BAY AREA WATER SUPPLY AND CONSERVATION AGENCY

BOARD OF DIRECTORS MEETING

February 8, 2019

Correspondence and media coverage of interest between January 1 and February 8, 2019

Media Coverage

Water Supply Condition:

Date: February 6, 2019
Source: KTVU Fox 2
Article: Santa Clara County officials release water from Anderson Reservoir as preventative Measure

Date: February 4, 2019
Source: Marin Independent Journal
Article: Series of storms boost Bay Area rainfall totals, Sierra Nevada snowpack

Date: February 4, 2019
Source: SFWeekly
Article: All This Rain Has Made a Big Dent in the Drought

Date: February 3, 2019
Source: The Weather Channel
Article: Here's How California's 6 Feet of Snow in 24 Hours Compares to Other Snowfall Extremes

Date: January 31, 2019
Source: San Francisco Chronicle
Article: New measurements show Sierra snow levels at long-term average. And that's a big deal

Date: January 31, 2019
Source: Sacramento Bee
Article: California snowpack at 100 percent of average as January ends, state officials say

Date: January 31, 2019
Source: Sacramento Bee
Article: Second snow survey to measure California water supply

Date: January 31, 2019
Source: Los Angeles Times
Article: Sierra snowpack doubles after January storms blanket California

Bay Delta:

Date: February 8, 2019
Source: SF Gate
Article: Bay Area Salmon Advocates Decry Proposed Delta Water Diversions

Date: February 6, 2019
Source: Modesto Bee
Article: Lawsuits from Central Valley, Bay Area keep state 'water grab' tied up in courts

Date: February 4, 2019
Source: 23 ABC News
Article: California Farm Bureau Federation files lawsuit to block plans for San Joaquin River

Bay Delta, cont'd.:

Date: January 31, 2019
Source: Auburn Journal
Article: Update on the state water grab

Water Infrastructure:

Date: February 7, 2019
Source: UC Merced
Article: New Project to Build Climate Resilience through Improved Land Management

Date: February 7, 2019
Source: KRCR News
Article: Two year anniversary of Oroville Spillway Crisis: Emergency spillway nears completion

Date: February 7, 2019
Source: Sacramento Bee
Article: Lawsuit claims corruption, racism, sexual harassment contributed to Oroville Dam crisis

Date: February 6, 2019
Source: The Press
Article: Senate Bill 204 increases WaterFix oversight

Date: February 5, 2019
Source: Maven's Notebook
Article: Reclamation releases Biological Assessment for California water operations

Date: February 1, 2019
Source: Courthouse News Services
Article: California Lawmakers Push for Oversight of Delta Tunnels Project

Date: January 28, 2019
Source: KCRA 3
Article: Engineers: Twin Tunnels project could endanger vital levees

Date: January 24, 2019
Source: Circle of Blue
Article: Water Utilities Call on Big Data to Guide Pipe Replacements

Miscellaneous:

Date: February 4, 2019
Source: Daily Journal
Article: Sea level rise agency takes shape

Date: January 30, 2019
Source: KPIX 5
Article: An Exclusive Look Inside Hetch Hetchy Dam's Mountain Tunnel

Date: January 1, 2019
Source: Breitbart News
Article: Republic of Thirst, Part 2: The Sites Reservoir and the Future of Water Storage

Santa Clara Co. officials release water from Anderson Reservoir as preventative measure
KTVU Fox 2 | February 6, 2019 | Jesse Gary

(KTVU) - Recent rainfall has led the managers at the Santa Clara Valley Water District to release water from Anderson Reservoir.

The release valve at the bottom of Anderson is shooting water downstream at the rate of 156,000 gallons per minute. It's a preventive measure not taken since the record rainfall winter of 2017. But now, the body of water above sits at 35.5 percent of capacity.

"It's a seismically deficient dam. So for safety, we need to try to keep that dam to 58-percent or lower. So in order to avoid getting to that 58-percent, we start releasing now," said Marty Grimes of the Santa Clara Valley Water District.

He says recent storms have left area reservoirs at or above normal levels. In addition to Anderson, releases are also planned for Almaden and Guadaloupe in South San Jose, Chesbro in Morgan Hill, Steven's Creek in Cupertino and Coyote Reservoir in San Martin.

"This is what we normally get. We get rain in winter. We don't get rain in summer. So we want rain in winter," said Dr. Alison Bridger.

Bridger is the chairwoman of the San Jose State University Meteorology Department. She says the extremes of drought and deluge the past few winters have given way to a more normal weather pattern. Computer models show a series of storms shaping up to over the next 10 days or so, which should keep the Bay Area on track to reach is average rainfall of about 15-inches. Currently, the area has seen more than eight inches.

"December, January, and February are the big months to get this. For all I know, we're not looking as far as March yet. But March could be as dry as a bone, and then we'll start complaining," said Bridger.

Water district officials say the snow pack level is above 100 percent and reservoirs water levels are rising. So with more storms bearing down on the Bay Area, releasing water now reduces the risk of the type of destructive flooding seen in 2017.

"Nature does what nature does and we can't guarantee that. But the odds are much less that we would reach that capacity this year," said Grimes.

Forecaster say their forecast models show the remainder of February will be a wet month, with moderate rainfall spread over several days. As opposed to downpours which can lead to flooding.

# # #

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Series of storms boost Bay Area rainfall totals, Sierra Nevada snowpack

Bay Area snow levels may drop as low as 1,000 feet overnight Monday

Marin Independent Journal | February 4, 2019 | Mark Gomez and Rick Hurd

The next in a series of early February storms that have boosted rainfall totals across Northern California is expected to blanket Bay Area mountains with snow.

A “very cold air mass” will lower snow levels in the Bay Area to about 1,000 feet Monday night and into Tuesday, according to the National Weather Service. The highest Bay Area peaks could accumulate between 6 and 9 inches of snow, and commuters who rely on Highway 17 (with a summit of 1,870 feet) may encounter a dusting of snow Tuesday morning.

“There’s a good chance of having snow on the road on Highway 17,” said Steve Anderson, a meteorologist with the weather service.

Monday afternoon, there was already reports of snow sticking at Mt. Hamilton, Mt. Diablo and Mt. Tamalpais.

The weather service warned of “potential hazardous driving conditions” on Highways 35, 9, 17, 29, 130 and 198 and other mountain roads and passes. In the North Bay Mountains, East Bay Hills and Santa Cruz Mountains, 2 to 4 inches of snow is possible above 1,000 feet, with 4 to 8 inches possible in these areas above 2000 feet.

“We have so little snow usually that most of our drivers aren’t prepared for it,” California Highway Patrol spokesman Officer Sam Courtney said. “By not prepared, I mean most of them don’t carry chains, they don’t have items to clear the windshield, etc. If they don’t have the equipment they need, I’d just advise them to avoid traveling if they can.”

Rainfall totals in the Bay Area from the upcoming storm are forecast to range from one-quarter to one-half of an inch, according to the weather service. The last time there was an accumulation of snow near sea level in San Francisco occurred on Feb. 5, 1976, according to Golden Gate Weather Services.

The storm did not cause any threats to flooding along the Uvas Creek in the Santa Cruz Mountains.

Storms that soaked the Bay Area this past weekend boosted rainfall totals across the region. San Jose, which often falls victim to a rain-shadow effect courtesy of the Santa Cruz mountains, received 1.9 inches of rain during a 72-hour period ending Monday at 2 p.m., more than San Francisco and Oakland, according to preliminary data from the National Weather Service.

Los Gatos received the biggest soaking over a 72-hour period, with 4.2 inches falling, according to the NWS. Other 72-hour rainfall inch totals across the Bay Area included: Kentfield 3.66, Napa 1.93, Redwood City 2.3, San Francisco 1.66, Livermore 1.55, Palo Alto 1.4, Hayward 1.2, Concord 1.3. Oakland received 1 inch.

Rainfall totals across Northern California continue to creep closer to average for this time of year. Through Sunday at 6 p.m., rainfall totals for the water year which began Oct. 1 include Redding at 21.24 inches (109 percent of normal), Santa Rosa at 19.23 inches (90 percent), San Francisco 12.22 inches (88 percent), Oakland 9.42 inches (81 percent) and San Jose 7.42 inches (87 percent).

Monday, the statewide Sierra Nevada snow pack level — a key source of California's summer water supply — increased to 115 percent of its historical average, up from 69 percent on New Year's Day. And with a blizzard warning in effect through Monday at 10 p.m., that percentage is likely to increase.

"The encouraging thing is, compared to last year, we're doing significantly better," said Jan Null, a meteorologist with Golden Gate Weather Services. "The pattern for the next week, we're certainly not going to flip into a dry pattern. There will be a few dry days after tomorrow, but then it looks like we're back into a wet pattern."

At this time last year, the Sierra Nevada snowpack was just 26 percent of normal. A series of late-season storms in late February and March boosted the Sierra Nevada snowpack to 54 percent of normal on April 1, considered by state water managers to be the end of the rainy/winter season.

Through Sunday, most of the state's major reservoirs had water levels at or above their historical averages for this time of year.

Rain showers are expected throughout the Bay Area on Monday, with a potential for isolated thunderstorms in the afternoon, according to the weather service.

Monday at 8:55 a.m., the weather service issued a flood advisory for the Carmel River in Monterey County, warning that "heavy rain overnight has resulted in rapid rises" and flooding is imminent. At 8:15 a.m., water levels on the Carmel River were at 7.59 feet; the flood stage is 8.5 feet.

Rain over the weekend caused a handful of mudslides and road closures across the Bay Area. In Fremont, Niles Canyon Road was briefly closed early Monday morning because of "falling rocks and potential mudslide." At 6:36 a.m., Fremont police reported the road was back open. But shortly after 12:30 p.m., the canyon was again closed in both directions, according to Fremont police.

A mudslide in San Mateo County has blocked both lanes of Highway 35 (Skyline Boulevard), about a half mile north of Castanea Ridge Road. County officials estimate the road will be closed for one week.

Monday morning, the weather service reported that the Sierra Nevada was experiencing "heavy snowfall" with accumulation rates up to 3 inches an hour. A blizzard warning is in effect through Monday at 10 p.m.

Ski resorts across the Sierra Nevada reported snowfall totals ranging from 12 to 35 inches from Friday through Sunday. More snow is expected to fall through Tuesday, and the weather service warned that travel through the Sierra Nevada will be "nearly impossible at times."

Monday at 10 a.m., the California Highway Patrol reported that Interstate 80 was closed from Colfax to the Nevada state line.

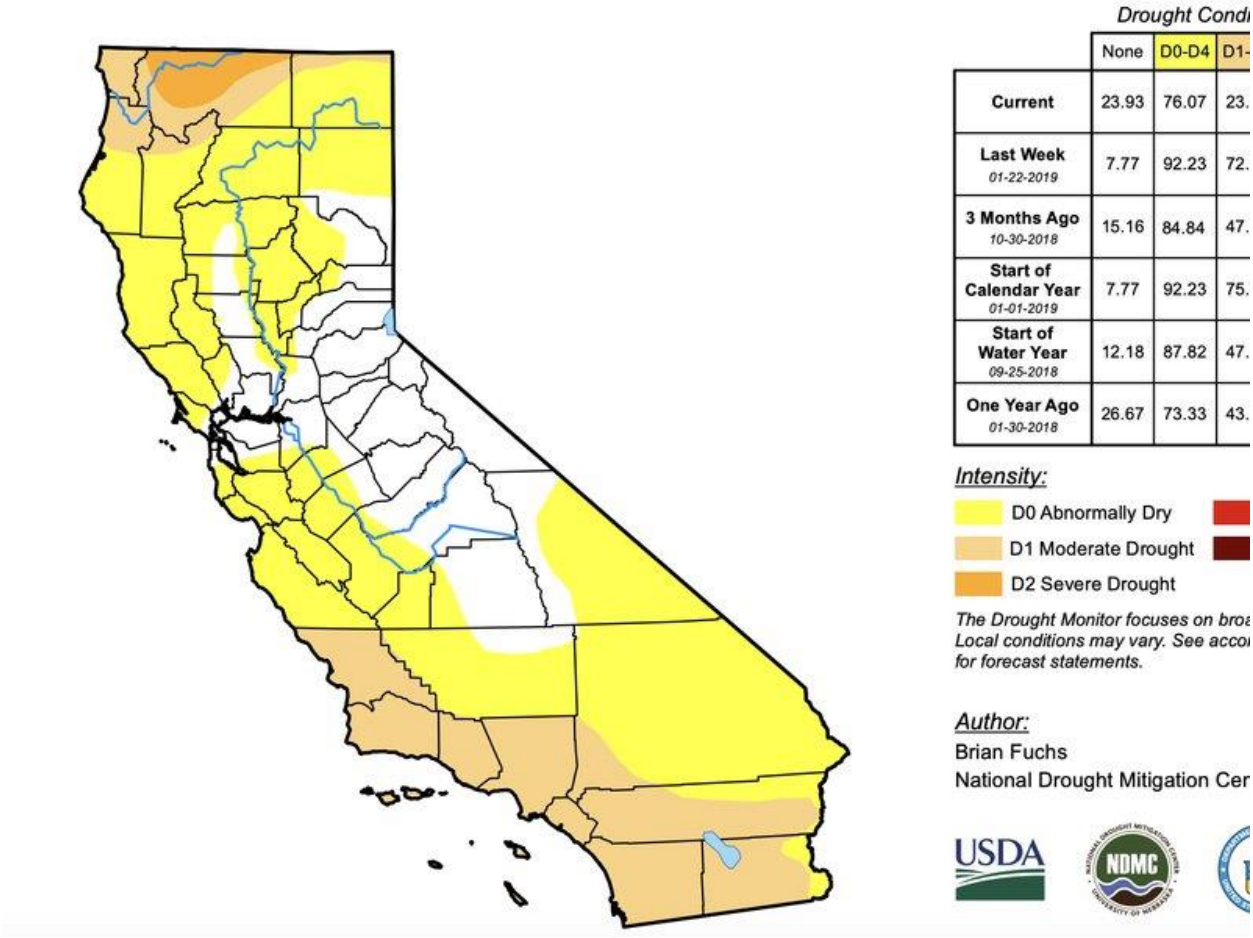
# # #

Staff writers George Avalos and Jason Green contributed to this report.

All This Rain Has Made a Big Dent in the Drought

Drought conditions have retreated to the extreme northern edge of the state, while the Sierra snowpack is at 100 percent, too.

SFWeekly | February 4, 2019 | Peter Lawrence Kane



How stormy has California been? Stormy enough that parts of Orange County got two inches of rain, enough to force Disneyland to close early, something the park hardly ever does. (This was unrelated to the guy jumping off Space Mountain last Thursday, temporarily shutting down that ride.)

