Area residents, including San Francisco.

The draft rule, which the board hopes to make final next spring, could severely restrict water use during drought years, when there is not enough water for both the ecosystem and humans at current rates of consumption.

Jeffrey Mount, an expert in water policy at the Public Policy Institute of California, a nonprofit think tank, called the steps a long-overdue effort to "rebalance the allocation of water for the ecosystem and water we use consumptively."

The Clean Water Act, a landmark federal environmental law, is driving a new approach, Mount said.

Mount, a senior fellow at the institute's Water Policy Center, called the plan to leave more water in the rivers far weightier than the multibillion-dollar twin tunnels that Gov. Jerry Brown wants built to draw water directly from the Sacramento River, bypassing the delta, and send it to cities and farms in the south.

The controversial giant tunnels are "a sideshow" compared with the board's attempt to guarantee a block of water to help the environment, Mount said.

Similarly, Spreck Rosekrans, head of Restore Hetch Hetchy, a group seeking to remove San Francisco's dam in Yosemite, called the proposal to leave more water in the Tuolumne much bigger than the dam removal idea, which has been rejected by San Francisco voters.

"This is a big deal," Rosekrans said of the draft rule, because it reduces the amount of water available for the city and its suburbs. Removing the Hetch Hetchy reservoir would still allow San Francisco to withdraw water from the river and store it elsewhere downstream.

State water board documents related to its proposal suggest that San Francisco might consider finding new sources of water through desalination or buying it from farmers.

State regulators said more water must be left in the Tuolumne and two other San Joaquin River tributaries, the Stanislaus and Merced, to halt an ecological crisis that threatens two salmon runs and several fish with extinction. Toxic algae blooms, rising prevalence of invasive species and other signs of failing ecological health abound in both the bay and the delta, they said.

California's native salmon are a keystone species, providing food to plants and wildlife from the forests of the Sierra Nevada, where spawning fish leave their carcasses. Salmon are also the mainstay diet of the Orca whale, which feed on the fish at the mouth of San Francisco Bay.

On Wednesday, regulators took steps to leave more water in California's largest river, the Sacramento, issuing a preliminary scientific report that analyzed the effects of letting anywhere from 35 to 75 percent of its waters flow to the ocean. Farms and cities use about half the river's water, in effect reducing the amount that flows down the Sacramento.

The report and the San Joaquin draft rule together are meeting fierce opposition from northern San Joaquin Valley farmers and San Francisco water officials.

Michael Frantz, a board member of the Turlock Irrigation District and a wholesale nursery grower, confirmed reports that farmers across the northern San Joaquin Valley are in an uproar. He said the average farm in the Turlock district is just 26 acres, growing mainly permanent tree crops. Frantz said that had the draft rules been in place during the current drought, these farmers would have received no water for two years.

Bay Area water officials have joined the alarm, publishing an Oct. 7 opinion piece in The Chronicle that called the San Joaquin plan untenable, warning that it "means we would have to fundamentally rethink where we get our water in drought years and how we consume that water."

The authors cited an earlier study by the San Francisco Public Utilities Commission that predicted that restrictions less harsh than what the draft rule calls for would result in water rationing and up to 188,000 in job losses along with nearly $50 billion in economic losses.

Peter Drekmeier, policy director for the Tuolumne River Trust, called the study seriously flawed and accused the utilities commission of trying to scare people. He said if the projections were true, the Bay Area would have lost 24,510 jobs last year when the drought forced significant reductions in water use.

He said the state water board's plan is "our last, best hope to revive the estuary."

But Turlock's Frantz urged the board to consider other methods to save the ecosystem, from building gravel beds for salmon to reducing invasive predator fish. He said Turlock farmers are prepared to "make a substantial financial contribution" to implementing such measures.

"Both San Francisco and the farming community have an intense desire to see the salmon fishery thrive, and we are convinced there are ways to get there without using so much water," Frantz said.

State officials are welcoming such proposals but have made clear that water is what the ecosystem most needs. As it is, the board's call for 40 percent of the San Joaquin's natural flow to be left in the river, which could be adjusted up or down by 10 percent depending on wildlife needs, is far below the 60 percent flow that board scientists determined was needed.

John McManus, head of the Golden Gate Salmon Association, a fishing group, said Californians are simply facing the consequences of the fact that the state over the last century has promised people five times more water than nature provides.

“You can look in the rearview mirror of history and say we made some mistakes,” McManus said. State regulators, he said, now just happen to have “the unenviable task of being the last in line when the system breaks, and they have to right the wrongs.”

