



# Some Dam – Hydro News™ And Other Stuff



*Quote of Note:* “Maybe it’s true that life begins at fifty ... but everything else starts to wear out, fall out, or spread out.” -- Phyllis Diller

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**“Good wine is a necessity of life.” - -Thomas Jefferson**  
**Ron’s wine pick of the week: 2013 Kendall Jackson Cabernet Sauvignon "Vintner's Reserve"**  
**“No nation was ever drunk when wine was cheap.” - - Thomas Jefferson**



## Dams:

(Here’s when it happened.)

### **TIMELINE: What Happened at the Oroville Dam**

February 16, 2017, by Associated Press, fox40.com

OROVILLE, CA — Here’s a timeline of events surrounding problems related to the Oroville Dam and its spillway.

- January 13** — Record rainfall in the Feather River watershed leads the state Department of Water Resources to make reservoir releases from Lake Oroville of up to 10,000 cubic feet per second (cfs).
- January 31** — Flows through the main spillway increase to more than 10,000 cfs as runoff into the river increases.



**February 7** — Reservoir releases through the main spillway were increase to 54,500 cfs to offset higher inflows from rainfall. DWR discovers a large amount of debris coming out of the concrete-lined spillway and stops all releases to inspect the damage. Engineers discover a massive crater. Authorities decide to use the crippled spillway, but with reduced flows.

**February 11** — The water elevation in Lake Oroville reaches 901 feet, its full capacity, leading water to flow over the emergency spillway for the first time in its nearly 50-year history.

### **Water flows over the Oroville Dam's emergency spillway for the first time in the dam's history**

**February 12** — Erosion begins to progress up the right side of the emergency spillway. Fearing the ground will collapse underneath a concrete slab holding water in the reservoir, authorities order a mandatory evacuation of 188,000 people in towns downstream. DWR increases the primary spillway releases to 100,000 cfs to draw down the water level. Within hours, water stops flowing over the emergency spillway so experts can assess the erosion.

**February 13** — Crews begin working around the clock to repair the eroded areas below the emergency spillway. Almost 200,000 people remain under evacuation order.

**February 14** — Water levels in Lake Oroville continue to drop. Authorities lift the mandatory evacuation order but ask residents to be prepared in case of another evacuation

### **Spillway Repairs Continue**

**February 15** — Dump trucks and helicopters for a second day drop thousands of tons of rocks and sandbags to shore up the emergency spillway. Lake Oroville's water levels had dropped by 26 feet.

**February 16** — Officials reduce the flow of water below 100,000 cfs for the first time since Sunday, allowing them to clear debris from the bottom and prepare to restart the dam's hydroelectric power plant.

(But, stuff can still happen.)

### **Oroville Dam: 'The threat level – it is much, much, much lower'**

By Ryan Lillis, Dale Kasler and Phillip Reese, FEBRUARY 16, 2017, sacbee.com

OROVILLE - After four days of relentless pounding on Oroville Dam, its operators dialed back water releases on the heavily damaged main spillway Thursday, even as forecasts show another "atmospheric river" poised to strike the region early next week. Feeling confident they've created sufficient empty space in Lake Oroville for the time being, state Department of Water Resources officials said they reduced spillway outflows so they could address another looming challenge: restarting the dam's hydroelectric plant, which can release additional water when operational. The plant was shut down last week after concrete and other debris from the spillway accumulated at the bottom of the dam, backing up water to the front door of the hydro facility. DWR acting director Bill Croyle said the water level in the reservoir has receded enough since Sunday that it's safe to reduce the spillway releases to allow crews to clear debris from the Feather River below the dam.



"The threat level – it is much, much, much lower than what it was on Sunday," he told reporters at DWR's regional office a few miles from the dam. Croyle said the main spillway does not appear to

have suffered significant new erosion since Sunday, when outflows were nearly doubled to 100,000 cubic feet of water per second in a desperate effort to drop the lake's level and avert a potentially catastrophic collapse of the dam's adjacent emergency spillway. Sunday afternoon, fearing failure of the emergency structure was imminent, officials ordered the evacuation of nearly 200,000 downstream residents from Butte, Sutter and Yuba counties. They were allowed to return home Tuesday, after dam operators were able to lower lake levels below the emergency spillway lip, and conditions stabilized. Despite forecasts of a substantial new rainstorm Monday and Tuesday, officials said they felt urgency to begin work on the hydro plant, even if it required dialing back releases. DWR spokesman Chris Orrock said debris that had accumulated at the bottom of the main spillway the past few days was starting to interfere with the power plant's outtake pipes. That would make it harder to restart the plant. Croyle said releases from the main spillway would be held at 80,000 cfs, a decline of about 20 percent, so crews could start removing debris. When operational, the hydro plant could release up to 14,000 cfs, Croyle said. "That adds another dial to our equation," he said. He also said he doubted the plant could be reopened in time for Monday's storm.

Independent experts interviewed said the strategy makes sense. The reservoir should be empty enough to handle the inflow from the "atmospheric river" forecast for Monday and Tuesday, and getting the power plant working again will prove vital to navigating the rest of winter and into spring, when snowmelt from the Sierra Nevada will generate heavy runoff. "They think they've got the reservoir under control," said Jeffrey Mount, a senior fellow at the Water Policy Center at the Public Policy Institute of California. "They've got the breathing room." The lake was down to 866 feet Thursday, a drop of 35 feet since Sunday. To leave sufficient room for flood control, Lake Oroville should stand at no more than 850 feet this time of year, according to U.S. Army Corps of Engineers regulations. Joe Countryman, a former Army Corps official, added that DWR needs the power plant running to augment water releases this spring.