Here in San Francisco, we got 1.13 inches between Saturday and Sunday, with more this morning. If you were even slightly late to work today, your cuffs probably got soaked, since it was pouring hard downtown right around 9 a.m. But all this rain has led to another positive consequence for our abnormally-dry-is-the-new-normal state: The low-level drought has abated significantly.

As of last Tuesday, Jan. 29, the Bay Area, Sacramento, and most of the Central Sierra were entirely drought-free. Even sections of Ventura and Los Angeles counties, which had been the locus of incipient drought conditions, were only in the “moderate drought” category. Statewide, 76 percent of California was “abnormally dry” or worse, down from 92 percent the week before. But the moderate drought category plunged from 72 percent of the state on Jan. 22 to only 24

percent last week. As this data reflects conditions from almost a week ago, it's likely that the most recent rainstorms will only improve the situation.

A mere 3 percent of the state is in the "severe drought" category — a sharp drop from the 23-percent figure at the beginning of the water year in late September. Nearly all of that area is localized within Siskiyou County on the Oregon border, meaning that California's northwest corner, usually among the rainiest places in the state, is now the site of the worst drought conditions. And that, too, might not last long: The Siskiyou County town of Weed, Calif., is expected to get snow showers almost every day for the next week.

Overall, the Sierra snowpack is now exactly where it needs to be. Barring an abrupt dry spell beginning in the middle of February, it looks as though the 2018-19 water year will replenish the state's coffers.

# # #

Here's How California's 6 Feet of Snow in 24 Hours Compares to Other Snowfall Extremes
The Weather Channel | February 3, 2019 | Chris Dolce and Brian Donegan

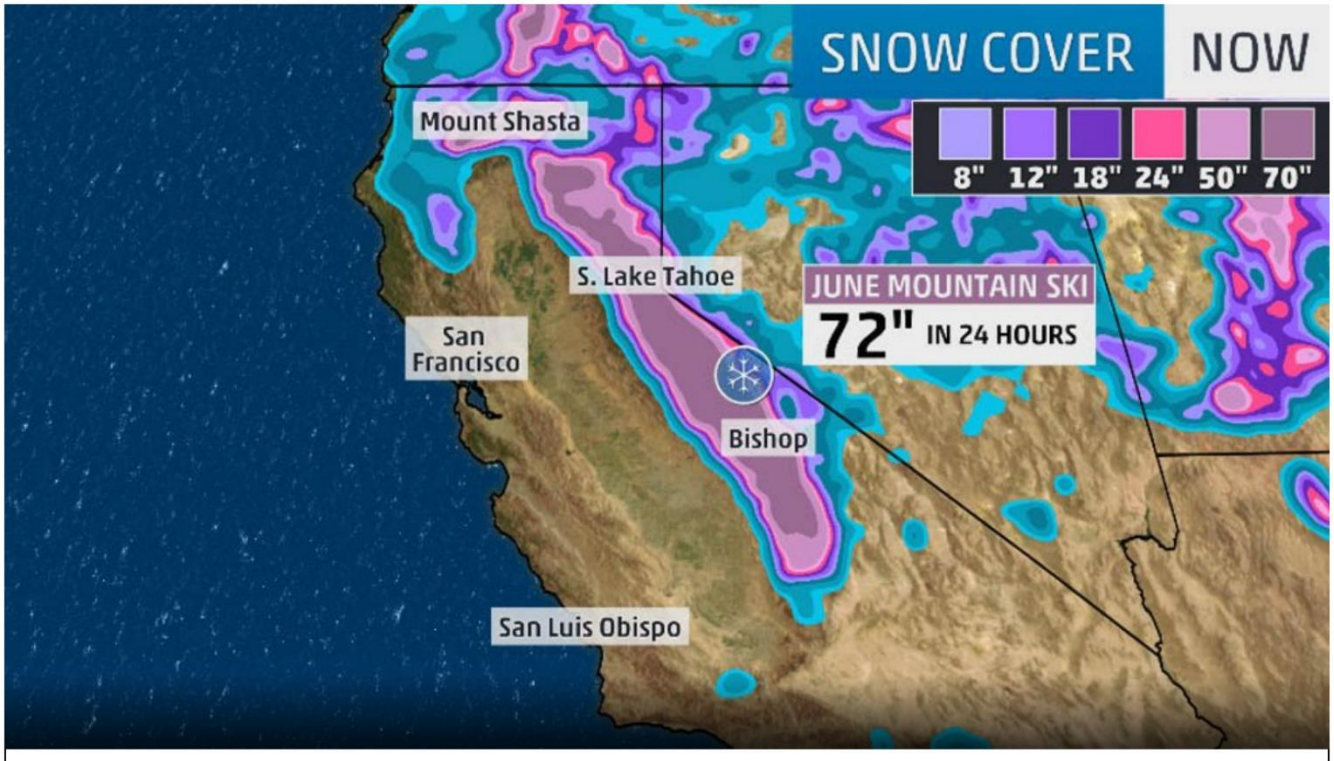
Six Feet of snow fell on February 3rd in Tahoe, California.

At a Glance

- June Mountain in the Sierra Nevada picked up 6 feet of snow in 24 hours.
- Its storm-total snowfall tallied 8 feet in less than three days.
- The ski resort was closed on Monday because of all the snow.

Incredible amounts of snow have fallen throughout parts of the Mountain West since last Friday after a one-two punch from winter storms Kai and Lucian. The Sierra Nevada, straddling the border between California and Nevada, has been particularly hard-hit, where one ski resort tallied 6 feet of snow in just one day.

Taking that crown is June Mountain, east of Yosemite National Park. June Mountain reported 72 inches of new snow in the 24 hours ending 9 a.m. PST Sunday morning.



June Mountain Ski Area received 72 inches (6 feet) of new snow in the 24 hours ending 9 a.m. PST Sunday, Feb. 3, 2019.

It should be noted the June Mountain 24-hour total is an unofficial measurement and won't be included in NOAA's climate records.

The official 24-hour snowfall record for California is 67 inches, measured at Echo Summit, a mountain pass south of Lake Tahoe, on Jan. 5, 1982.

The storm-total snowfall at June Mountain from Friday through mid-morning Sunday was measured at 96 inches, according to the National Weather Service in Reno, Nevada.

Yes, that's 8 feet of snow in less than three days. And it was too much for the ski resort to handle; June Mountain was closed on Monday as workers attempted to dig out, the resort said in a Facebook post.

That got us thinking – what are some of the heaviest snowfall records in United States history? Below, we take a look at a few of the known records, including the heaviest monthly, seasonal and 24-hour snowfall amounts.

Most Snow Measured in a Month: 390 Inches

Tamarack, California, holds the record for the most snow in a calendar month, with 390 inches (32.5 feet) in January 1911. That is nearly twice the average snowfall during an entire winter in very snowy Marquette, Michigan, which averages about 204 inches annually.

Tamarack's location high in the Sierra Nevada makes it an ideal spot to intercept copious amounts of moisture provided by an active storm track off the Pacific Ocean. The site of this record is at an elevation of 7,000 feet, near where the Bear Valley Ski Resort is now, according to Christopher Burt of Weather Underground.

Biggest Seasonal Snowfall Total: 1,140 Inches

An incredible 1,140 inches (95 feet) was recorded at Mount Baker Ski Area (elevation: 4,200 feet) during the July 1, 1998 to June 30, 1999 snow season.

For perspective, that snow total is equal to the height of nine to 10 basketball goals stacked on top of each other, or the distance on a football field from the goal line to just past the 30-yard line.

Most Snow Measured in 24 Hours: 75.8 Inches

If you are 6 feet tall and stood outside for 24 hours in Silver Lake, Colorado, April 14-15, 1921, you would've been buried by snow from head to toe. That location recorded 6.3 feet of snow in a single day at an elevation of 10,220 feet in the Colorado Rockies.

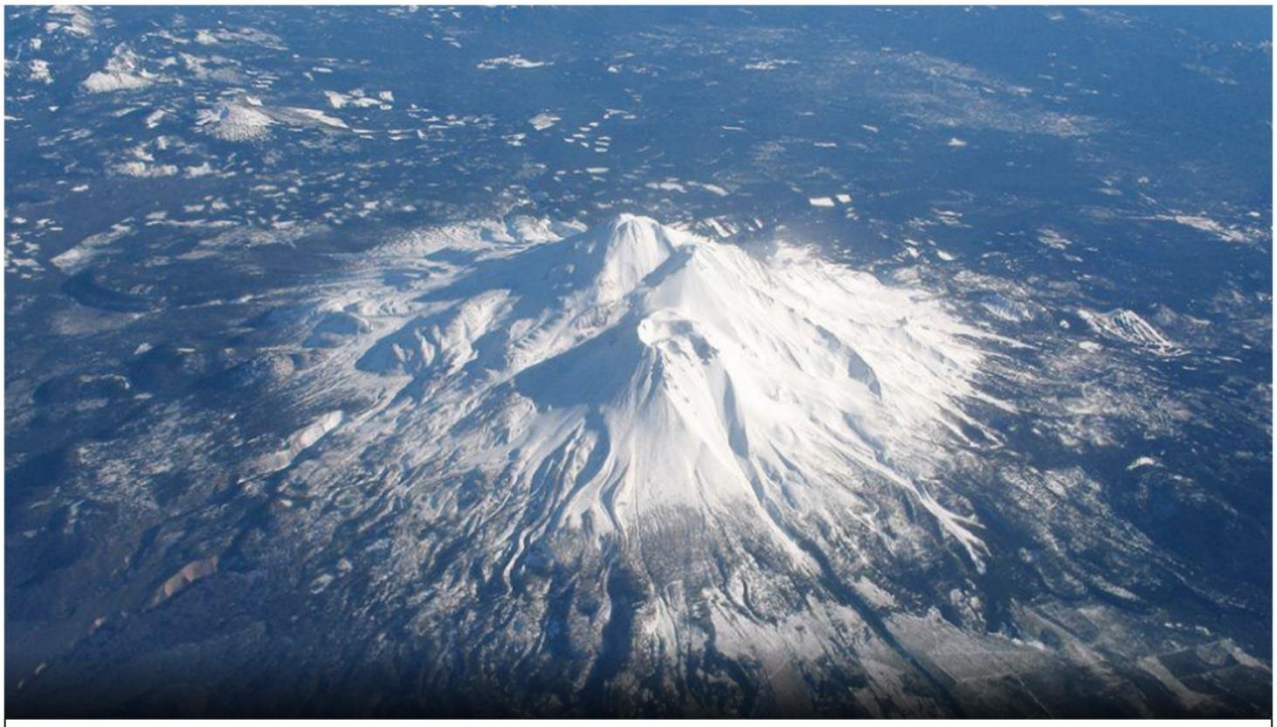
In 1997, a report of 77 inches of snow measured in 24 hours in Montague, New York, east of Lake Ontario on the Tug Hill Plateau, was submitted for review by NOAA to see if the Silver Lake record was defeated. A committee reviewed the report and determined the Silver Lake record should remain after finding proper climatological guidelines were not used to measure the snow in Montague.

Most Snow in Two Days: 120.6 Inches

Thompson Pass, Alaska, holds the record for the most snow in a two-day period, according to Burt. Just over 10 feet of snow was measured there Dec. 29-30, 1955.

Thompson Pass is located to the east of Valdez, Alaska, one of the snowiest cities in America.

Most Snow from a Single Storm: 189 Inches



Mount Shasta

Image credit: USGS/Lyn Topinka

(USGS/Lyn Topinka)

The old Mount Shasta Ski Bowl in Northern California holds the record for the most snow received from a single storm system.

A total of 15.75 feet (189 inches) of snow was measured Feb. 13-19, 1959.

Mount Shasta is a volcano in the Cascade mountain range and rises as high as 14,160 feet. It is the second-highest of 15 main volcanoes in the Cascade range, according to the National Park Service.

Greatest Snow Depth on Record: 451 Inches

Tamarack, California, also holds the U.S. record for greatest snow depth ever measured. A maximum snow depth of 451 inches, or 37.5 feet, was recorded on March 11, 1911. The record monthly snowfall in January of that year helped contribute to the record depth.

Burt researched locations outside the U.S. and found that an even greater snow depth of 465.4 inches was measured Feb. 14, 1927, on Mount Ibuki in Japan (Honshu Island).

Most Snow Measured in One Hour: 12 Inches

Lake-effect snow events dominate the record books when it comes to extreme short-term snowfall amounts.

Burt compiled a list of the record snowfall rates in his book "Extreme Weather," and the top amount in a single hour was 12 inches in Copenhagen, New York, east of Lake Ontario on the Tug Hill Plateau, on Dec. 2, 1966. That same location also picked up 6 inches in 30 minutes during the event.

The record is unofficial, as the National Weather Service does not keep official records on snowfalls of less than 24 hours in duration.

For other extreme snowfalls spanning various time periods, plus an explanation of why snow can be so challenging to measure, see the Weather Underground article by Christopher Burt.

# # #

New measurements show Sierra snow levels at long-term average. And that's a big deal
San Francisco Chronicle | January 31, 2019 | Peter Fimrite

Department of Water Resources Water Resource Engineer John King checks the weight of the snow sample on a scale held by DWR State Climatologist Dr. Michael Anderson, left , during the first snow survey of the season at Phillips Station, Thursday, Jan. 3, 2019, near Echo Summit, Calif. A second survey on Thursday, Jan. 31, 2019, will show that snow levels in the Sierra Nevada are on par with the long-term average, which is good news, the surveyers say. Photo: Rich Pedroncelli / Associated Press

New snow measurements to be taken Thursday are expected to confirm that snow levels in the Sierra Nevada are on par with the long-term average, thanks to a series of storms that thrashed California in January.

Those results may sound pretty ho hum, but getting to average is a pretty big thing in today's topsy turvy world of snow analysis, where the absence of pending disaster due to too little snow is something to celebrate.

The findings by snow surveyors at the California Department of Water Resources mean the state is on a pace to fill its reservoirs, nourish cropland, avoid killing off fish and maybe, just maybe, prevent flames from rampaging across the landscape next summer.

"Over the last several years we have experienced some very low snowpack years, so relative to those this is a high snowpack," said Noah Diffenbaugh, a climate scientist and professor of earth sciences at the Woods Institute for the Environment at Stanford University. "We're now in

a climate where what used to be average appears to be a lot. That tells us something about what we've been dealing with recently in California."

The water content of the snow in the California mountains is 100 percent of the long-term average for this time of year, according to the official monthly measurements taken by the state Department of Water Resources.

A month ago, it was 67 percent of normal and last year at this time it was 30 percent of the long term average.

And things are going to get even better. Storms are expected to drop more snow in the Sierra starting Friday and do it again Sunday night into Monday, putting the state snowpack on a decidedly above normal trajectory.

"It's going to be a pretty sloppy weekend in the Sierra," said Jan Null, a meteorologist who runs the private Golden Gate Weather Services. "It will help" with the water supply, he said. "Whether its significant is in the eye of the beholder."

