

California Drought (and Flood) Update



For February 16, 2017
by Patrick Ruckert

Published weekly since July, 2014

<http://www.californiadroughtupdate.org>

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

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Yet our distress comes from no failure of substance. We are stricken by no plague of locusts. Compared with the perils which our forefathers conquered because they believed and were not afraid, we have still much to be thankful for. Nature still offers her bounty and human efforts have multiplied it. Plenty is at our doorstep, but a generous use of it languishes in the very sight of the supply. Primarily this is because rulers of the exchange of mankind's goods have failed through their own stubbornness and their own incompetence, have admitted their failure, and have abdicated. Practices of the unscrupulous money changers stand indicted in the court of public opinion, rejected by the hearts and minds of men.

True they have tried, but their efforts have been cast in the pattern of an outworn tradition. Faced by failure of credit they have proposed only the lending of more money. Stripped of the lure of profit by which to induce our people to follow their false leadership, they have resorted to exhortations, pleading tearfully for restored confidence. They know only the rules of a generation of self-seekers. They have no vision, and when there is no vision the people perish.

President Franklin D. Roosevelt

Inaugural Address

March 4, 1933

A Note To Readers

You may notice that I renamed the report, at least for this week, as “California Drought (and Flood) Update.” About one month ago, you may recall, I wrote that perhaps this winter's storms of record or near record rain and snow signals something more fundamental is happening with the climate of the region. It is more and more appearing that we are returning to the characteristic climate of the past

2,000 years of alternating mega-droughts and mega-floods. It is only the past 150 years that the state has had relatively mild weather of moderate precipitation and droughts lasting no more than five years. For the remainder of these past two thousand years, droughts lasted decades and floods turned the Central Valley into a 400 mile-long lake.

So after 5-6 years of drought, the worst since record keeping began, we now have record rain and snowfall. Here is once again the link to a book review on the topic: “Are We Controlled by the Whims of Nature, or Will We Create Our Future?” http://larouchepub.com/eiw/public/2014/eirv41n19-20140509/48-52_4119.pdf

Our report this week highlights the Oroville Dam emergency, but also includes the more general discussion that has erupted on the question of infrastructure more generally, including what the attention to immediate necessary repair of dams and other infrastructure means for the Trump administration.

Highlighting my theme of mega-droughts is this report of February 16 from *AccuWeather*:

“Biggest storm of winter' to unleash flooding rain in California at week's end

By AlexBy Sosnowski, AccuWeather senior meteorologist

February 16, 2017

<http://www.accuweather.com/en/weather-news/biggest-storm-of-winter-to-unleash-flooding-rain-in-california-at-weeks-end/70000864>

A new train of storms has arrived along the Pacific coast, and a potent one is set to hit California hard with heavy rain, mountain snow and strong winds during the latter part of this week.

FLASH: 1:00PM The storms, four of them, about to hit, will be much bigger, warmer and intense than reported earlier today. Up to 10 inches of rain is expected in the Oroville area just from the storm that will arrive on Sunday. <http://www.latimes.com/local/lanow/la-me-ln-oroville-weather-forecast-20170216-story.html>

And this from the *Los Angeles Times* today hits our second theme of infrastructure:

It's not just Oroville: Record rain is straining California's whole flood control network

By Rong-Gong Lin II, Paige St. John, Matt Stevens and Corina Knoll

Los Angeles Times

February 16, 2017

<http://www.latimes.com/local/california/la-me-oroville-floods-norcal-20170216-story.html>

The frantic effort over the last few days to lower water levels at [Oroville Dam](#) after the structure's two spillways became damaged is part of a larger drama playing out as California rapidly shifts from extreme drought to intense deluges.

Large swaths of the region are on track to experience their wettest winter on record, with many areas having already surpassed their average precipitation for an entire year.

And all that water is putting new strains on the network of dams, rivers, levees and other waterways that are essential to preventing massive flooding during wet years like this one.

With that as our introduction, we begin with the *U.S. Drought Monitor*:

U.S. Drought Monitor

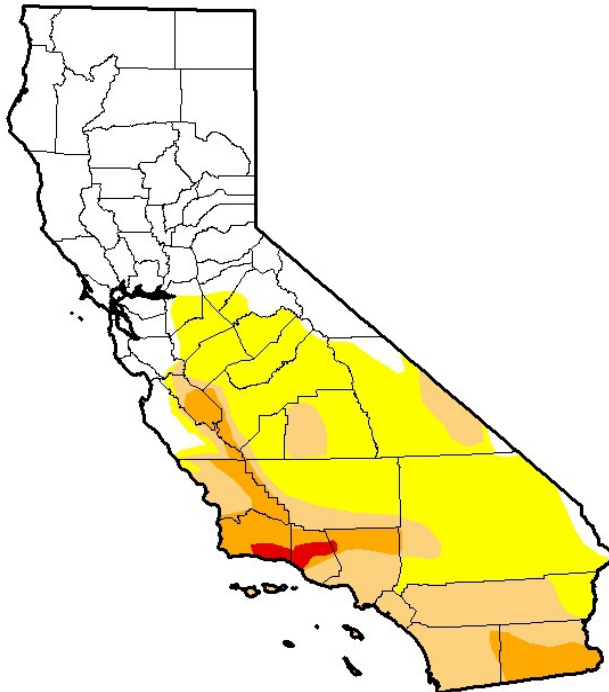
Again, like last week, this past week has seen a dramatic shrinkage of the portion of the state in drought. In one week it has gone from 47 percent of the state in drought to just 24 percent. When it rains, it pours, and pour it has done for the last weeks. Of note is that only 7 percent of the state is now in even “severe drought, and virtually none in the highest two categories of drought.