# # #

Even with drought, a California river will begin flowing year-round for the first time in 60 years

Los Angeles Times | October 22, 2016 | Associated Press

A decade ago, environmentalists and the federal government agreed to revive a 150-mile stretch of California's second-longest river, an ambitious effort aimed at allowing salmon again to swim up to the Sierra Nevada foothills to spawn.

A major milestone is expected by the end of the month, when the U.S. Bureau of Reclamation says the stretch of the San Joaquin River will be flowing year-round for the first time in more than 60 years.
But the goal of restoring native salmon remains far out of reach.

The original plan was to complete the task in 2012. Now, federal officials expect it will occur in 2022. And the government's original cost estimate of $800 million has ballooned to about $1.7 billion.

"I think we all had hoped we'd be further along," said Doug Obegi, an attorney with the Natural Resources Defense Council, which led the lawsuit that produced the deal with the government to bring back the salmon. "Restoring the state's second-largest river was never going to be a cakewalk."

James Nickel is among the farmers in the fertile San Joaquin Valley region around Fresno questioning whether the project should go forward.

California is enduring a fifth year of drought, and many farmers have experienced sharp curtailments in water allotments from the government, leaving some fields fallow.

Nickel, a fifth-generation farmer working the land along the river, doubts the wisdom of spending money on an intricate system of passages to get salmon around the river's many dams and siphoning off more water from agriculture.

"Most practical folks would look at it and say, 'Impossible,'" Nickel said. "It seemed like a waste."

Scientists say salmon are a keystone species for the region. For thousands of years, salmon spawned and died, their decomposing bodies feeding nutrients into the valley soil, helping to make it one of the nation's most fertile farming regions.

The San Joaquin River spans 366 miles and is among the state's most dammed rivers. It starts as snowmelt high in the Sierra Nevada Mountains, cascades down through granite canyons and fills a reservoir at Friant Dam east of Fresno.

A few miles below Friant, the river has been running dry for much of the year. At Mendota, a community about 40 miles west of Fresno, the river resumes flowing with the help of various tributaries and eventually feeds into San Francisco Bay.

Before the U.S. Bureau of Reclamation opened Friant Dam in 1949, the river teemed with up to a half-million salmon a year and was deep enough that paddleboats transporting cargo could navigate far into the San Joaquin Valley.

The dam gave farmers irrigation water that dramatically expanded agriculture but ended the salmon migration.

The Natural Resources Defense Council in 1988 set out to revive the river, filing a lawsuit that claimed the government's dam and irrigation channels favored commerce at the native salmon's expense.

The battle ended in a 2006 settlement that requires farmers to give up roughly 18% of the water captured behind Friant Dam. It also set an aggressive schedule to bring back natural salmon runs by 2012.

"It was a longshot, to say the least, that everything would be executed on that timeline," said Jason Phillips, who led early efforts by the U.S. Bureau of Reclamation to restore the river.

Today, he's chief executive of the Friant Water Authority, which provides water primarily from the dam to growers irrigating 1 million acres of farmland. He calls it an "open question" whether the San Joaquin can be revived as envisioned under the settlement.

He said water for farms has become even scarcer since the settlement was reached with tightening regulations. And forecasts of climate change's effects on California's water supply weren't calculated into the deal, he said.

Adding complexity, officials say, is the fact that during a 2012 attempt to restore the river’s flow, water seeped onto a farmer's field, destroying his tomato crop, a broad issue that has plagued the project.

Construction has not yet begun on passages for migrating salmon to swim around two dams on a lower stretch of the river that distribute water to farmers. Design for one abruptly halted in 2013 when engineers found the ground was sinking at an alarming pace — the result of farmers pumping groundwater to irrigate.

Meanwhile, state wildlife officials are raising salmon in tanks on the riverbank in small numbers and trucking them past obstacles to spawn. Plans call for reviving a migration of roughly 40,000 a year once the obstacles are cleared, allowing salmon to swim on their own from the Pacific up to the base of Friant Dam.

Money is another question. The project is to be paid for through state and federal sources. Much of the federal funding, however, needs Congress' approval each year, creating a degree of uncertainty, said Alicia Forsythe, current manager of the San Joaquin River Restoration Program for the Bureau of Reclamation.

Forsythe defended the project's slow pace, saying officials have spent time collaborating with farmers along the river rather than simply forcing the project on them.

Rene Henery, California science director for Trout Unlimited, a party to the lawsuit, said the state lost sight of the river's essential role in its rush to develop a vast system of dams, reservoirs and canals that spawned a thriving farm economy.

He noted other large government projects — bridges, airports and mass-transit systems — often run over budget and miss deadlines, but the benefits outweigh the costs in this restoration project.