The snow in the Sierra and lower Cascades provides as much as a third of the drinking and irrigation water in the state. The annual snowpack measurements, updated daily between January to May, are considered a crucial gauge of how much runoff will flow into California's sprawling network of aqueducts, which supply water districts throughout the state.

On Thursday the Department of Water Resources surveyors will use metal tubes to calculate the depth and water content of the Sierra snow at 260 locations throughout the state. That includes historic Phillips Station, just north of the Sierra-at-Tahoe resort south of Lake Tahoe in El Dorado County, an easily accessible snow course where the press is invited for the monthly assessments.

The measurements are taken during a 10-day window around the first of the month and the numbers are combined with amounts on electronic gauges at more than 100 locations.

The key measurements are in April, when snow levels are at their peak before the melting starts. Last year was an example of just how drastically things can change. After a dismal start, the snow level more than tripled in early March and was 52 percent of average by April.

The figures in December, January and February are important because those are typically the wettest months of the year.

Currently the northern and central Sierra, from the Trinity Alps to Yosemite National Park and including Lake Tahoe, are between 100 and 102 percent of average for this time of year. The south is not doing quite as well, but it's still 97 percent of the historical average for the beginning of February.

It's a major accomplishment given that the first major storm of the current rainy season didn't arrive until late November.

California needs every bit of snow it can get considering the state has been on a major warming trend since 2014-15, when record-high average temperatures were recorded and a troubling lack of snow left the state with shortages of drinking and irrigation water.

The trend was interrupted in 2016-17, but picked up again in 2018, which was the third-driest year on record — only 1977 and 1991 were drier. Meteorologists said October, November and December were 2 to 4 degrees warmer than average.

The government's fourth National Climate Assessment released in November predicted warmer average temperatures, shorter winters, less snow, more weather extremes and fire unless governments take immediate steps to reduce carbon emissions.

"Climate change is, in its most fundamental sense, a trend overlaid on the existing variability, so we still expect cold days and cold spells and we can still expect to have high snowpack years, but the overall trend is a decreasing snowpack in the West and around the world," Diffenbaugh said. "It is clear that as global warming continues to unfold we can expect intensification of what we have been seeing — which is less precipitation falling as snow, particularly in lower elevations, earlier melting and less reliable water storage."

The amount of water in the 154 reservoirs that the state keeps track of now stands at 71 percent of average for this time of year.

At capacity, the 602-foot Shasta Dam, the largest reservoir in the state, holds back 4.5 million acre-feet of water — enough to cover 4.5 million acres in a foot of water — in the upper Sacramento River northwest of Redding.

It and Oroville Dam, which is the tallest dam in California, carry 80 percent of the state's reservoir supply, which is used to irrigate 8 million acres of farmland and provide water to close to 30 million people.

The two reservoirs are kept below capacity during the winter to avoid flooding in the event of major storms, such as those that prompted Oroville Dam officials to release a torrent of water in February 2017 that caused the main spillway to partially collapse.

# # #

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California snowpack at 100 percent of average as January ends, state officials say
Sacramento Bee | January 31, 2019 | Michael McGough

The Department of Water Resources conducted California's second manual snow survey of the year Thursday at Phillips Station, which offered some good news for the state.

DWR water resource engineer John King announced that snow water content doubled since the start of the month at the survey site near Echo Summit.

"The snow depth today is 50 inches and the snow-water equivalent is 18 inches, which results in 98 percent of average to date and 71 percent of the April 1 average at this location," King said. "This is a significant increase since the last survey, where we had just measured 25.5 inches of depth and 9 inches of snow-water equivalent."

This year's Jan. 3 survey at Phillips found snowpack below average, but well above the levels recorded at the start of 2018. Last January's first reading came in at a dismal 0.4 inches of "snow water content," as officials announced on dry grounds, wearing boots and jeans.

On Thursday, DWR officials were in snow pants and heavy jackets, stomping through the powder in snow shoes. The Phillips Station announcement was streamed live to Facebook.

A statewide summary of snow-water equivalent showed California at 100 percent of normal (17.3 inches) as of Jan. 31.

"This is typically the date of maximum snow accumulation," King said. "California started 2019 with a series of cold storms which increased our statewide snow-water equivalent to 100 percent of average (to date) according to our statewide monitoring network."

The Sierra will also see a strong storm system pass through this weekend, expected to create major travel delays around Tahoe while bringing moderate to heavy precipitation across Northern California. The winter storm is expected to further boost snowpack numbers.

Manual surveys are performed at 260 snow courses measured statewide throughout California.

"This data drives decisions that are made throughout the state by water managers," DWR Chief of Hydrology and Flood Operations John Pasch said Thursday.

Pasch said snow-water measurements affect management decisions all the way through spring and summer, but is crucial in real-time during the winter. This data helps DWR determine reservoir levels needed for adequate flood storage.

"Average isn't necessarily normal," Pasch said. "We've had really wet years and some really dry years, so it really is comforting to have an average year for the Feb. 1 measurement."

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Second snow survey to measure California water supply
Sacramento Bee | January 31, 2019 | Associated Press

Officials will trek into the mountains on Thursday to measure California's snowpack again, seeking to learn whether recent storms have added to the water supply. The survey comes as a new storm arrives in the state, prompting some voluntary evacuations.

The California Department of Water Resources will perform the second survey of the season in the Sierra Nevada.

Farther south, rain fell from southern Sonoma County southward down the Central Coast.

Winter snow provides drinking water for much of the state as it melts in the spring and summer and flows into reservoirs for storage.

The Sierra snowpack was 67 percent of normal in this winter's first manual measurement earlier this month. The amount of snow is measured monthly through the winter at more than 260 locations to help water managers plan for how much they can deliver to customers later in the year.

Precipitation has been up and down as the state continues to recover from a devastating drought that led to tight water restrictions for residents and farmers. Persistent drought has also dried out trees and brush, contributing to severe wildfires.

Former Gov. Jerry Brown declared a formal end to a three-year drought emergency in 2017, but said water conservation efforts must continue.

California typically gets about two-thirds of its annual rainfall between December and March.

By early Thursday, Big Sur had already received three-quarters of an inch (1.9 centimeters) of rain by early Thursday, according to the National Weather Service.

The cold front has spawned a few thunderstorms on the Central Coast and is expected to move down into Los Angeles County by midday.

The current storm will be followed by a break and then a much stronger storm late Friday into Saturday.

Riverside County authorities early Thursday elevated a voluntary evacuation warning to mandatory for a dozen risk zones adjacent to the burn scar left by a wildfire last summer.

The fire ravaged more than 36 square miles (93 square kilometers) of the Cleveland National Forest in Riverside and Orange counties.

Thursday's storm is expected to be followed by a brief break before an even stronger storm arrives late Friday.

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Sierra snowpack doubles after January storms blanket California
Los Angeles Times | January 31, 2019 | Alejandra Reyes

A series of January storms that brought record rains to the state and massive amounts of snow to the mountains helped double the snowpack in the Sierra Nevada, experts with the state Department of Water Resources said Thursday.

Surveyors recorded 50 inches of snow at the department's Phillips station, where a layer of plush, thick powder covered the ground. The measurement is equal to 18 inches of water and brings the snowpack to 98% of average to date and 71% of average based on the April 1, 2018, measurement, according to John King, a water resources engineer.

Overall, the state's snowpack is at 100% of average, based on the department's statewide snow-monitoring network, he said.

Earlier this month, surveyors tracked a less-ideal result, with 25.5 inches of snow, or 80% of average for that date. But that was much better than the year before, when surveyors found nothing but small patches of snow on a dry bed of grassy land.

Now, the snowpack is in even better condition.

"It's very encouraging, and we still have two more months to accumulate" before the April 1 measurement, when snowpack is typically the highest, King said.

In addition to the improved snowpack, multiple storms over the past month added 580 billion gallons of water to the state's reservoirs.

Chris Orrock, a Department of Water Resources spokesman, said the new measurements are a stark contrast to last year, when the snow-water content was just 2.56 inches and 30% of average.

And more snow is on the horizon.

"Even though we're coming out of a warm dry spell in the last week, the high-pressure zone has gone away and we're bringing in some good weather to increase our snowpack," he said.

This weekend is bringing a trio of storms to the state, including some that will pass through the Sierra Nevada. The National Weather Service issued a winter storm watch for snow and strong winds between Friday afternoon and Monday evening in the Sierra Nevada from Yosemite to Kings Canyon and the Tulare County Mountains.

Heavy snow is expected at elevations of 5,000 feet starting Friday, with a short break Sunday. By the end of the weekend, the weather service predicted 5 feet of snow will have dropped.

The same is true for the northern Sierra, and forecasters said heavy snow could reach lower elevations.

California's climate has bounced up and down dramatically in recent years — wildly swinging from drought to deluge — so seeing an average year is a positive, experts said.

"We go from a record year in [2016 and 2017] that followed a multiyear drought … to this year," Orrock said. "To be at average is great for people that look at the snowpack … to be able to look down the future and see what we're able to supply."

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Bay Area Salmon Advocates Decry Proposed Delta Water Diversions
SFGate | February 8, 2019 | Bay City News Service

Officials from a San Francisco-based group dedicated to preserving the region's salmon habitat say a new federal plan to divert more water from the Sacramento-San Joaquin River Delta and San Francisco Bay would decimate the fish as well as jobs.

"This is a blatant water grab that threatened thousands of fishing jobs and families in California," said Dick Pool, secretary of the Golden Gate Salmon Association.

Added GGSA Director Noah Oppenheim, "The Trump administration won't be able to get away with killing off our salmon runs if the state refuses to cooperate."

These comments come in response to Monday's release by the U.S. Bureau of Reclamation of a "biological assessment" helping guide long-term operation of the Central Valley Project and the State Water Project, which operate separate but largely parallel canals in the Interstate Highway 5 corridor.

The Trump administration aims to make more water available to the agricultural producers in the central part of the state. The biological assessment is part of that overall plan. It isn't known yet how much more water state farmers could get.

The GGSA calls the assessment's assertions "a step towards abandoning federal rules governing the damaging effects of the giant state and federal water diverting pumps in the Delta."

"We've seen what happens when water users are given free rein to divert Bay-Delta water," said Mike Aughney, another GGSA director, who also published USAfishing.com. He said that before 2008, so many baby salmon were killed that the commercial salmon fishing season was cancelled the following year.

If the state opts to free up additional water to help preserve fisheries, that water would likely come from the State Water Project, which serves a mostly urban use base. The federal Central Valley Project largely provides water for ag producers.

The economic power of the salmon fishing industry, GGSA officials said, is approximately $1.4 billion annually, at current volumes. This includes everything from commercial and recreational fishing, fish processors, equipment manufacturers, the hospitality industry and businesses that support the fishing industry.

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Lawsuits from Central Valley, Bay Area keep state 'water grab' tied up in courts
Modesto Bee | February 6, 2019 | Ken Carlson

An assortment of groups, from a leading farming organization to a water supplier for Silicon Valley, joined the legal fray in courts over the State Water Board decision in December to reduce water diversions for farms and cities from the Tuolumne, Stanislaus and Merced rivers.

Monday, the California Farm Bureau Federation said it filed a lawsuit in Sacramento Superior Court, charging the water board's plan misrepresents and underestimates the impacts on Central Valley agriculture, which is the lifeblood of local communities. The plan would require irrigation districts to leave 30 to 50 percent of watershed runoff in the rivers from February through June to push young salmon downstream to the San Joaquin-Sacramento delta and the ocean.

Lawsuits opposing the Dec. 12 decision were filed in early January on behalf of Modesto, Turlock, Oakdale, Merced and South San Joaquin irrigation districts. The Farm Bureau, with 36,000 members in California, filed its own suit because many of its members outside those water districts are affected by the state board decision, a spokesman said.

The suit charges that the Bay-Delta water quality plan for the lower San Joaquin River and its tributaries violates the California Environmental Quality Act because the economic losses and community impacts are "insufficiently analyzed, insufficiently avoided and insufficiently mitigated."

Jim Houston, the Farm Bureau's manager of government and legal affairs, said the state's environmental review also failed to consider impacts related to California's Sustainable Groundwater Management Act. After irrigation deliveries are cut, farmers will desperately turn to groundwater pumping to keep their trees alive, but are certain to run into SGMA restrictions.

According to the Farm Bureau, the state board brushed off the warnings of damage to the ag industry and approved a salmon restoration plan that simply entails letting more water flow in rivers. A different approach, including well-timed water releases and lower water temperatures during spawning, food supply and habitat projects, and efforts to control predation of juvenile salmon, is a better solution for fish and people, the Farm Bureau contended.

The emotions leading up to the Dec. 12 decision — and the legal action that's followed — have touched off debate on what exactly could restore a severely impaired delta estuary and depleted salmon populations and what it will cost for Central Valley communities, Bay Area water customers and Southern California interests that rely on the delta.

In updating the Bay-Delta water quality plan, the State Water Board is expected to balance the needs of cities, industry, recreation, agriculture and wildlife. A 2010 state report, often cited by environmentalists, said 60 percent of unimpaired flow from the San Joaquin and its branches were desirable for creating natural conditions for native fish species in the estuary, which mainly consists of man-made channels and diked farmland.

As a regulatory agency, the state water board is obligated to harmonize the competing interests that receive Northern California water that's transported through the delta by the state and federal water projects. Near the end of the Dec. 12 meeting in Sacramento, the board members agreed to delay the next step in the process until March, which allowed more time for voluntary

settlement talks between state Department of Natural Resources staff and local irrigation districts.

Those talks have focused on a $1.7 billion plan, unveiled at the Dec. 12 hearing, for supporting salmon and refreshing the delta with 700,000 acre feet of water from the Sacramento and San Joaquin river systems.

The State Water Board decision also is opposed by the San Francisco Public Utilities Commission, which is supporting litigation to protect its Tuolumne River supplies in Hetch Hetchy Reservoir, the source of deliveries for 2.7 million Bay Area water customers.

Also challenging the plan is the Santa Clara Valley Water District. Its lawsuit in mid-January attacks the state's environmental review for not accounting for depletion of groundwater in Santa Clara County. About 15 percent of water from Silicon Valley cities like San Jose, Palo Alto and Mountain View comes from the San Francisco PUC.

The Santa Clara water agency agreed with San Francisco and the Central Valley plaintiffs that there are more effective solutions for increasing the salmon population.

"We respect the state's efforts in the last few years to address the issue of fish decline," said board chair Linda LeZotte of the Santa Clara district, in a news release announcing the suit. "We hope the courts can help us all arrive at a balanced decision that benefits the delta and doesn't leave the Silicon Valley high and dry."

The delta plan also drew a Jan. 25 lawsuit from a coalition that wants to save the historic migrations of chinook salmon in the rivers.