U.S. Drought Monitor California

February 14, 2017

(Released Thursday, Feb. 16, 2017)

Valid 7 a.m. EST



Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	43.94	56.06	24.19	7.41	0.73	0.00
Last Week 2/7/2017	41.46	58.54	46.99	10.93	0.73	0.00
3 Months Ago 11/15/2016	12.03	87.97	73.04	60.27	42.80	21.04
Start of Calendar Year 1/3/2017	18.07	81.93	67.61	54.02	38.17	18.31
Start of Water Year 9/27/2016	0.00	100.00	83.59	62.27	42.80	21.04
One Year Ago 2/16/2016	0.29	99.71	94.69	81.82	61.40	38.48

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:

Jessica Blunden
NCEI/NOAA



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

The drought is not over, and the governor still holds on to his “state of drought emergency” edict, while issuing “flood emergency” declarations. Don't you just love Gerry? We should remember that the damage done by this drought is deep and will be with us for years to come:

Despite Dam Danger, California's Still In a Drought

Look beneath the surface for an unresolved water crisis

By Erin Blakemore

smithsonian.com

February 14, 2017

http://thumbs.media.smithsonianmag.com/filer/2a/7d/2a7d5bfd-6b4e-408d-ad30-60e67b142483/c4fymgmueaafwpdjpg_large.jpeg_800x600_q85_crop.jpg

Drought Monitor, which tracks drought conditions throughout the country, a large portion of central and southern California is still in the midst of a drought. Though much of the state's dry segment is at a “moderate” drought level, pockets of “severe” and “extreme” drought remain despite extensive snowfall that has put statewide snowpack at 176 percent of normal. The water below the surface, known as groundwater, also remains in crisis. According to [Thomas Harter](#), a groundwater expert and Robert M. Hagan Endowed Chair for Water Resources Management and Policy at the University of

California, Davis, this deep water offers a kind of liquid insurance for the state.

The Oroville Dam Emergency

This is what the broken spillway looks like now:



Here you can see the flowing water over the emergency spillway eating away at the supporting soil.



And here is a two minute video that presents an overview of Dam, the spillway, the emergency spillway and the action being taken to prevent a catastrophe.

<http://fox40.com/2017/02/12/water-no-longer-flowing-over-oroville-dam-auxiliary-spillway/>

As I am sure most know, the Department of Water Resources on Sunday afternoon, February 12, issued an emergency evacuation order forcing nearly 200,000 people from the area below the dam. It was blunt, and the Sheriff's office broadcast repeatedly, "This is not a drill, you must leave now." The fear

was that the emergency spillway could collapse within the hour.

February 12, 2017

From the Department of Water Resources:

Based on information received from the California Department of Water Resources (DWR) and the incident command team managing Lake Oroville, counties and cities near Lake Oroville and the surrounding area issued evacuation orders for residents. The concern is that erosion at the head of the auxiliary spillway threatens to undermine the concrete [weir](#) and allow large, uncontrolled releases of water from Lake Oroville. Those potential flows could exceed the capacity of downstream channels.

The report I wrote on February 14 summarizes both the emergency and presents the necessary background:

Oroville Dam update

By Patrick Ruckert

February 14, 2017; updated February 15

While engineers and their equipment frantically work to shore up the emergency spillway at Oroville Dam, before the arrival of another series of storms about to hit the region, delivering perhaps another six to eight inches of warm rain (melting some of the near record level of snow in the Sierras), a little background is perhaps useful for those not so familiar with it all.

But first, here is the latest: As of Tuesday afternoon the evacuation order, that sent 200,000 residents fleeing, has been lifted and residents may return to their homes. The announcement was accompanied by the warning that a call for another evacuation could be given at any time. Crews working around the clock have made progress repairing the emergency spillway by filling the holes with rock, stabilizing the soil. By increasing the flow of water from the main spillway to over 100,000 cubic feet per second, the lake level has fallen to 884 feet on Tuesday morning. The emergency spillway is at 901feet, thus the lake is now 17 feet below the spillway. Operators are attempting to lower the lake to 50 feet below the top before the next storm hits on Wednesday and Thursday. That may not be enough to prevent the reservoir from again overflowing, as, for example during the last storm water was flowing into the lake at 190,000 cubic feet per second.



Aerial photo taken Sunday morning, February 12, shows water running over the emergency spillway,

at right, and down the hill into the diversion pool. The main spillway flows at center and the dam is at left. Officials fear the emergency spillway could fail and have ordered evacuations.

Oroville Dam is not only the tallest dam in the United States at 770 feet, but it is the lynch-pin reservoir of the California State Water Project, which, with the Central Valley Project initiated by FDR, created the most extensive and complex water management system in the world. Oroville, about 60 miles northeast of Sacramento, sits on the Feather River, which flows into the Sacramento River, and is the heart of the system that provides the water for 23 million people and millions of acres of farmland, including southern California 400 miles to the south.

Thus, not only is there a danger of a catastrophic flood that has already forced the evacuation of 200,000 people in the flood path, but the water supply for most of the state is at risk.

This water management system was completed in 1972-- yes, 45 years ago-- and Oroville Dam was completed in 1968. The population of the state in those 45 years has increased from about 20 million to the 39 million who live here now. What worked for 20 million cannot and does not work for 39 million. Those same 45 years has seen our economy turned into a gambling casino by the parasites of Wall Street and London, turning the nation into a broken-down pale reflection of its once leading role in the world in science, industry and infrastructure.

The current six years of drought, the worst in the state's history, has now given way to a deluge of rain and snow, and where we had dust we now have floods. Empty reservoirs are now overflowing, and that is from where the problem at Oroville began.