The San Joaquin will help recharge the valley's depleted groundwater supplies that have caused the land to sink and will open recreation opportunities, spurring their own economic vitality, he said.

Most importantly, he said, salmon will again migrate from the Pacific hundreds of miles inland, renewing a critical link between the land and sea.

"Water is the most important element for life on this planet," Henery said. "Our rivers, they're the vascular system of our landscape and of our societies."

Are farmers, San Francisco up the same river?
Farm Press Blog | October 15, 2016 | Todd Fitchette

Rather than call out the hypocrisy of San Francisco's complaint that losing nearly half of its Tuolumne River water to the State Water Board and environmental activists, let's see these concerns as a "glass half-full" opportunity.

According to the San Francisco Chronicle's opinion page, the city/county's public utilities commission is concerned about losing much of its water to a state water grab with strong concerns rippling across the state.

In an opinion piece written by general managers of the San Francisco PUC and the Bay Area Water Supply and Conservation Agency, roughly 2.6 million Bay Area water customers would be severely impacted if state water regulators take 40 percent of their water through a plan to force about half the Tuolumne River to be released to the ocean with no diversions allowed.

In water language they call it "unimpaired flows."

Perhaps this is a grand opportunity to get the big cities – those with the money and the votes – to join with California farmers from central and northern California to take a firm stand against draconian water grabs by the California Water Resources Control Board.

Northern California water users had better pay close attention to this as well. Just because they sit between Sacramento and big reservoirs constructed to serve as water banks for the rest of the state means little to nothing to renegade regulators and the environmental activists bankrolling the lawsuits that have led to such irrational behavior.

Stories reported lately suggest the next big attack will be an attempt to turn California's water rights system on its head.

It's not the 1914 law that separates junior from senior water rights holders that is the problem. The issue is 40 million people in a state vying for water supplies created decades ago for only 15 million people.

Couple that with environmental laws that favor wildlife over human beings and you wind up with third-world water conditions in Tulare County and farmers with no water to grow the crops that feed Bay Area and Los Angeles residents.

We have a golden opportunity for farmers, water users at both ends of the state and metropolitan voters to sit at the same table and agree on the common need for water and work together to achieve this.

# # #

Meet the Minds: Newsha Ajami on Innovation in the Water Sector

California helped to reinvent the energy sector, and now the drought is providing a perfect opportunity to help the state break out of its old structure for managing and funding water, says Stanford University's Newsha Ajami.

Water Deeply | November 2, 2016 | Eline Gordts

For Newsha Ajami of Stanford University, California's drought is not only a massive challenge, but also a huge opportunity. "I really hope that we as Californians use this drought as an opportunity and build on the current momentum to become a leader in moving the water sector into a new era," she told Water Deeply recently.

Ajami is the director of Urban Water Policy at Stanford's Water in the West program and NSF-ReNUWIt initiatives. She has focused much of her research efforts on the role of big data in building sustainable water resource management solutions, water policy, innovation and financing.

Water Deeply spoke with Ajami as part of Meet the Minds, our series canvassing experts working on California water issues.

Water Deeply: What are you working on that you want the world to know about?

Newsha Ajami: Our group is very excited about a new study evaluating how the media has been impacting water use in California during the current drought. Some of the results show that water issues that were politically important or part of the policy discussions in Sacramento, California, or nationally – for example the 2014 drought emergency declaration or 2015 mandatory water savings by Governor Jerry Brown – triggered extensive media coverage of the California drought, which in turn has led to wide behavioral changes at the customer level.

The study is a good example of the broader work we are doing on water informatics. We are overlaying water data with other related data such as climate, socioeconomic, demographic, political and others to better understand how different factors are affecting water use in various regions. This kind of knowledge can inform the decision-making process and help the water utilities rethink and reimagine future supply planning, and demand management options and move more towards a sustainable water resource management strategy.

Water Deeply: What surprised you in the past year about work in the water field?

Ajami: The drought has certainly altered the way we as a society think about water. Two things that have surprised me the most are the level of water conservation that different communities were able to achieve in the past year, and increased public awareness of the drought and California's water challenges.

Water Deeply: Is there anyone, or anything, that particularly inspires you?

Ajami: The level of innovation in the water sector has been really inspiring to me. There are so many great ideas, but I personally love the ones that think outside the box and go beyond our conventional approach to water management and governance. There are so many lessons we can learn from other sectors such as the energy sector, which has gone through a crisis and has had the opportunity to reinvent itself during the past few decades.