The Pacific Coast Federation of Fishermen's Associations charged the plan has insufficient flows for protecting imperiled salmon and other species in the delta. The coalition, including the North Coast Rivers Alliance and Winnemem Wintu Tribe, claims that numerous public trust resources, including fish, wildlife and recreation, will be adversely affected because the river flows were set below the 60 percent in the state's 2010 flow criteria report.

Berkeley attorney Stephan Volker, representing the coalition, said in an email Tuesday the proposed voluntary settlements don't come close to restoring the unimpaired flows recommended by the State Water Board's scientists.

A water board led by Chairwoman Felicia Marcus, a former lead attorney for the Natural Resources Defense Council, hasn't given Central Valley leaders much confidence of finding an acceptable middle ground.

MID and TID officials have assured that lawsuits can delay implementation of the Bay-Delta plan for years. The suit on behalf of TID claims the water board approved a different Bay-Delta plan than was analyzed in the environmental review. A plan that originally specified 40 percent unimpaired flows February through June later evolved to include "flow shaping" and "flow shifting" at different times of year, reservoir refill restrictions in dry years and minimum storage requirements.

Those additional elements are expected to wreak the most damage on the local economy and communities and were not adequately studied, according to Arthur Godwin, special counsel for TID. The district's suit also alleges the Bay-Delta plan violates state and federal due process laws; that is, water rights are property and property can't be taken away without due process.

In addition, TID also claims the board's environmental review was "unlawfully segmented" when the Bay-Delta plan was broken into two phases looking separately at the San Joaquin and Sacramento watersheds. Godwin cites scientific opinion affirming that the delta issues can't be resolved without contributions from both river systems.

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California Farm Bureau Federation files lawsuit to block plans for San Joaquin River
23 ABC News | February 4, 2019 | Noëlle Lilley

The California Farm Bureau Federation has filed a lawsuit to block by the State Water Resources Control Board's plans for the lower river flow of San Joaquin River.

In a press release, the Farm Bureau said that the Board's plan, which was adopted last December, "misrepresents and underestimates the harm it would cause to agricultural resources in the Central Valley". According to a media release from the Board, the plan would redirect 30 to 50 percent of “unimpaired flows” in three San Joaquin River in order to "increase fish population" and "restore waterflows".

In its lawsuit, the Farm Bureau said the plan would have “far-reaching environmental impacts to the agricultural landscape in the Central Valley." It also added that those impacts had been “insufficiently analyzed, insufficiently avoided and insufficiently mitigated” in the board’s final plan.

The State Water Resources Control Board has not yet responded publicly to the lawsuit.

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Update on the state water grab
Auburn Journal | January 31, 2019 | Einar Maisch

Last December, the State Water Resources Control Board (SWRCB) adopted much anticipated, new flow requirements for the San Joaquin River and its tributaries. Under the new regime, 40 percent of river flows, that could be stored in reservoirs, will now flow out to the ocean. The purpose of this new regime, we're told, is to protect the health of native fish in the Sacramento-San Joaquin Delta Estuary (Bay-Delta), including salmon and Delta smelt. While certainly a laudable goal, the SWRCB's decision will have a terrible impact on San Joaquin Valley agriculture, industry and residents. The Merced Irrigation District said 50 percent of its water supply will be lost as a result of this decision. The San Francisco Public Utilities Commission expects to lose 40 percent of its dry year supply from Hetch Hetchy Reservoir.

If the tremendous damage facing the agricultural economy of the San Joaquin Valley isn't enough for state regulators to find a more equitable agreement, consider the effect on the City of San Francisco. Because most of San Francisco's water use is indoors, a 40 percent reduction in the city's dry year supply will require residents to cut in-home and business water use by 40 percent in dry years. Combined with new water conservation mandates enacted last year, the result will be a lot of angry, thirsty, and politically-powerful San Franciscans.

Moreover, the benefit to fish is not guaranteed. In fact, the latest science suggests that habitat restoration is much more important to species recovery than simply increasing river flows down sterile, rock-lined channels; and, the United States Geological Survey predicts that sea level rise will eventually make the Bay-Delta too salty for many native species, regardless of how much fresh water from northern California is flushed out to the ocean.

Details of the Sacramento River portion of the SWRCB's plan are still preliminary, but we expect the required water releases to be higher for the Sacramento River, and its tributaries, than they are for the San Joaquin River. SWRCB staff is currently recommending that between 45 and 65 percent of the natural runoff of northern California rivers be allowed to flow to the ocean unimpeded.

Fortunately for the Sacramento region, our local use of American River water is less than 10 percent of the river's flow in most years, and more than 50 percent of the river's natural flow already makes it to the Bay-Delta in most months of the year. Additionally, a new binding agreement between the United States Bureau of Reclamation and the California Department of Water Resources shifts a larger portion of outflow responsibilities to Oroville Reservoir, in dry years, which is good news for water storage at Folsom Reservoir. While all these factors are helpful, it is far from clear how new regulations would be implemented or how they would affect upstream systems like PG&E's reservoirs on the Yuba River, a major source of water for PCWA customers, or PCWA's reservoirs on the American River above Folsom Reservoir.

PCWA believes there are ways to maintain a healthy ecosystem and not destroy the state's economy. In an effort to protect the interests of our customers and the region, PCWA has been working with key stakeholders from river systems throughout the state, including the federal and state government, to find those solutions. Locally-derived, voluntary agreements that address regional ecosystem and water supply needs will prove more durable and more effective over the long term than a top-down regulatory approach espoused by the state government.

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Einar Maisch is Placer County Water Agency's general manager.

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New Project to Build Climate Resilience through Improved Land Management
UC Merced | February 7, 2018 | Lorena Anderson

Researchers will develop data and analysis tools to plan landscape restoration, better manage California's wildlands and measure the benefits of investments in new policies and practices.

A $4.6 million grant to UCs Merced and Irvine will help researchers develop new tools and methods for better managing the state's forests, shrub lands and grasslands.

The Innovation Center for Advancing Ecosystem Climate Solutions, a three-year program co-led by UC Merced Professor Roger Bales and UC Irvine Professor Michael Goulden, was selected through the Strategic Growth Council's competitive Climate Change Research Program. This program is part of California Climate Investments, a statewide program that puts billions of cap-and-trade dollars to work reducing greenhouse gas emissions, strengthening the economy, and improving public health and the environment — particularly in disadvantaged communities.

The goals for the Innovation Center include reducing wildfire risk, improving long-term carbon sequestration and bolstering resilience in the face of climate change, with an emphasis on California's rural regions and low-income communities.

"Right now, many of California's forests, shrub lands and grasslands are carbon sources, and we need to change them into carbon sinks," said Bales, director of UC Merced's Sierra Nevada Research Institute and distinguished professor of engineering. "Our research will address information bottlenecks to guide decision making, build local capacity for science-based land management and develop methods for translating benefits of land restoration into financing for land restoration."

California's recent drought, tree die-offs, wildfires and rising temperatures all point to the necessity of improved forest stewardship, Goulden said.

"Officials in the state government and agencies recognize this need, but uncertainty over how to proceed has sometimes slowed progress," he said.

Because there are critical gaps in the understanding of carbon cycles, uptake by forests and negative feedback from climate change, this project initiative has been established to develop new knowledge through measurements and modeling. Researchers will synthesize the resulting data to produce actionable information for stakeholders.

"This research will enable UC Cooperative Extension advisors to provide better advice to land managers to reduce the severity of wildfires. Severe wildfires are not only releasing greenhouse gases, but polluting the air of many communities, aggravating the health of people in less-affluent, inland areas such as Tulare, Yuba and Mariposa counties."

Glenda Humiston, UC vice president for agriculture and natural resources

Most of the work will be conducted by scientists at Merced and Irvine, but collaborators from UC Berkeley, UC Davis, Stanford University, San Diego State University and the University of California Division of Agricultural and Natural Resources, as well as state agencies, will play important roles.

"This research will enable UC Cooperative Extension advisors to provide better advice to land managers to reduce the severity of wildfires," said Glenda Humiston, UC vice president for

agriculture and natural resources. “Severe wildfires are not only releasing greenhouse gases, but polluting the air of many communities, aggravating the health of people in less-affluent, inland areas such as Tulare, Yuba and Mariposa counties.”

At UC Merced, an interdisciplinary group of researchers from three departments — Civil & Environmental Engineering, Life & Environmental Sciences and Management of Complex Systems — plus the UC Cooperative Extension, will work collaboratively and engage with local stakeholders. The group will study and identify the most effective land-management practices in terms of water conservation, forest health, fire resistance and carbon capture.

“We will develop the spatial data and analysis tools to plan landscape restoration, develop local capacity for better managing the state's wildlands in a warming climate, and enumerate the greenhouse-gas and other benefits from investments in land management,” Bales said.

Goulden, professor of Earth systems science, said UC Irvine researchers will use a big-data approach to analyze observations collected by satellites since the 1980s to measure the efficacy of thousands of past and ongoing forest treatments, while UC Merced takes a different approach.

“We will work with groups in rural communities to systematically evaluate how well, or poorly, our products can support decision making,” Bales said, “and then develop both implementation pathways and policy recommendations to better and more-quickly implement landscape-restoration and carbon-capture projects across the state.”

Bales and Goulden agreed the Innovation Center will target low-risk, high-yield opportunities to reduce California’s greenhouse-gas contributions.

Just a small improvement in management efficiency will have meaningful benefits — on the order of several million metric tons of CO2 per year, Goulden said.

The program will also benefit low-income communities in the state by reducing wildfire risk, which disproportionately impacts poorer areas in California, by maintaining water quality through better vegetation management; by fostering tourism in disadvantaged locales; and by preparing students in these areas for careers in sustainability and climate resilience.

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Two year anniversary of Oroville Spillway Crisis: Emergency spillway nears completion
KRCR News | February 7, 2019 | Kelli Saam

Thursday marks two years since the first hole opened up in the Oroville Dam Spillway, triggering an emergency that forced the evacuation of nearly 200,000 people
The crisis started on February 7, 2017. The California Department of Water Resources (DWR) had been releasing 60,000 cubic feet of water per second, when they noticed the concrete on the spillway began to disintegrate. That first day, the hole was 30 feet deep by 180 feet wide.

DWR was releasing water to make room in Lake Oroville for heavy rain that was causing the lake levels to rise.
Due to the growing hole in the spillway, DWR was forced to temporarily stop the release of water and lake levels continued to rise. Crews resumed the water releases over the next several days, but by then rain continued to elevate the lake level faster than the water could be released. DWR released as much water as possible, further deteriorating the damaged main spillway.

On February 11, for the first time in the history of the Oroville Dam, water began to flow over the dirt hillside of the Emergency Spillway.
The next afternoon, on Sunday, February 12, the hillside had eroded to such an extent that DWR engineers and Butte County Sheriff Kory Honea began discussing the possibility that the Emergency Spillway concrete structure would collapse, sending a potentially deadly wall of water downstream.

Late in the afternoon on Sunday, February 12, 2017, Sheriff Honea issued the evacuation order for Oroville and thousands of residents downstream. They were allowed to return home two days later.

Over the last two years, thousands of construction crews have worked to rebuild the main spillway and the emergency spillway. As of November 1, 2018, the main spillway was ready for use.

Minor finishing work like sidewall back fill and site clean-up is ongoing on the main spillway
On the emergency spillway, construction crews are currently installing a concrete cap on top of the buttress and general site mitigation is ongoing including grading and hydroseeding. DWR expects to complete the entire $1.1 billion project in the summer of 2019.

There are key differences between the new spillway and the original spillway built in 1968.

The concrete on the original spillway chute had an average thickness of 2 feet 8 inches.

The new spillway chute is about three times as thick, an average of 7 feet 6 inches.

The rebar on the original spillway was 4 million pounds. The rebar on the new spillway is three times heavier, at more than 12 million pounds.

The main spillway has more than half a million cubic yards of concrete, enough to build a five-and-a-half foot sidewalk from Oroville to Amarillo, Texas.

The new emergency spillway is covered with roller-compacted concrete that looks like a giant staircase. It is one of the biggest changes during the reconstruction of the spillway project.

The emergency spillway concrete splashpad is so large, 25 football fields with endzones would fit. The large concrete steps have a minimum thickness of 10 feet. At the bottom is a new cutoff wall to stop erosion and headcutting of the downstream hillside.

Combined, the main and emergency spillways have more than 1.2 million cubic yards of concrete, enough to fill 372 Olympic-size swimming pools.

In January 2018, an independent panel of dam experts issued their report on the spillway emergency. Those experts said long-term and systemic failures by officials in California and elsewhere caused the near-disaster at the nation's tallest dam.

The independent panel of dam experts says the dam had inherent design and construction weaknesses. The report faults California's Department of Water Resources and other regulators for allegedly failing to recognize and address those problems.

Erin Mellon, spokesperson for the Department of Water Resources, said the organization remains committed to public safety.

"DWR has a long-term commitment to curating the best available science, sufficient financial investments, and a high standard of innovative expertise.," Mellon said. "In just 19 months, DWR and our contractors repaired and reconstructed Oroville’s main and emergency spillways, which stand ready to use when needed. DWR's dam safety practices, organization, and emergency action plans that facilitated their actions during the crisis continue to be supplemented, with benefits and lessons imparted to the global dam industry."

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Lawsuit claims corruption, racism, sexual harassment contributed to Oroville Dam crisis
Sacramento Bee | February 7, 2019 | Ryan Sabalow and Darrell Smith

Workers were patching Oroville Dam's weathered concrete spillway, nearly four years before a massive crater would tear it open.

Michael Hopkins, an employee at the Department of Water Resources, alleges he saw something he would never forget.

A legally deaf woman was assigned to drive a truck down the spillway and listen for hollow sounds in the concrete as her colleagues performed what's known as "chain drag testing," Hopkins wrote in a declaration filed last week in Sacramento Superior Court.

"This isn't going to work," the woman told her supervisor, who brushed off her concerns and told her to get back to work, Hopkins wrote.

Hopkins' allegation isn't the only alarming charge found in a lawsuit stemming from the crisis at the nation's tallest dam, which began two years ago Thursday when a large crater formed in the spillway, eventually leading to the evacuation of 188,000 people.

The suit before Sacramento Superior Court Judge James McFetridge has ballooned to include allegations that dam officials stole equipment, cooked financial books to conceal wrongdoing, destroyed evidence and fostered a toxic culture of sexual and racial harassment that included slurs and nooses hung where a black worker would find them.

State attorneys deny those allegations in court documents, calling them "salacious" and irrelevant to the allegations at the heart of the suit: whether Department of Water Resources' negligence caused the Oroville Dam's spillway to fail. The suit was filed by lawyers representing the city of Oroville and dozens of farmers, businesses and others seeking hundreds of millions in damages.