Twelve years ago, as first reported by the San Jose Mercury News two days ago, state and federal authorities were warned at recertification hearings for Oroville Dam, that the earthen flow path of the emergency spillway was a disaster waiting to happen. They were warned that any water flow from the dam would quickly wash away the dirt holding the berm of concrete in place over which the overflow from the dam would flow. All across the board, agencies and government authorities assured all listening that there could never be such a problem. Two other such warnings a couple years earlier were also similarly ignored. Why? It was the early years of this century and the speculative financial bubble was in full-swing; flipping houses and Mortgage Backed Securities paid well, so why "waste" money on things like shoring up our infrastructure?

Despite the fact that other dams and structures that were to be part of the State Water Project were never built, thus putting more stress on the parts that were built, Oroville Dam was doing its job of flood control and water storage. But, this winter's deluge was too much for the 49 year-old structure. The powerful flow of water down the spillway began eating away the concrete, creating a 200 foot hole 45 feet deep. Stopping the flow down the spillway, with more than 100,000 cubic feet per second of water flowing into the reservoir from the storm run-off and melting snow, resulted in the reservoir level rising as much as 10 feet per day. Saturday the rising reservoir overflowed into the emergency spillway, while at the same time water was once again allowed to flow down the main spillway, with the managers accepting the consequence that more damage would be done to it.

By Sunday afternoon, as forecast a dozen years ago, the water flow onto the earthen emergency spillway began eating away at its base, threatening to topple it, releasing a 30 foot wall of water that would devastate the communities below the dam. It was at that moment the emergency evacuation order was given.

Oroville Dam is just one of thousands of dams in the nation that 40 years of neglect have made

dangerous to millions of people. Oroville Dam must be the wake-up call to the nation that a serious infrastructure building and repair policy must be initiated now, and the only way that can be done is by putting in place the Four New Laws as put forward by Lyndon LaRouche, beginning with the reinstatement of the Glass-Steagall banking law. President Trump's often stated goal of building infrastructure cannot become a reality without LaRouche's plan.

Finally, there have been a few voices raised in this crisis attempting to promote the unscientific fraud that both the drought and now the flood experienced in California is due to "climate change." Grasping at straws is not an unusual behavior for those who have nothing else to grab, and such nonsense should be ignored. But, since they raise the topic, let's briefly discuss California's climate. As paleoclimatological studies have demonstrated, the past 2,000 years of California's climate has been characterized by alternating mega-droughts and mega-floods. Some of the droughts lasted a century, and the last mega-flood was in 1862, which put Sacramento under ten feet of water for months. For the past more than 150 years we have had neither mega-floods or mega-droughts, but perhaps with this drought and this year's deluge we are returning to the "normal" climate for this region.

The Broader Political Reality

It Was Not ICE or DEA Agents Who Took 200,000 Californians from Their Homes!

Feb. 13 (EIRNS)—Just when they had been worked to a fever pitch about deportation raids, sanctuary cities invaded, executive orders, a new war on drugs, and other "Trump threats," nearly 200,000 Californians were suddenly ordered from their homes Sunday night.

To their shock, it was not "Trump" ICE or Customs or DEA agents who evicted them; it was the threatening failure of a 50-year-old work of major economic infrastructure. It has clearly been in need of investment for repairs.

Gov. Jerry Brown, who in December had virtually called for independence for California over President Trump's climate policies, was forced to ask for a Federal emergency disaster declaration.

It should give those Californians, and other Americans watching this dramatic event, a "wake-up call."

Emergency radio/TV announcements starting at 5:45 p.m. Pacific time Sunday stated that a failure of the Oroville Dam emergency spillway, in the Northern California Sierra Nevada foothills, was "expected" within as little as 60 minutes. Oroville is the highest dam in the United States at 770 feet, 44 feet higher than the world-famous Hoover Dam. Very heavy rains had filled Lake Oroville completely, to a total maximum depth of 900 feet, then 902 feet. By later Sunday night 190,000 people were out of their homes, which remain threatened.

The dam is not damaged, but its main spillway—essentially a steep concrete canal—obviously has needed repairs. Once the operators started releasing 50,000 cubic feet/second down that spillway to get the lake back down below 900 feet, a huge hole opened up in the spillway and water burst out sideways and down into the Feather River. The operators then started releasing water down the dam's auxiliary spillway on its other end, a hillside with a reinforced wall on top. Once that too started eroding with only very small releases, the potential arose for explosive flooding, with the lake bursting through the hillside, and immediate mass evacuation was ordered.

With releases down the concrete spillway then doubled to 100,000 cubic feet/sec—making the large

hole even bigger—Lake Oroville had been stabilized at 898 feet by Monday. But the forecast of more heavy rain starting Wednesday means continuing danger for the towns around the lake. And operators will have to assess whether the main spillway will make it through the releases necessary during the mountain snowmelt season, without the huge sinkhole expanding and breaking it apart.

Whatever happens next, Oroville Dam is a warning.

Years of severe drought in the West have given way, temporarily and primarily in Northern California, to very heavy Pacific Ocean rains. Despite EIR and LaRouche PAC having developed the infrastructure needs in detail, for both tackling the long-lasting drought and handling episodic flooding, nothing has been done. Governor Brown's answer, backed by zero funding by Barack Obama's administration, was to cut water use, and then cut it further, in the nation's most productive farming and industrial state.

And Oroville Dam, a project spearheaded by Brown's father Gov. Edmund Brown, and finished under Gov. Ronald Reagan, needed repair investments and didn't get them. Twelve-year-old recommendations that the emergency spillway had to be armored with concrete were ignored by both the state and the Bush administration, because of a cost of tens of millions of dollars.