"They're thinking down the road," said Countryman, a member of the Central Valley Flood Protection Board. "It's very, very important to make that (power plant) functional, no doubt." Countryman said the releases down the main spillway still will be considerable. "It's not like they're cutting it back to zero; 80,000 (cfs) is a lot of water." Reducing the outflows provided a better look at the damage to the main spillway, revealing significant gaps in the retaining walls on either side of the 3,000-foot-long concrete chute, as well as a ravine that has been carved out of the hillside east of the structure. A DWR incident report dated Feb. 11 suggests that heavy rainfall running down adjoining hillsides may have contributed to the problem at the main spillway after its initial fracture. "Flowing water was diverted toward the adjoining hillsides, effectively eroding and undermining the spillway causing a section to collapse," said the report, which was obtained by the Los Angeles Times. However, DWR spokesman Chris Orrock said the report doesn't pinpoint the underlying cause of the fracture, and a full investigation will take months. The storm that rolled into the Oroville region late Wednesday didn't bring significant rain, and a second storm forecast to begin early Friday isn't supposed to deliver much of a punch, either. But the National Weather Service reported that a warm, heavy storm known as an atmospheric river is expected to hit Monday and Tuesday.

"It is looking like the system for next week is trending wetter and warmer," said Michelle Mead of the National Weather Service in Sacramento. Mead said the rainfall, nonetheless, is expected to be only half as heavy as last week's storm. The weather service said Oroville could expect up to 1 inch of rain Thursday and another half-inch Friday. The seven-day outlook calls for 10 inches of rain, most of it coming Monday and Tuesday, when temperatures will turn warmer. While not as bad as last week, when total rainfall approached 20 inches in the Feather River Basin, Mead said the reservoir can expect a significant amount of new water. "Enhanced inflows are expected," she said. Last week's storm swamped Lake Oroville with peak inflows of 191,000 cubic feet per second just as a massive crater opened in the main spillway. That fracture temporarily stalled efforts to push water out of the reservoir, allowing the lake to rise to the point that it topped the lip of the emergency spillway early Saturday for the first time in the dam's history. A day and a half later, inspectors found major erosion in the hillside just below the concrete apron of the emergency

structure. That sparked concerns the spillway would collapse, prompting the evacuation order Sunday afternoon. The large crews working to reinforce the emergency spillway with tons of rock and concrete continued their efforts Thursday, despite periods of heavy wind and rain. Croyle said one of the three eroded spots was patched by noon Thursday. The other two spots were 25 percent and 69 percent completed, he said.

(They're not out of the woods yet. More rain is coming.)

## California slows release of water from Oroville dam lake

February 17, 2017, sfgate.com,

OROVILLE, Calif. (AP) — California officials continued their slow release of water Friday from a lake behind the nation's tallest dam so crews can remove debris from the bottom of the structure's damaged spillway.

Officials had been releasing 100,000 cubic feet of water, or enough to fill an Olympic-size swimming pool, each second from the lake since Sunday, when the sheriff ordered an immediate evacuation for towns downstream from the dam.



The amount being released was reduced to 80,000 cubic feet of water per second late Thursday and continued at that rate on Friday. Removing debris protects Oroville Dam's power plant and will allow for it eventually to be restarted, officials have said. The level of the reservoir has been reduced by 40 feet to accommodate inflow from upcoming storms. Water inflows are not expected to exceed current outflows, officials said two trails near the damaged spillway remained closed, but the lake's boat ramps were open.

(This is not good news. Better beef up the EAP.)

## AP Exclusive: If California dam failed, people likely stuck

By Ellen Knickmeyer, associated press, Feb 17, 2017, abcnews.go.com

Communities immediately downstream of California's Lake Oroville dam would not receive adequate warning or time for evacuations if the 770-foot-tall dam itself — rather than its spillways — were to abruptly fail, the state water agency that operates the nation's tallest dam repeatedly advised federal regulators a half-decade ago.



Regulators at the time recommended that state officials implement more public-warning systems, carry out annual public education campaigns and work to improve early detection of any problems at the dam.

Six years later, state and local officials have adopted some of the recommendations, including automated warnings via reverse 911 calls to residents. But local officials say the state hasn't tackled other steps that could improve residents' response, such as providing routine community briefings and improving escape routes. The catastrophic scenario of a sudden breach at California's second-largest water reservoir, outlined between 2010 and 2012 in online archives of federal dam regulators, is a different and far graver situation than the concern that prompted sudden evacuation orders Sunday for 188,000 downstream residents. Operators of the nearly half-century-old dam in California's Sierra Nevada foothills became worried that the water cascading

from the reservoir after a series of winter storms could roar uncontrolled down a rapidly eroding emergency spillway toward towns downstream.

The shortfalls in organization as well as infrastructure to quickly get residents out were on full display in the chaotic hours after the evacuation order. Residents found themselves caught in traffic jams for hours on clogged roads, leading some families to abandon their cars. While many local officials and ordinary people rushed to help direct traffic and staff emergency shelters, evacuees also reported seeing fistfights on gridlocked roads. In an email Thursday, state water agency spokesman Ed Wilson said that despite the repeated back-and-forth correspondence between state and federal officials about reducing detection and response times in a sudden dam failure, the scenario was "hypothetical" and "not how dams typically fail in real life." Asked Friday whether residents immediately downstream would have time and warning to get out if the dam itself failed, Sheriff Kory Honea in Butte County, where Lake Oroville is located, answered, "it's a very, very daunting challenge." "That is why we're taking steps now to refine our notification plan and our evacuation plan, potential evacuation routes, in hope that we can give people more time to exit the area should that happen," Honea said.