"Further, DWR vigorously disputes these allegations, which were apparently included in the respective complaints simply to try to embarrass DWR and prejudice the public against them," wrote Donald Carlson, a San Francisco attorney the California Attorney General's Office hired to defend the case.

Judge McFetridge will hold a hearing next week in response to Carlson's motion to toss the allegations.

Joseph Cotchett, a Burlingame attorney representing the plaintiffs, said the allegations are relevant because they show DWR fostered a culture in which dam workers were dangerously distracted from the vital work they were supposed to perform.

Included in Cotchett's filings is a nearly $1 million settlement DWR signed in 2012 with a former employee, Chris Thomas, who sued the state alleging he was passed up for promotions because he is black. His 2010 suit alleged he suffered years of racial slurs, found a doll hanging from his locker, and that his supervisors failed to take down a noose that hung for months in a meeting room.

"They're saying, 'The fact we hung a noose in a workman's ... locker with the words, 'N------ should only pick cotton' that's immaterial to the failure of the dam,'" Cotchett said in a phone

interview Wednesday with The Sacramento Bee. “But could you imagine if your office had that kind of language? What kind of (safety) environment would you have?”

Cotchett’s filings include allegations that female workers at DWR’s Oroville division suffered similarly derogatory treatment. The case includes declarations from UC Davis sociology professor Kimberlee Shauman and California State University, Sacramento, management professor Amy Mickel, who argued a toxic workplace culture could have factored into the spillway failure.

“It is my professional opinion that such conduct would more likely than not affect the ability of employees to effectively do their jobs including jobs related to the safety and maintenance of Oroville Dam,” Mickel wrote.

Hopkins, the worker who alleged he saw a deaf woman performing sound tests on the spillway, said in his declaration that his supervisors at one point tried to pressure him into lying that Thomas, the black DWR employee, had threatened to beat him up. He said he refused.

He claims he was transferred as a result. He eventually was transferred back to Oroville and in 2013 was on the team that was conducting repairs to the spillway in advance of a federal inspection.

Hopkins alleges he and another employee noticed a wide array of problems as they did hasty repairs, such as superfluous patches in too-thin concrete, cracks and clogged drains. Investigators have since pointed out that those kind of maintenance problems may have played a role in the spillway’s failure.

“When the crew questioned the effectiveness of the work we were doing, (our supervisor) instructed us ‘to make it look pretty’ and get back to work,” Hopkins wrote in his declaration.

Another employee, Trevor Hunter, worked on the same crew that year and alleged in a separate declaration that concerns raised about the hasty concrete patches and repairs were met with: “Shut up and get back to work.”

Hopkins said it was an ongoing problem when employees pointed out safety issues. He said he was regularly told to “keep (his) mouth shut.”

“I often referred to the DWR as the ‘Water Mafia’ because they operated more like a corrupt mafia than a state department,” Hopkins wrote.

The crater formed in Oroville’s spillway in 2017 during heavy storms. To try to keep it from expanding, DWR’s dam operators let the lake rise to the point where water flowed over the adjacent emergency spillway for the first time since the dam was completed in 1968.

The earthen hillside below the emergency spillway started to wash away. Fearing the concrete spillway would crumble and release a “wall of water,” officials ordered a frantic evacuation of 188,000 Sacramento Valley residents.

Last year, an independent forensic team the state hired to come up with causes of the spillway failures heavily criticized California officials, saying DWR did a poor job of designing, building and maintaining the structure and neglected safety while focusing on the “water delivery needs” of the districts that store water in Oroville.

The forensic team described the festering problems at Oroville as a “long-term systemic failure.”

In response, DWR revamped its dam safety programs and ordered 93 dams it oversees to conduct thorough inspections and other ongoing safety upgrades.

“As was the primary focus during the February 2017 Oroville incident, DWR remains committed to public safety. DWR continues to build industry-leading programs and operational protocols to further ensure the safety of our facilities, employees, visitors and nearby communities,” DWR spokeswoman Erin Mellon said Thursday in an emailed statement.

A trial date for the lawsuit has been set for June 2020.

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Senate Bill 204 increases WaterFix oversight
The Press | February 6, 2019 | Tony Kukulich

During a town hall meeting in November 2017, the Delta Caucus co-chairs state Sen. Bill Todd (D-Napa) and Assemblymember Jim Frazier (D-Discovery Bay) opined for more legislative oversight pertaining to the California WaterFix project.

Last week they took a step in that direction.

Todd introduced Senate Bill (SB) 204, which would require the Department of Water Resources (DWR) and the Delta Conveyance, Design and Construction Authority (DCDCA) to submit information about pending State Water Project contracts to the legislature for public review prior to those agencies moving forward with work on the Delta Tunnels.

“In years past, there has been too little opportunity for impacted communities to influence this flawed project, which will have a massive impact on the Delta’s environment, the local economy and drinking water quality,” wrote Todd in a press release. “This bill gives the legislature and Delta residents a place at the table to learn about what’s going on, express concerns and offer solutions that will serve Californians. We’re eager to begin a new chapter where the voices of those who live in our Delta communities are adequately considered.”

DWR is the agency responsible for overseeing the WaterFix project and conducting its regular operation should it become reality. DCDCA is one of two agencies created by a Joint Powers Authority, and it has responsibility for the design and construction of the tunnels and related infrastructure. The Delta Conveyance Finance Authority is responsible for securing financing for the project’s construction.

The California WaterFix project as currently proposed would use three newly constructed intakes to draw water from the Delta just south of Sacramento and channel it 30 miles south to the Clifton Court Forebay near Tracy through two tunnels, each measuring 40 feet in diameter and buried 150 feet below ground. From that point, the water will enter the existing Central Valley Project and State Water Project distribution networks and be delivered throughout the Central Valley and Southern California. The price tag for the construction of the tunnels is estimated to be nearly $20 billion, though many believe the final cost will be several times that amount.

“Californians deserve to know the true financial and environmental impacts of WaterFix, the largest public works project in state history,” said Barbara Barrigan-Parrilla, executive director of Restore the Delta. “SB 204 will help make the planning process more transparent so members of the public can evaluate WaterFix for themselves.”

The state’s Water Code requires DWR to advise the Joint Legislative Budget Committee (JLBC) at least 60 days prior to the renewal or extension of water supply contracts between DWR and water contractors. In September 2018, DWR sought to extend the contracts with 29 water contractors from the current expiration date in 2035 to a new expiration date of 2085. During the hearing to review the contract extension, legislators renewed the call for increase oversight.

“I’ve been saying all along that DWR should not be spending large sums of tax dollars on any WaterFix contracts without oversight from the legislature,” said Frazier at the time. “I am working

with other Delta Caucus legislators to determine what that oversight would look like and what it might take to implement it legislatively."

The Water Code does not currently require DWR to review with legislators any contract amendments regarding the financing of new water facilities including those facilities related to WaterFix. SB 204 would require DWR to provide notice to the JLBC regarding negotiations for amendments to water supply contracts of statewide significance. It would also require the DCDCA submit to the JLBC the terms of any contract for the planning, design or construction of WaterFix before entering into any such contract.

A request for comment was submitted to DWR, DCDCA and DCFA. Representatives of those agencies either declined to comment or did not respond to the request by press time.

"This is a commonsense, good-government bill that increases accountability," said Frazier. "Any large infrastructure project or major decision by a state agency should have legislative oversight. This is why people elect us, to protect their interests. Hopefully, the foolish WaterFix proposal will never be allowed to move forward. It would be the most expensive project in the state's history, and we are still totally in the dark about what the true costs will be. But if it does move forward, this bill will provide another level of scrutiny by the legislature."

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For more information, see: https://water.ca.gov/, www.restorethedelta.org, www.dcdca.org/, https://mavensnotebook.com/ and https://nodeltagates.com.

Reclamation releases Biological Assessment for California water operations
Maven's Notebook | February 5, 2019 Maven | From the Bureau of Reclamation:

"The Bureau of Reclamation released late yesterday the Biological Assessment for the re-initiation of consultation on the coordinated long-term operation of the Central Valley Project and State Water Project. The document was transmitted to the U.S. Fish and Wildlife Service and the National Marine Fisheries Service for consideration in developing new biological opinions covering CVP and SWP operations. Reclamation and the California Department of Water Resources re-initiated consultation in 2016 based on new information related to multiple years of drought and ongoing science efforts.

In October 2018, President Donald J. Trump signed the Presidential Memorandum on Promoting the Reliable Supply and Delivery of Water in the West, citing the "diminished…ability" of America's infrastructure "to deliver water and power in an efficient, cost-effective way." To that end, the Memorandum directed the Secretary of the Interior and the Secretary of Commerce to work together to complete the consultation process in a timely manner.

The Biological Assessment supports Reclamation's consultation pursuant to Section 7 of the Endangered Species Act of 1973. It was prepared consistent with the timeline outlined in the Presidential Memorandum. The U.S. Fish and Wildlife Service and National Marine Fisheries Service are expected to issue final biological opinions within 135 days.

"It has been 10 years since the biological opinions on the coordinated long-term operation of the CVP and SWP were issued. Since then, we've experienced extreme drought and invested significant resources to advance the science of the Central Valley and the Delta in coordination with our state and federal partner agencies and stakeholders. The result of our investments is an improved understanding of the system," said Mid-Pacific Regional Director Ernest Conant. "By expanding our toolkit with the best science and using what we know today, new biological opinions will allow us to maximize water and power benefits while supporting endangered fish populations."

The Biological Assessment analyzes potential effects of the proposed action on federally listed endangered and threatened species and critical habitat for these species. The proposed action incorporates the best available science into the operation of the CVP and SWP. Proposed actions outlined in the document include temperature management at Shasta Dam, fall habitat and salinity measures in the Delta, and entrainment management related to water exports. Together, these proposed actions aim to give water operators more flexibility, maximize water supply delivery and optimize power generation consistent with applicable laws.

The Biological Assessment is available here

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California Lawmakers Push for Oversight of Delta Tunnels Project
Courthouse News Services | February 1, 2019 | Nick Cahill

SACRAMENTO, Calif. (CN) – A group of Northern California lawmakers seeking more sway over a mammoth $17 billion water project introduced a proposal Friday that would require new construction contracts to be reviewed by the Legislature.

The Legislative Delta Caucus says because of the scope of the California WaterFix, the project should require more scrutiny from both the public and lawmakers now that former Gov. Jerry Brown has left office.

Brown fiercely advocated for the expensive public works project that he and supporters believe will both update the state's aging water delivery infrastructure and protect it against sea level rise and other effects of climate change. Also known as the Delta Tunnels, the project calls for two 30-mile tunnels that would funnel water around the Sacramento-San Joaquin River Delta to aqueducts that supply farmers and cities farther south.

State Sen. Bill Dodd, D-Napa, believes his proposal will shed new light on the "flawed" project that environmental groups bitterly oppose.

"This bill gives the Legislature and delta residents a place at the table to learn about what's going on, express concerns and offer solutions that will serve Californians. We're eager to begin a new chapter, where the voices of those who live in our delta communities are adequately considered," Dodd said in a statement.

Senate Bill 204 would require the state agencies in charge of WaterFix, namely the state Department of Water Resources, to submit information about pending contracts with private companies to the Legislature before finalizing deals.

Voters nixed a similar water project in the 1980s but the concept was revived under former Gov. Arnold Schwarzenegger and advanced by Gov. Brown.

During his final term, Brown and his officials were able to successfully lobby the state's largest water districts into financing most of the project's estimated $17 billion price tag. The main player, Metropolitan Water District of Southern California, agreed to pay for the bulk of the project this past July and many other suppliers have followed suit.

Yet the project is far from shovel-ready despite Brown's efforts in 2018: Environmental lawsuits, damning audits and now a new governor mean the fate of WaterFix remains a mystery.

Delta residents and environmental groups warn that if built, the twin tunnels would be the final blow to ecosystem already beset by poor water quality and declining salmon populations. The delta is the largest estuary on the West Coast and it supplies water for thousands of farms and an estimated 25 million Californians. Critics worry that depriving the delta of flows from the Sacramento River will spoil water quality by allowing brackish water from the San Francisco Bay to creep deeper into the estuary.

"Californians deserve to know the true financial and environmental impacts of WaterFix, the largest public works project in state history," said Barbara Barrigan-Parrilla, executive director of Restore the Delta, which is sponsoring the proposal. "SB 204 will help make the planning process more transparent so members of the public can evaluate WaterFix for themselves."

New Gov. Gavin Newsom has taken a more subdued approach to WaterFix thus far, and has promised to look at the project with “fresh eyes.” He also suggested on the campaign trail that the project may have to be scaled down to one tunnel instead of two.

Newsom’s office declined to comment on Dodd’s proposal, adding SB 204 would be evaluated “on its merits” if it reaches his desk.

Democratic Assemblyman Jim Frazier, whose district covers parts of the delta, called SB 204 a

“common-sense, good-government bill.”

“Any large infrastructure project or major decision by a state agency should have legislative oversight. This is why people elect us. To protect their interests. Hopefully, the foolish WaterFix proposal will never be allowed to move forward,” Frazier said in a statement.

# # #

Engineers: Twin Tunnels project could endanger vital levees
KCRA 3 | January 28, 2019 | Kevin Oliver

SACRAMENTO, Calif. (KCRA) — At the peak of pear packing season, Daniel Wilson's Sacramento County operation is bustling. Pears are sorted wrapped and prepared for shipments to stores across the country.

"I get so buried in it, I don't think about it too hard. We just go until we're done," Wilson said.

It's an operation that sits a few feet below sea level, so flooding is always in the back of Wilson's mind. His orchards and packing plant is surrounded by levees.

"If you look, all the equipment is up high and that's why," Wilson explained, adding, "100 percent of what we farm is protected by levees anywhere from five feet below sea level (to) five feet above sea level. If the levees break, we're out of business."

That's why many farmers, like Wilson, and engineers are concerned about the state's proposal to dig two four-story tall water tunnels under the Delta. Engineers are concerned that the below-ground construction could disrupt vital levees and other infrastructure above it.

"We really don't know the competency of that soil," said Chris Neudeck, an engineer who works with irrigation districts that maintain many of the levees along the Delta. "If you dig a hole and then pull out, would it collapse?"

He pointed to smaller projects that had a difficult time getting through this part of the state.

"We've had similar situations in the Delta, with boring machines that are more like four feet in diameter that have failed initially because of soft soil," Neudeck said.

"Generally speaking, they'll be working within that muck setting that's very soft, almost if you think of San Francisco Bay mud -- very sticky, we think," Wilson said. "The one thing they don't have is gravel, rock, things of that nature."

The proposed tunnel path stretches 35 miles from west of Elk Grove to just below Discovery Bay. The tunnels would take water from three intakes along the Sacramento River to existing aqueducts south of Discovery Bay, and then the water will be sent to Southern California.

Along the proposed path, there are at least 22 levees that would sit above the tunnels, Neudeck said.