*How much good did using less water do for those residents, when Lake Oroville started coming over the top of the dam? LaRouche PAC and EIR campaigned since 2010 for a new water transport, management, and water production system for the entire drought-hit West, as well as nuclear desalination to supply city and agricultural water. The whole necessary investment is developed in Chapter 11 of EIR's special report, *The New Silk Road Becomes the World Land-Bridge*.*

Now the Trump administration is promising large-scale investments in infrastructure at last, and discussing investments from Japan, with such offers from China as well. It will take the national enactment of Lyndon LaRouche's "Four Laws," including immediately Glass-Steagall re-enactment and a national credit institution for such investments, to make Trump's promises happen.

More Background

What follows are excerpted articles that provide more background, both technical and political. Political because for more than 12 years the federal and state government, its agencies and the water contractors who pay their share for repairs and operations of the dam and other water infrastructure knew that the emergency spillway would not work.

Here's the nightmare scenario at Oroville Dam that officials are fighting to prevent

By Rong-Gong Lin III, Raoul Ranoa and Chris Megerian

February 13, 2017

Los Angeles Times

<http://www.latimes.com/local/lanow/la-me-ln-oroville-dam-how-20170213-story.html>

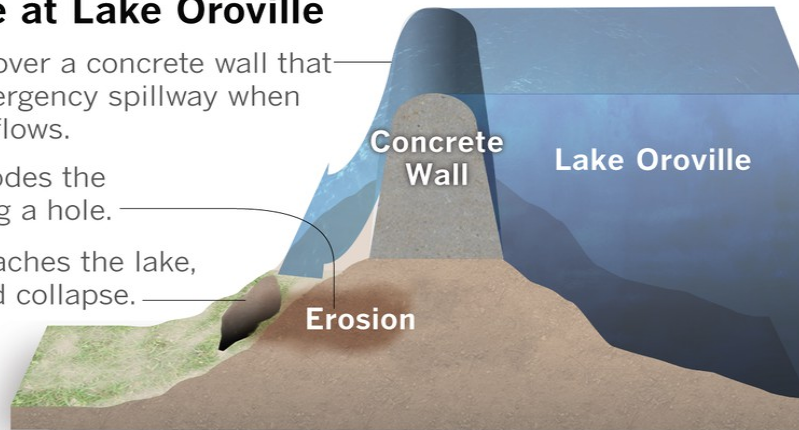
Any dam engineer would be terrified of this nightmare scenario — the possible collapse of a retaining wall in California's second largest reservoir.

The erosion that could lead to a collapse at Lake Oroville

Water pours over a concrete wall that forms an emergency spillway when the lake overflows.

The water erodes the earth, forming a hole.

If the hole reaches the lake, the wall could collapse.



Source: DWR
Graphics reporting by Rong-Gong Lin II, Chris Megerian

@latimesgraphics

The threatened concrete structure, called a weir, was designed as an emergency escape route of sorts for rapidly rising waters at swollen Lake Oroville. By allowing some water to spill over its shoulders, the concrete wall would relieve tremendous pressure building on [Oroville Dam](#) itself, which is located nearby.

This concrete wall is the key feature of Lake Oroville's emergency spillway, and it had never been used since the dam was completed in 1968. This last weekend was its first test, however, after erosion caused major damage to the facility's main spillway.

It wasn't long after water began flowing over the weir, however, that the emergency spillway revealed a major weakness: An area of earth downhill from the weir had begun to erode and was creeping uphill, closer to the concrete wall.

If enough earth washed away, the hole would undermine the wall and breach it, releasing a 30-foot-wall of water on the valley below.



An aerial view shows the emergency spillway in the left part of this photo—a low concrete wall over which excess water spills over. Officials were alarmed that earth near the base of the concrete wall at

Lake Oroville was rapidly eroding, which could cause the wall to collapse. (Rich Pedroncelli / Associated Press)

Oroville Dam Emergency-- They knew there was a problem

By Patrick Ruckert

February 13, 2017

As of this morning, about 200,000 people are continuing to be evacuated south of the Oroville Dam, which is still threatening to unleash a three story wall of water if the emergency spillway collapses.

Over the past few weeks, near record amounts of rain and snow have not only ended the drought in more than one-half of the states, filled the reservoirs, and caused some flooding, but now with the damaged spillway at the Oroville Dam, threatens a major catastrophe.

Oroville dam at 770 feet in height, is the highest dam in the United States, and its reservoir is the second largest in California. Located about 60 miles north of Sacramento on the Feather River, the dam and lake is a central piece of California's State Water Project, supplying water for the state's Central Valley agricultural heartland and Southern California.

Last Tuesday a hole in the dams main spillway was discovered, which as the flow of water continued, continued to grow. Photos taken after the spillway was closed showed serious damage, which now is estimated to be as large as a football field and about 50 feet deep.

As water continued to pour into the reservoir behind the dam the operators had no choice but to reopen the main spillway to prevent the reservoir from topping the dam, causing untold damage to the entire structure. But, the reservoir kept rising and by Saturday the emergency spillway designed for just such an emergency began sending water over the earthen front-side of the dam. The emergency spillway was rated to handle 250,000 cubic feet per second flow, but it began to show weakness Sunday after flows peaked at only 2,600 cubic feet per second.

That was when the evacuation order was issued.

An article in the San Jose Mercury News on February 12 by Paul Rogers, "Oroville Dam: Feds and state officials ignored warnings 12 years ago," claims that, "More than a decade ago, federal and state officials and some of California's largest water agencies rejected concerns that the massive earthen spillway at Oroville Dam — at risk of collapse Sunday night and prompting the evacuation of 130,000 people — could erode during heavy winter rains and cause a catastrophe."