Local officials, residents and a Florida-based evacuation expert said the federal-state discussion highlights the steps that the state Department of Water Resources and others still should take to improve warning and escape for people downstream. "You know what the evacuation plan is? 'Get the hell out of town!'" said Kevin Zeitler, a critic of the state water agency's interactions with communities downstream of the dam. The state informed federal dam regulators that local emergency officials "do not believe there is enough time to perform evacuations in the communities immediately downstream of the dam during a sudden failure," according to a Feb. 8, 2011, letter reviewed by The Associated Press. Absent significant advance warning, emergency responders instead would likely withdraw to safer ground and prepare for victims, said the same letter by the Federal Energy Regulatory Commission, which oversees safety of hydroelectric dams, in a summary of the state's conclusions.

The federal government in recent years has made evacuation and emergency-response plans for major dams off-limit information for the public, for fear details could be exploited for terror attacks or hacking. California officials cited that reason this week in declining to release the latest emergency plans for the dam. Wilson, the state water agency spokesman, said authorities have implemented the reverse-911 automated warnings recommended by federal regulators, and also activated an emergency broadcast system locally. Residents confirmed the reverse-911 system worked Sunday. With months left in the rainy season, state spokesperson Nancy Vogel said California now has drones, cameras and human lookouts watching the dam and its spillways. Operators have been releasing torrents of water down the damaged main spillway to avoid a repeat of last weekend. Even with round-the-clock efforts by dam operators, Oroville Mayor Linda Dahlmeier immediately began praying for those closer to the dam when she heard the first drops of rain hit the metal roof of her home Thursday. "You just start bawling," Dahlmeier said. "This is Mother Nature's hand."

Oroville used to have civil-defense sirens for emergencies, Dahlmeier said, but funds for such public expenses have dwindled in the Sierra Nevada foothill counties. Neither she nor others recalled the annual safety briefings for the public that federal regulators urged of the state water agency. A May 2013 hazards-assessment report by Butte County estimates 8,735 people live in a so-called inundation zone in Oroville that would likely be under water in the event of a sudden rupture at the dam, which is five miles from the vulnerable area in Oroville. Since the 1990s, Oroville and other communities in Butte County have asked the state for the \$300 million it would take to widen the full route of a key highway out of the county from two lanes to four, said Jon Clark, head of the Butte County Association of Governments. Unquestionably, that would have helped in the evacuations, Clark and others said. For Butte County's many low-income retirees and others unable to drive, Clark's association got buses on the road Sunday to carry people to safety. In a disaster as sudden as a major problem with a dam, authorities will have had warning signs telling them to increase their vigilance, even if that is just forecasts of storms coming, said John

Renne, an urban-planning professor at Florida Atlantic University. And the public can almost always be warned, even if it entails greater government investment in public-warning technology. "Minutes can save lives," Renne said. *Associated Press writers Don Thompson and Jonathan J. Cooper in Sacramento and Tim Reiterman in San Francisco contributed to this report.*

(How about this?)

### Check out this interactive 3D model of Oroville Dam

FEBRUARY 17, 2017, [sacbee.com](http://www.sacbee.com)

<http://www.sacbee.com/news/local/article133545764.html>

(More website info.)

### Oroville Dam crisis imagery

February 16, 2017

<https://www.gearthblog.com/blog/archives/2017/02/oroville-dam-crisis-imagery.html>

(If they get by, will they still remember - usually they don't?)

### Will the crisis at Oroville Dam become a catalyst for change?

By Chris Megerian, Contact Reporter, [latimes.com](http://latimes.com), Feb.17.2017

Jeffrey Mount, a leading expert on California water policy, remembers the last time a crisis at the Oroville Dam seemed likely to prompt reform. It was 1997 and the lake risked overflowing, while levees further downstream failed and several people died. "If this doesn't galvanize action, I don't know what will," Mount said he thought at the time. But spring came, the waters receded and no changes came to pass. Now another threat looms in Oroville, where deteriorating spillways forced widespread evacuations, and more heavy rain is around the corner. State officials have remained focused on quick fixes at the dam needed to prevent catastrophic flooding, but some are already thinking about how the crisis could spur long-term shifts in policy. It's a conversation that's gaining momentum in think tanks and government offices from Sacramento to Washington, and it touches on climate change, infrastructure spending and statewide water policy.



(So are other states.)

### Oroville Reveals Concerns About California's 1,500 Aging Dams

By Chriss W. Street, 19 Feb 2017, [breitbart.com](http://breitbart.com)

The Oroville Dam crisis is highlighting concerns that there are substantial risks to the integrity of California's 1,500 regulated dams due to age and infrastructure underfunding. The spillway near-failure at Oroville Dam is being blamed on the "snow water equivalents" in the Northern Sierra Mountains being at 143 percent of normal average for this time of year. But the "snow water equivalents" in the Central Sierra Mountains are even higher, at 182 percent of average, and the measure for the Southern Sierra Mountains is at 192 percent. That explains why the earthen New Don Pedro Reservoir is also at 97 percent of capacity. Holding back about two-thirds of the water as giant Oroville Lake, engineers are about to open the New Don Pedro Dam emergency spillway for only the second time in its 46-year history.