The concern is not so much the levees themselves, but the kind of soil that is below the levees. Neudeck said it's possible a tunnel boring machine could weaken the levees. As the machine goes under the levees, it could cause the soft soil above the machine to move around or settle, leaving the levees weakened. Another possibility: The digging could lower parts of the levees, leaving areas more prone to flooding.

"Any displacement of that fill vertically down would be a risk to the flood protection," Neudeck said.

The threat of flooding is evident even in the state's own project animation. A clip shows how the state plans to use fill dirt to build up the construction site.

"The elevated pad would be raised high enough to protect vital equipment and the tunnel from flooding in case of a levee breech during construction activities," a narrator says in the video.

"The rate at which the actual tunnels are constructed and bored out is actually very slow. They take years to go through and dig," said Mike Mierzwa, a civil engineer for the Department of Water Resources.

Mierzwa said the tunnels are being planned 15 stories below ground because it's what the state considers solid ground.

"It's deep enough where you are getting below the rivers where that we will be fine for the construction," he said.

Mierzwa said the depth is similar to what's been used in other big civil projects, including the Channel Tunnel between England and France. He also said the state has already taken 200 soil samples along the proposed route.

"There's been an assessment of the levees themselves to make sure that they are shored up and can handle whatever happens during construction," Mierzwa said.

Neudeck said the state's assessment is not complete and there are still questions.

"Every time you try to pin them down on a on a levee stability issue, they go, 'Well, we haven't made the plans yet, and we so we can't give you a straight answer,'" Neudeck said. "So that the target is very squishy. There is no there, there for lack of a better term."

The DWR said there is still more planning to do. There would also be monitoring of the levees during construction to ensure if there was an issue with a levee, it could be addressed immediately.

Click here to view footage

# # #

Water Utilities Call on Big Data to Guide Pipe Replacements
Circle of Blue | January 24, 2019 | Brett Walton

The drinking water industry says aging infrastructure is its top challenge. Can AI help?

Workers in Manhattan excavate 23rd Street to replace the water main. Photo courtesy of Flickr/Creative Commons user MTA

For five consecutive years, water professionals surveyed by the American Water Works Association have ranked replacement of aging infrastructure as the industry's top challenge

Artificial intelligence and machine learning, combined with utility pipe-break archives and data about environmental factors like flow rates, soil chemistry, and temperature can pinpoint which pipes are most likely to fail and thus are the best candidates for replacement

Only one out of five utilities surveyed last year by the American Water Works Association said that they use data mining to improve the operation and maintenance of their water and sewer systems

Doing surgery on San Francisco's water system is no simple task. Replacing one mile of distribution main costs about $3.8 million dollars. That's just the direct cost of installing a section of drinking water pipe. There are also side effects: disruptions to traffic, sidewalks, and businesses when streets are pried open.

In one of the nation's densest and highest-cost cities the expense amounts to an incentive for well-informed decisions about what to dig up and when.

"To leave good pipe in the ground as long as possible is economically important," said Katie Miller, manager of the water distribution division at San Francisco Public Utilities Commission.

But, out of the city's more than 1,200 miles of water mains, which are the good ones? Age is a clue but not a conclusion. Miller told Circle of Blue that some pipes beneath San Francisco that were installed more than a century ago are still in adequate condition, whereas other pipes half as old, but made from inferior materials, are cracking.

To leave good pipe in the ground as long as possible is economically important." — Katie Miller, San Francisco PUC

Detailed data can help separate the good from the bad, and San Francisco PUC and a handful of other utilities are turning to a growing cluster of analytics companies to help them make sense of it. The hope is that the tools of artificial intelligence and machine learning, combined with utility pipe-break archives and data about environmental factors like flow rates, soil chemistry, and temperature can pinpoint which pipes are most likely to fail and thus are the best candidates for replacement.

The need for precision has never been greater. For five consecutive years, water professionals surveyed by the American Water Works Association have ranked replacement of aging infrastructure as the industry's top challenge, above long-term water availability, cybersecurity, watershed protection, financing, and other pressures. The trade organization also estimates that the replacement tab for America's water pipes will run close to $1 trillion over 25 years. Meanwhile, more water mains are breaking and maintenance costs are growing at an increasing pace, taking up a larger share of utility budgets. With water rates already rising and the affordability of drinking water service for the poor an emerging public policy concern, utilities have reason to be selective in their pipe replacement programs.

"It's about using ratepayer money most effectively," said David Katzev of East Bay Municipal Utility District, which is using AI tools. Repairing a broken pipe costs between $10,000 and $15,000, he estimated. Replacement is several orders of magnitude more expensive, roughly $2.5 million per mile in East Bay MUD's service area on the east side of San Francisco Bay. "It's so costly to replace pipe that we want to make sure that we're replacing the right one."

From Reaction to Prediction

Digital technologies and Big Data — using computing power to find patterns in large sets of numbers — are transforming, albeit slowly, even the most hidebound industries, including municipal water utilities. Sensors detect changes in sewer systems flows in real-time, alerting managers to the possibility of an overflow. Smart meters track household water use by the hour, allowing leaks to be noticed more quickly. Bluefield Research, which follows water utility trends, says that using data insights to improve the performance of their assets could save utilities billions of dollars in the next decade. Industry heavyweights and startups alike are angling for a piece of the data analytics market.

Both East Bay MUD and San Francisco PUC are working with a company called Fracta to help guide their pipe replacement decisions. Both utilities are in the early stages of increasing annual water main replacement. East Bay MUD replaced 15 miles of water mains last year, and plans to replace 20 miles a year by 2020. The long-term target is 40 miles per year. With data analysis, the aim is to move from reaction to prediction, to "get ahead of the game," said Katzev, a civil engineer who is managing the utility's pipeline rebuild program.

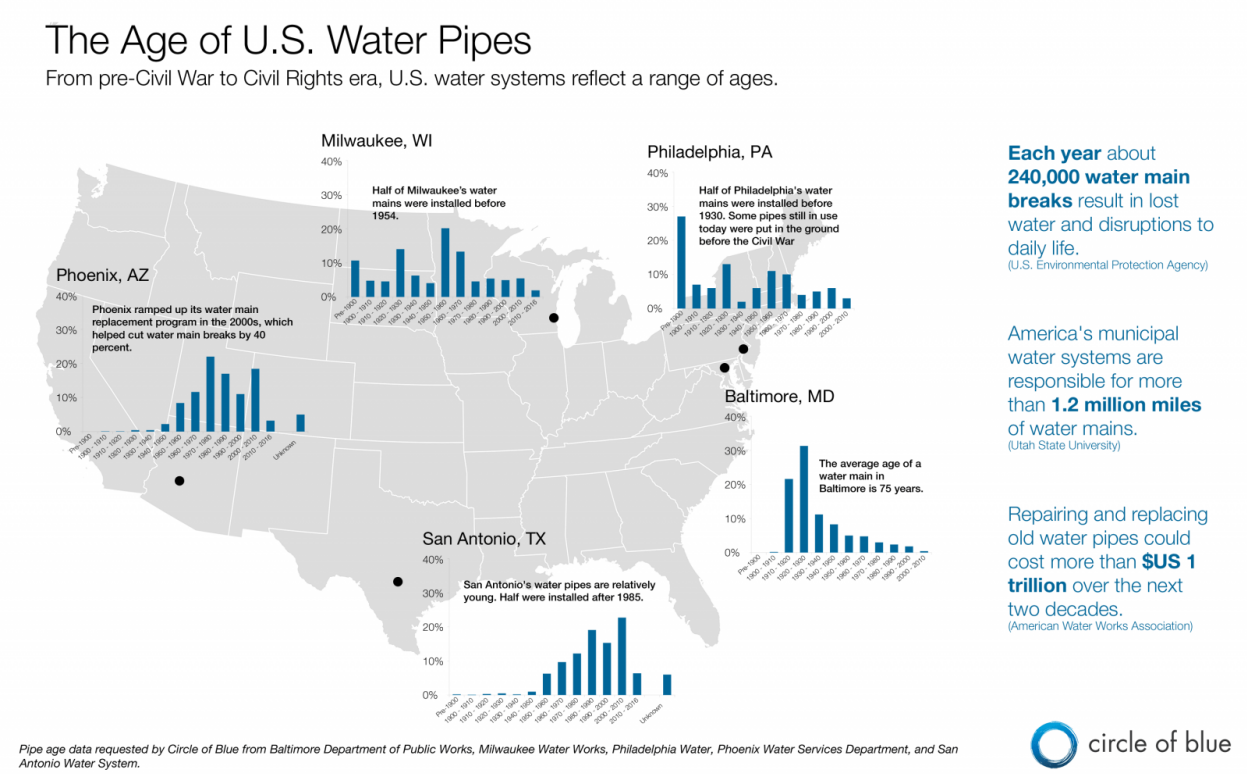
A subsidiary of Kurita Water Technologies, a Japanese firm, Fracta started life with physical assessments. The company, when it was operating under the name HiBot USA, sent robots into pipes to scope out the interior walls, mostly in oil and gas lines.

Physical assessments turned out to be too slow and expensive so company leaders turned to number crunching instead. They read the American Water Works Association pipe replacement report and saw an opportunity in the water sector.

The Fracta recipe takes utility data on pipe age, material, and break history and adds in dozens of additional environmental factors like soil chemistry, soil slopes, air and water temperature, and proximity to other infrastructure. Those data streams, after being cleaned for missing or incomplete numbers, are fed to computer algorithms that look for correlations between data points. How do ductile iron pipes in low pH soils in the city center compare with an asbestos cement pipe that crosses beneath a freeway in a low-lying area?

“Machine learning looks at all of that and identifies that these variables in this setting are associated with a break with this type of pipe,” said Doug Hatler of Fracta. The more data to feed the model, the better it performs, he said.

After running the computer model, Fracta then gives each section of pipe a risk score, from low- to high-probability of a break.



Graphic © Kaye LaFond / Circle of Blue

The percent of current water mains installed by decade for five U.S. cities. Click image to enlarge.

So far the experiment is proving fruitful for San Francisco PUC and East Bay MUD.

“Our breaks are all happening in high-risk-of-failure pipes,” Miller said. Her team, which started working with Fracta in 2016, is now using the risk scores to deploy acoustic sensors that listen for leaks in the pipes most likely to fail.

Katzev also says that early results look promising.

Success will be measured in a long-term decline in the utility’s water main break rate, he said. But it’s too soon for those conclusions.

“I don’t think one or two years is going to get us there,” Katzev said.

A Tool, Not Magic

Big Data has promise — “The marriage of data and water lay the foundation for tomorrow’s smarter cities,” proclaimed one industry publication last year — but for now it’s more buzz than honey for most water utilities.

Like a child, AI can learn bad things if the data is not good.” — Sunil Sinha, Virginia Tech

Only one out of five utilities surveyed last year by the American Water Works Association said that they use data mining to improve the operation and maintenance of their water and sewer systems. Water officials, according to the report, “remain unconvinced” about the long-term potential of the data revolution that is remaking other industries.

“It’s definitely still early days,” said Will Maize, a research director with Bluefield Research. Maize told Circle of Blue that East Bay MUD is known within the industry as an early adopter, willing to sample new technologies. Because it does not involve construction or integrating new hardware, the predictive tool offered by Fracta is even less of a leap. “It’s a really low-risk opportunity for these utilities,” he said.

But what works for East Bay MUD and San Francisco PUC might not apply elsewhere.

Sunil Sinha, an engineering professor at Virginia Tech, thinks that talk of a Big Data revolution for predicting water pipe breaks is premature. Utility data is generally not detailed enough for computer modeling to have an advantage over traditional statistical methods, he said.

“Like a child, AI can learn bad things if the data is not good,” Sinha said.

And Sinha and colleagues are finding bad data everywhere they look. They are heading up a national evaluation of water distribution pipes. Called PIPEiD, the project will collect data from 500 utilities to produce a pipe performance database that utilities can use to gauge the health of their own systems.

Part of the project is determining which data are most crucial. “The majority of utilities do not collect good data,” Sinha said. Most simply record a break as a break, not marking whether it was across the length of the pipe, around its circumference, or a spot of corrosion. Nor do they track physical data that affects pipe health: water pressure, for example, or water and soil chemistry.

Maize agreed that data is an obstacle. “Data quality is certainly one thing that advanced asset players run up against,” he said.

Though San Francisco PUC generally has high quality data, it wasn't until recently that it was complete, consistent, and accessible, Miller said. The utility has digitized four decades of its pipe break data, which stretches across 100 years. When extracting data from the old plumber's logs, staff found that the records were mostly complete, but they found a number of errors that had to be reconciled.

"The break might have been recorded as being on a six-inch pipe, but the pipe in the ground is sixteen inches," Miller said, outlining a hypothetical scenario. "Did they record the street wrong or get the pipe length wrong?" Reconciling these inconsistencies and digitizing the files is expensive and time-consuming, she said. But it's necessary for Big Data methods.

Katzev said that East Bay MUD has main break data since 1990. Prior records have disappeared. "It would be nice to have earlier main break data," he said. "It was on paper, but we just lost it."

Sinha, whose doctoral work was in artificial intelligence, repeatedly leans on medical metaphors — "Just because a baby is born, it doesn't mean it will live 80 to 90 years. Same with pipes." — to describe water systems and AI networks.

Tracking breaks is like tracking heart attacks, he said. The data can identify a pattern, but it is not going to stop heart attacks. The long-term challenge is changing the behaviors that resulted in the emergency. For utilities that means taking better care of their pipes, a task that is easier for those, like San Francisco PUC and East Bay MUD, that have the funds, expertise, and management.

One small West Virginia utility that Sinha is working with on the PIPEiD project is particularly stricken, he said. Most of its budget, managers told him, is going to pipe repairs.

"They're running the business like a hospital," Sinha commented. "They're in crisis mode all the time."

Brett Walton

Brett writes about agriculture, energy, infrastructure, and the politics and economics of water in the United States. He also writes the Federal Water Tap, Circle of Blue's weekly digest of U.S. government water news. He is the winner of two Society of Environmental Journalists reporting awards, one of the top honors in American environmental journalism: first place for explanatory reporting for a series on septic system pollution in the United States(2016) and third place for beat reporting in a small market (2014). Brett lives in Seattle, where he hikes the mountains and bakes pies. Contact Brett Walton

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Sea level rise agency takes shape

New flood district to include environmental priorities such as sea level rise in scope

Daily Journal | February 4, 2019 | Anna Schuessler

A countywide effort to address sea level rise is gaining momentum after San Mateo County supervisors took steps to form a new government agency to manage flooding, sea level rise, coastal erosion and stormwater infrastructure this week.

By expanding the San Mateo County Flood Control District's responsibilities to address sea level rise and adjust its governance structure to include city and county officials, officials have looked to the proposal to form the San Mateo County Flood and Sea Level Rise Resiliency Agency to facilitate coordination between jurisdictions as they set their sights on a new set of challenges for water infrastructure projects.