<http://www.mercurynews.com/2017/02/12/oroville-dam-feds-and-state-officials-ignored-warnings-12-years-ago/>

As Rogers reports, "Three environmental groups — the Friends of the River, the Sierra Club and the South Yuba Citizens League — filed a motion with the federal government on Oct. 17, 2005, as part of Oroville Dam's relicensing process, urging federal officials to require that the dam's emergency spillway be armored with concrete, rather than remain as an earthen hillside."

"The Bush administration rejected that request, however, after the state Department of Water Resources, and the water agencies that would likely have had to pay the bill for the upgrades said they were unnecessary. Those agencies included the Metropolitan Water District of Southern California, which provides water to 19 million people in Los Angeles, San Diego and other areas, and the State Water Contractors, an association of 27 agencies that buy water from the state of California through the State Water Project.

"Federal officials at the time said that the emergency spillway was designed to handle 350,000 cubic

feet per second and the concerns were overblown.

“On Sunday, with flows of only 6,000 to 12,000 cubic feet per second — water only a foot or two deep and less than 5 percent of the rate that FERC said was safe — erosion at the emergency spillway became so severe that officials from the State Department of Water Resources ordered the evacuation of more than 130,000 people. The fear was that the erosion could undercut the 1,730-foot long concrete lip along the top of the emergency spillway, allowing billions of gallons of water to pour down the hillside toward Oroville and other towns downstream.”

“A filing on May 26, 2006, by Thomas Berliner, an attorney for the State Water Contractors, and Douglas Adamson, an attorney for the Metropolitan Water District of Southern California, discounted the risk. It urged FERC to reject the request to require that the emergency spillway be armored, a job that would have cost tens, if not hundreds of millions of dollars.

“The emergency spillway was designed to safely convey the Probable Maximum Flood and DWR has reviewed and confirmed the efficacy of the PMF hydrologic analysis for Oroville Reservoir,’ the attorneys noted.

“Ultimately, they were successful. FERC did not require the state to upgrade the emergency spillway.”

Engineers have known for decades that Oroville’s backup spillway was unreliable

By Stuart Leavenworth, Sean Cockerham and Ryan Sabalow

McClatchy Washington Bureau

February 13, 201

<http://www.newsobserver.com/news/nation-world/national/article132528514.html#storylink=cpy>

Engineers have known for decades that if water ever spilled onto Lake Oroville’s unpaved auxiliary spillway, it would cause serious erosion, possibly compromising the earthen structure that holds back the reservoir and threatening communities downstream.

But California water districts that helped pay for Oroville resisted calls to armor the backup spillway, which would have required construction outlays in the tens of millions of dollars. Environmentalists, meanwhile, opposed an earlier proposal to install gates atop the structure to raise the dam’s elevation and prevent water from topping it during a flood.

I include this article solely to illustrate the mind of a bureaucrat. The statement is highlighted.

California official denies Oroville Dam was problem waiting to happen as evacuations remain in effect

By Jeff Daniels

February 13, 2017

CNBC

<http://www.cnn.com/2017/02/13/california-official-denies-oroville-dam-was-a-problem-waiting-to-happen.html>

State and federal officials failed to heed safety warnings about Oroville more than a decade ago, according to the [Mercury News](#). The report Sunday said three environmental groups warned the Federal Energy Regulatory Commission about the vulnerability of the hillside emergency spillway.

But DWR spokesman See denied Monday that the state had ignored earlier concerns about the Oroville Dam's emergency spillway or had been lax in inspections there.

"We have a very rigorous schedule of inspections that is determined by state and federal regulators," said See. "We actually do those inspections annually."

Here is a graphic from the *Washington Post*:

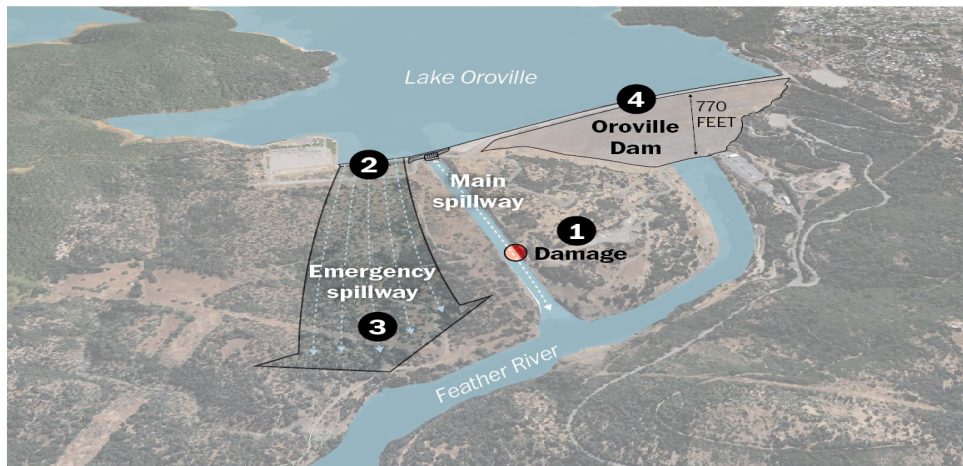


1. Damage to the main spillway slowed the release of dam water causing the high lake levels.

2. The emergency spillway was used for the first time Saturday after lake levels went over 901 feet.

3. Authorities worried that if the emergency spillway failed, uncontrolled flooding would occur.

4. Oroville dam itself was not compromised. By early Monday water levels had dropped.



Source: California Department of Water Resources; Google Earth; National Weather Service

THE WASHINGTON POST

One more graphic:

The damaged spillway sits beside the main earthen dam that holds back Lake Oroville, the state's second largest reservoir and a central piece of California's government-run water delivery network. The dam can store 3.5 million acre-feet of water, which is divvied out through the year for farming and drinking water needs across great stretches of California. Much of Southern California's drinking water is stored in the reservoir.