I really try to find projects that utilize existing data and information to better understand the availability of our water resources and to change decision-making processes in the water sector. For example, the new groundwater initiative in Pajaro Valley that is using sensors to measure groundwater recharge is very interesting and useful, since it can be used to measure the performance of various groundwater recharge projects and green infrastructure, as well as implementation of innovative financing mechanisms.

Water Deeply: What's the one most important thing California should be doing right now to create a more sustainable water future?

Ajami: California has an opportunity to embrace change in the way we value and govern our water resources. The water sector is still operating based on an old business model that doesn't necessarily fit the current paradigm shift in the sector. We have to re-envision the current economic structure that guides the water business in our state from the way we price water, plan and invest in solutions and projects, recover the cost of service, and engage with customers. It could ultimately lead to more reliable and sustainable funding sources, which would not only focus on operation and maintenance of our current water system, but also enable us to invest in innovation, conservation and efficiency, and provide better and more consistent service to low-income and disadvantaged communities.

California has an opportunity to embrace change in the way we value and govern our water resources.

Secondly, California needs to do a better job gathering, standardizing and using data and improve its soft infrastructure – information technology, related data repository and sharing platforms. I believe the effective use of data and information is a foundation to change in the water sector.

Water Deeply: Looking to 10 years from now, what do you hope California will have accomplished on water issues?

Ajami: It would be great if California can repeat and replicate its success in overhauling and reinventing the energy sector in the water sector. The state can become a hub for new ideas and trigger change in the water sector, from innovative policy initiatives and financing mechanisms, to diversifying local water supplies and demand management solutions, to revisiting our water management and governance tools in order to reimagine the development of the next generation of physical and virtual infrastructure.

I really hope that we as Californians use this drought as an opportunity, and build on the current momentum to become a leader in moving the water sector into a new era, and change the way we value and manage this vital resource for decades to come.

# # #

Conservation Groups Protest Water Rights for Centennial Dam

Protest of NID's application based on environmental, public interest and legal grounds

YubaNet.com | October 25, 2016 | Foothills Water Network

Nevada City, Calif. October 25, 2016 – The Foothills Water Network, a coalition of conservation and recreation organizations, submitted a joint water rights protest to the State Water Resources Control Board (SWRCB) today demanding that Nevada Irrigation District's (NID) water rights application for the proposed Centennial Dam be denied based on environmental, public interest and legal grounds.

"Centennial Dam's alleged benefits are unlikely to justify the financial and environmental cost," said Otis Wollan, President of the American River Watershed Institute and a former member of the Placer County Water Agency board of directors, asserting that the dam will have negative environmental impacts on the Bear and Yuba River watersheds and surrounding communities. "Rather than build a new dam, NID should maximize the use of its existing resources and infrastructure."

NID's proposal to build a new 110,000 acre-foot reservoir with a 275 foot-tall dam on the Bear River would inundate six miles of the Bear River, completely flooding the Bear Campground, more than 25 homes and 120 parcels, and Dog Bar Bridge, the only crossing of the Bear River between Highway 49 and Highway 174.

"It is legally questionable and against the public interest for the State Water Resources Control Board to assign priority water rights reserved to the State for the coordinated development of water resources to NID for a questionable project that will do little to address the pressing water management challenges of today," said Chandra Ferrari, Trout Unlimited's Water Policy Advisor and Staff Attorney.

Since about 400,000 acre-feet of the South and Middle Yuba River water already gets diverted to the Bear River each year, the South Yuba River Citizens League (SYRCL) is concerned that Centennial could demand even more Yuba River water.

"NID has made it clear that this dam would support more growth and development. NID should be looking for alternative ways to protect our precious water resources that are environmentally sustainable such as restoring meadows, wetlands, and floodplains," said Caleb Dardick, SYRCL's Executive Director.

The Network suggested a range of alternative actions for NID to consider such as repairing or modifying its aging facilities, improving canal efficiency, incentivizing water conservation, stopping leaks, and metering water.

NID representatives have stated on multiple occasions that NID intends to add hydropower to Centennial Dam in the future. "NID's attempt to confiscate federal land owned by BLM, plus its efforts to bypass the hydropower licensing process, would set a bad precedent with national consequences," said Chris Shutes of the California Sportfishing Protection Alliance. "The new dam would also unravel the benefits of minimum flows below Rollins Dam that we just spent seven years negotiating with NID."

The Centennial Dam proposal has alarmed community members throughout the Bear and Yuba watersheds. Nearly 400 people attended two public scoping meetings about the proposal in early March to express their concerns about the project's potential impacts on the environment. NID's Draft Environmental Impact Report is expected late Spring 2017, which will be another opportunity for the community to raise its concerns.

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