The California Department of Water Resources directory of “Jurisdictional Dams” lists 50 pages. With 30 dams per page, that are on the “National Dam Registry.” About 1,250 are under the sole regulatory authority of the state, and another 250 dams are jointly regulated by the **supposedly independent Federal Energy Regulatory Commission (FERC)**. FERC, as an independent agency, gives the majority party in the U.S. Senate the right to appoint 3 seats, and the minority 2 seats, to four-year terms. But both FERC Republican appointees have resigned, and the 3 remaining Democrat appointees will soon be down to 2 Democrats on February 3, when Democrat appointee Norman Bay will resign. Given that it takes a minimum of 60 days to fill a seat, FERC will lack a quorum until May to make decisions for all but most serious emergency situations. Oroville Dam, as a state-owned facility, is an example of the risk from both Democrat and Republican governors slashing infrastructure spending by 83 percent from a national high 20 percent of the state budget 40 years ago, to the nation’s second worst at 3.4 percent this year, according to a study by the Center for Budget and Policy Priorities.

**The American Society of Civil Engineers (ASCE) warned in 2013 that California has a \$65 billion infrastructure investment deficit in providing an adequate level of public infrastructure for dams, waterways, airports, roads, bridges, seaports and tunnels.** ASCE warned in 2013 that “Investment in infrastructure is vital to our state’s productivity, competitiveness and economic well-being.” And in a warning that should have been heeded, ASCE highlighted in its “Infrastructure Report Card” that levees/flood control was California’s most neglected sector, earning a “D” grade. ASCE also warned that to prevent major flooding from storms, California would need to invest “\$2.8 billion per year for the next 10 years” to bring its channels, levees, dams and pumping stations up to proper condition to protect thousands of homes, businesses and critical community infrastructure. **But Breitbart News has reported that the ability of California to reverse course and start funding infrastructure is highly constrained.** Gov. Jerry Brown warned in January that despite economic growth of 3.29 percent, California’s \$122.8 billion budget will suffer its first deficit since 2012, as state spending has grown by 7.46 percent per year. In the past, California could borrow tens of billions of dollars, but the state and local governments now owe \$1.3 trillion for bonds, loans, debt guarantees, unfunded public employee pensions and post-employment benefits. **With debt of 52 percent of GDP, “California taxpayers are shouldering debt burdens on a par with residents of peripheral Eurozone states,”** according to a new report from the California Policy Center.

(There are always things that need maintained.)

## **Oroville Dam spillway crisis becomes lesson in flood control Crews working daily on Feather River levee improvements**

By Vicki Gonzalez, Reporter, Feb 17, 2017,  
kcra.com

SUTTER COUNTY, Calif. (KCRA) — “Right now we are monitoring the levees 24 hours a day,” Joe Henderson with Reclamation District 1001 said. “We’ve been in a drought for a while, so it’s been little while since we’ve got something like this.” **“As the river levels have come up-- the longer that they are up-- the more seepage and possibility for boils we get,”** Henderson added. “Unfortunately, the water has been up for quite a while.” The



Feather River is rising as a result of increase released from Oroville Dam due to two damaged spillways that evacuated nearly 200,000 residents Sunday. **Although the Feather River is below flood stage — and officials do not anticipate it to crest at any time in the near future — the recent threat is serving a reminder of the importance of flood control maintenance.** “This type of flooding events that we have had throughout the region, it only brings it more to the forefront of everybody’s minds that it is very important to get these improvements in place,” Michael Bessette with Sutter

Butte Flood Control Agency said. "There was an evacuation (Sunday) and the entire basin had to get evacuated. So they live with the threat of flooding every day."

Sutter Butte Flood Control Agency was established in 2007, responsible for 46 miles of levee from Oroville down to Sutter Bypass. Since starting construction in 2013, the agency has completed 37 miles of levee improvements at a cost of \$300 million. Six of the remaining nine miles are currently be worked on at a cost of \$75 million. Bessette explains 76 percent is paid for by the state, and the remaining is funded through property tax from the approximately 100,000 residents directly benefitting from the improvements in the basin. "You never know. Right now, with the state of the situation up at Oroville, we don't know how high of flows we will receive because with the nature of the two spillways and its uncertainty," he added. "So, we are preparing for the worst."

In Yuba City, the agency is working on a levee improvement project directly as a result from the crisis in Oroville. Rep. Doug LaMalfa (R-District 1) toured the grounds Friday. "Look, we have got to rebuild the old bridges, we've got to rebuild the old highways, we've got to re-do the existing levees and do the maintenance," the congressman said. Rep. LaMalfa is hoping federal funds will reimburse Sutter Butte Flood Control Agency the \$5 million price tag for the project. "We have the president's attention, (President Donald Trump) called me back a couple days ago to get a little bit more detail about what's going on, and he assured me that it has his attention," Rep. LaMalfa shared. "(President Trump) will do everything he can to direct people to do what's appropriate."