<http://www.sacbee.com/news/state/california/water-and-drought/article131743014.html#storylink=cpy>

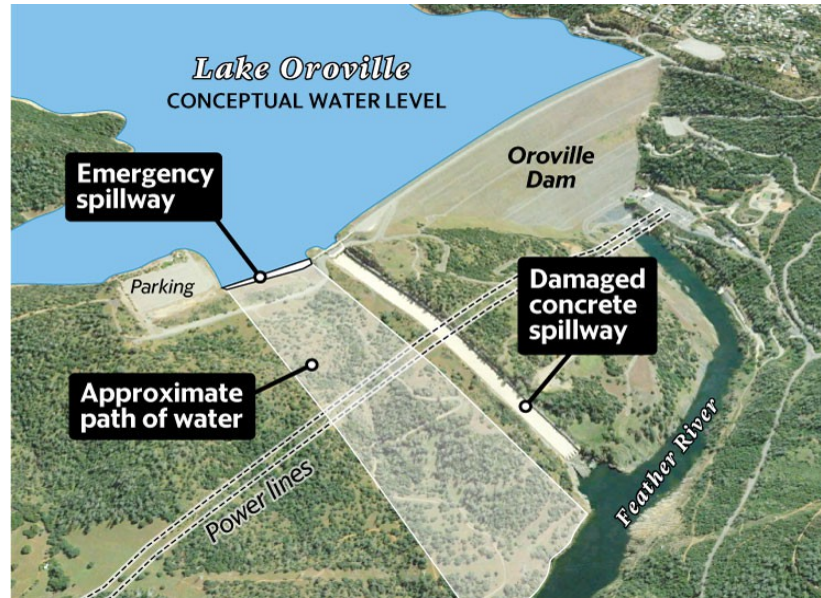


Image: Google Earth Pro (2015 aerial image) NATHANIEL LEVINE nlevine@sacbee.com

As reported in my February 13 article above, Paul Rogers of the *San Jose Mercury News* was the first to report on February 12 the warnings about the emergency spillway a dozen years ago. He followed up that report with this one on February 13:

Oroville Dam: State said emergency spillway was ‘safe and stable’

<http://www.mercurynews.com/2017/02/13/oroville-dam-update-evacuations-remain-in-place/>

By [Paul Rogers](#) and [Matthias Gafni](#)
February 13, 2017

As authorities raced to reduce the level of Lake Oroville before the next storm, new evidence emerged on Monday that more than a decade ago state water officials insisted that the emergency spillway that forced the evacuation of nearly 200,000 residents this week was “a safe and stable structure founded on solid bedrock that will not erode.”

The revelations in a May 26, 2006, filing from the state Department of Water Resources to federal officials underscored how state officials rejected calls 11 years ago from three environmental groups to require that concrete be used to armor the emergency spillway at the nation’s tallest dam.

The department went on to say in its document to the Federal Energy Regulatory Commission that its geology division had closely evaluated the emergency spillway at Oroville, the tallest dam in the United States. Environmentalists’ concerns that the spillway — a 1,730-foot concrete lip along the reservoir’s edge, with only a tree-lined, earthen hillside below — could fail, triggering a catastrophe, were overblown, department officials said at the time.

“There are only one to four feet of erodable topsoil in the downstream area, and that erosion would not compromise the stability of the emergency spillway,” Michael A. Swiger, an attorney for the Department of Water Resources, wrote in the filing.

Eventually, the federal commission agreed, and did not require the state to reinforce the emergency spillway. On Saturday, after water only about 1 foot deep flowed over it for the first time since the dam's construction was finished in 1968, erosion carved in the hillside below so violently that the Department of Water Resources said the spillway could collapse within an hour, forcing Butte County's sheriff to order a mass evacuation from what could have been one of the worst dam failures in U.S. history.

There were more warnings:

Alarms raised years ago about risks of Oroville Dam's spillways

By Peter Fimrite, Cynthia Dizikes [and Joaquin Palomino](#)

February 13, 2017 Updated: February 14, 2017 4:33pm

<http://www.sfchronicle.com/bayarea/article/Alarms-had-been-raised-about-flaws-in-Oroville-10929996.php>

Bea, who has analyzed disasters including the deadly 2010 pipeline explosion in San Bruno, said the first indication of trouble in the main spillway was in 2009, when defects in the base slabs, which form the concrete chute, were detected.

The situation got worse, and repairs were made in 2013, said Bea, who obtained photographs showing construction in the same spot as this month's rupture. More repairs were made in that area in 2014 and then in 2015, he said, when cracks were detected in the spillway.

Bea said inspectors noticed trees growing on the right side of the spillway in their 2015 report. The inspectors recommended removing the trees, but the damage may have already occurred.

And here is an article from the *Sacramento Bee* from 2005, reprinted in that paper on February 13, 2017:

Spillway threat asserted: A state agency seeks relicensing to run Oroville Dam, but a challenge sees design flaws.

This story was originally published on November 27, 2005. It is being republished in light of [damage at the Oroville dam](#).

*By Randy Pench
The Sacramento Bee
November 27, 2005*

Oroville Dam contains a flaw, some critics assert, one that could damage the structure during a major flood and threaten downstream communities.

That flaw is the dam's emergency spillway, which empties onto a bare dirt hillside adjacent to the earthen-fill dam.

If the emergency spillway had to be used to help quickly drain the reservoir during a major flood, the force of water rushing over the spillway lip would violently erode the hillside, washing out roads and power lines below, according to both the critics and the state agency that operates the dam.

It also could undermine the foundation of the spillway, a potential disaster, said Ronald Stork, a senior policy advocate at Friends of the River.

