

California Drought (and Flood) Update



For May 4, 2017

by Patrick Ruckert

Published weekly since July, 2014

<http://www.californiadroughtupdate.org>

<https://www.facebook.com/CaliforniaDroughtUpdate>

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And God blessed them, and God said unto them, Be fruitful, and multiply, and replenish the earth, and subdue it: and have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moveth upon the earth.

Book of Genesis: Chapter 1:28

A Note To Readers

“Be fruitful, and multiply,”-- is not just an injunction from God to man, but it is the fundamental law of the universe. That which does not grow and develop, dies. Mankind, whom for the past 40 years or more, has been subjected to the anti-growth and depopulation paradigm, perhaps now, shall once again be on the natural pathway of growing, building, and creating a future for the generations to come. In just ten days leaders from more than 100 nations will gather in Beijing for the international Belt And Road Forum to discuss and push forward the greatest infrastructure building project in all of human history. President Trump must be there. The U.S. has an \$8 trillion infrastructure deficit, at the very least, and it needs Chinese expertise and investment to help rebuild the country's infrastructure at the highest technological level. With the President's developing and excellent relationship to Chinese President Xi, what was impossible under our former President (whose name I am trying to forget) can now be the agenda.

The British empire idea, the very concept of Empire, of a world composed of Darwinian people and nations functioning like animals, fighting for advantage over the other, can be deposited into the historical garbage can once and for all. Mankind can then go forward to its true destiny, in building a just and prosperous world, moving mankind into space, and creating a cultural Renaissance among all peoples.

This presentation by Benjamin Deniston addresses the fundamental role of infrastructure, or as Mr. LaRouche has termed it “platforms of productivity,” required for not only today's needs, but those of tomorrow. The presentation was given at the conference, “U.S.-China Cooperation on the Belt and Road Initiative and Corresponding Ideas in Chinese and Western Philosophy,” held in New York City on April 13-14, 2017. Deniston's talk was titled, “Economic Platforms:” https://www.youtube.com/watch?v=4JS20hk_En8

This week's report

It was 88 degrees here in Oakland yesterday, breaking the record high of 81 degrees set in 2001. With this mini-heat wave, all that snow in the mountains is melting fast. So, we may have some flooding, and some of the levees, weirs and dikes along a few rivers are threatened.

Otherwise, the California climate and weather is just like it always has been: Volatile.

So, we start this week's report with, to use one of the President's favorite words, the HUGE snowpack and related topics.

Then following the update on Oroville Dam are a couple of related dam items.

The concluding item is from Senator Barbara Boxer and her support for building the Huntington Beach desalination plant.

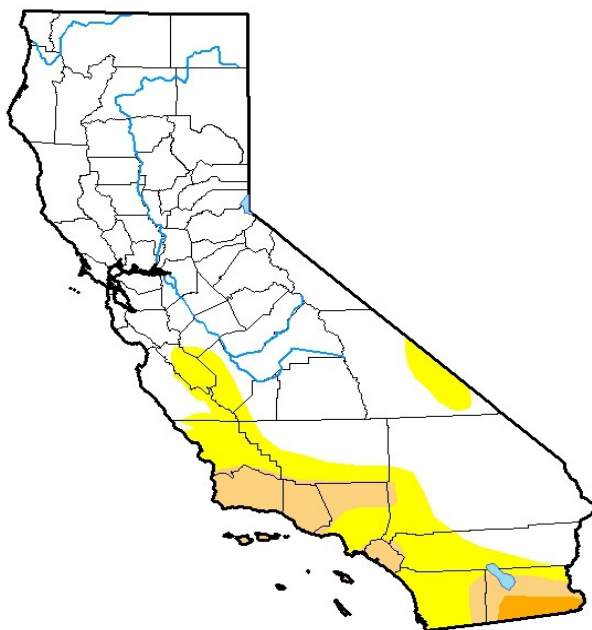
U.S. Drought Monitor

U.S. Drought Monitor California

May 2, 2017

(Released Thursday, May. 4, 2017)