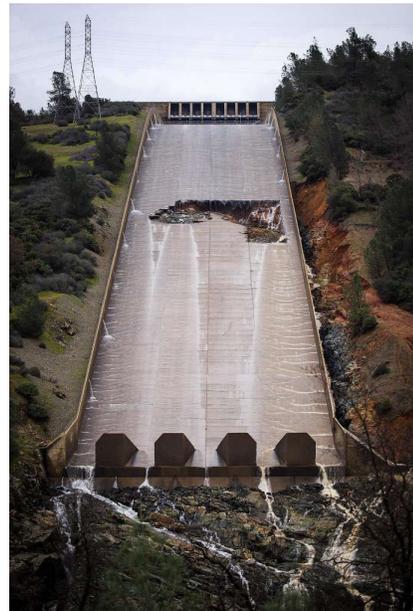
(Now, they're starting the blame game. They're criticizing what's considered the best state dam safety program in the country. People forget you're only as good as the resources they give you will allow. Most state and federal dam safety programs are underfunded. Look what happened in SC and still they are underfunded. Some politicians said it will never happen again. Yes, it will and then who is to blame. States have a problem that Federal regulators most often don't. They have to deal with many dam owners that don't maintain their dams. As always said, "If you don't maintain a dam, today's little problems become tomorrow's big problems.")

### **Disturbing deficiencies seen in California's dam safety efforts**

By Joaquin Palomino and Cynthia Dizikes, San Francisco Chronicle, February 19, 2017, sfchronicle.com

The dam burst on a warm afternoon, unleashing nearly 300 million gallons of muddy water on a Los Angeles neighborhood. Five people died and dozens of homes were swept off their foundations and destroyed. In the aftermath of the 1963 Baldwin Hills Dam catastrophe, the state strengthened inspection regulations, helping establish California as a modern leader in dam safety.

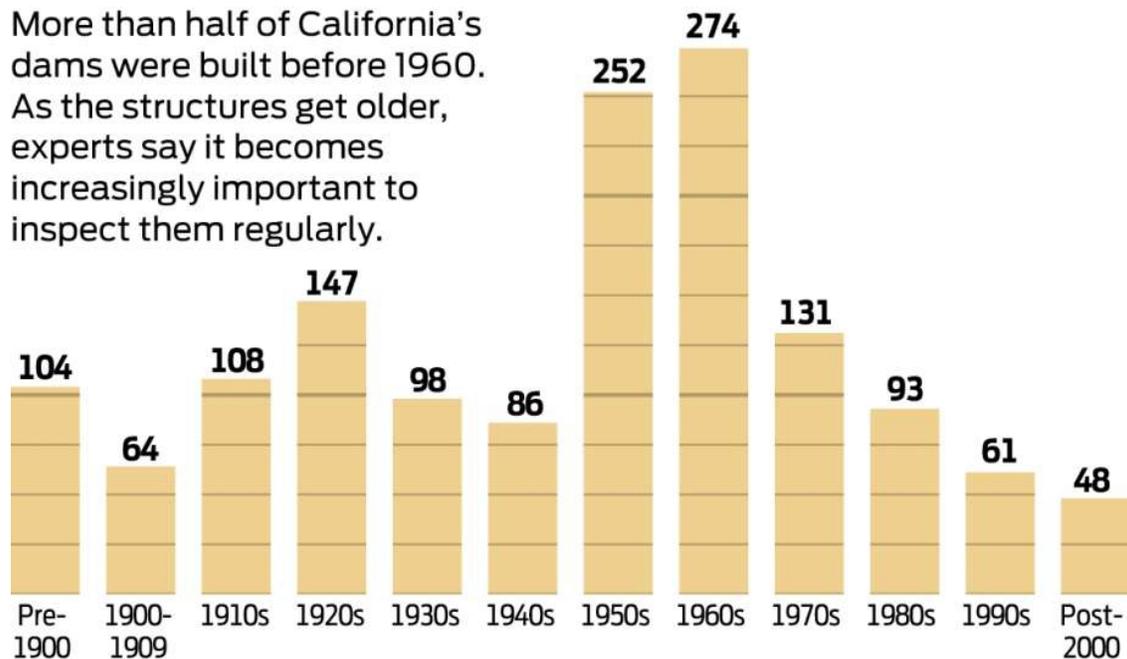
That reputation was called into question last week, however, as two spillways at the towering Oroville Dam north of Sacramento began to crumble in the wake of heavy rains and snowmelt, forcing tens of thousands of people to evacuate. Though the dam — the tallest in the nation at about 770 feet — had been regularly inspected and cleared as safe, both spillways eroded when carrying relatively small amounts of water. The 50-year-old structure's apparent fragility took many by surprise, prompting calls for more robust inspections, maintenance and emergency planning at all of California's 1,585 dams — aging facilities that likely will be tested more severely in the coming years by global warming and anticipated periods of intense rain.



Despite those concerns, a Chronicle review of federal data found disturbing deficiencies in California's dam-safety efforts.

## California's dams aging

More than half of California's dams were built before 1960. As the structures get older, experts say it becomes increasingly important to inspect them regularly.



Note: 117 dams did not have a construction date. Some large projects, such as Oroville, are counted more than once since they have multiple dams.

Source: U.S. Army Corps of Engineers' National Inventory of Dams, 2016.

John Blanchard / The Chronicle

As of October 2015, about a dozen state-monitored dams where failure could result in death or property destruction had gone more than two years between inspections, though checks are supposed to be done once a year. Home to some of the country's biggest dams, California also lags behind the national average in emergency preparedness for dam failure, with hundreds of high-risk sites lacking plans to handle a potential crisis. "It is reason for alarm," said Robert Bea, a professor emeritus and engineering expert at UC Berkeley. "If systems are in the very old, geriatric phase, inspections need to be annual." Officials with the Department of Water Resources, which inspects most dams in California, defended their safety program as well-funded and robust. In recent years, they said, they have worked with more than 100 dams to prepare emergency plans and currently have about \$2 billion worth of repair projects under way. "In California, detailed reviews of dams is based on highest priority and greatest need, with public safety as the first priority," department officials wrote in an email.