Highlighting the fragile nature of the entire California water management system is this editorial from the Los Angeles Times on February 13. Excerpted:

A disaster at the Oroville Dam could easily become a crisis for Los Angeles too

The Times Editorial Board

February 13, 2017

<http://www.latimes.com/opinion/editorials/la-ed-oroville-dam-20170213-story.html>

Southern Californians have been drinking from the Feather River — and washing in it, flushing with it and sprinkling it over their lawns — for nearly a half century without giving it much thought, so the emergency at distant Oroville Dam provides a jolting reminder of our dependence on the wetter, northern part of the state. A disaster there could easily become a crisis here.

Oroville is the linchpin of the State Water Project, the massive engineering feat that brings Northern Sierra water from the Feather River to the Sacramento, through the Sacramento-San Joaquin River Delta, into the California Aqueduct, over the Tehachapis and to our faucets.

California is an extremely engineered environment. Decades ago, the natural state of affairs in years like this one had previously been flooding in the Sacramento and San Joaquin valleys. Since 1960, the State Water Project has helped to protect Northern California cities, towns and farms from floodwaters while providing usable water to Central Valley farms and Southern California homes. Ratepayers here, as elsewhere, help keep the system in repair. The project binds Californians to each other, despite the difference in precipitation between the wet north and the dry south. A catastrophe at Oroville Dam — for example, spillway-loosened detritus blocking flow to the delta — could cause a water-supply emergency here, despite all the rain.

It Is Not Completely Broken, But It Is A Crisis: America's Infrastructure, What is Needed and How to Do It, and Not Do It

In this section I excerpt articles that address the conversation that has erupted with the Oroville Dam emergency. The articles in general take off from the emergency to discuss a far-ranging array of issues on the general topic of U.S. infrastructure. This includes the entire water management system of California, the nation's vulnerable dams more generally, the broader topic of all infrastructure, and President Trump's as of yet vague infrastructure building policy. This includes the entire water management system of California, the nation's vulnerable dams more generally, the broader topic of all infrastructure, and President Trump's as of yet vague infrastructure building policy.

I have placed the following article first in order to illustrate how hysterical articles blaming everything on man-caused climate change produce absurdities such as the last sentence in the article, which is highlighted:

Broken California Dam Is a Sign of Emergencies to Come

Climate change is leading to more extreme rainfalls that can overwhelm infrastructure

- By [Anne C. Mulkern](#), [E&E News](#) on February 14, 2017

<https://www.scientificamerican.com/article/broken-california-dam-is-a-sign-of-emergencies-to-come/>

While it's too soon for studies that would look for a climate link to the Oroville drama, experts said climate models show California likely will swing between devastating droughts and extreme storms.

That could cause significant problems if the state's infrastructure isn't ready, they said.

Brown's press office did not respond to multiple inquiries about whether he sees a climate connection with the storms. He yesterday requested federal assistance in connection with the Oroville dam.

In a statement about that, he said that January storms “caused flooding, mudslides, erosion, power outages and damage to critical infrastructure across California.”

In another letter to Trump last weekend asking for a federal emergency declaration after a series of storms, he said that “this series of powerful winter storms brought relentless precipitation and high winds that caused flash flooding, debris and mud flows, erosion, power outages and damage to critical infrastructure.”

Northern California rainfall totals hit more than 79 inches in a 24-hour period, he said.

In Peril at Oroville Dam, a Parable on Infrastructure

By [THE EDITORIAL BOARD](#)

FEB. 13, 2017

New York Times

https://www.nytimes.com/2017/02/13/opinion/in-peril-at-oroville-dam-a-parable-on-infrastructure.html?smprod=nytcore-ipad&smid=nytcore-ipad-share&_r=1

Oroville is hardly an isolated case. The [American Society of Civil Engineers](#) gives the country's dams an average grade of “D” and estimates that at least \$21 billion is needed to fix aging, high-hazard dams. The average age of the country's 84,000 dams is 52 years, and 70 percent of them will be more than a half-century old by 2020.

White House calls Oroville Dam emergency ‘textbook example’ of need for public works spending

<http://www.chicoer.com/general-news/20170214/white-house-calls-oroville-dam-emergency-textbook-example-of-need-for-public-works-spending>

By Katy Murphy, Bay Area News Group

Posted: 02/14/17

Washington, D.C. >> White House Press Secretary Sean Spicer addressed the Oroville Dam emergency in a press briefing Tuesday, calling the evacuation of more than 180,000 residents a “textbook example” of the consequences of the nation's aging infrastructure.

“The president's been keeping a close eye on the Oroville Dam situation in California,” Spicer said. “The situation is a textbook example of why we need to pursue a major infrastructure package in Congress.

“Dams, bridges, roads and all ports around the country have fallen into disrepair. In order to prevent the next disaster we will pursue the president's vision for an overhaul of our nation's crumbling infrastructure.”

The Oroville Dam Crisis Exposes the Flaws in Trump's Infrastructure Plan

By Kriston Capps

<http://www.citylab.com/politics/2017/02/oroville-dam-flooding-california-infrastructure/516417/>

A near-disaster in California probably wouldn't be averted by the kind of privatized investment that the president has in mind.

Upgrading the Oroville Dam spillways isn't a project that fits neatly into Trump's [\\$1 trillion prescription for infrastructure spending](#). So far, Trump's plan largely means privatizing infrastructure development through the use of tax credits. Armoring the Oroville Dam's emergency spillway isn't the kind of investment likely to lure profit-minded private developers.

But this work is absolutely necessary to protect communities near dams—to say nothing of the bridges, water pipes, and other aging systems that serve Americans. If infrastructure investment in the Trump era means widening highways and nothing more, communities will pay dearly once the bill comes due for the projects the government neglects.