Valid 8 a.m. EDT



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	76.47	23.53	8.24	1.06	0.00	0.00
Last Week 04-25-2017	76.54	23.46	8.24	1.06	0.00	0.00
3 Months Ago 01-31-2017	38.98	61.02	50.80	20.30	1.87	0.00
Start of Calendar Year 01-03-2017	18.07	81.93	67.61	54.02	38.17	18.31
Start of Water Year 09-27-2016	0.00	100.00	83.59	62.27	42.80	21.04
One Year Ago 05-03-2016	4.27	95.73	89.68	74.37	49.15	21.04

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:

Brian Fuchs
National Drought Mitigation Center



<http://droughtmonitor.unl.edu/>

The Snowpack, Potential Flooding and Subsidence

The interrelated dynamic of the water cycle, seasons, the snowpack, weather, a breaking-down water management system, and what you had for dinner (just kidding on the last one), is presenting the state with a complex of problems and developments that is more than challenging.

Warm temperatures are melting the snow, and the non-repair and maintenance of the levees and dikes on the rivers are threatening some flooding. In addition, the dramatic land subsidence of especially some areas of the Central Valley exacerbate this even more.

Here are some recent articles discussing all this. All are excerpted.

Biggest May 1 Sierra Nevada snowpack since 1998 raises flood risk

<http://www.eastbaytimes.com/2017/05/01/may-1-sierra-nevada-snowpack-is-biggest-since-1998/>

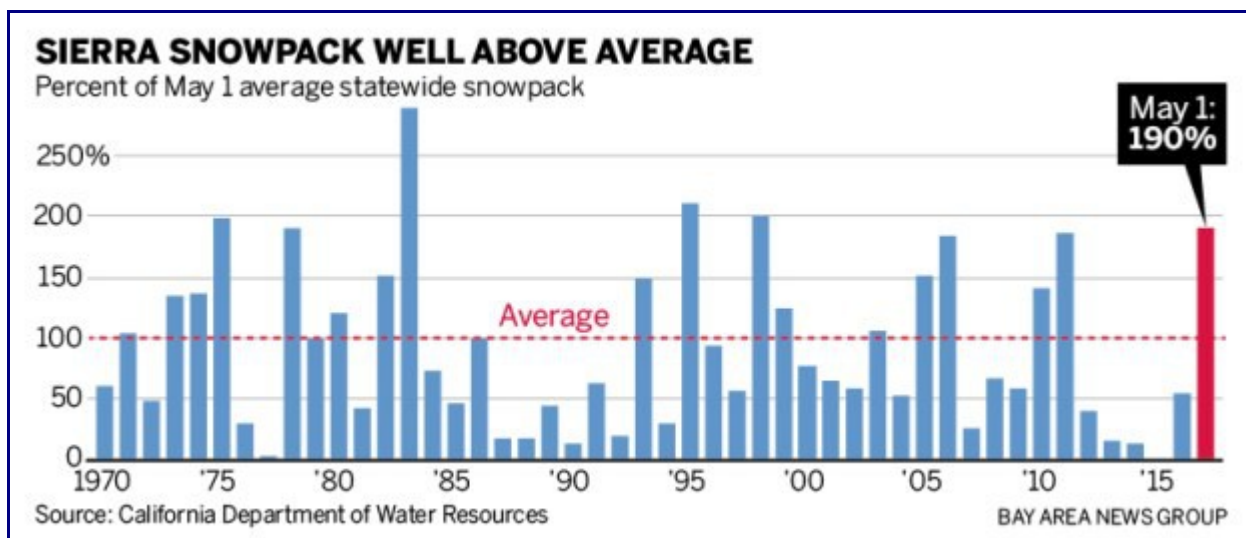
State officials on Monday reported a near-record May snowpack, but the bountiful winter that demolished California's five-year drought is now increasing the risk of late spring flooding, as temperatures climb across the Sierra Nevada.