Having focused on the threat of a rising shoreline for the last five years, Supervisor Dave Pine noted the effects of climate change are being documented across the globe through events such as the melting of ice sheets in Greenland and erosion on coastal bluffs in San Mateo County at the Board of Supervisors' meeting Tuesday.

Noting Foster City's efforts to improve its levee, protections on the San Francisquito Creek and the San Francisco International Airport's investments in shoreline planning, Pine acknowledged several efforts to combat the effects of sea level rise are already underway. Released last year, a report completed by the county's Office of Sustainability detailed the impact of a creeping shoreline as well as a range of mitigation measures for sea level rise, added Pine.

But to better position the county and its 20 cities for federal and state funds and develop expertise in sea level rise, Pine advocated for a new agency to focus on the cross-jurisdictional work needed to address the complex issue threatening San Mateo County's Bayside and coastal shorelines.

"We … know that sea level rise poses a particular threat in San Mateo County," he said, according to a video of the meeting. "There's a lot happening, but to really take this to the next level, we need to come together in a more formal way."

Established in 1959, the San Mateo County Flood Control District has largely managed flood control for the areas surrounding the Colma, San Bruno and San Francisquito creeks, explained county Public Works Director Jim Porter. After the Board of Supervisors allocated some $6.2 million to address flooding in the county's unincorporated areas, officials have been able to begin addressing flooding along the Bayfront Canal in Redwood City, the Belmont Creek in Belmont and San Carlos as well as the Navigable Slough in South San Francisco, he said.

Porter acknowledged many flood mitigation projects must now account for high tides, intense storms and sea level rise, which can also drive up the cost and extend the timelines of projects already estimated to cost tens of millions of dollars.

Since collaboration between jurisdictions can be an attractive feature of applications for state and federal funding, Porter underscored the importance of the collaboration between the county's multiple jurisdictions as they seek support for these types of projects.

"We as a county want to speak as one voice about these issues," he said. "Water knows no boundaries … It's important we look at this as a ... county."

More than three years ago, Porter said the City/County Association of Governments formed an ad-hoc water committee to explore countywide coordination of water projects, noting the group has focused on exploring the effects of sea level rise in the last year. In crafting a proposal for the new agency, the C/CAG water committee convened 18 staff representatives from C/CAG, San Mateo County, cities and other water-related agencies, he said.

Porter said consensus was reached among staff and C/CAG officials that cities and the county would contribute $1.5 million annually for three years to establish the new agency and fund two or three staff members to identify funding sources for sea level rise mitigation measures. Of the $1.5 million contributed annually, the county would come up with $750,000 and cities would collectively contribute $750,000 in different amounts based on population, he said.

Approved by the C/CAG Board of Directors Jan. 10, the proposal will go before city and town councils in the coming months, said Porter. He added Assemblyman Kevin Mullin, D-South San Francisco, has agreed to pursue state legislation needed to change the flood district's governance to a seven-member board consisting of five city officials and two county supervisors, one of whom will represent District 3, which includes much of the county's coastline.

Once the agency is formed, Porter said it will focus on hiring an executive director, entering into contracts with the county's Public Works Department for flood protection services, studying the coastline to prioritize mitigation measures to prevent erosion and establishing a presence in Washington, D.C., so the agency can be effective in advocating for federal funding.

In voicing support for the new agency, Supervisor Don Horsley, who represents District 3, noted the threat of erosion on coastal housing and harbors and the importance of developing protection measures for the coast. He credited coastal residents and officials for focusing on projects protecting shoreline over the years and maintaining a beautiful stretch of the California coast.

Moss Beach resident Zoe Kersteen-Tucker, who is also a board member on Midpeninsula Regional Open Space District, also supported a renewed focus on countywide collaboration to protect the environment, housing, roads and businesses as well as the agency's potential to become leading experts in sea level rise.

"Much of the really critical natural and built infrastructure is directly in harm's way on the coastside," she said. "I look forward to seeing this agency move forward and take a leadership role in the state."

# # #

An Exclusive Look Inside Hetch Hetchy Dam's Mountain Tunnel
KPIX 5 | January 30, 2019 | Don Ford

SIERRA NEVADA MOUNTAINS (KPIX 5) — For nearly 100 years, the Mountain Tunnel has transported the water supply from the Hetch Hetchy Dam to the Bay Area. 2.7 million customers rely on the pure water that travels through the tunnel.

For the first time in history, TV cameras went inside while engineers made repairs. KPIX 5 got an exclusive first look inside, using carefully inspected and equipped Quad Vehicles to travel five miles within.

"We are, right now, 750 feet below the surface, under the town of Groveland," said Steve Ritchie, Assistant General Manager for Water at the San Francisco Public Utilities Commission. Engineers needed to know how the old tunnel is doing.

"We were concerned that the tunnel, at some point, could collapse, or some portions could collapse, but what we found was the liner was in better shape than we thought!" explained Ritchie

The tunnel is 19 miles long. Engineers say they are surprised that little erosion damage happened in the last century, but some areas need critical attention. Holes and cracks are being filled, repairs that are designed to last for the next hundred years.

"Every customer that we serve receives its water from this tunnel. Yes! Right here where we are standing!" said Mountain Tunnel Project Manager Dave Tsztoo.

Two hundred million gallons–or three hundred Olympic swimming pools–flow past the tunnel each day. The project is scheduled to be completed by March.

Click here for footage

# # #

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Republic of Thirst, Part 2: The Sites Reservoir and the Future of Water Storage
Breitbart News | January 1, 2019 | Joel B. Pollak

"Republic of Thirst" is a three-part series made possible by a generous fellowship from the Robert Novak Foundation. Part I of examined the debate over how California's scarce water resources should be allocated. Part III will examine whether those resources can be expanded through technological innovations like desalination. Part II examines whether more can be done to store and manage the water that falls naturally on the Golden State.

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The water burst out through the spillway in a constant gush, a mad torrent of white, unstoppable and ferocious. It swept down the smooth concrete — then pounded into the new cracks in the failed spillway, sending a spray hundreds of feet into the air and carving a new chasm in the hillside.

Alongside the ruined structure, new channels appeared in the earthen emergency overflow spillway, strewn with rip rack rock that had been dropped by helicopter to keep the hillside from collapsing, to save the cities downstream.

Oroville Dam Spillway (Joel Pollak / Breitbart News)

Viewed from a small airplane above the Oroville Dam — at 770 feet, the highest in the U.S. — in March 2017, the future of water storage in California looked doubtful. That year, California's deep drought was broken by record rainfall, filling that dam and many others.

As water continued to pour in, authorities opened the spillway gates as wide as possible. But the concrete cracked, and the main spillway failed — spectacularly. The earthen emergency spillway, used for the first time ever, eroded itself and nearly failed.

Initially, local authorities evacuated nearly 200,000 people downstream of the dam. But a herculean effort by engineers managed to save and stabilize the emergency spillway, averting a massive disaster.

Still, the crisis provoked questions about whether state authorities had mismanaged Oroville Dam or ignored warnings about the structural integrity of the spillway — or even of the dam itself, which, some claimed, had already begin to leak.

To critics of dams, especially among environmentalists, the events at Oroville Dam were further proof of the dangers of dams and reservoirs — which, they argued, stored water only at great cost to nature and great risk to human life.

To others, especially advocates of industry and agriculture, the Oroville near-disaster was proof the state government had neglected California's infrastructure needs in favor of redistribution, water conservation mandates, or flashy pet projects.

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Life as we know it in California today would be unthinkable without the extensive system of dams, reservoirs, pumps and aqueducts that make urban life possible and that have transformed the drought-prone Central Valley into the most productive farming region on earth.

And yet it is a system that remains almost frozen in time, constructed largely during the early 20th century, the New Deal era, and the postwar boom that followed — designed for a population of 10 million, in a state now reaching 40 million.

It is also a system replete with ironies. The state that gave Ronald Reagan to America, and with him a new brand of unapologetic conservatism, is one in which the survival of the population depends on massive investments in infrastructure — albeit paid for, ultimately, by water users themselves.

Moreover, the liberal cities that have incubated America's utopian environmental movement for decades could not exist without ongoing human intervention in the environment that brings water from mountaintop to tap.

For decades, policymakers have debated whether to build new reservoirs. One project, the Auburn Dam, was authorized by Congress in 1965 for flood control, but later abandoned over structural and environmental concerns. Numerous other proposals have been studied for decades, with little progress at the state or federal level — though local authorities have built their own projects, such as the Los Vaqueros Reservoir in the East San Francisco Bay, one of the few projects environmentalists have not opposed (though many have since opposed its expansion.)

Another project, the Sites Reservoir, has been debated for decades. Rather than capturing water by blocking a river with a dam, the reservoir would be built in a valley with minimal water and would receive excess water during floods, relieving pressure on other dams and allowing them to store more.

As Robert Dolezal of the California Water Alliance, a non-profit advocacy group funded by the state's business community, told Breitbart News:

Sites Reservoir … reduces the flood potential of the Sacramento River … and it allows the entire Central Valley system, all the other major dams in the north — Trinity, Shasta, Oroville, and Folsom — to rebalance … [A]s much as 3 million more acre-feet of water can be stored in Trinity, Shasta, Oroville and Folsom because they don't have to prevent flooding of Sacramento and other downriver communities, rebalancing the system. A similar proposal to raise the height of the Shasta Dam has a similar purpose, as would Temperance Flat on the San Joquin River near Fresno.

But critics say these dams would achieve little for storage, while hurting fish populations and destroying Native American heritage sites. They call such projects "vampire dams" — "because they so often rise from the dead" after being rejected by state leaders, one wrote recently.

The divisions over water storage do not match partisan divisions on other issues. In the Central Valley, Democrats tend to be as vociferous in their advocacy for water storage as Republicans are. And in the past, Republicans were as skeptical of such projects as urban Democrats are today.

Regardless of political predilection, during years of drought, one thought pervades public consciousness: how much water is left? Residents anxiously turn to the state's reservoirs as they slowly drain, and dry.

The consequences of poor planning, and political infighting, have become clear — from a distance, at least for now. Across the ocean, the South African city of Cape Town, Africa's most advanced and cosmopolitan city, provides a new warning. Its population has doubled over the past two decades, but it has not built much new water storage capacity — thanks, in part, to the fact that the national government has authority over water and the local government is controlled by the opposition. As a result, the city nearly ran out of water in 2018, forcing severe restrictions on residents.

That foreshadows California's grim fate — if it cannot find solutions now.

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"Droughts are nature's fault. Water shortages are our fault."

Rep. Tom McClintock (R-CA) greeted me in his office on a frigid Tuesday in December. He is one of the last seven Republicans left in the 53-strong California congressional delegation after Democrats won the midterm elections.

The hallway was strewn with the furniture of departing GOP colleagues, but for McClintock, it was business as usual. And the business at hand was water storage in California.

A continent away, frantic negotiations were continuing on the eve of the State Water Resources Control Board (SWRCB) decision on the Bay-Delta Plan, the controversial new policy that will mandate that rivers in the San Joaquin watershed must have an average of 40% “unimpeded flow” during the spring months — a decision that shifts precious water from farmers and cities to the environment in an effort to save threatened fish populations.

McClintock’s office was well-apprised of the state of talks between the various parties, including outgoing Governor Jerry Brown and incoming governor Gavin Newsom. The two liberal Democrats asked the SWRCB to postpone its decision, originally scheduled for November, to Dec. 12 to leave time for voluntary agreements with local water authorities. (The day following my meeting with McClintock, the SWRCB voted to approve the Bay-Delta Plan, despite some agreements being reached.)

The governors’ real priority, some skeptical observers claimed, was to secure enough water for the California Waterfix — the “Twin Tunnels” project that will divert water from the Sacramento River under the California Delta to be pumped south.

But that is a fight about allocation. McClintock focused on storage, noting that the cheapest and best way to solve the state’s water problems — measured in cost per acre-foot — is to build more reservoirs rather than letting much of the state’s rainfall run out to sea. McClintock reminded me that it has been 40 years since California’s last dam, the New Melones Dam, was completed in 1978.

The state’s largest water reservoir — by far — is the natural reservoir provided by its Cascades and Sierra Nevada Mountain Range snowpack. That dwarfs the man-made facilities and, through gradual snowmelt in spring, continuously refills the man-made reservoirs long after winter rains and snows have stopped for the season.

Though smaller than nature’s own reservoir, California’s system of man-made reservoirs is vast — and complex. The Public Policy Institute of California notes that “state and federal agencies manage 240 large reservoirs that account for 60% of the state’s storage capacity,” with the rest of the state’s reservoirs owned and operated by local water agencies, or by private entities for use on private lands.

The California Department of Water Resources notes: “On average, California receives about 200 million acre-feet of water per year in the form of rain and snow.” (It adds that the state rarely experiences an “average” year.) The state’s reservoirs can capture about 42 million acre-feet of that — roughly one-fifth. The rest seeps into underground aquifers, or flows out to the sea.

Dolezal notes that California uses an average of about 80 million acre-feet of water per year, and over the past two decades, roughly half of that is preserved for environmental use — dropping to 40% in the most recent drought, with agriculture using just over 40%, in both wet and dry years.

The reservoir system has a variety of purposes — and storage is just one of them. Many dams and reservoirs were built for flood control.

The state’s capital city of Sacramento, which sits at the confluence of the American and Sacramento Rivers, was inundated during the Great Flood of 1862, which “turned enormous regions of the state into inland seas for months,” Scientific American recalled. That event, and others like it, fueled enthusiasm for building dams.

California’s dams are also multipurpose facilities, providing hydroelectric power generation; water storage and supply; recreation; and flood management protection.

But in times of drought, such as the unusually severe drought that gripped the state from 2011 to 2017, storage is the most salient priority. And McClintock believes there is too little of it.

He and others argue that California can add to its storage capacity relatively easily — not just by building new dams, but expanding existing ones, such as the Shasta Dam, one of the major reservoirs in the federal Central Valley Project, which supplies water to farmers hundreds of miles south.

Shasta Dam was built under President Franklin Delano Roosevelt during World War Two, reaching 602 feet, though it was designed to be even bigger. (An even bigger dam was envisioned for the Klamath River, but was canceled in the 1970s; today dams along the Klamath are set to be torn down.)

Shasta Dam, Mount Shasta, and Lake Shasta (Joel Pollak / Breitbart News)

Shasta Dam and Sacramento River (Joel Pollak / Breitbart News)

“Simply finishing the Shasta Dam to its design height [of 800 feet] could add nine million acre-feet to the system,” McClintock says. Indeed, the Trump administration, is proposing to raise the dam by 18.5 feet, increasing the capacity of the dam by 7 percent (630,000 acre-feet) — if tiny salamander species that environmentalists wish to have declared “endangered” do not stop plans for expansion.