Trump approves California's request for emergency aid

By [Melody Gutierrez](#), San Francisco Chronicle

February 14, 2017

<http://www.sfgate.com/news/article/Trump-approves-California-s-request-for-10932968.php>

SACRAMENTO — President Trump issued major disaster declarations to enable federal funding for California on two fronts — to aid with the Oroville Dam spillway damage and mass evacuations and to help the state deal with the widespread effects of January's storms.

State Seeks Federal Funding for \$100 Billion in Priority Infrastructure Projects Needed Statewide

Submitted by Emily Allshouse on Thu, 02/09/2017

<http://www.acwa.com/news/federal-budget/state-seeks-federal-funding-100-billion-priority-infrastructure-projects-needed->

Hoping to receive a portion of the \$1 trillion in federal infrastructure investment funding promised by President Donald Trump, Gov. Jerry Brown's office Wednesday submitted a list of priority infrastructure projects needed throughout the state. The project list represents a total of \$100 billion of targeted investments identified by the California State Transportation Agency and the California Natural Resources Agency.

Projects include investments in roads, levees, bridges, ports, train and public transit systems, water storage and recycling, and energy project and energy, military, veterans and emergency operations facilities and services.

Oroville Dam drags California's \$65 billion infrastructure annual price tag into the open

By Katy Murphy

February 14, 2017

<http://www.mercurynews.com/2017/02/14/oroville-dam-drags-californias-aging-infrastructure-into-the-open/>

SACRAMENTO — Shock over the emergency evacuation downriver from the Oroville Dam has given way to serious questions about how California is coping with its aging infrastructure — which the American Society of Civil Engineers says would cost the state a staggering \$65 billion per year to fix and maintain after years of neglect.

But now, amid deep concern over the safety of the state's second largest dam and with a Republican

White House eager to spend as much as \$1 trillion over 10 years on infrastructure, California finds itself in an awkward position politically.

“The state of California can’t write checks to cover its infrastructure needs — plain and simple,” said Bill Whalen, a research fellow at Stanford’s Hoover Institution who was a strategist for former Republican Gov. Pete Wilson. “If the state of California wants to address its myriad infrastructure needs, it needs Washington’s cooperation.”

“Dams, bridges, roads and all ports around the country have fallen into disrepair,” Press Secretary Sean Spicer said. “In order to prevent the next disaster, we will pursue the president’s vision for an overhaul of our nation’s crumbling infrastructure.”

With its extraordinarily complex system of levees, dams and pipelines, the state needs to spend \$2.8 billion per year for a decade to protect its citizens from floods, according to the [2013 report card](#) from the American Society of Civil Engineers.

Failing to do so, the report warns, could lead to dire consequences: “A catastrophic failure of any one of the levee systems in the Sacramento-San Joaquin Delta carries with it the very real potential to be a mega-disaster greater than Hurricane Katrina caused in New Orleans.”

Oroville Dam hole illustrates California infrastructure deficit

February 10, 2017

Sacramento Bee

By the Editorial Board

<http://www.fresnobee.com/opinion/editorials/article131946754.html#storylink=cpy>

On the day the massive hole in the Oroville Dam spillway was discovered, the California Department of Water Resources issued a report detailing a separate and very real threat to the state’s vital water delivery system.

Because of overpumping to irrigate crops during the drought, large swaths of the Central Valley in and around Chowchilla, Corcoran and the Fresno County town of Tranquility [subsided rapidly in 2015 and 2016](#).

Land subsidence in the Central Valley and the [gaping hole that appeared in the spillway at Oroville Dam](#) are not connected in any direct way. But they are of a piece. California’s plumbing system, largely built five decades ago, is outdated and in distress. We will face a reckoning sooner rather than later.

Dam crisis is wake-up call for ageing California water system

By Rory Carroll

February 14, 2017

http://www.thestar.com.my/~media/online/2017/02/14/03/20/20170214t031711z_1_lynxmped1d06u_rt_roptp_4_californiadamsafety.ashx/?w=620&h=413&crop=1&hash=66E209A9E1E00FB5CF5403E75B495045856CE405

The Oroville Dam crisis this week, in which nearly 190,000 residents were abruptly evacuated from a valley below the tallest U.S. dam, illustrates the safety risks of the Golden State’s ageing infrastructure in increasingly populated areas.

Sixty-four California reservoirs, or around 5 percent of the state’s total, are restricted to holding less than their rated capacity due to earthquake risks and other concerns, a state dam safety official said on

Monday.

California's Oroville Dam disaster is a wake-up call for America

CNBC.com

February 13, 2017

Commentary by Jake Novak, CNBC.com senior columnist.

<http://www.cnbc.com/2017/02/13/californias-oroville-dam-disaster-is-a-wake-up-call-commentary.html>

When we talk about America's need for an improved and repaired infrastructure, we usually focus on roads, airports, and innovative new projects like the Hyperloop. But we often forget the crucial role dams play in our infrastructure grid. When built and used properly, dams provide crucial clean water resources for commercial and private use, ease the effects and threats of flooding, and also provide a massive source of power via hydroelectricity.

And that brings us back to America's general infrastructure crisis and President Donald Trump's promises to launch a massive infrastructure improvement effort. He and we may not think a lot about dams in that context, but we should since the greatest infrastructure building period in modern U.S. history was all about dams. That would be the New Deal era of the 1930s and 1940s, when dams comprised the two biggest infrastructure projects of the era. They were the Grand Coulee Dam and the Hoover Dam. They both employed tens of thousands of workers, provided irrigation for new farmland, and produced enough electricity to power entire regions of the country. More than 70 years later, all three of those things are still needed.

As President Trump now faces what may be tens of thousands of infrastructure project requests, the current emergency situation in California should put dam and reservoir building efforts front and center.