The final monthly snowpack reading of this winter — 190 percent of the historic average — gives California its largest May 1 statewide Sierra Nevada snow level since 1998, when a major El Niño winter that year left the mountains with 201 percent of normal.

The Sierra Nevada snow is a key part of California's water supply, providing roughly one-third of the state's water. As the snow melts through every summer, it fills rivers and reservoirs, providing water for farms, cities and fish.

This year, it also poses a later-than-normal risk of flooding in some areas. Due to hot weather this week, starting Wednesday morning and peaking early Friday morning, the Merced River in Yosemite Valley — where temperatures are forecast to hit 84 degrees Wednesday — could overflow its banks.

On Monday, analysts at the state Department of Water Resources concluded that the "snow water equivalent" of the snow now burying the Sierra is 27.8 inches. In other words, more than two feet of water, spread out across the 400 miles of alpine country from Lassen County in the north to Tehachapi Pass in Kern County, is waiting to melt — nearly twice as much as the historic May 1 average of 14.6 inches.



Nearly all of California's largest reservoirs are at above normal levels. The largest, Shasta Lake near Redding, is 94 percent full, or 109 percent of average for May 1. And Lake Oroville in Butte County, where contractors are rushing to repair a spillway that partially collapsed during heavy rains earlier this year, is 74 percent full, or 91 percent of average for this date.

Similarly, rainfall totals have been impressive.

San Jose has received 18.4 inches of rain since Oct. 1, or 123 percent of its historic average over that time. San Francisco has received 32.24 inches, or 143 percent. And Oakland is at 145 percent of normal, with 28.45 inches. Cities in the Central Valley and Southern California have had a similarly wet year. Los Angeles has received 18.67 inches, or 131 percent of average; San Diego 11.71 inches or 118 percent; and Fresno 17.08 inches, or 160 percent.

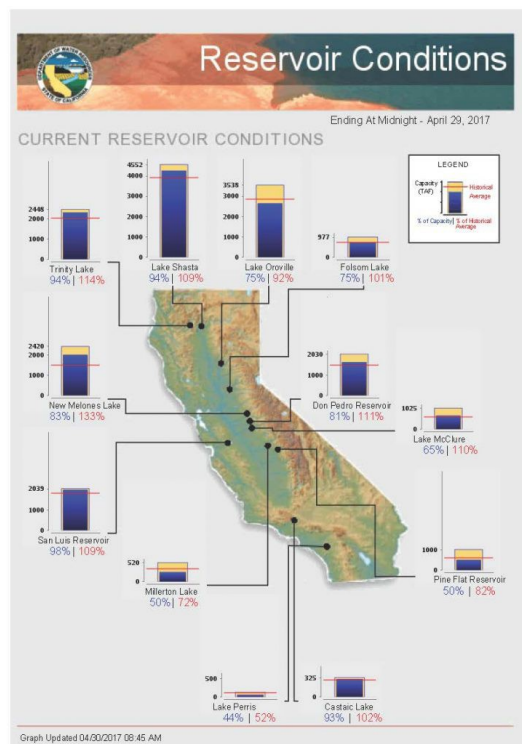
Final Survey of 2017 Finds Water-Rich Snowpack: Statewide 196% of May 1st average

May 1, 2017

From the Department of Water Resources:

Today's manual snow survey by the Department of Water Resources (DWR) at Phillips Station in the Sierra Nevada found a Snow Water Equivalent (SWE) of 27.8 inches, 190 percent of the May 1 long-term average there (14.6 inches).

Electronic measurements indicate the water content of the statewide snowpack today is 42.5 inches, 196 percent of the May 1 average. The SWE of the northern Sierra snowpack is 39.9 inches (199 percent of average); the central and southern Sierra readings are 47.1 inches (202 percent of average) and 37.6 inches (180 percent of average), respectively.