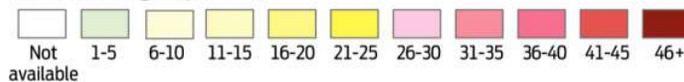
A 2016 peer review conducted by the Association of State Dam Safety Officials at the request of the Department of Water Resources concluded that California had the leading dam safety program in the country, noting that most high-risk dams were monitored by a "very well-documented and rigorous" state inspection program. One in 3 dams in California was built in the 1950s and 1960s, when the bulk of the state's sprawling water system was put in place. Since then, entire towns have popped up downstream from the aging facilities, making inspections and maintenance increasingly important, experts say. California routinely monitors most of its dams, including Oroville, which is designated as "high-hazard" — meaning failure or misoperation would likely result in people dying.

State-regulated dams that could pose safety risks to people or property are supposed to be inspected at least once a year, but can go essentially 24 months between reviews, if inspected at the beginning of one year and the end of the next. Those examinations often include visual checks to see if anything obvious is amiss and measurements of issues like seepage and water pressure. Every five years, federal inspectors and independent consulting boards conduct more in-depth evaluations of the critical structures, which are used to prevent floods and store water.

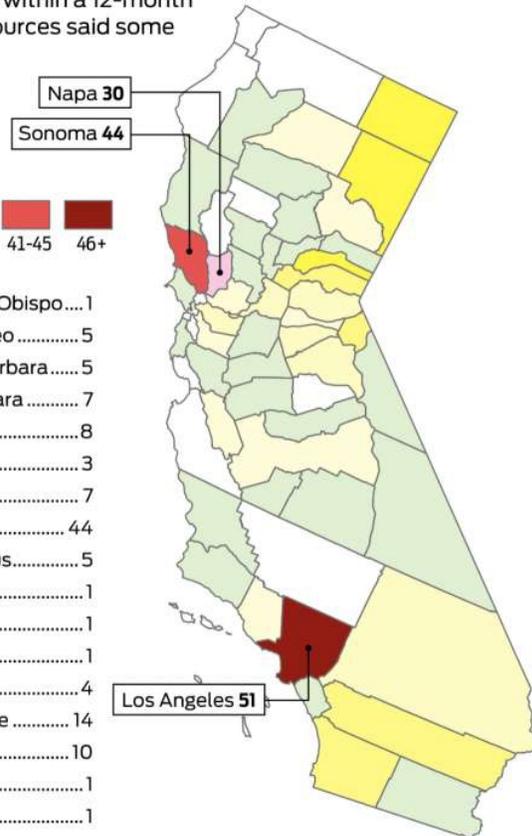
## Dams not inspected in more than 12 months

As of Oct. 20, 2015, roughly 500 dams in California that were supposed to be inspected once per year had not been examined within a 12-month time period. The California Department of Water Resources said some of the seemingly overdue inspections are because the agency can inspect a dam at any point during a fiscal year – essentially extending the inspection period to 24 months.

### Dams needing inspections



County	Dams
Alameda	10
Alpine	16
Amador	10
Butte	5
Calaveras	14
Colusa	5
Contra Costa	15
El Dorado	15
Fresno	9
Imperial	4
Inyo	5
Kings	1
Lake	3
Lassen	23
Los Angeles	51
Madera	3
Marin	4
Mendocino	4
Merced	2
Modoc	22
Mono	4
Not available	6
Napa	30
Nevada	25
Orange	5
Placer	18
Plumas	10
Riverside	17
Sacramento	11
San Benito	7
San Bernardino	12
San Diego	19
San Joaquin	5
San Luis Obispo	1
San Mateo	5
Santa Barbara	5
Santa Clara	7
Shasta	8
Sierra	3
Solano	7
Sonoma	44
Stanislaus	5
Sutter	1
Tehama	1
Trinity	1
Tulare	4
Tuolumne	14
Ventura	10
Yolo	1
Yuba	1



Source: U.S. Army Corps of Engineers' National Inventory of Dams, 2016.

John Blanchard / The Chronicle

Oroville shows importance of flood insurance. More than half of California's dams — 833 — are rated "high-hazard." More than 80 percent of those are considered to be in relatively good condition, compared with only 40 percent nationally, according to 2015 National Inventory of Dams data. California is one of only 16 states that strives to inspect high-hazard dams once a year, according to Mark Ogden, project manager with the Association of State Dam Safety Officials. Although the association recommends annual checks to ensure safety, most states go two or more years between inspections. As of Oct. 20, 2015, at least 38 California facilities overseen by the state also had not been inspected within the recommended time frame, according to a Chronicle review of U.S. Army Corps of Engineers data. Of those dams, at least 13 would likely cause property damage or death if they failed.