Another proposal is to build the Sites Reservoir in the foothills west of the small town of Maxwell, just over an hour north of Sacramento. As noted earlier, the Sites Reservoir would store 500,000 acre-feet of “off-stream” water, meaning that it would not dam an active river, but rather be a site for water from other sites to be stored as available and used as needed. Proponents argue that it would contribute to environmental quality as well as the state’s storage capacity.

Crucially, the Sites Reservoir appears to have some startup funding. As much as half of the money will come from a special water bond passed by voters in Proposition 1 of 2014, which set aside $2.7 billion (of $7.5 billion) for water storage projects. The rest of the project would theoretically be funded by long-term contracts for water not reserved for public use.

Jim Watson, general manager of the Sites Project Authority, told Breitbart News that he was confident the project would proceed, given the support of the voters for water storage when they passed Proposition 1. He noted that $816 million had been set aside for Sites — the largest

project funded by the proposition bond, compared to several competing projects. He added that local water agencies had also been working with state and federal authorities in preparing studies for the project.

“Some of the water that will be produced from the project will be dedicated for environmental projects,” he said, nothing that some water would help fish, and some would supply existing refuges that support waterfowl species.

Given that “no formal opposition” was raised by environmentalists during the approval process for Sites, he said, he did not anticipate significant opposition from them — though they were skeptical the reservoir would provide the water promised. Watson said the project was consulting with environmental interests to allay those concerns, and to explore their thoughts about how the water should be managed once it had been stored, in the reservoir. He said the management process the project had developed would include local communities and Native American groups. And he added that the Sites Reservoir will have “statewide reach” by helping recharge depleted aquifers throughout California — an urgent necessity once the state’s new groundwater management requirements go into effect in 2020.

“Three years ago, the concept of a local agency taking on such a project, that had been on the board since the 1950s, seemed pretty remote,” he said. “We have now become the state’s lead agency for complying with environmental requirements.

“We’ve come a long way … we’re starting to put the pieces together,” he added with evident pride.

Likewise, Erin Curtis of the U.S. Bureau of Reclamation told Breitbart News, “There is a lot of momentum for the project right now.

“And obviously,” she added, “for any project in California, especially related to water, there’s going to be some discussions with environmental organizations and local landowners, but it did get Proposition 1 funding.”

Curtis described the value of the project in terms environmentalists might understand: given that the state’s climate is changing, and becoming warmer, that means more of California’s annual precipitation is falling as rain, rather than snow.

Without that frozen, natural reservoir, the system must build new capacity to store water — or else it will be lost, not just to industry and agriculture, but to environmental and recreational users as well.

“We have been getting less and less water in the form of snowpack, which means less storage — we get more rain, so we can’t store it.” Sites, she said, provides “another place to put that water.”

Critics, however, say that state authorities allocated just enough money to the project to make it appear as if they are spending money on water storage, while not quite enough to allow the reservoir to be built.

McClintock is among the skeptics. He told Breitbart News that he has been hearing talk about the Sites Reservoir for decades, and that Californians are constantly told that construction is imminent. But somehow, that reservoir, and others, are never built.

He blamed the state and federal environmental laws and regulations that make dams more difficult, and more expensive, to build. “Until we change the environmental laws, construction is cost prohibitive,” he told me.

That would be perfectly fine with many environmental groups, for whom opposition to dams has become something of an article of faith over the past several decades. Dams were once thought to provide an environmentally-friendly source of renewable energy, through hydroelectric power. But they destroy whatever habitat finds itself submerged by reservoirs; impede fish migration; and — if managed poorly — create new hazards, such as mechanical failure.

McClintock dismissesdconcerns about Oroville. “No dam, no work of man is perfect,” he said. “We make mistakes, we learn, we go forward.”

That is, dam projects would go forward — if there were the political will to build them.

Oroville Dam Spillway Reconstruction (Joel Pollak / Breitbart News)

The lack of will has less to do with engineering challenges, he maintains, than it does with politics, bureaucracy, and lawsuits by radical environmentalist groups.

Environmentalists have made no secret of their opposition to the Sites Reservoir. The Sierra Club has cast the project as a fatal threat to the Sacramento River, declaring:

The Sites Reservoir would be filled by significant water diversions from the Sacramento River, which could harm the river's dynamic flow-based ecosystems. More than 20,000 acres of federal and state public lands along the river that were acquired to protect and restore the river's riparian and aquatic habitats, could be degraded by the diversions.

In addition to reducing flows in the Sacramento River, the reservoir would drown up to 15,000 acres of existing oak woodlands, grasslands, wetlands, and agricultural land in the western Sacramento Valley. Impacts associated with the reservoir footprint would harm the federally protected bald eagle, a host of other sensitive wildlife species, several rare plants, and significant historical and cultural resources.

The Sites Project Authority, a consortium of water districts and local governments, claim that the reservoir could store up to 1.8 million acre feet of water (making it the seventh largest reservoir in the state) and reliably yield about a half million acre feet of water annually for communities, farms, and the environment. But this yield estimate fails to adequately consider the effects of climate change, chronic drought, and reservoir evaporation on project storage and deliveries.

Sites supporters are essentially proposing to take water away from the environment, while promising to give back a small portion of that water for dubious environmental purposes.

The Sites project's alleged "environmental benefits" seem little more than window dressing to secure public funding through the state water bond (Prop. 1) and to gain the support of gullible politicians.

Historian, essayist, and family farmer Victor Davis Hanson told Breitbart News that the environmentalist opposition to the Sites Reservoir is less about the actual impact of the project and more about hostility to commercial farming.

Once, he said, dams were favored by Democrats –part of the "1950s, 1960s, can-do attitude. And the people who opposed it were sort of Republican tight-fisted guys who didn't really believe the government should be doing this."

Now, however, "They don't want agribusiness on the west side of the San Joaquin River. … They don't believe in artificially changing the earth, or allowing a bunch of corporate farmers to make a killing."

The Sites Reservoir, he noted, was originally one of several low-elevation reservoirs planned for the system, including Temperance Flats on the San Joaquin River. They were "integral to the original design," he said, because they would allow flood waters to be captured during occasional years of heavy rainfall and snowmelt. They have the additional benefit of being low-cost and away from seismically sensitive regions that complicate construction.

What had particularly irritated environmentalists in recent years, he said, was that the farmers on the naturally dry west side of the valley had found ways to survive even when their federal water allocations had been slashed. They switched to highly profitable permanent crops like almonds, found water in a hitherto-unknown deep aquifer, and adopted high-tech solutions such as drip irrigation.

That, environmentalists said, proved that farmers could survive without more water storage. But it also meant that farmers were "systematically draining their aquifer" — a potential catastrophe.

And most farmers prefer surface water to water pumped from wells below: it is generally better for crops, and pumping water uses costly energy, Hanson noted.

“Environmentalists feel that if these things [reservoirs] fill up, no matter what they do, they can’t stop agriculture and agribusiness,” he concluded.

Hence the rough political road ahead, potentially, for the Sites Reservoir.

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A week after meeting with McClintock, I traveled to the unincorporated community of Sites itself to examine the proposed future reservoir. The town, such as it is, sits at the end of a narrow, winding road at the end of the main street through the tiny rural town of Maxwell, just west of the Interstate 5 freeway. The road begins on a plain, then twists and turns through foothills along a small creek as cattle graze lazily in the tall grass along the steep banks.

At the end is a T-junction, a sign commemorates John Sites, the landowner for whom the area was named. A few homes and farms cluster near the junction, from which dirt roads branch out to the north and south. Beyond lies a shallow green valley, home to just over a dozen families, where herds of cattle graze placidly on non-irrigated land.

The whole north-south valley, roughly up to the area of the T-junction, is set to be inundated with water, eventually, under the plan prepared by the Sites Reservoir project.

Sites Reservoir, Looking West (Joel Pollak / Breitbart News)

It looks almost ideal for a reservoir — and many of the locals feel the same way. In 2015, the Santa Rosa Press Democrat interviewed fifth-generation cattle rancher Mary Wells, who said that while she was sad at the prospect that her family home could be underneath 350 feet of water, she recognized the urgent need the water could meet: "I wish it was here last year. Because I look at generation six and seven and say if I'm going to give them a legacy, we've got to have more [water] storage." Other locals agreed: "It's a bonanza of advantages where the disadvantages are few," a Maxwell rancher told the paper.

The local Appeal-Democrat applauded the Trump administration for offering a $449 million loan to build a pipeline connecting two nearby canals, which will also serve the Sites Reservoir.

However, an editorial warned, the overall cost of the project was $5.1 billion, meaning that proponents would have to commit to "years of advocacy" before succeeding.

To that end, even lame-duck Republican congressman Jeff Dunham, who had just suffered a close defeat in the midterm elections, continued to promote the project. He told the local Manteca/Ripon Bulletin: "I made a promise to the voters and we are living up to that … Water is our future and I am always going to continue to work for that."

The enthusiasm for the Sites Reservoir is bipartisan. Sen. Dianne Feinstein (D-CA), who often partners with Republicans on water issues, issued a statement reacting to the grant:

> California must expand our water storage capacity so we can save more water from wet years for dry years. As we continue to experience the worsening effects of climate change, that need will only become greater in the future.
>
> Projects like the Sites Reservoir are vitally important to counter climate change. Once completed, this 1.8 million acre-foot off-stream reservoir will allow us to catch excess Sacramento River flow, saving it for environmental, agricultural and residential use.

Former California State Assemblyman Dan Logue, a Republican who represented the area in which the Sites Reservoir is to be situated, co-authored a bill in 2014 with a Democratic colleague to fund a water bond to build it.

He told Breitbart News that he remains confident the reservoir will be built, given bipartisan support for the project, and given that it does not block an existing river. "If any one's going to be built, this is going to be it," he said.

But other proponents of the dam are less optimistic about the prospects for the Sites Reservoir — even if the dam is completed.

Former State Assembly Republican Caucus Chief Consultant Doug Haaland, an authority on water issues in the state, told Breitbart News that when Republican Governor Pete Wilson first signed the law authorizing the Sites Reservoir in 1994, "my grandson was nine months old. Now he's twenty-four, and we haven't turned a spade of dirt" at Sites.

Even with the Sites Reservoir in place, he said, he was skeptical about the overall impact on the state's water supply. "The effect of Sites is going to be negated by the new water flow restrictions the state board is imposing" through the Bay-Delta Plan he said. "More [fresh] water flows out to sea under the Golden Gate Bridge every day than the reservoir can save." The SWRCB seemed to have made its decision for the sake of the fish without a sense of the state's overall water supply.

In addition, Haaland told Breitbart News, the state simply had not prioritized water. “We could have built Sites, Temperance Flat, and several others in between for all the money we are spending on high-speed rail,” he said.

When California began to grapple with climate change, he added, residents were warned about the strain on the state’s water supply — but then the state government neglected to do anything to add to California’s storage capacity.

Climate change had become an argument for more new projects, ostensibly to save energy and cut down on fossil fuels, rather than an impetus for holistic planning that examined the state’s needs and how it could use resources, including water, more efficiently. Planning for new water infrastructure like the Sites Reservoir had become an ad hoc process, shaped more by political opportunism and clout than any management principles, program, or plan.

Some of those involved in water planning in the state told Breitbart News that the Sites Reservoir had the advantage of being more organized than other projects — better prepared with maps and studies showing regulators a range of anticipated impacts, in anticipation of lengthy public consultations and debates.

Still, like many water plans, it is subject to the ebb and flow of public interest — intense during drought years, and nonchalant when rain is plentiful.

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One such plan that has returned, repeatedly, throughout the history of California water policy is the idea of bringing water from the Sacramento River to the San Joaquin River valley, and from there to Southern California. The existing state water project follows that model somewhat, with the existing dams providing water to communities of the Central Valley, and water from the California Delta pumped south from the Jones plant near Tracy, California.

But planners have always envisioned a more ambitious plan — one that brought water directly from the Sacramento watershed south, bypassing the Delta. A century ago, in 1919, the U.S. Geological Survey’s Lt. Robert B. Marshall proposed the idea, but its prospects were dimmed by the Great Depression. It was Governor Jerry Brown, then in his first term, who convinced the state legislature to authorize the Peripheral Canal to accomplish that purpose.

Yet the Peripheral Canal ignited political tensions in the state, “pitting environmentalists and Northern Californians against farmers and Southern Californians, and destroying political careers in the process,” as the Los Angeles Times put it in 2007, after Gov. Arnold Schwarzenegger revived the idea. Voters defeated the Peripheral Canal in a statewide referendum, Proposition 9, in 1982, but the natural and economic factors that inspired the plan remained.

After his return to the governor’s mansion, Brown proposed a new plan, the “Twin Tunnels” or California Waterfix — 35 miles long, 40 feet wide, and 150 feet deep. Opponents were not convinced: “He wanted the Peripheral Canal. The tunnels are the Peripheral Canal with a lid on it,” one said. Financial support for the project was also weaker than expected, as the cost grew, potential contractors for the water, withdrew, and the cost tripled to $17.1 billion.

Days before leaving office, Brown told journalists at the Sacramento Press Club that he was confident the tunnels would be built — even though his successor had been somewhat cooler to

the idea. “The [California] Delta will be destroyed unless we have some kind of peripheral canal or a tunnel,” he said.

Brown also said he was confident his other pet project, the high-speed rail linking San Francisco to Los Angeles, would be built, despite enormous costs.

A few days later, I attended a public meeting of the Delta Stewardship Council, a government body charged with the task of ensuring compliance with the Delta Plan, the state’s effort to balance environmental values with other needs in the California Delta.

The December 20 meeting was to be a showdown over the California Waterfix, where opponents had prepared to argue the project violated the Delta plan.

And then, suddenly, on Dec. 9, the California Department of Water Resources withdrew its certification that the Waterfix met the Delta Plan’s requirements. The council still held its meeting, but it was rather anticlimactic.

Delta Stewardship Council (Joel Pollak / Breitbart News)

The state is expected to re-submit its plans — but for now, Jerry Brown’s signature water infrastructure project is on hold.

With the fate of these massive projects still uncertain, and opposed by various interest groups from right to left, it might seem to make sense to focus on infrastructure projects that could

make an immediate difference at lowest cost and least impact. The Sites Reservoir would seem to fit the bill: a guarantee of additional water storage during flood years that could provide additional reserves during drought years or recharge the state's over-pumped aquifers.

The project seems to be creeping forward — slowly. But it is hostage to changing power dynamics in Washington and Sacramento; limited by the natural forces that cause projects like the Oroville Dam spillway to crumble; yet still driven by needs that require human ingenuity, in the face of natural scarcity, to be met.

Adding storage capacity remains the simplest and cheapest way to balance the needs of people and nature.

But in California, that has no bearing on the chances of whether it will happen.

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