Rains end, but flooding dangers loom if massive Sierra snowpack melts too quickly

*By Joseph Serna
Los Angeles Times*

<http://www.latimes.com/local/lanow/la-me-ln-central-valley-flood-control-20170504-story.html>

The rain has largely stopped after one of the wettest winters in California.

But as spring temperatures begin to climb and snow in the Sierra Nevada melts, the threat of flooding has communities across the Central Valley on edge.

The storms that set a rainfall record in Northern California have left a vast layer of mountain snowpack, which now sits at almost 200% of average for the first week of May. In some areas, the snow is 80 feet deep, according to state and NASA reports.

Downstream, the rapid snowmelt is keeping public agencies juggling water levels across the state's network of reservoirs. Water district managers conduct daily conference calls to coordinate how much water each expects to release into California's labyrinth of rivers, creeks, bypasses and canals.

The coordination is crucial, as the reservoir releases affect water levels far downstream days later. Also, one reservoir's release may meet with another, so managers must painstakingly chart how much water rivers and levees can support before overflowing.

The concerns are magnified in some areas by subsidence, a festering problem exacerbated by five years of drought in the Central Valley.

Though the land's gradual sinking has been documented for decades in California, studies show that in Tranquillity and other Central Valley locations, the ground has begun to dip even faster in recent years. During [the drought](#), mandates to protect fish and other wildlife in the Sacramento-San Joaquin Delta limited irrigation deliveries to farmers in places like Tranquillity, west of Fresno, and Corcoran to the south. Those farmers increasingly relied on groundwater pumping for their crops, which has caused the ground to sink by several feet in some areas.

This subsidence has lowered levee walls in some places and created dips in canal channels that can alter the flow of water.

"The levees, they're just taking a beating," said David Rizzardo, water supply forecasting chief for the state Department of Water Resources. "It's like a boxing match, and the guy just doesn't give up and he's taking a left and a right to the face."

Officials are monitoring California rivers at all times for signs of flooding from snowmelt. Pictured is the forecast for the week beginning April 30 from the California Nevada River Forecast Center. (National Weather Service)

A heat wave could cause chaos

In Mendota, where the Kings and San Joaquin rivers converge and flow north to the delta, subsidence has reduced the capacity of at least one adjacent flood-control channel, officials said.

The question remains how the system will hold up if a scorching heat wave or a warm rain rapidly melts the snow and the reservoirs aren't ready for the surge.

"Just think of a bathtub fairly full, and now you have several bathtubs waiting to fill it and a very small drain on the other end," Rizzardo said. "It's like a maze that you haven't figured out how you're going to get out of yet."

Taking matters into his own hands

Many of the state's dams and weirs are at least 60 years old, and in the Central Valley, many were built more than a century ago, the report stated. It noted that flood-management responsibilities in California are spread among more than 1,300 local agencies managing an infrastructure of more than 20,000 miles of levees and channels and more than 1,500 dams and reservoirs.

In February, Fuller decided he no longer could wait for the politicians. He called a local contractor who has lived in the community for decades to supply the labor, hammered out a contract in a week with the Corcoran prison to excavate one of its wheat fields and launched a \$14-million effort to raise 14 miles of levee wall by 4 feet.

Fuller said his agency will be able to pay off the contract by 2020. In the meantime, crews have piled on more than 700,000 cubic yards of dirt, enough to cover 120 football fields, on top of and alongside the area's levees.

They are now 4 feet taller and 10 feet wider than they were before the drought, he said.

Oroville Dam Update

This section of the weekly report is becoming my favorite. Mostly because week by week, the incompetence and irresponsibility of the water managers is so continuously on display, but also because the project is demonstrating that when it is decided to get something done it can be done, and in record time. All the insane permitting bureaucracy is dumped, along with the years of environmental studies.