The Bidwell Lake Dam, which was built in 1865 and stores drinking water for 660 homes in rural Plumas County, has not been inspected since June 2014, despite being considered a high-hazard facility. The dam sits about 2 miles upstream from the small town of Greenville, and pales in size compared with Oroville. Still, the recent crisis has some residents worried about the man-made lake above them. "I think whenever those things happen it raises concern," said Chris Gallagher, general manager of the Indian Valley Community Services District, which owns the dam. "Because of its age, it would be nice if the Department of Water Resources came and took a look at it on a

more regular basis.” The Suttentfield Dam in Sonoma County near Glen Ellen, also considered high-hazard, went more than two years without inspection between 2013 and 2015. An examination last year revealed no safety concerns, said Brian Ferguson, a spokesman for the agency that operates the facility. **Sonoma County had 10 of the 13 high-risk dams that went multiple years without an official review by the state.**

“If you don’t do (timely) inspections, you’re going to miss problems,” said Peter Gleick, co-founder of the Oakland environmental think tank the Pacific Institute. “There are unsafe, hazardous facilities, and I would suspect that deeper inspections will reveal deeper problems.”

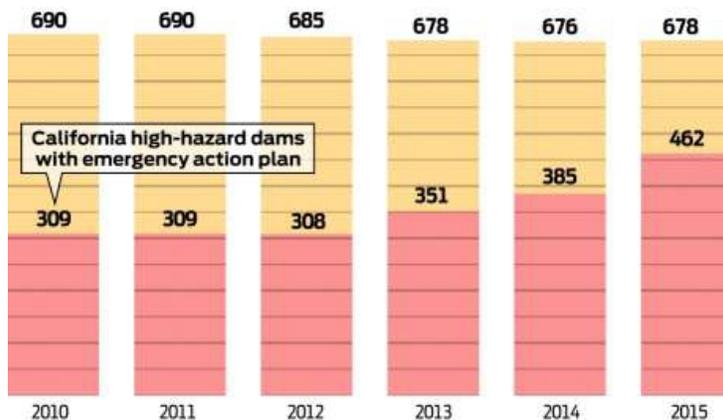
**Unlike some states, California does not require owners of high-hazard dams to create emergency action plans.** Such plans include maps of areas expected to be inundated by flooding, procedures for warning downstream residents and other information crucial to reducing potential death and destruction following a breach. The Rector Creek Dam, which is 3 miles from Yountville and supplies water to a nearby veterans home, does not have an emergency plan, according to the Department of Water Resources, which has regularly inspected the facility. A spokesman for the state’s Department of Veterans Affairs, which owns the dam, said the dam does have an emergency plan, but he was unable to provide it before publication. **Of the 678 high-hazard dams regulated by state authorities, 216 did not have a formal emergency action plan in place, according to 2015 data provided by the Association of State Dam Safety Officials.** “It’s troubling,”

said Ogden of the national association. “Emergency preparedness comes down to human life: If you can prevent failure from occurring, or at least get people out of the way, you can save lives.” The review conducted last year by the association also found emergency response weaknesses in the state’s dam safety program, including that many staff members were unaware of their responsibilities during and after an event. **As of last month, Department of Water Resources officials said, there were 679 high-hazard dams and they had encouraged about a dozen more to implement emergency plans.** Oroville Dam, built in 1968 and owned, operated and inspected by the Department of Water Resources, has an emergency plan. **But a 2011 letter from the agency to**

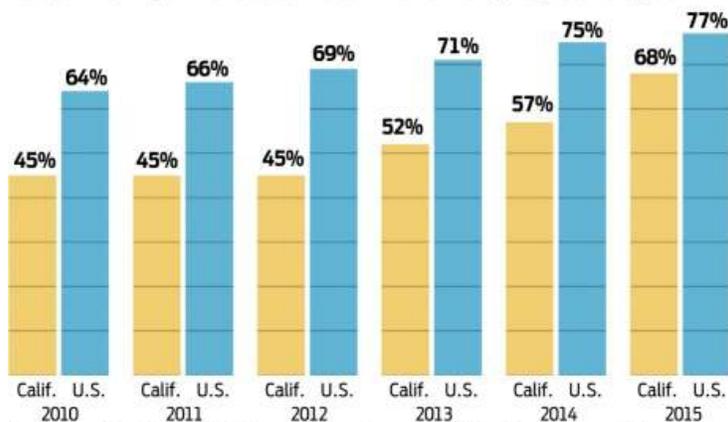
## California lags in emergency preparedness

Many California dam owners do not have official plans in the event of an emergency, even though there are hundreds of dams that would likely result in fatalities if breached. As of 2015, the proportion of emergency action plans at California’s high-hazard dams was less than the national average.

### California high-hazard dams



### Percent of high-hazard dams with an emergency action plan



Note: As of Jan. 25, 2017, California’s Department of Water Resources said there were 679 high-hazard dams in the state and 70 percent had emergency action plans.

Sources: Analysis of U.S. Army Corps of Engineers’ National Inventory of Dams provided by the Association of State Dam Safety Officials, 2016.

John Blanchard / The Chronicle

federal regulators revealed that local officials do not believe there would be enough time to evacuate nearby residents in the event of a dam failure, according to the Associated Press.

Lake Oroville is a key cog in California's water system, second only to Lake Shasta in storage capacity. The massive reservoir sends water to Central Valley farms as well as several urban water agencies, including the Metropolitan Water District of Southern California and the Santa Clara Valley Water District. The reservoir also provides flood control for downstream communities and helps regulate salinity in the Sacramento-San Joaquin River Delta. On Feb. 7, a gaping crater formed in the primary spillway, and the dam's emergency spillway later eroded to a point of near-failure under far less water flow than both were designed to withstand. Surrounding towns were evacuated on Feb. 12. The problems appear to have been caused by defects that either had shown up in inspections or were flagged to state and federal officials going back more than a decade — prompting some experts to question the state's monitoring of the dam.