In that regard recall the building of the desalination plant at Carlsbad. After twelve years of blockage by permitting and the law suits by environmentalists, construction began in late 2014 and was completed in one year. It now produces 50 million gallons per day of fresh water. Now, apply how the Oroville Dam spillway is being repaired to building a couple dozen Carlsbad-type plants on the coast and in San Francisco Bay. The ones in the Bay can pump directly into the two major aqueducts of the state.

What we see at Oroville right now is a seven days per week, 24 hours per day schedule to fix the damage enough so at least the spillway is operable by November 1, the beginning of the rainy season. Full repair is expected to take two years.

As for the cost, already \$274 million has been spent and the contract for this first phase of the repair is another \$275 million. The cost for the second phase next year is not even calculated yet. Then, as one of the articles below makes the point, millions of more will be required to repair the collateral damage all along the Feather River. Most likely the total cost will be about \$1 billion.

Just a reminder: The Oroville Dam is the lynchpin of the California State Water Project. It is, at over 700 feet high, the tallest dam in the United States.

Here are some excerpted articles and editorials:

Questions, answers and a bit of scorn for DWR at Oroville meeting

By Heather Hacking

Chico Enterprise-Record

05/02/17

<http://www.chicoer.com/general-news/20170502/questions-answers-and-a-bit-of-scorn-for-dwr-at-oroville-meeting>

- *Who will pay for repairs? How much will it cost?*

So far, \$274 million has been spent, and a contract has been made for another [\\$275 million](#) in repairs.

When the dam was built, bonds were issued, explained Gutierrez explained, to be repaid by water users, who are state water contractors. Normally, contractors would pay for the repairs the spillway. However, because the spillway incident was a disaster, there's a possibility the Federal Emergency Management Agency could pay for a "piece or a large part" of the spillway recovery, Gutierrez said.



The Oroville Dam spillway is at the center of the photo. Notice that the spillway is to the left of the dam, and at the far left is the emergency spillway, the use of which nearly caused a catastrophe three months ago.

Editorial: State's Oroville recovery focus should be more than just spillway

May 4, 2017

Chico Enterprise-Record

<http://www.chicoer.com/opinion/20170503/editorial-states-oroville-recovery-focus-should-be-more-than-just-spillway>

A DWR official said \$274 million has been spent on the spillway response so far, and a contract for an additional \$275 million to rebuild part of the spillway has been awarded. But hearing the laundry list of problems makes it clear that more than half-billion dollars is a mere ripple on the lake.

The spillway can't be the state's only focus. So far, the official response has been, "We'll worry about that later. We're dealing with an emergency here." Nearly three months in, that explanation is no longer valid. The state needs to start paying attention to the collateral damage — all of it felt right here, locally.

Editorial: DWR should quit trying to downplay dam disaster

April 30, 2017

<http://www.chicoer.com/opinion/20170430/editorial-dwr-should-quit-trying-to-downplay-dam-disaster>

"The emergency spillway worked." That, the latest tone-deaf utterance from the leader of the state Department of Water Resources, is the type of comment we've come to dreadfully expect from the Department of Denial.

To hear that remark at a legislative hearing in Sacramento only compounded the shock.

The Senate Natural Resources and Water Committee was the first to get to ask questions about the Oroville spillway fiasco, nearly three months after the structure started falling apart and the hill got forever scarred.

While the committee's background paper asked a lot of great questions, mostly about who's paying for all that work in Oroville, it was largely told that most of the answers would come later. There were no shocking disclosures, nothing we hadn't heard before. No surprise there. The DWR has been tight-lipped with information, but loose-lipped with the way it has downplayed the disaster.

Bill Croyle, the DWR's acting director who answered questions from legislators Tuesday, is the same one who shockingly compared the half-billion-dollar dam catastrophe to a car owner who forgets to check his oil.

"This happened. Stuff happens," he said. "So, you get a flat tire on your car, you run your car out of oil. I mean, these things happen."

He summed up the spillway disaster to the legislative committee like this: "The dam is safe. The spillway is impaired. The emergency spillway worked."

Gov. Jerry Brown keeps Oroville Dam repair costs hidden, state lawmakers say

By Jennifer G. Hickey

Published April 28, 2017

Fox News

<http://www.foxnews.com/politics/2017/04/28/gov-jerry-brown-keeps-oroville-dam-repair-costs-hidden-state-lawmakers-say.html>

California Gov. Jerry Brown has unsealed previously secret memos related to repair plans and safety issues at the damaged Oroville Dam, but his administration's alleged refusal to be transparent about the contract bidding process and overall project costs has some state legislators frustrated.

In testimony before the state Senate Natural Resources and Water Committee hearing on Tuesday, the acting director of California's Department of Water Resources (DWR), Bill Croyle, admitted he knew none of the details of the \$275 million contract awarded to repair the Oroville Dam, which was

damaged in February.

While the Brown administration did allow some light to be shined on repair plans, state officials continue to cite national security concerns as justification for keeping the veil on the Kiewit contract.

David Gutierrez, an adviser to the DWR, told reporters in a Monday conference call that Kiewit would be responsible for rebuilding and stabilizing the dam's main and auxiliary spillways before November's rainy season but would not address the full scope of their work.

Experts say the clock is ticking at the Oroville dam

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"I give them credit for opening up the reports and that is good moving forward. But we have to make sure the repairs are done on time and on budget. The acting director could not tell us who was responsible for negotiating the contract. He should know," said State Sen. Jim Nielsen, who sits on the budget subcommittee that oversees the water project, and whose district includes Oroville.

The state awarded the \$274 million contract to the Nebraska-based Kiewit Infrastructure West, which had proposed the lowest-cost bid among three companies. However, Kiewit's offer was \$44 million more than a \$231.7 million estimated by DWR engineers and almost \$100 million more than initial estimates by the state.

A Second Oroville Dam? Probably Not, We Hope

Another giant California dam has downstream residents worried

By Jane Braxton Little

Bee Correspondent

<http://www.sacbee.com/news/state/california/water-and-drought/article147609839.html#storylink=cpy>

Deep in the Trinity Alps, 130 miles northwest of the troubled Oroville Dam, local officials are raising alarms about another earthen dam with documented weaknesses and limited capacity for releasing the water that has poured in from storms and melting snow.

Trinity Lake, the state's third-largest reservoir, was filled to 97 percent of its storage capacity Tuesday, and a snowpack estimated at 150 percent of normal still looms over the watershed.

If the reservoir were to overtop the dam, the results would be catastrophic, said Keith Groves, a Trinity County supervisor representing the district that includes Trinity Dam.

"It would take out bridges ... and a big section of (Trinity County) would be wiped off the face of the planet," Groves said. He said 3,500 people live in the immediate pathway of potential flooding.

Bureau officials are aware of the accumulation of snow above the reservoir and the mounting water levels, but they are not concerned about water overtopping the structure, said Russell Grimes, acting public affairs officer for the Bureau's mid-pacific region in Sacramento.

"Even at 96 percent (of capacity) there's quite a lot of space for inflow," he said.

Completed in 1962 as part of the Central Valley Project, Trinity Dam was the largest earthen dam in the world until it was eclipsed by Oroville. It sits on the Trinity River, 45 miles northwest of Redding, and just above Lewiston Lake, which was formed by a second dam 8 miles downstream. A 3-mile tunnel diverts water from the Trinity River Basin to the Sacramento River Basin, providing water for hydroelectric production at four power plants and irrigation to the agricultural industry in the San Joaquin Valley.