The Department of Water Resources has defended its management of the main spillway and its handling of the situation, describing it as a unique event. It is unclear what inspectors may or may not have found during the dam's most recent, more detailed five-year inspection; those records were not immediately available. "Did they miss something that they should have caught? Or did they catch it and ignore it?" said Martin McCann of Stanford's National Performance of Dams Program, a research group dedicated to dam operations, safety and public policy. "Maybe they did everything right and it just wasn't good enough to catch this particular problem." Still, McCann said, the deterioration of both spillways under relatively low water flows raised serious concerns about whether the inspections and engineering evaluations were thorough enough and whether they should be done more often. In response to the crisis at Oroville, Assemblyman Marc Levine, a San Rafael Democrat, introduced legislation Friday that would require more extensive annual inspections of spillways on state-managed dams.

"It was announced that the state had engaged in visual rather than physical inspections of the Oroville Dam spillways," Levine said. "I was alarmed and, quite frankly, angry to learn they had not applied a level of seriousness necessary to protect human life in California." Similarly strong reactions followed the breakdown of a huge gate at Folsom Dam in 1995. The breach spilled enough water each second to supply a family of five for a year and forced boaters, hikers and anglers to evacuate the American River, the Associated Press reported at the time. High-hazard Sutterfield Dam in Sonoma County went uninspected for over two years, but a check in 2016 showed it to be safe. Although the incident posed no danger to communities downstream, it prompted significant improvements in how dam gates are evaluated, inspected and maintained, McCann said, such as establishing regular replacements of mechanical components. "All of this points to some level of concern about how we look at dams and how we capture evidence on issues that may be taking place that we are not uncovering and dealing with in a timely manner," McCann said.

As of 2013, California budgeted nearly \$12 million for its dam safety program, or more than \$9,000 per regulated dam — compared to the national average of less than \$1,000 per dam, according to National Inventory of Dams data. That funding does not include money for maintenance and repair, said Ogden of the Association of State Dam Safety Officials.

"They are really far and above any other state program," he said. "They have a lot of resources and they use them. "Still, critics argue that the investment is not enough for the nation's largest and most complex water system, which was built with much different weather patterns in mind. Due to ongoing climate change, experts say California's expected snowfall will decrease, and the state will face longer stretches of drought followed by extreme rain and floods. Dams will likely be severely strained during wet years and should be upgraded to handle more punishing weather.

The 64-year-old Isabella Dam, on the Kern River near Bakersfield, is set to begin a sweeping \$500 million reconstruction project this fall to address earthquake safety concerns, seepage problems and to prepare for more water flow than it was constructed to handle. In the new design, the dam's spillway capacity has been tripled to accommodate a "Noah-like event," said Dana Munn, the Kern

**River Watermaster, who handles policy affecting the river.** “The crisis at Oroville tells us we need to be thinking more carefully about California's overall water challenges,” said Gleick of the Pacific Institute. “We can't take the old infrastructure's safety for granted any longer.”

Nicholas Sitar, a UC Berkeley professor in civil and environmental engineering, said the situation at Oroville provides important lessons. Historically, the political climate in California has put dam maintenance and upgrades low on the state's list of priorities — even as the risk of failure, and the potential for catastrophic damage, have steadily grown. “The impact if something happens is so different than when these dams were built and designed,” Sitar said. “What was acceptable risk at the time is no longer acceptable.” Residents of Oroville were confronted with that reality last week as their local dam turned from a scenic hill, often used for hiking and recreation, into a life-threatening hazard. Joe Williams, a 27-year-old manager at a local coffee shop, said the evacuation was chaotic and surreal. Since his return last Tuesday, he said he has kept an emergency backpack full of clothes in his car just in case he must flee again. “It has left us all with an uneasy feeling that hasn't gone away yet,” Williams said. *Joaquin Palomino and Cynthia Dizikes are San Francisco Chronicle staff writers. Email: jpalomino@sfchronicle.com, cdizikes@sfchronicle.com Twitter: @JoaquinPalomino, @cdizikes*



### ***Other Stuff:***

(Always thought Wash. DC was 2<sup>nd</sup> worst.)

### **10 Worst Cities in World for Traffic Congestion**

**Los Angeles drivers fare the worst**

By Newser Editors, Newser Staff, Feb 20, 2017, newser.com

10 comments Comments

(NEWSER) – Los Angeles is a world leader in an unwanted way: traffic congestion. In a study by analytics firm Inrix, the city topped all others in terms of how much time people spend stuck in gridlock traffic, reports USA Today. In LA, broke down to 104 hours per person in 2016. The world's 10 worst, per the AP:

1. Los Angeles, 104 hours
2. Moscow, 91 hours
3. New York City, 89 hours
4. San Francisco, 83 hours
5. Bogota, Colombia, 80 hours
6. Sao Paulo, Brazil, 77 hours
7. London, 73 hours
8. Atlanta, 71 hours
9. Paris, 65 hours
10. Miami, 65 hours



Here are the 10 worst in the US, per Inrix: <http://finance.yahoo.com/news/los-angeles-tops-inrix-global-050100714.html>

1. Los Angeles, 104 hours
2. New York City, 89 hours
3. San Francisco, 83 hours
4. Atlanta, 71 hours
5. Miami, 65 hours
6. Washington, DC, 61 hours
7. Dallas, 59 hours

8. Boston, 58 hours
9. Chicago, 57 hours
10. Seattle, 55 hours

You can dig into the full rankings here: <http://inrix.com/scorecard/>



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