Trinity Dam [Bureau of Reclamation photo. http://www.usbr.gov/lc/region/g5000/photolab](http://www.usbr.gov/lc/region/g5000/photolab)

Concerns about the dam's safety date to 1974, when an unseasonably warm storm, known as a "pineapple express," dropped heavy rain and snow in the Trinity Alps. The water level in the lake rose so high it nearly overwhelmed the dam, said Groves.

At that time, the Reclamation Bureau, which operates the dam, reduced the reservoir level it considers safe to 1.85 million acre feet, around 75 percent of the lake's total capacity. This week, the reservoir was holding more than 2.3 million acre feet of water.

Trinity Dam has three ways to release water: an uncontrolled concrete-lined tunnel that starts flowing when the lake gets high enough, a type of spillway often called a glory hole; a concrete-lined outlet at the bottom of the dam, and an outlet associated with the dam's hydroelectric power plant. Together they can release about 35,000 cubic feet of water per second (cfs). By comparison, the damaged spillway on Oroville Dam was releasing 100,000 cfs in February as the state worked furiously to lower a dangerously high lake level.

Although Reclamation officials never expect any dam to face a maximum flood event, the bureau's 2000 report says the Trinity Dam could not withstand one should it occur. "The resulting breach would discharge in excess of 1,000,000 cfs," the report states.

Another Dam Project You Probably Did Not Know About

Some readers may recall my report from about two months ago on the American Society of Civil Engineers (ASCE) quadrennial “Infrastructure Report Card” for 2017. The ASCE sees a total gap in needed infrastructure spending over the next decade of \$2.06 trillion. That more or less included about \$50 billion per year for California's infrastructure. The report card included the statement that 17% of U.S. dams are rated “high hazard potential.” Well, one of those dams is located near San Jose.

The article excerpted below explains. For the more technically minded, the entire article is of interest.

Engineers rebuild behemoth in face of earthquake risks

By Jeremy P. Jacobs

E&E News reporter

Greenwire: Monday, April 24, 2017

<https://www.eenews.net/stories/1060053463>

ALAMEDA COUNTY, Calif. — If you think the era of big dam building is over in America, check out the Calaveras project.

Since 2001, construction crews have been excavating a gap in a ridge as tall as a city skyline near San Jose. They've sliced off part of a hillside and laid a concrete spillway longer than four football fields with 50,000 cubic yards of cement — enough to pave a sidewalk between Washington, D.C., and New York.



Construction crews will begin raising the 220-foot Calaveras replacement dam here this year. Its new spillway, to the left, was completed last year. Photo was taken from the original dam, 1,200 feet upstream. Photo by Jeremy P. Jacobs.

A custom conveyor belt this spring will carry 3.5 million cubic yards of earth — the same amount used in Egypt's Great Pyramid of Giza — to build a 220-foot dam.

Calaveras is the country's largest new dam project. And it's only 1,200 feet downstream from another dam.

The San Francisco Public Utilities Commission is replacing the Calaveras Dam, an earthen berm impounding a reservoir that provides water to 2.6 million people in the Bay Area.

Just A Note On Desalination

It has been awhile since we have covered this topic, mostly because not much is moving. The Huntington Beach plant, which will be a sister of the Carlsbad plant is moving, slowly, forward. Senator Barbara Boxer is on board with the cheerleaders for it, though with the usual genuflecting to environmentalists.

Huntington Beach desal project is a 'no-brainer'

By Barbara Boxer

Special to The Bee

April 27, 2017

<http://www.sacbee.com/opinion/article147035394.html#storylink=cpy>

I wrote many bills that created grants and loans for desalination plants in order to encourage this technology. I wrote a letter in 2015 supporting the proposed Huntington Beach Desalination plant after visiting Poseidon Water's 50 million gallon per day Carlsbad facility, which is so impressively built and operated.

I have chosen to join the broad-based effort to advocate on behalf of the Huntington Beach project because as I said when I left the Senate, I would be continuing my work on issues like climate change prevention adaptation, and environmental preservation.